Update in Pediatric Dysphagia: The Growing Years

April 2018 ISHA Indiana Donna Edwards, M.A. CCC-SLP, BCS-S, OSLHA-F, ASHA-F

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Disclosure:
Nonfinancial Relationship
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Objectives

- The participant will be able to state four recent research resources supporting treatment and evaluation of dysphagia in children and young adults.
- The participant will be able to delineate between typical and atypical feeding and swallowing development in children and young adults.
- The participant will be able to describe four avenues to promote advocacy efforts to support children and families dealing with dysphagia.

Historically

- Complex interplay of physiological, social, and behavioral factors
- Structural abnormalities, neurological conditions, cardiorespiratory complications, metabolic dysfunction, behavioral issues
- Similar behavioral feeding patterns occur in healthy young children, but at a higher frequency in children with a feeding disorder
- Slow feeders: longer than 30 minutes
- Significant association between picky eating pattern, length of meal time and oral motor dysfunction
- Slow transition between meals, settings, feeders, foods, etc.
- The term picky eater, a common pattern for toddlers, is exacerbated to the level of narrowed food selection often with insufficient necessary nutrients

Critical Thinking: Our Charge for Functional Outcomes

- Adept at diagnosing, treating and re-assessing feeding and swallowing disorders and recognize that treatment varies in relation to individual patient need
- Ultimate goal is to increase oral intake with the purpose of helping each patient meet his or her nutritional needs in the safest, most effective way possible across settings
- Analyzing the feeding disorders and dysphagia in association with our ever growing understanding of sensory systems, psychosocial, psychobehavioral and motor aspects of food and liquid consumption in light of the family and social dynamic

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**Reduced Airway Protection**

**High risk of aspiration post swallow**

**Stasis or Residue**

- Reduced pharyngeal pressure
- Reduced laryngeal excursion/anterior movement
- Thicker is not always better

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**Functional single swallow**

- Thin liquids
- Sipper Cup presentation
**DMSS**

**Dysphagia Management Staging Scale (DMSS)**

Quick test for dysphagia, unsafe eating behaviors and delayed development of eating skills that has been standardized on over 800 people, including children and adults, with developmental disabilities. It can be administered in as little as 10 minutes.

The DDS is appropriate for use for ages, 2-years through adulthood.

The DDS is a task analysis tool that describes the characteristics of the disorder and provides raw and standardized scores that are numerical measures of severity. The scores permit test-re-test comparisons, and comparisons between individuals and between groups of individuals.

The DMSS is a five-level scale for rating severity of involvement for feeding and swallowing disorder based on management needs and health related outcomes. It is used in conjunction with the DDS.

This is work! What do you see?

Notice:
Reduced endurance and coordination with repetitive chewing

Recruitment of other muscles/movements for maladaptive compensatory efforts
- head
- periorbital
- procerus
- nasalis
- mentalis
- saliva management
- shallow nasolabial folds
- pale
- horizontal jaw slide

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How Do We Apply Research To Practice?
EBP

Key points: Belgium Study (120 children)
- Pulmonary problems play an important role in the morbidity and mortality of children with neurocognitive impairment
- Impact may be under-recognized by caregivers and doctors.
- Medical literature pays relatively little attention to this topic.
- The diagnostic and therapeutic approach should be multidisciplinary.

Key points: Belgium Study
- Children with neurocognitive impairment often present with chronic or recurrent respiratory problems.
- The respiratory problems have an important impact on quality of life and life expectancy.
- The underlying causes are multiple: risk of aspiration, insufficient cough, upper airway obstruction and progressive kyphoscoliosis.
- There is often a complex interplay between these known risk factors.
- The diagnostic and therapeutic approach should be multidisciplinary.
Risk factors for respiratory illness in children with disability.

