The Dysphagia Tool Box: Using Validated Dysphagia Assessment Tools

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Disclosure Statement

• Dr Carnaby published the MASA which is commercially available from Cengage Publishing. She receives royalties from the sale of this text.
Concept of the Dysphagia Tool Box

WHY NEEDED:

• Often is wide variability in documentation across treatment settings
• Difficult to make comparisons of care for patients
• Standardized measures/ outcomes are not being used.
Concept of the Dysphagia Tool Box

WHAT IT OFFERS:

• Integrated system of assessment tools
• Access to reliable and valid outcome measures
  – i.e. speed, ease, validity, reliability, utility
• Can be implemented in the clinic without increasing SLP burden.
• Promotes continuity of care & communication
• Provides a complete profile of patient
  – i.e. impairment, disability, quality of life
SRL-Tool Box

• Lets take a look

• [http://srl.phhp.ufl.edu/](http://srl.phhp.ufl.edu/)
MASA

COMPONENTS
- Prerequisite skills
- Communicative
- Oral
- Pharyngeal
- Laryngeal
- Integrity (risk rating)

- 24 items
- ordinal coding
- stages of swallow
- weighted score system
- risk rating for aspiration / dysphagia
MASA Total Score Performance

Dysphagia = ≤ 178

MASA Score

severe  moderate  mild

102  166  174
Or ..... MASA Skill Profile
MASA

• Psychometrics
  – 128 stroke patients
  – Inter rater reliability:
    • Kappa by clinicians: 0.85 (dysphagia), 0.74 (aspiration)
  – Internal consistency = Alpha 0.88
  – Concurrent Validity to VFE = SE: 73% , SP: 89%
  – Criterion validity:
    • Significant associations with FOIS, mRS, MBI
      – FOIS = 0.76 (correlation)
  – Cross Validation
    • Significant associations with dysphagia and aspiration (VFE) in larger study of 306 strokes
Video example—lets try it...
MASA-Cancer Version

- Ceiling effect in original MASA exam
- Doesn’t code effects of CRT well
- New exam developed including 15 original and 7 new items:
  - Discarded: alertness, cooperation, respiratory rate, swallowing, dysphasia, dyspraxia, gag, cough reflex
  - Neck palpation, mouth opening, taste, smell, current diet, oral mucous membrane, weight loss
  - Saliva, trache – modified to reflect HNC
MASA-C

• *Psychometrics (n = 50 HNC)
  • Inter rater reliability: ICC = 0.96 (baseline), 0.94 (Post Tx)
  • Internal consistency: Alpha =0.94
  • Test re-test = 0.92
  • Concurrent validity – VFE : (Se: 83; Sp 96,) cut point ≤185 (dysphagia)

• Criterion validity:
  • Significant associations with FOIS (0.83), FACT H/N (0.49), MASA (0.69)
  • Predictive Validity -10 point rise in MASA-C score =15.49 times likely to reach favorable outcome post treatment

* In submission Supportive Cancer Care
Functional Oral Intake Scale

• FOIS
  – Completed by interview with patient or family and/or by chart review
  – Be careful to probe into patient’s response
    • Eg. Yes, I can eat meat
      – (Probing reveals only chews it and swallows the saliva for taste)
  – For FOIS Levels 4 – 7 Based only upon FOOD rating
FOIS

- Psychometrics (neuro version 2005)
  - 302 stroke patients
  - Inter rater reliability:
    - Perfect agreement on 85% of ratings
    - Kappa on individual items: 0.86 – 0.91
  - Consensual validity: Kendall concordance = 0.90
  - Criterion validity:
    - Significant associations with MASA, mRS, MBI)
      - MASA = 0.76 (correlation)
  - Cross Validation
    - Significant associations with dysphagia and aspiration (VFE)
      - Dysphagia severity: 0.54
      - Aspiration presence: 0.40
MEASURING OUTCOME

• “Functional Oral Intake Scale”:
  • diet level of safe oral intake meeting nutritional and hydration needs

Levels:

1. Nothing by mouth (NPO)
2. Tube dependent with minimal attempts of food or liquid
3. Tube dependent with consistent intake of liquid or food
4. Total oral diet of a single consistency
5. Total oral diet with multiple consistencies but requiring special preparation or compensations.
6. Total oral diet with multiple consistencies without special preparation, but with specific food limitations.
7. Total oral diet with no restriction.
FOIS Rating Practice

1. Patient on total NG feeding

2. Patient eating ‘regular’ diet except salad, rice, and meat, bread

3. Patient eating full diet but cuts all solid food into small pieces and uses water to wash these through the throat. Meals take extra time (> 1 hour).

