Validation and Implementation of MGH Swallow Screening Tool – 2007 Update

Massachusetts General Hospital
Boston, MA
Collaborative Effort

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MGH-SST ©
Outline

• Background
• Tool development
• Validation study and results
• Education
• Marketing campaign
• Process improvement
• Panel Q & A
National Guidelines for Dysphagia Screening in Acute Stroke Patients

- American Heart Association/American Stroke Association
- JCAHO 2006
- Medicare Physician Quality Reporting Initiative
- CDC ‘s Paul Coverdell National Acute Stroke Registry
- Veteran’s Administration
Back in 2004….

Criteria for dysphagia screening tool development
- Evidence based items
- High sensitivity
- Uncomplicated administration and scoring
- Readily incorporated into daily practice
- Simple to teach and learn
Available screening tools at the time…

• Focused on a single behavioral sign such as cough after drinking water, oxygen desaturation while drinking or eating
• Rated multiple behavioral characteristics
• Too detailed or ambitious for screening purposes
• None validated against a gold standard
Objectives of screening

- Afford early identification of neuroscience inpatients unsafe for oral intake
- Facilitate safe administration of medication, food, and liquid
- Trigger timely consultations for comprehensive swallowing evaluation for patients identified at risk for dysphagia/aspiration
- Reduce complications associated with aspiration and hopefully impact hospital length of stay
MGH Swallow Screening Tool

Two Part Tool

Part I  Patient readiness

Part II  Clinical screening
MGH Swallow Screening Tool: Part I

Part I
- Wakefulness
- HOB elevated
- Unlabored breathing
- Clean Mouth

Yes ➔ Proceed to Part II
No ➔ Pt is NPO Re-screen when appropriate

Pt is NPO Re-screen when appropriate
Swallow Screening Tool: Part II

- Tongue Movement (one point)
- Volitional Cough (one point)
- Vocal Quality (one point)
- Water Swallowing (two points)
- Pharyngeal Sensation (one point)

Total Score = 6
Passing Score = 5 or 6
Part 1: Patient demonstrates:

- wakefulness
- unlabored breathing
- upright posture
- clean mouth

(All four must be present to move on to Part 2)

- If not, **FAIL** - keep NPO due to inability to complete Part 1 and re-screen when able.

Part 2: Score patient’s function on the following 5 items (check the appropriate box):

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**Final Score**

- If final score is 1-4, FAIL.
- If final score is 5 or 6, PASS.

Final Scoring:

- **FAIL** (score ≤ 4) – make patient NPO and order SLP consult
- **PASS** (score > 5) – give patient regular diet and observe for first meal
- **FAIL** (override based on clinical judgment) – make patient NPO and order SLP consult

Signature ______________________________

Circle One: MD PA RN NP
Part II - Tongue movement

• Rationale:
  – Adequate tongue range of motion and strength is critical for bolus manipulation and propulsion in the oral and pharyngeal stages of swallowing

• TASK:
  – Stick out your tongue beyond your lips
  – Lick all the way around your lips

• Scoring: 1
Part II - Volitional cough

• Rationale:
  – Weak cough predicts inability to clear airway if patient aspirates

• Task:
  – Cough as hard you can
  – Listen for sharp contact of vocal folds

• Scoring: 1
Part II - Vocal quality

• Rationale:
  – Wet, hoarse and/or raspy vocal quality indicates impaired laryngeal sensation and incomplete laryngeal closure

• Task
  – Say “ha-ha-ha-ha-ha”
  – Listen for gurgliness, breathiness and hoarseness

• Scoring 1
Part II- Pharyngeal sensation

• Rationale:
  – Positive findings – 2.5 times greater likelihood of aspiration (Horner et al 1991; Kidd 1993)

• Task:
  – Have patient close their eyes and open mouth
  – Gently stroke right pharyngeal wall consecutively with q-tip
  – Ask patient to indicate by raising hand on the side that was touched
  – Repeat on left

• Scoring: 1
Part II - Swallowing water

• **Rationale:**
  – Highest predictor of aspiration
  – Positive findings (coughing and wet vocal quality) possibility of aspiration is 5.7 x more likely (Horner and Kidd, 1991, 1993; Martino et al, 2000)

• **Task:**
  – 3 x tsp of water
  – Assess for cough, vocal quality, throat clearing, SOB
  – If no change in voice quality or cough, give 3oz of water via consecutive swallows
  – Assess for cough and vocal quality

• **Scoring:** 2
Validation Study
Aim

• To validate the MGH-SST against Fiberoptic Endoscopic Evaluation of Swallowing
Why FEES?

