Dysphagia as a Post-Stroke Complication

Nancy B. Swigert, M.A., CCC-SLP, BRS-S
Speech-Language Pathologist
Board Recognized Specialist in Swallowing and Swallowing Disorders
Director: Speech-Language Pathology and Respiratory Care
Baptist Health-Lexington

Disclosures

- Nancy B. Swigert has the following disclosures:
  - Non-financial: She is currently chair of the Specialty Board for Swallowing and Swallowing Disorders
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Goals of the session

- Review epidemiological data and highlights of research on neuroanatomy as it pertains to dysphagia in stroke.
- Discuss toll that complications of dysphagia takes on healthcare system as well as patients and their families
- Review current screening, assessment and treatment strategies of dysphagia
- Identify current strategies to improve swallowing function in patients with stroke.

U.S. statistics

- 795,000 people a year suffer stroke
- 160,000 are first attacks
- 3rd leading cause of death
- More than 140,000 people die each year
- Leading cause of serious, long-term disability in the U.S.
- From 1995-2005 stroke death rate fell 30% and actual number of stroke deaths declined 14%

Incidence of stroke

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Central Baptist Hospital’s Primary Stroke Center has earned the Gold Seal of Approval™ for health care quality.
Dysphagia and stroke

- Prevalence of dysphagia ranges from 25%-70% in patients who have experienced stroke
- Estimates vary because of method of assessing swallowing function, timing of assessment, and number and type of stroke patients studied
- High incidence of dysphagia and pneumonia in patients with stroke

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Cost of dysphagia

- Retrospective S.C. Medicare beneficiaries with ischemic stroke in 2004
- Attributable costs:
  - Cost of caring for patients with dysphagia after stroke that was over and above the costs of general stroke-related care.
  - People with dysphagia post-stroke had $9,279 higher one year attributable costs than those without.

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Neuroanatomy of swallowing lesions

- Dysphagia may result from bilateral hemispheric and brainstem strokes
  - Horner et al 1990
  - Kim et al 2000
- Dysphagia may result from unilateral strokes of either cerebral hemisphere
  - Robbins et al 1993

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Dysphagia and stroke

- Improves in most patients following stroke
- 10%-30% continue to have dysphagia with aspiration

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Cost of dysphagia

- Costs appear to be driven by:
  - Hospital
  - DME
- Differences in persons with dysphagia:
  - Age
  - Comorbidities
  - Discharge status
  - Stroke severity
  - Mortality

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Neuroanatomy of swallowing lesions

- There are contradictory findings concerning swallowing lateralization
  - Dysmotility pattern and aspiration risk may be related to the hemisphere lesioned
  - Hemisphere may not discriminate dysmotility pattern or risk of aspiration
  - Daniels & Foundas, 1999; Alberts et al 1992
Neuroanatomy of swallowing lesions
- Swallowing behavior differs in left and right hemispheric stroke (Robbins et al)
  - Left hemisphere stroke
  - Oral dysmotility
  - Right hemisphere stroke
  - Pharyngeal dysfunction
  - Aspiration
- Swallowing behavior does not differ in left and right hemisphere strokes
  - Daniels et al 1999

Hemispatial neglect significantly associated with initial non-oral intake
Aphasia not associated with swallowing outcome
(Schroeder, et al 2006)

RHD associated with more protracted dysphagia
Lesion site rather than hemisphere or lesion size predicted dysphagia characteristics or aspiration
Anterior lesions and subcortical periventricular white matter (PVWM) sites were commonly infarcted in patients with risk of aspiration
Patients without risk of aspiration more likely to have posterior lesions or lesions to subcortical gray matter

VFSS 20 consecutive ischemic stroke patients with purely subcortical lesions
R = 10  L = 10
Lesions to LPVWM may be more disruptive to swallowing behavior than similar lesions to the R PVWM
Swallowing deficits involving oral control and transfer may be a marker of subcortical neural axis

Common sites of involvement are evident
Distributed neural network
Both cerebral hemispheres and subcortical structures
Involvement of multiple levels
May induce more severe or protracted dysphagia

Mortality
Malnutrition
Dehydration
Pneumonia
Medical status - mortality
- Smithard et al (1996) - presence of dysphagia was associated with increased risk of death
- Cowen et al (1997) - mortality was high in patients with severely abnormal swallowing studies who required non-oral feeding