Marijke Proesmans Breathe 2016;12:e97-e103

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Obstructive sleep apnea

What do we know?
Kyphoscoliosis

Children with CP, and other neurological problems, are prone to develop musculoskeletal deformities. May result in:
• loss of selective motor control
• an increase in underlying muscle tone/muscle imbalance which can lead to abnormal deforming forces acting on the immature skeleton
• mechanical disadvantage of the respiratory muscles
• decrease chest wall compliance
• If present in the young child may limit lung growth.
• In children and adults with severe neurological impairment, kyphoscoliosis is one of the major factors predicting increased end-tidal carbon dioxide, a measure of respiratory ventilator
• Occasionally, severe kyphoscoliosis can lead to airway compression by the displaced spine.

Postural Stability Principles

Movement

- mature, organized mobility develops from stability
- movement develops proximal to distal
- gross motor control precedes fine motor control
- facilitation of maximal independent function is the long term goal

Primary Role: Rehabilitative Exercises

- effect change in the physiologic components of swallowing
  + strength
  + duration
  + timing of movement
  (Koellner, et. al. 2009)
- retraining the neuromuscular systems to bring about neuroplasticity
  + the ability of the brain and nervous system to change
  + structurally
  + functionally
- pushing any muscular system in an intense and persistent way will bring about changes in neural innervation and patterns of movement
  (Langmore & Piesgna 2015)
Neuroplasticity

Use it or lose it: Failure to use a swallow results in degradation of the swallowing musculature and diminished innervation. Patients should purposefully swallow more often to improve swallowing (muscle memory).

Transference: Other motor units can learn to participate in the task (perhaps by increasing overall strength) or even take over the task (i.e. non-damaged adjacent cortical areas or recruitment of non-damaged areas) as transference occurs (Burkhead et al., 2007; Robbins et al., 2008).

Synkinesis or recruitment of neck musculature

Principles of exercise: Neuroplasticity

- **Integrity** underlies any swallowing exercise program.
- Engaging in exercise that is not intense enough to push the system beyond the level of activity to which it is accustomed will not result in adaptation.
- The swallowing exercise must exceed usual levels of activity and performed for an adequate duration to have an effect (Burkhead et al., 2003, p. 255).

Specificity, swallowing recruits specific motor units. Training that task will reinforce the motor units and the involved neuronal pathways (Clark, 2003; Clark and Shelton, 2011; Robbins et al., 2008).

Expiration muscle strength training (EMST)

- Improve vocal intensity
- Treatment philosophies can be extended to other populations with small movements beyond ALS
- Retrain sensory perception, establish new association between effort and normal movement (make it bigger)
- Relation to Principles of neuroplasticity
  - Forced/Effortful use
  - Intensive practice
  - Complexity/Challenging
  - Feedback/motivation

Non-swallowing exercises:

- **Lee Silverman voice treatment (LSVT)**
  - Improve vocal intensity
  - Treatment philosophies can be extended to other populations with small movements beyond ALS
  - Retrain sensory perception, establish new association between effort and normal movement (make it bigger)
  - Relation to Principles of neuroplasticity
  - Forced/Effortful use
  - Intensive practice
  - Complexity/Challenging
  - Feedback/motivation

Expansory muscle strength training (EMST)

- Enhancing quickly and forcefully into a mouthpiece that is attached to a one-way valve, blocking the flow of air until the patient produces sufficient expiratory pressure.
- It is meant to strengthen the expiratory and sub-mental muscles by increasing the physiologic load.
Swallowing Exercises:

- **Makoto.** This maneuver involves swallowing while protruding the tongue beyond the lip and holding it between one’s teeth. Incomplete contact between the posterior pharyngeal wall and the base of the tongue.
- **McNeil dysphagia treatment protocol.** This is a relatively new program in which swallowing “hard” is the single focus. This exercise appears similar to the Effortful Swallow. Reportedly, bolus sizes and volumes are increased in difficulty and the patient is encouraged to swallow faster and harder.
- **Mendelsohn.** Well-known swallow maneuver to target laryngeal excursion. It is often taught with some form of biofeedback to help the patient perform it correctly.
- **THE super-supraglottic swallow.** This maneuver involves a person holding a tight breath, swallowing while keeping the airway tightly closed, then immediately coughing after the swallow. Swallowing elicits an immediate effects on laryngeal and hyoid excursion.
- **No studies investigated the long-term effect or carryover** (Langmore & Pisegna 2015).

