New Evidence-Based Support of a 3 Ounce Water Swallow Challenge Protocol

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3 Ounce Water Swallow Protocol

- **Programmatic Line of Research**
- **Study Design(s) and Data Collection:**
  Began 1999 and continues today
- **First Publication:** 2008
- **Related and Corroborating Publications:**
  2009 - 2012
- **Future Research Initiatives:** Ongoing

Leder & Suiter, ASHA 2012
YNHH

Bedside Dysphagia Screening Tool – Step 1

Screening deferred: NO risk factors for dysphagia.

Any YES answer to the following risk factors will also defer screening:

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If the patient’s clinical status changes and there is a risk for dysphagia, the patient must be re-screened before PO intake.

Leder & Suiter, ASHA 2012
3 Ounce Water Swallow Challenge

If patient is at risk for dysphagia and all of the above are answered NO, perform 3 ounce water swallow challenge

- Sit patient upright at 80-90º (or as high as tolerated)

- Ask patient to drink entire 3-oz (90 cc) of water from a cup or with a straw in sequential swallows without stopping (cup/straw can be held by staff or patient)

- Assess patient for coughing or choking during or immediately after completion of drinking
Results /Interpretation:

- **Pass:** Successful uninterrupted drinking of all 3-oz without overt signs of dysphagia, i.e., coughing or choking.
  - If patient passes, collaborate with MD/LIP to order a diet. If dentate, order a modified or regular diet. If edentulous, order a liquid and puree diet. Consult with SLP for other diet modifications.

- **Fail:** Inability to drink entire amount in sequential swallows (stops/starts) or patient exhibits coughing or choking.
  - If patient fails, keep NPO and collaborate with MD/LIP for a referral for formal swallowing evaluation by SLP. Re-evaluate in 24 hours if patient clinically improves.

Leder & Suiter, ASHA 2012
Expanding from a Screen to a Protocol

- Not just determining isolated success or failure of the 3 ounce water swallow challenge
- Incorporating a richer patient-oriented environment by including:
  - Cognitive Status
  - Oral-peripheral/Oral mechanism evaluation

Leder & Suiter, ASHA 2012
Expanding from a Screen to a Protocol

- Which leads to the next area in this programmatic line of research…
3 Ounce Water Swallow Protocol

Answering Orientation Questions and Following Single-Step Verbal Commands: Effect on Aspiration Status

Leder SB, Suiter DM, Warner HL.

*Dysphagia* 2009;24:290-295
Purpose: To determine if there was a difference in odds for aspiration when giving the 3 ounce protocol based upon correctly answering 3 orientation questions (name, place, date) and 3 single-step verbal commands (open mouth, sick out tongue, smile).

N = 4,070 referred acute-care patients (December 1999 – January 2007)
Associated Research

Results

Odds of Liquid Aspiration:
- 31% greater for patients NOT oriented to person, place, & time.

Odds of Liquid & Puree Aspiration and also being deemed unsafe for ANY oral intake:
- 48-69% greater for patients UNABLE to follow single-step verbal commands.

Leder & Suiter, ASHA 2012
Associated Research

- Conclusions with Direct Diagnostic and Clinical Importance:
  - Ability to answer orientation questions and follow commands provides information on odds of aspiration for liquid and puree foods as well as overall eating status prior to dysphagia testing.
  - Allows individualization of testing to optimize swallowing success.

Leder & Suiter, ASHA 2012
Associated Research

One still gives the 3 ounce protocol to all appropriate patients
- If protocol is PASSED (even with incorrect orientation/following commands) then recommend oral diet

But…
- If protocol is FAILED then you know how to individualize FEES/VFSS

Leder & Suiter, ASHA 2012
Associated Research

- **Why?**
  - Alerts clinician to potential swallowing difficulty

- **How?**
  - Allows extra care to ensure most clinically useful test in order to promote safest swallowing
  - Bolus volume modifications implemented
  - Bolus delivery modifications (spoon v. straw)
  - Bolus consistencies modifications available

Leder & Suiter, ASHA 2012
3 Ounce Water Swallow Protocol

Can an Oral Mechanism Examination Contribute to the Assessment of Odds of Aspiration?