Medical status - mortality
- Very difficult to demonstrate that dysphagia management results in reduced mortality because dysphagia occurs with many other diseases which may cause the mortality

Medical status - malnutrition & dehydration
- Malnutrition occurs in 47% of stroke patients when admitted to rehabilitation
- Dysphagia increases risk of malnutrition because patients often have reduced amount of oral intake, restricted diet, and are tube fed

Medical status - dehydration
- Does dysphagia increase risk of dehydration because we restrict patients from taking thin liquids?
- Garon et al (1997) tested hypothesis that patients become dehydrated on thickened liquids
- Two groups of stroke patients previously identified as aspirating thin liquids

Medical status - dehydration
- Control subjects given only thickened liquids (mean intake 1210 cc/day)
- Study group allowed thickened liquids with additional thin water intake. Combined fluid intake 1318 cc/day.
- Patients did not report satisfaction with thick liquids but study subjects reported high satisfaction with access to water.
- No patient developed pneumonia, dehydration or complications during 30-day study

Medical status - dehydration
- Authors surmised study subjects did not drink less thickened liquid and more thin
- Patients said they drank water for oral dryness and to quench thirst
- Still not sufficient evidence to support use of this approach widespread
Medical status - pneumonia
- Relationship between pneumonia and aspiration not clear
- Not everyone who aspirates gets aspiration pneumonia

Feinberg (1990) - patients who aspirated thin liquids on fluoroscopy got no more pneumonia than patients who did not aspirate (unless they were tube fed)

Medical status - pneumonia
- Corghan et al (1994) - no difference in number of patients who got pneumonia when comparing known aspirators to those who did not

Schmidt et al (1994) - patients were 7.6 X more likely to develop pneumonia if they aspirated on fluoroscopy

Medical status - pneumonia
- Non-compliers with dysphagia recommendations had more hospital admissions because of chest infections or aspiration pneumonia
- Low et al 2001

Medical status - pneumonia
- Who will get pneumonia?
- How much is aspirated?
- Are lungs able to clear material?
- What was baseline pulmonary status?
Risk factors for developing pneumonia (patients: OP, acute care, nursing home)

- Langmore (1998)
- Dependent for feeding
- Multiple medical diagnoses
- Current smoker
- Tube fed
- Dependent for oral care
- Number of decayed teeth
- Number of meds

Risk factors for chest infection in acute stroke

- 412 patients admitted in UK
- Subjects who developed pneumonia were:
  - Older
  - Had higher NIHSS scores
  - History of chronic obstructive pulmonary disease
  - Lower AMT (Abbrev. Mental Test) scores
  - Higher Oral Cavity Score
  - Greater proportion with positive bacterial culture from oral swabs

Independent predictors of pneumonia were:

- Age >65
- Dysarthria or no speech due to aphasia
- Modified Rankin Scale score >4 (see next slide)
- AMT <8
- Failed water swallow test

Clinical Score (A2DS2) to Predict Pneumonia in Acute Ischemic Stroke (Hoffmann et al 2012)

Between 2007 and 2009, 15,335 patients with ischemic stroke were registered within the Berlin Stroke Register.

The observed rate of pneumonia in hospital was 7.2%. A 10-point score was derived for prediction of post-stroke pneumonia.

A2DS2

(Age >75 years=1, Atrial fibrillation=1, Dysphagia=2, male Sex=1, stroke Severity, National Institutes of Health Stroke Scale.

See next slides for NIH Stroke Scale

- 0–4=0
- 5–15=3
- >=16=5

MODIFIED RANKIN SCALE (MRS)

Score Description
1 No response or death
2 No significant disability despite symptoms, able to carry out all usual duties and activities
3 Mild disability, unable to carry out all previous activities, but able to look after own affairs without assistance
4 Moderate disability, requiring some help, but able to walk without assistance
5 Moderately severe disability, unable to walk without assistance and unable to attend to own bodily needs without assistance
6 Severe disability, bedridden, incontinent and requiring constant nursing care and attention

TOTAL (6-49)

4/9/2013
Rate of pneumonia
- 0.3% if score = 0
- 39.4% if score = 10
- The only "treatment" or management of dysphagia described was use of NG and then PEG

Risk Factors for Nosocomial Pneumonia in Acute Stroke Patients with Dysphagia
Schumann et al 2012
- Retrospective cohort
- All patients with acute stroke admitted to hospital in Germany b/t 2007-2010
- Of 1,643 acute stroke patients, swallowing disorder found in 34.3% (swallow screening within first 24 hours)
- 103 patients developed pneumonia (18.3% of stroke patients with dysphagia, 6.3% of all stroke patients)...