• Specificity and sensitivity in detecting aspiration and silent aspiration similar to VFS
• Customary practice in in-patient units
• Limits need for other resources
• Conducted at the bedside
  – No need to transport potentially unstable patients
Methods

• 9 month period (August 2006-April 2007)
• 1868 consecutive admissions to Neuroscience Service at MGH
• 253 met inclusion criteria
• 129 refused
• 124 consented
• 100 subjects completed testing
Subject Exclusion Criteria

- Diminished alertness
- Hemodynamically unstable
- Tenuous respiratory status
- Patients not medically cleared for FEES
  - Transphenoidal pituitary tumor resection
  - Concern for uncontrolled epistaxis
- Tracheostomized and intubated patients
- Lower back surgery
- Epilepsy monitoring
- Methotrexate administration for patients with CNS lymphoma
Subject Characteristics
Methods

- Research SLP obtained consent
- Within 72 hours of admission
- 1 of 3 trained research RN’s administered and scored MGH-SST
- < 4 hours interval (range 5 mins to 5.5 hours, median 1.5 hours)
- 1 of 3 trained SLP’s performed FEES, scored
- RN’s and SLP’s blinded
  - To each other’s findings
  - Details of patient history
Methods: MGH-SST

- Patient seated as upright as possible
- RN inspected oral cavity before screening
- If subject failed the first three items of the MGH-SST water swallows were deferred
- RN scored MGH-SST
- Data from MGH-SST was not used clinically
Methods: Research RN Training

• Three research nurses
• Viewed web-based MGH-SST training with research SLP
• Completed pre and post test
• Direct observation on 10 non-study patients
RN Inter-rater Reliability

- 30 randomly selected non-study patients received SST by one of three nurses
- Others observed and all scored responses
- Blinded to scores of others, SLP in attendance
- High level of concordance, ICC = 0.92; Anova F= 1.3
- Overall pass/fail agreement
Methods: FEES Procedure

- Endoscope inserted transnasally after lubrication
- No anesthesia administered
- Three single teaspoons green dyed milk
  One sip from a straw
  ½ and 1 teaspoon green dyed pudding
  ½ cookie coated with green dye
- Clinician inspects larynx carefully for aspiration
- Study recorded for later analysis
Methods: SLP training

• 1 of 3 SLPs performed FEES
• Using non-study videorecordings, SLP’s trained on the following parameters
• Binary scoring
  – Endolaryngeal secretions
  – Delayed pharyngeal swallow response
  – Laryngeal penetration
  – Transglottic aspiration
  – Pharyngeal residue
Endolaryngeal Secretions

Definition: Secretions observed in the larynx before giving food or liquid

• Presence highly predictive of subsequent aspiration of food or liquid
  (Murray et al; 1996; Donzelli et al)
Pharyngeal Delay

Definition: Bolus fills vallecular space, reaches pyriform sinuses or touches laryngeal rim before swallow is triggered (Langmore, 2005)

- Percentage of the bolus that reached these locations
  - > 50% is considered delay
- Dwell time (Langmore, 2005)
Laryngeal Penetration

Definition: Bolus enters the laryngeal vestibule over the rim of the larynx (Langmore, 2005)

- Remains above true vocal folds
- A speck in the larynx was not counted
Aspiration

Definition: Bolus passes below the true vocal folds

- Bolus noted transglottically
- Bolus pouring over the post-cricoid region below the true vocal folds
Pharyngeal Residue

Definition: More than a coating of the bolus remains in the vallecular space, pyriform sinuses and/or on the posterior pharyngeal wall after the swallow

• If the patient swallowed spontaneously to clear, scored as normal
Clinical Ratings – Estimation of Risk of Dysphagia/Aspiration

• Category I
  – No clinical concerns
  – Ready to start oral diet without further evaluation