4. Patient on blended food diet but can drink water
FOIS Rating Practice

5. Patient on PEG but sips water when mouth is dry

6. Patient on pureed diet but has tried some fish and eggs

7. Patient on PEG but drinks different liquids daily and has tried some pudding level foods

8. Patient on PEG but sips coffee (larger amounts make her cough) and can swallow ‘whipped cream’
FOIS: Score from Patient Report
VideoFluoroscopic Examination (VFE)

- Weighted median score based on ordinal ratings first described by Mann (Carnaby) in 1998.
- Validity Estimates: (stroke established- 1998)
  - Criterion Validity (HNC)
    - FOIS: -0.33 (p=0.01)
    - Weight Loss: 0.47 (p=0.0006)
    - MASA-C: -0.40 (p=0.004)
- Rater reliability based on 26 exams:
  - Overall kappa = 0.91
  - Section reliability:
    - Oral prep: 0.87
    - Oral Trans: 0.81
    - Pharyng Init: 0.87
    - HL Excursion: 0.91
    - Pharyn Fx: 0.89
    - PES: 1.00
    - Aspiration: 0.90
C-VFE Protocol

• Currently use Varibar Contrast Materials:
  – Thin Liquid
  – Nectar Thick Liquid
  – Pudding

• Two Volumes:
  – 5 and 10 mL

• Additional materials/strategies if clinically indicated
  – Honey thick liquid
  – Masticated cracker/cookie
  – Marshmallow
  – Pill
  – Straw vs Cup

• Lateral view to begin
• Include Anterior view at end
Our Approach

• Uses ordinal scoring system
  – “0” is WNL
  – “4” is severe impairment
• Rates 7 swallow traits
  – Oral preparation
  – Oral transit
  – Pharyngeal initiation
  – Hyolaryngeal excursion
  – Pharyngeal function
  – PES function
  – Aspiration
Oral Preparation

• Ability to control a bolus through lips and onto tongue. Ability to form and position bolus.

• Score based on ability to take and control an oral bolus.
Oral Transit

• Ability to transport a bolus effectively through the oral cavity.

• Score based on timing and efficiency of oral transport of a bolus
Pharyngeal Initiation

• Appropriate triggering of the pharyngeal swallow response. From bolus passage at mandibular corner (ramus) to initiation HL excursion

• Score based on delay in pharyngeal initiation
Hyolaryngeal Excursion

• Duration and extent of hyoid and laryngeal excursion during a swallow. Consider both anterior and superior movement.

• Score based on degree and timing of HL excursion
Pharyngeal Function

• Efficiency of bolus passage through pharynx
• Pharyngeal wall movement and constriction
• Pharyngeal transit time
• Post swallow residue (valleculae and piriform)
• Presence/absence of penetration/aspiration

• Score based on pharyngeal movement, residue, penetration/aspiration
PES (CP) Function

• Opening/closing traits of the PES.
• Passage of bolus through PES
• Presence of any physiologic or anatomic obstruction (CP bar, Zenker’s etc)

• Score based on severity of obstruction to bolus passage through PES
Aspiration

• Passage of materials below the TVF

• 0 = no aspiration
• 1 = trace aspiration
• 2 = small volume of aspiration (> trace)
• 3 = large volume of aspiration
• 4 = severe aspiration with no patient reaction
VFE Scoring Example
VFE Score Profile

Wgt Median = 0.172
Closing Thoughts

• Toolbox concepts are employed in many different areas of healthcare
• The Toolbox is intended to provide easy and free access of valid and reliability tools.
• We have begun the Dysphagia Toolbox with a few tools that meet our criteria
• Professionals may submit additional tools by contacting us through our website