Who got pneumonia?
- Older
- Higher NIHSS
- Significant association with:
  - Positive water swallow test
  - Aphasia
  - Ventilation
  - Severity of dysphagia
  - Decreased LOC
- No effect:
  - Male
  - Diabetes
  - Stroke location
  - Dysarthria
  - Patient’s awareness of dysphagia...
Independent predictors of who got dysphagia
- Positive Water Swallow Test
- Ranking Scale Score >4
- Ventilation

Aspiration pneumonia
- Highest mortality rate of any infection
- Among hospitalized elderly, development of pneumonia is associated with 43% mortality rate
- Pneumonia 2nd most common infection in nursing homes
- Up to 80% of nosocomial pneumonia may be aspiration pneumonia

Aspiration pneumonia
- Kasprisin (1989) - compared two groups of treated patients with group of untreated patients
- Both treated groups had significantly less aspiration pneumonia than the untreated group

Aspiration pneumonia
- Kasprisin conclusions
  - Even mildly dysphagic patients are at risk for the development of aspiration pneumonia
  - Severely dysphagic patients responded to management of their swallowing problems

Pneumonia
- Stroke accounts for more than 5 million deaths annually worldwide. Most stroke deaths are caused by complications, of which chest infections are the most important
- One large study showed that 30% of acute stroke patients diagnosed with pneumonia had died before hospital discharge (Lopez et al 2001)

High incidence of respiratory infections in NPO stroke patients
- Langhara et al 2007
- 369 acute stroke patients — Perth Australia
- 51 respiratory infections in 330 survivors
- Dysphagia at 48 hours and 7 days was strongly associated with respiratory infection
- Survivors NPO at 48 hours and 7 days were significantly more likely than survivors fed orally to develop respiratory infection
- 75% of survivors fed by NG or PEG were treated with antibiotics for infections
- Oral factors found to be significant in predicting respiratory infections
- Subjects who had poor oral hygiene and were NPO 48 hours post stroke had risk ratio of respiratory infection of 18.39
Risk factors, IP care and outcomes of pneumonia after ischemic stroke (Finlayson et al 2011)

- 8,251 patients (Canadian Stroke Network)
- Stroke-associated pneumonia 7.1%
- Pneumonia increased 30-day (2.2 Odds ratio) and 1-year (3.0) mortality
- Pneumonia associated with poor functional outcomes
- Higher access to organized IP care resulted in reduction of 30-day mortality

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BRS-S

- Are you ready?

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Have you...

- Practiced 3 years after completing your CFY?
- Accrued 75 hours of CE related to dysphagia in the last 3 years?

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Have you...

- Accrued 350 contact hours with patients each year for the last 3 years (Clinical Track)?
- Accrued 100 hours with patients each year for the last 3 years
- Held Academic position or
- Administrative Position

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Have you....

- Developed expertise in the area?
- Demonstrated excellence in
  - Education/Mentorship
  - Leadership
  - Scholarship/Research

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Then you might be ready!

- Contact [www.swallowingdisorders.org](http://www.swallowingdisorders.org) if you would like to talk to a mentor.
- If you're not ready, you could still talk to a mentor to discuss your next steps to get ready.

### Why evaluating swallowing is important

- Swallowing involves a distributed neural network.
- Swallowing should be clinically evaluated in all acute stroke patients.

### How can we identify dysphagia?

- **Screening**
- **Clinical evaluation by SLP**
- **Instrumental evaluation by SLP**

<table>
<thead>
<tr>
<th>Incidence of dysphagia per type of procedure:</th>
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<tr>
<td>Screening 37-45%</td>
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<tr>
<td>Clinical exam by SLP 51-55%</td>
</tr>
<tr>
<td>Instrumental testing 64-78%</td>
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Martino et al 2005

### The Joint Commission

- **Joint Commission**
- **For Primary Stroke Center certification**, The Joint Commission (TJC) previously required a dysphagia screen to be conducted prior to any patient receiving any food, fluids or medication by mouth.
- **Beginning in January 2010** the Joint Commission no longer required primary stroke centers to report data regarding dysphagia screening for stroke performance measure 7 (SKR-7) to maintain primary stroke center certification.