Leder SB, Suiter DM, Murray J, Rademaker AW

*Dysphagia* (Submitted)
Associated Research

**Purpose**: To investigate if components of an oral mechanism examination, i.e., binary judgments (complete/incomplete) of labial closure, lingual range of motion, and facial symmetry, were associated with increased odds of aspiration as confirmed by subsequent instrumental testing (FEES).
Associated Research

Study Design: Single group (n = 4,102) referred case series with a single judge.

Confirmatory intra- and inter-judge agreement performed (n = 128) with 100% agreement for tracheal aspiration on at least 1 liquid or puree swallow on FEES.

Inclusion Criteria: Adequate cognitive ability to participate in an oral mechanism examination

N = 3,919
Associated Research

Results

Univariate Analysis: Only incomplete lingual range of motion was significantly associated with an increased odds of aspiration (Odds Ratio 2.37, p < 0.0001)

Leder & Suiter, ASHA 2011
Associated Research

Results

Step-wise logistic regression analysis indicated that incomplete lingual range of motion and incomplete facial symmetry had odds of aspiration 2.72 (p < 0.0001) and 0.76 (p = 0.017), respectively, compared to complete lingual range of motion and facial symmetry.

Leder & Suiter, ASHA 2011
Associated Research

But, since the increased odds of aspiration associated with incomplete facial symmetry was weak (0.76)...

The dysphagia specialist may choose to place increased clinical importance re: odds of aspiration on incomplete lingual range of motion v. incomplete facial symmetry.

Leder & Suiter, ASHA 2011
Associated Research

Labial Closure

Although not associated with increased odds of aspiration, it is still a clinically relevant component of the oral mech. exam.

Labial closure prevents bolus loss/drooling

Crucial for successful oral phase of swallowing

Leder & Suiter, ASHA 2011
Generalizing Results to Different Patient Populations

- Building a foundation based on a programmatic line of research: From evidence-based practice to optimal clinical care implementation

- Targeted Patient Populations:
  - Pediatric
  - Trauma
  - Stroke
  - General Hospital

Leder & Suiter, ASHA 2012
Pediatric 3 Ounce Water Swallow Protocol

Suiter DM, Leder SB, Karas DE

The 3-Ounce (90cc) Water Swallow Challenge: A Screening Test for Children with Suspected Oropharyngeal Dysphagia

Otolaryngol Head Neck Surg 2009;140:187-190

Leder & Suiter, ASHA 2012
Pediatric 3-Ounce Water Swallow Protocol

- **Purpose:** To determine generalizability and clinical utility of the 3 ounce water swallow challenge protocol for determining aspiration status and safety of diet recommendations in pediatric patients.
  - N = 56 (mean 13 y, range 2 – 18 y)
  - FEES = objective criterion standard for comparison with the 3 ounce protocol results

Leder & Suiter, ASHA 2012
Pediatric 3-Ounce Water Swallow Protocol

Methods

- N = 56 (mean 13 y, range 2 – 18 y)

- FEES = objective criterion standard used for comparison with the 3 ounce protocol results

- Procedures: Same as Suiter & Leder (2008)
Pediatric 3 Ounce Water Swallow Protocol

Results

- Corroborated findings with adults (Suiter & Leder, *Dysphagia* 2008;23:244-250)

3 ounce challenge:

- 100% sensitive for determining aspiration of thin liquids (all who aspirated on FEES also failed water swallow challenge)

- 100% sensitive for identifying individuals deemed safe for oral intake (all given oral diet)

Leder & Suiter, ASHA 2012
Pediatric 3-Ounce Water Swallow Protocol

Conclusions

- If the 3 ounce water swallow challenge protocol is passed, not only thin liquids but diet recommendations with puree and solid food consistencies can be made for children without the need for further instrumental dysphagia testing.

Leder & Suiter, ASHA 2012