• Category II
  – Clinical concerns
  – Needs comprehensive swallowing evaluation
  – May be able to eat with modifications

• Category III
  – Significant clinical concerns
  – Not safe to eat orally
  – Remain NPO
FEES Inter-rater Reliability

- 3 SLP’s blinded to patient characteristics and diagnosis and MGH-SST scores
- Viewed videorecording simultaneously
- Rated each bolus according to defined parameters
- Arrived at consensus after discussion
- Assigned category of risk
Results and discussion
Results

• Sensitivity
• Specificity
• Positive and negative predictive values
• What does this all mean?
Sensitivity

- Presence of a failed screen when there is true dysphagia/aspiration on FEES
Specificity

- The presence of passed screen when there is no aspiration or dysphagia on FEES
Positive Predictive Value

• The likelihood of aspiration/dysphagia if failed MGH-SST
Negative Predictive Value

• The likelihood of not having aspiration/dysphagia if passed MGH-SST
Limitations

• Pharyngeal sensation on SST
• FEES procedure
• Randomization of FEES and MGH-SST
• Tolerance of FEES
• Not generalizable to other populations
Recommendations

• Need further validation on larger cohorts, at other centers
• Assess validity and reliability of screening in multiple users
• Multivariable analyses
Conclusions

• MGH-SST is easy to use
• Reliable
• Effective tool
• Trained users do not have to have a neuroscience background
• Identifies patients safe to eat by mouth
I have a screening tool,

Now What?
• Pre-Implementation

• Marketing Campaign

• Training

• Documentation

• Process Improvement
Pre-Implementation

?’s to Consider
Pre-Implementation: What/who is driving this initiative?

- **External drivers**
  - e.g. JCAHO, stroke center accreditation

- **Financial incentives**
  - LOS; cost of aspiration pna
  - Pay for performance

- **Quality and Safety**
  - maximize patient safety and improve quality of service
  - IOM: 6 pillars

- **Combination**
  - Initially driven by external; now truly embraced
Pre-Implementation:
Who is charged with the development?

……COLLABORATIVE EFFORT
a joint project with each discipline bringing their strengths and expertise to the project
Pre-Implementation:
How would you characterize your institution?

- Size
- Rotating attendings / residents vs. consistent medical teams
- Travelers/per diem
- Pace
- Performance improvement models
- Culture of change
- Top Down or Bottom Up
Pre-Implementation: Do you have leadership support?

• Determine whether you have it

• Strategize how to gain it

• Involve those you need:
  – Your Director/Manager
  – Department of Quality and Safety
  – Nursing leadership
  – MD leadership
  – Senior Administration
• Pre-Implementation

• **Marketing Campaign**

• Training

• Documentation

• Process Improvement
Marketing Campaign

?’s to Consider
Marketing Campaign

• Why?
  – Competing initiatives
  – Behavior change

• How?
  – Saturation
  – Multiple modalities
  – Incentives
Meds and Food are Hard to SWALLOW Without a Screening

Aspiration pneumonia can be deadly…but YOU can help prevent it:

✓ Become Certified in Swallow Screening

✓ Perform the MGH SST before giving medication and/or food

✓ Complete the MGH SST sticker

✓ Do not give meds/food to patients that FAIL the screening

100% RN Certification
• Pre-Implementation
• Marketing Campaign

• Training

• Documentation
• Process Improvement
Training

?’s to Consider
Training: What to include?

- Background info on swallowing
- Nature of dysphagia
- Aspiration pneumonia facts
- Importance of oral care
- Purpose of a screening
- Clinical items
- Pre-test/Post-test
## Training: Who does it?

| **SLP trains all staff** | **Benefits:** You control the content; comes from the “dysphagia expert”  
Considerations: ALL shifts; SLP time limits; clinical workload |
|-------------------------|------------------------------------------------------------------|
| **SLP trains “super users”/champions** | **Benefits:** Less staff for SLP to train, empowers superusers as mini experts  
Considerations: Ensure superusers are expertly trained; interested and willing staff; Cover all shifts; staff turnover; sustainability |
| **Clinical nurse specialist or nurse manager** | **Benefits:** Fits well with their role as generally responsible for education and competencies; empowers ownership at unit level  
Considerations: Competing administrative responsibilities; does this role exist? |
| **Self-Guided Training** | **Benefits:** Staff complete at their convenience; can include video technology; supportive reference material; allows for repeated individual reviews; eliminates trainer  
Considerations: Ensure that the material is reviewed; technology / time allotted to support this; who will develop training |
Training: Who does it?