Other Clinical Considerations

- Lung disease related to chronic pulmonary aspiration is a major cause of death in neurologically impaired children (Silverman 2015).
- The best clinical course may appear to be a non-oral feeding plan to protect a child's lungs.
- We don’t want to overlook the importance of oral experiences on the child’s ability to develop appropriate oral motor and swallow function.
- We realize the lack of opportunity throughout critical developmental periods can impair acquisition of appropriate oral motor and swallow function (Arvedson, 2008; Kelly, Huckabee, Jones, & Frampton, 2007).
- Close monitoring of oral development and lung health must be ongoing for children at risk for chronic aspiration (Arvedson & Coffin, 2007).
- To balance all factors, a clinician should advocate for a feeding plan that allows for:
  - greatest amount of exposure to oral trials
  - lowest amount of aspiration risk
- What should we do clinically?

Behavioral Assessment

- Identify components of the feeding problem
- Determine if the family’s goals are appropriate and achievable
- Clarify family’s treatment objectives
- Observation of the child while being fed
- Clinical interview
- Caregiver-completed questionnaires

Medical record review

- Observations of the child eating
- Determined if the family’s goals are appropriate and achievable
Behavioral Management Strategy

Pick a Reward
- Immediate reinforcement after the goal is reached
- Transient reinforcer
- Over time transition to random reinforcement
- Earn game time or special event

Extinguishing Strategies
- Ignore fussing
- Present food until accepted
- Modify challenge
- Once accepted, provide 30 second break

Behavioral Reinforcement

Positive Reinforcement
<table>
<thead>
<tr>
<th>Behavior</th>
<th>Rewarding Stimulus Provided</th>
<th>Future Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore new food</td>
<td>Parent or clinician praise performance</td>
<td>Increased exploration of new food</td>
</tr>
<tr>
<td>Portion control/reduce bite size</td>
<td>Limited volume chewed 1 water</td>
<td>Increased acceptance of bites</td>
</tr>
<tr>
<td>Refuse to eat school lunch with peers</td>
<td>Reduced separation from peers</td>
<td></td>
</tr>
</tbody>
</table>

Negative Reinforcement

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Rewarding Stimulus Provided</th>
<th>Future Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore new food</td>
<td>Lack of parent/counselor praise</td>
<td>Increased exploration</td>
</tr>
<tr>
<td>Accepts requested bite challenge of new food</td>
<td>That food is put away for session</td>
<td>Increased acceptance of food and challenges</td>
</tr>
<tr>
<td>Refuses presence of new food near self on plate</td>
<td>Not asked to explore or eat</td>
<td>Increased acceptance of non-preferred foods</td>
</tr>
</tbody>
</table>

Incorporating Family and Cultural Issues into a School Swallowing and Feeding Program

- What do you think resulted in the swallowing/feeding problem?
- Have other family members had the same or similar conditions?
- How would you describe family meal times/community meals/school meals?
- What have you done to try to improve the swallowing/feeding problem?
- Have you sought advice or treatment?
- What goals do you have related to the swallowing/feeding problem?
- What results are you hoping to achieve in therapy?
- Who would you like to be a part of this process (i.e., family, friends, interpreters)?
- Do you agree with the diagnosis and recommendations?

