

# The diagnostic reliability of dysphagia screening

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# Stroke in UK

Every three minutes someone in the UK has a stroke

Stroke is the third biggest killer and the leading cause of severe disability in the developed world;  
uses  $\approx$  6% UK health & social care budget

Almost one in four men, one in five women aged 45 can expect to have a stroke if they live to 85

# Incidence of dysphagia in stroke

## Videofluoroscopic Swallowing Studies:

- in 65% within 5 days of admission

(Daniels et al 1998)

- in 64% at median 10 (0-47) days from symptom onset

(Mann et al 1999)

# Videofluoroscopic Swallowing Study

- Not all patients can be transported to radiology and positioned as required
- Labour-intensive, minimum two practitioners
- Radiation exposure
- Limited standardization of volumes, consistencies, textures of food and fluids, screening protocols and parameters of normal swallowing
- Presents a brief insight at one time and place; may not identify problems seen clinically
- Inter and intra-rater reliability

# Incidence of dysphagia in stroke 2

## Bedside clinical assessment:

- in 50% by SLT at median 3 (0 -16) days from symptom onset (Mann et al 1999)
- in 51% by doctor at median 14 (0.5 -50) hours from symptom onset  
in 31% by SLT at median 1 (0 -5) days from onset (but only 87% assessed)  
(Smithard et al 1997)

# Screening & Assessment

- Swallowing screening: a procedure designed to detect any clinical indicator of potential neurological deglutition dysfunction/ aspiration risk.
- Swallowing assessment: a process including observation with a range of textures/ consistencies, resulting in detailed description of the clinical function of component phases of swallowing, usually accompanied by judgement of degree of dysfunction/ aspiration risk.

# Screening tools / methods

- **Pulse oximetry, alone or with water swallow**  
(Lim et al 2001; Chong et al 2003)
- **Burke Dysphagia Screening Test (BDST), includes '3-oz water swallow' / '50ml3 drinking test'** (DePippo et al 1992; Gottlieb et al 1996)
- **Standardised Swallowing Assessment (SSA)**  
(Ellul et al 1993, 1996, 1997)
- **'Timed test'** (Hinds & Wiles 1998)
- **Bedside Swallowing Assessment (BSA)**  
(Smithard et al 1996, 1997, 1998)
- **Clinical examination seeking 'any two' of a list of features** (Daniels et al 1997)

# Daniels et al features of dysphagia

Ability to distinguish mod/severe dysphagia from mild/non-dysphagic compared to VSS findings:  
dysphonia

sensitivity 73%, specificity 76%

dysarthria

sensitivity 77%, specificity 61%

abnormal gag

sensitivity 54%, specificity 67%

abnormal volitional cough

sensitivity 39%, specificity 85%

cough post swallow

sensitivity 61% specificity 79%

voice change post swallow

sensitivity 31% specificity 88%

# Sensitivity & specificity

- Pulse oximetry    sensitivity 56/77%    specificity 100/83%  
+ water swallow    sensitivity 94/100%    specificity 62/71%
- 'Any 2'                      sensitivity 92%                      specificity 67%  
2 coughs                      sensitivity 78%                      specificity 70%
- BDST                      sensitivity 88%                      specificity 22%
- Water swallow              sensitivity 76%                      specificity 59%  
+ cough/ voice              sensitivity 72%                      specificity 67%
- 'Timed test'                sensitivity 100%                      specificity 52%
- SSA                      RR of LRTI 4.0  
                                    sensitivity 97%                      specificity 90%
- BSA                      sensitivity 70%                      specificity 66%

# Developing prospects

- Monitoring breathing patterns
- Airflow patterns and sound pressure level of voluntary cough
- Impedance pharyngography
- Surface electromyographic studies of muscle activity during swallowing and drinking
- Swallowing sound signals

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