DYSPHAGIA SCREENING and CLINICAL SWALLOW EVALUATIONS

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Diagnostic Tests vs. Screening

• Diagnostic tests are used when a person is suspected of having a condition.
  – Purpose is to confirm this or rule it out.

• Screening tests are given more broadly, usually to groups of asymptomatic people to determine if any of them have the condition in question.
  – Groups can range from everyone in the population to a more individualized, case-finding approach of people at high risk for a condition.

(Streiner, 2003)
Screening Tests

- Screening tests in general have high sensitivities and low specificities, which allows detection of most patients with a condition, while having the acceptable disadvantage of a high rate of false positivity.

Screening Tests

- Use of screening tests for early detection is based upon 2 assumptions:
  1. The nature of the disorder is such that previously undetected problems will become major ones if untreated;
  2. Treatment exists and is effective.

Streiner, 2003
<table>
<thead>
<tr>
<th></th>
<th>Screening tests</th>
<th>Diagnostic tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>To detect potential disease indicators</td>
<td>To establish presence/absence of disease</td>
</tr>
<tr>
<td>Target population</td>
<td>Large numbers of asymptomatic, but potentially at risk individuals</td>
<td>Symptomatic individuals to establish diagnosis, or asymptomatic individuals with a positive screening test</td>
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<tr>
<td>Test method</td>
<td>Simple, acceptable to patients and staff</td>
<td>maybe invasive, expensive but justifiable as necessary to establish diagnosis</td>
</tr>
<tr>
<td>Positive result</td>
<td>generally chosen towards high sensitivity not to miss potential disease</td>
<td>Chosen towards high specificity (true negatives). More weight given to accuracy and precision than to patient acceptability</td>
</tr>
<tr>
<td>result threshold</td>
<td></td>
<td></td>
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<tr>
<td>Positive result</td>
<td>Essentially indicates suspicion of disease (often used in combination with other risk factors) that warrants confirmation</td>
<td>Result provides a definite diagnosis</td>
</tr>
<tr>
<td>Cost</td>
<td>Cheap, benefits should justify the costs since large numbers of people will need to be screened to identify a small number of potential cases</td>
<td>Higher costs associated with diagnostic test maybe justified to establish diagnosis.</td>
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• ASHA's Preferred Practice Pattern on Swallowing Screening:

"Swallowing screening is a pass/fail procedure to identify individuals who require a comprehensive assessment of swallowing function or a referral for other professional and/or medical services" (ASHA, 2004, p. 3-10).

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Goals of Swallow Screening

1. To determine the likelihood that dysphagia is present;
2. To determine the need for formal swallow evaluation;
3. To determine when it is safe to recommend resumption of oral alimentation.
What comprises a screening test?

• Interview or questionnaire
• Observation of the signs and symptoms of oropharyngeal swallowing dysfunction.
• Formulation of appropriate recommendations, including the need for a full swallow function assessment.
• Communication of results and recommendations to the team responsible for the individual's care.

» ASHA, 2004, p.11
Why screen?

- Videofluoroscopy is considered the criterion standard for dysphagia assessment.
- FEES also has its merits.
- Why not do an instrumental assessment on everyone?

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Why screen?

• Risk of pneumonia is 11 times higher for patients with severe dysphagia and aspiration.

• Hospitals using a mandatory and formal dysphagia screening have lower pneumonia rates than those without (Hinchey et al., 2005; Odderson et al., 1995)
Why screen?

- ASHA, AHA, VHA all recommend screening patients who are suspected of having dysphagia.
- Dysphagia screening for individuals admitted to the hospital with stroke or suspicion of stroke is recommended or required in the U.S., Canada, Australia, and the United Kingdom (Martino et al., 2008).
The Joint Commission

• The Joint Commission Primary Stroke Center certification:
  – One performance measure included a dysphagia screen for all individuals with ischemic and hemorrhagic stroke prior to ingestion of food, fluids, or medications.
  – This requirement was retired as a performance measure in 2010.
    • WHY?

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What makes a good screening test?