### Join me!

- Become a Board-Recognized Specialist in Swallowing and Swallowing Disorders
- [www.swallowingdisorders.org](http://www.swallowingdisorders.org)

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Why screening should continue (Lakshminarayan et al 2010)
- 18,017 patients in registry
- Classified as:
  - Unscreened US  4,509 (25%)
  - Screened and passed S/P  8,406 (47%)
  - Screened and failed   5,099 (28%)

Utility of dysphagia screen
- Screened patients were significantly more impaired
- Suggests patients are selectively screened
- Pneumonia rates
  - US  4.2%
  - S/P 2.0%
  - S/F 6.8%
- After adjusting for demographic and clinical features, US patients were at higher risk of pneumonia compared to S/P

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NPO except meds?
- Case study Leder & Lerner 2012
- 71 year old made deemed at risk for aspiration due to coughing with thin liquids
- An aspirated 5cc puree bolus elicited a cough reflex and a pill was expelled from the trachea (that had been given some time before that)

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Does Dysphagia Screening Work?
- IMPORTANT CONCEPTS:
  - Construct validity
    - The extent to which a test (dysphagia screening) measures the intended trait (dysphagia)
  - Sensitivity
    - The number of people with a problem (dysphagia) who are correctly identified
  - Specificity
    - The number of people with no problem (no dysphagia) who are correctly excluded

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Screen vs. Evaluation/Assessment
- SCREEN
  - Seeking signs and symptoms that suggest patient is at risk
  - Quick, efficient, safe for patient at highest risk
  - Does not give: physiology, merely provides information
- EVALUATION/ASSESSMENT
  - Provides physiologic data
  - In depth history
  - Observation
  - Considerable expertise by clinician
  - Invasive

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Does Dysphagia Screening Work?

- SLP literature focuses almost exclusively on correct identification of aspiration.
- The accuracy of identification has usually been measured in two ways:
  - In comparison to a subsequent instrumental examination
  - By looking at the incidence of an ultimate health status consequence (pneumonia rates, length of stay)

Some Big Problems…

- Cough does not necessarily indicate aspiration
- Cough does not necessarily indicate ejection of material from the larynx
- Absence of cough does not necessarily rule out silent aspiration
- Absence of cough does not rule out other swallowing problems (e.g. residue)

Debated Techniques

- Observing “wet voice” as an indicator
- Water swallow test
  - High false positive rate in study with patients with variety of disorders
- Pulse Oximetry (desaturation as an indicator)
- Laryngeal Cough Reflex (absence of cough to irritant chemical as indicator)

What about cough? (Ward et al 2010)

- VC and RC are both impaired in hemispheric stroke patients, despite preserved expiratory muscle strength.
- Sensory pathways seemed intact
- Cough coordination is probably cortically modulated and affected by hemispheric stroke.

Commercially available or screening tools found in the literature-examples

- TDR-BST
- Gugging Swallowing Screen
- Barnes Jewish Acute Stroke/Acute Stroke Dysphagia Screen
- 3 oz water swallow
**Systematic Review** Schepp et al. 2011  
- What standardized protocols have been described  
- How do protocols compare with respect to reliability, validity, and feasibility as defined by ease of training and administration  
- What are the challenges of screening?

Another systematic review  
- Only 1 study used dysphagia as the outcome measure.  
- Aspiration or risk of aspiration (laryngeal penetration with residue) was the outcome measure in the remaining studies.  
- Items generally achieved either high specificity or high sensitivity (>80%).

Systematic review cont’d  
- Only 1 item, the water swallow test (WST) administered in 10 5-mL volumes, achieved both high sensitivity and specificity;  
- However, this study did not achieve a high score for methodological rigor.  
- Most studies reported only validity for single items;
Systematic review

- Another study found that a combination of 4 of these same features achieved better validity (McCullough et al. 2001).
- Using logistic regression, unilateral jaw weakness, dysphonia, and global judgment of aspiration on the 3-oz WST were identified as the best combination of features to identify aspiration (McCullough et al. 2005).

Conclusions

- A WST appears to be an important part of screening; however, the most valid protocol remains to be determined.
- Cough and wet voice after swallow typically used.
- Given inconsistent validity for most items, it appears that a cluster of swallowing and non-swallowing features may achieve both high sensitivity and specificity.