(Calgary Health Region, 2005) modified
Help the Parent Feel Successful: Optimize carryover to home(s)

- Reduce meal time stress
- Offer achievable, simple tasks
- Gradually transition skills with most readily accepted foods in session to home
- Work toward family/child goals
- Explore foods grocery shopping, preparing meal, cleaning up
- Help plan foods to bring to therapy
- Goals for same family meal

“Schools are the right place for a healthy start”
-CDC

- Enhancing and improving academic performance
- Recognizing the close relationship between health and education
- Skipping breakfast, minimal intake of specific foods, nutrient deficits and insufficient food intake:
  - Lower grades
  - Higher rates of absenteeism
  - Inability to focus
  - Grade repetition

Goals and Core Concepts

Incorporate treatment goals into school related core concepts

- Depending on the age, grade level and skill level:
  - Compare/contrast multiple fruits with classmates, caregivers, siblings (appearance, touch, taste, mashable?, etc.)
  - Complete sentence generation with subject + verb agreement (spoken, written)
  - Write a paragraph/draw image
  - “Why questions”
  - Write a story using vocabulary related words (crunchy, shape,..)
  - How to prepare a dish/sandwich using appropriate sequence

ASHA 2012 School Survey

- Students
- Preschoolers
- Day/Residential
- Autism
- SLP serve
- Feeding Prob
- Selective feeder
- Typically Dev
Diagnosis update

**DSM-IV**
- Child must be under the age of 6 at the time of onset
- Poor oral intake or inability to maintain a healthy weight for at least 1 month that cannot be associated with a medical condition
- Difficult parent-child relationship

**DSM-5**
- Avoidant/Restrictive Food Intake Disorder (ARFID) has replaced Feeding Disorder of Infancy and Early Childhood
- Persistent disturbance in eating leading to significant clinical consequences
  - Weight loss
  - Inadequate growth
  - Nutritional deficiency
  - Dependence on tube feeding or nutritional supplements to sustain adequate intake
- Impaired psychosocial functioning (unable to eat with others)

Role of Classroom and Personal Assistants

- Follow swallowing plan under the supervision of the classroom teacher
- Reports observed feeding/swallowing changes to the teacher or dysphagia case manager
- Note: Classroom assistants may also be referred to as para-professionals, health/safety aides, classroom aide, para-educator, teacher assistant, etc.

Individual vs. Classroom activities

- Take a trip to the school library to select food related/cooking book.
- Share books with parent/caregiver as a routine part of life.
- Name some foods/recipe ingredients in a book.
- Talk about food preparation/vocational roles in books.
- Listen attentively to stories. (restaurant/shopping)
- Begin paying attention to specific print such as the first letters of their names.
- Make a collage/trace/draw pictures of foods
- Trace/copy food words/food shaped letters (o = cereal ring)
- Ask to help prepare/serve foods at home.
- Clear the table/help with grocery list preparation/shopping
- Explore touching, smelling and talking about foods. (grid)
- Understand that food/liquids provide fuel for the body/growth/nutrition
- Identify familiar foods from home/restaurants
- Participate in food related games. (make a rainbow plate)
- Identify some smells/quotes and describe
- Attempt writing a menu/plan class party/celebration

To work effectively as a team each member must be willing to:
- Be aware of each person’s role
- Share information
- Realize personal and professional limitations in relation to dysphagia
- Be open to suggestions and to problem solving
- Have open communication among the team members

Strategies to incorporate

- Students must develop skills for eating efficiently during meals and snacks so they can complete eating and drinking activities with their peers safely and in a timely manner
- Modified diet
- Extended time for meals/snack or meal with peers
- Limiting distractions
- Use of adapted utensils
- Equipment for proper positioning
- Partial to total assist with intake
- Needs of students may change as environments, social situations, the need for independence and advancing nutritional needs evolve

*References*
- Bryant-Waugh 2013
- Mabry-Price (2014)
Parental Perception

The literature supports:

- An association between parents’ anxiety and reporting feeding problems
- Caregivers frequent expression of inadequacy and frustration
- The importance of a multifactorial approach to understanding childhood feeding difficulties,

Further research needed:

- Neural control of feeding and breathing coordination in full-term and premature infants
- Thickening agents and their effect on the pediatric and elderly geriatric gastrointestinal tract
- Effect of aspiration on the developing pulmonary system
- Effect of aspiration on the developing sensory system

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