- Easy to administer
- Inexpensive
- Accuracy
  - Sensitivity
  - Specificity
  - Positive predictive value
  - Negative predictive value

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Screening test accuracy

• Sensitivity:
  – A test's ability to designate an individual with disease as positive.
  – A highly sensitive test means that there are few false negative results, and thus fewer cases of disease are missed.
  – High sensitivity values mean a negative result on the clinical test should help rule out the diagnosis.

(Rosenbek, McCullough, & Wertz, 2004)
Screening test accuracy

• Specificity:
  – The ability of a clinical test to designate an individual who does not have a disease as negative.
  – A highly specific test means that there are few false positive results.
  – High specificity values mean that positive results for a clinical measure should help rule in the diagnosis.

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Screening test accuracy

- **Positive predictive value:**
  - Positive predictive value is the probability that a patient with a positive (abnormal) test result actually has the disease.
  - So, PPV for a clinical test (e.g., 3 oz. test) for detecting aspiration, as confirmed by instrumental assessment, is the proportion of patients who fail the 3 oz. test who also aspirate on instrumental exam.

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Screening test accuracy

• Negative predictive value:
  – Probability that a person with a negative (normal) test result is truly free of disease.
  – So, NPV for a clinical test (e.g., ability of the 3 oz. to detect aspiration, as confirmed by VFSS) is the proportion of patients who pass the 3 oz. test who also do not aspirate on VFSS.

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Screening test accuracy

• Likelihood ratio
  – The likelihood that a given test result would be expected in a patient with the target disorder compared to the likelihood that that same result would be expected in a patient without the target disorder (Centre for Evidence Based Medicine, 2009).
Who should screen?

- Speech-language pathologists
- Nurses
- Physicians
- Others

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What are we screening for?

- Aspiration
- Dysphagia
- Need for instrumental assessment
- Ability to tolerate oral diet

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How are we screening?

• Bolus administration:
  – Any?
  – Amount?
  – Viscosity?

• Questionnaire:
  – What items are important?
  – Who completes?
  – What constitutes a failure?
  – What happens after failure?
Models of Screening
(Swigert, Steele, & Riquelme, 2007)

A. Nurse-administered screening
   • Nursing staff trained by SLPs.
   • Patients who fail are referred to SLP.

B. Physician-administered screening
   • Administered as part of routine medical evaluation.
   • Physician refers patients who fail screen to SLP.

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Models of Screening  
(Swigert, Steele, & Riquelme, 2007)

C. Model A or B
   • All patients automatically referred to SLP for assessment within specified time period, regardless of screening results.

D. No prior screening. All patients automatically referred to SLP for swallow screening or assessment.
The Toronto Bedside Swallowing Screening Test (TOR-BSST) (Martino et al., 2009)

• Intended for use by any health care professional who has received training in screening.
• Developed for use with patients with stroke.
• Can be administered across healthcare settings.
• Items include:
  – Vocal quality assessment before and after swallow
  – Tongue symmetry
  – Water swallows (10 individual tspns)
Guggling Swallowing Screen  
(Trapl et al., 2007)

- Developed for patients with stroke.
- Screening for dysphagia, not just aspiration.
- SLP administered
Gugging Swallowing Screen  
(Trapl et al., 2007)

• Two parts:
  – Indirect swallowing test
    • Alertness
    • Cough/throat clear
    • Saliva swallow
  – Direct swallowing test
    • Starts with administration of 5 ½-tspns of water thickened to pudding
    • Liquid – Max. is 50 mL
    • Solid - Bread
Massey Bedside Swallowing Screen
(Massey & Jedicka, 2002)

• Developed for patients with stroke.
• Screening for dysphagia
• Nurse-administered.
• Assesses:
  – Alertness
  – Dysarthria
  – Oral mech
  – Cough
  – Water swallows: 1 tspn, 60 cc
Modified Mann Assessment of Swallowing Ability (Antonios et al., 2010)

• Physician-administered (Neurologists)
• For patients with CVA
Modified Mann Assessment of Swallowing Ability (Antonios et al., 2010)