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**Self-Guided Training**

**Benefits:** Completed at staff’s convenience; may include video technology; supportive reference material; allows for repeated individual reviews; eliminates trainer

**Considerations:** Ensure that the material is reviewed; technology / time allotted to support this; who will develop training
Training: How do we do it?

• 1:1 tutorial
• Classroom size
• Small Groups
• Demonstrate at patient bedside
• Video format- multi-media
Training:
How do we do it, cont.? 

- Length of training
- Experienced staff vs. New Staff; Staff turnover
- Single opportunity vs. multiple sessions
Training:
Which staff need it?

Where?
- ER
- Neuro
- All units

Who?
- MD
- RN
- NP
- PA
- RD
Training: How to ensure that staff have learned it?

**Competence:** A requirement for an individual to properly perform a specific job; Encompasses a combination of knowledge, skills and behavior.

- **Frequency**
  - once
  - annual
- **Manner**
  - at bedside
  - direct observation
  - pre and post test
  - documentation review
- **Quantity**
  - consistent
  - variable
• Pre-Implementation

• Marketing Campaign

• Training

• **Documentation**

• Process Improvement
Documentation

?’s to Consider
Documentation:
How will screening be documented?

- Location

- Manner

Part 1: Patient demonstrates:
- wakefulness
- unlabored breathing
- upright posture
- clean mouth

(All four must be present to move on to Part 2)

If not, FAIL - keep NPO due to inability to complete Part 1 and re-screen when able

Part 2: Score patient's function on the following 5 items (check the appropriate box):

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Final Score

Final Scoring:
- FAIL (score < 4) – make patient NPO and order SLP consult
- PASS (score ≥ 5) – give patient regular diet and observe for first meal
- FAIL (override based on clinical judgment) – make patient NPO and order SLP consult

Signature ______________________________
Circle One: MD  PA  RN  NP

If final score is 1-4, FAIL
If final score is 5 or 6, PASS
Documentation:
Do you have electronic documentation?

• If so---Use it!
• Place it on RN/MD task list
• Automatic pop-up on Neuro patient list
• Screening results pre-populate orders template
• Diet/oral meds can only be ordered if screening passed
• SLP consulted automatically on patients that fail
• Pre-Implementation
• Marketing Campaign
• Training
• Documentation

• Process Improvement
Process Improvement

?’s to Consider
Process Improvement: Is tool being used as intended?

Chart audits

– Presence of documentation
– Accuracy of scoring
– Compare screen results to SLP eval
– NPO until documented screening
– Proper diet order based on screening results
– SLP consults driven by screening results
Process Improvement: How to ensure proper use?

**Breakdowns:**
- **Use of Tool**
- **Accuracy**
- **Documentation**
- **“Workflow” & Communication**

**Process Improvement:**
- **Marketing Blitz**
- **Increase training**
- **Triggers**
- **Systems Re-design**

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Process Improvement: Have we made a difference?

- Aspiration pneumonia rates
- LOS
- Mortality
- Patient satisfaction
- Financial
Nurse Reflections
Collaboration

• “Collaboration is building and maintaining a therapeutic team in order to provide optimum therapy.”
  • Patricia Benner

• The only way this work could have been accomplished was through collaboration.
Reflections

• A means to empower the nurse in care of complex patients
• The importance of not only considering diet restrictions but also oral medications
• Different learning styles: resistance vs. openness
  – Experienced staff/ neophyte staff
  – The use of web-based education
• Changing practice is a complex process especially in an environment of constant change
• The need to constantly revisit where we are and where we need to go
What Have We Learned?

• Training is vital

• Observational component and competency assessment are critical

• Administration support/buy-in is essential

• Inter-disciplinary involvement is the key to success
www.massgeneral.org/pcs/heal_lang.asp

www.massgeneral.org/stopstroke/index.aspx