- Screening includes 12 of 24 items from the MASA
  - Alertness
  - Cooperation
  - Expressive Aphasia
  - Auditory comprehension
  - Dysarthria
  - Oral Mech Exam
  - Respiration
  - Cough

- No boluses are presented
3-Ounce Water Swallow Test

• 3-ounce water swallow test (DePippo et al., 1992)
  – Widely used clinical screening to determine risk of aspiration
  – Patients are given 3 ounces of water and asked to drink the entire amount.
    • Failure:
      – Inability to consume entire 3 ounces
      – Coughing/throat clear within 1 minute of test administration
3-Ounce Water Protocol

(Leder & Suiter)

- Orientation questions
- Command following (1-step)
- Oral mechanism exam
  - Lingual/labial ROM
- 3 ounce water test

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Conclusions

• Still no consensus on:
  – Who
  – What
  – How to screen for dysphagia and/or aspiration risk.

• Water swallow test appears to be necessary part of screening
Clinical Swallow Examination

- Chart Review
- Case History
- Patient Observation
- Oral-Mech Examination/Cranial Nerve Examination
- Swallow Examination if appropriate

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Purpose of the Clinical Examination
(ASHA, 2000, Clinical Indicators for Instrumental Assessment of Dysphagia)

• Allows the SLP to:
  – Integrate information from interview/case history, review medical records, observations from physical exam
  – Observe and assess integrity and function of structures of the upper airway and digestive tract
  – Identify presence and observe the characteristics of a dysphagia based on clinical signs and symptoms

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Purpose of the Clinical Examination

(ASHA, 2000, Clinical Indicators for Instrumental Assessment of Dysphagia)

– Identify clinical signs/symptoms of esophageal dysphagia or GER
– Determine need for instrumental exam
– Determine if patient is appropriate candidate for treatment and/or management
– Recommend route of nutritional management
– Recommend clinical interventions
Can a clinical swallow examination identify swallow pathophysiology?

- Delayed initiation of the swallow?
- Hyolaryngeal excursion?
- Tongue base retraction?
- Pharyngeal constrictor movement?
- Cricopharyngeal function?

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How good are we at predicting aspiration based on CSE?

- Rosenbek, McCullough, & Wertz, 2004
  - Completed CSE and VFSS on 60 patients with acute stroke
  - Examined accuracy of each of the following for predicting aspiration on VFSS:
    - Case history
    - Oral/motor praxis
    - Voice
    - Trial Swallows

Suiter, ASHA, 2012
How good are we at predicting aspiration based on CSE?

• Rosenbek et al., 2004
  – Best predictors on case history
    • Pneumonia
    • Poor nutrition
    • Tube feeding
    • Needing suction

• All had fairly high specificity (.763-1.000) with lower sensitivity (.048-.500)

Suiter, ASHA, 2012
How good are we at predicting aspiration based on CSE?

• Rosenbek et al., 2004
  – Best predictors on oral motor exam
    • Tongue strength
    • Cough strength
    • Secretions
  • Sensitivity ranged from .500-.700; specificity ranged from .450-.842

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How good are we at predicting aspiration based on CSE?

• Rosenbek et al., 2004
  – Best predictors of aspiration on speech/voice/praxis
    • Dysphonia
    • Dysarthria

• Sensitivity ranged from .773-1.000; specificity ranged from .270-.553).

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How good are we at predicting aspiration based on CSE?

- Rosenbek et al., 2004
  - Best predictors of aspiration based on trial swallows
    - Spontaneous cough
    - Wet voice
  - Sensitivity ranged from .500-.682; Specificity ranged from .632-.816)

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How good are we at predicting aspiration based on CSE?

• Rosenbek et al., 2004
  – The best predictors for aspiration were combinations of signs from different categories
    • E.g., Presence of 2 signs from the history exam (pneumonia and tube feeding, for example) had a likelihood ratio of 12.23.
Continuum of Dysphagia Assessment

Screening

Clinical Exam

Instrumental Assessment

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