One hospital’s approach—Baptist Health-Lexington in 2005

- Literature review (ASHA FAQ on screening)
- Item selection, review and revision
- Training
- Competency validation
- We conducted inter-rater reliability b/t the nurse and the SLP for two years. The best we achieved was 90%.

Bedside/clinical evaluation by SLP

- Usually the first step in assessing a patient.
- Sometimes it is all that can be done.
- If treatment for suspected pharyngeal disorder is based solely on bedside evaluation, patient is placed at risk.

Bedside/clinical evaluation by the SLP

- Identification of patients warranting instrumental testing.
- Develop hypothesis of etiology of dysphagia.
- This evaluation yields important information about the oral phase of the swallow and...
- Provides clues about the pharyngeal phase.
- Develop thoughts about management program.

What should the clinical exam include?

- Review of medical records
- Evaluation of:
  - Cognition (e.g. responsiveness, comprehension)
  - Oral motor skills
  - Sensation
  - Speech & Voice
  - Swallowing

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Predicting risk of aspiration
Daniels et al. 1997 & 1998
- Consecutive stroke patients
- Six features were predictive of identifying risk of aspiration
  - Abnormal volitional cough
  - Abnormal gag reflex
  - Dysarthria
  - Dysphonia
  - Cough after trial swallow
  - Voice change after trial swallow
Identification of any 2 of the 6 clinical features was accurate in identifying risk of aspiration
  - Sensitivity = 92%
  - Specificity = 67%

McCullough et al. 2001
- High sensitivity with presence of 2 of 6 of the same clinical predictors
- High specificity required 4 of the 6 clinical predictors

Leder & Espinosa (2002)
- Used Daniels 6 factors
- Consecutive acute stroke patients (N=49)
- Examined within 24 hours of admission
- Some differences in how risk of aspiration was defined and different protocols
- Sensitivity = 86%
- Specificity = 30%
- Underestimated aspiration risk in patients with aspiration risk and overestimated aspiration risk in patients who did not exhibit aspiration risk

Mann Assessment Swallowing Ability: Risk ratio example (Mann & Hankey, 2001)
- Clinical items as independent predictors of dysphagia (measured radiographically)
  - Age > 70
  - Male
  - Disabling Stroke (Barthel < 60)
  - Palatal weakness or asymmetry
  - Incomplete oral clearance
  - Impaired pharyngeal response (cough/gurgle)

Risk ratio example (Mann & Hankey, 2001)
- Clinical predictors of aspiration
  - Delayed oral transit
  - Incomplete oral clearance

McCullough et al. 2005
- N=165 patients within 6-weeks of stroke
- Compared clinical swallow evaluation with videofluoroscopic evaluation
- Best measures of aspiration:
  - 3-oz water swallow test-judgment of aspiration
  - Presence of dysphonia
  - Jaw weakness
Clinical judgment

- Research indicates that most SLPs can rule in aspiration when it is present but
- Ruling out aspiration when it is absent is difficult to do

Instrumental Procedures

- Videofluoroscopy
- Endoscopy
- Endoscopy with sensory testing

Comparison MBS & FEES®

- Oral phase observed
- Pharyngeal wall and tongue base movement during swallow
- Elevation and forward motion of larynx
- Opening of criocopharynx
- Tipping of epiglottis
- Movement of bolus during swallow
- Structures of the larynx and pharynx
- Amount and location of secretions
- Laryngeal sensation
- Closure of true cords
- Arytenoid movement
- Residue in lateral channels

Reliability MBS (McCullough et al 2001)

- Intra-judge reliability on measures of:
  - Penetration-aspiration
  - Lingual function
  - Oral residue
  - Vallecular residue
  - Pyriform sinus residue
  - Hypopharyngeal residue
- Are acceptable
- Inter-judge reliability of most measures (with exception of aspiration yes/no) varies among clinicians
- Unacceptable

What MBS shows with stroke (Power et al 2009)

- Determined probability of aspiration from measures of swallowing pathophysiology observed on MBS
- Aspiration was observed in 52% of subjects

MBS measures

- Pharyngeal transit time
- Swallow response time
- Laryngeal closure duration
- If these factors could be translated into something observed on clinical exam, could help direct intervention
Examining swallow recovery with MBS (Daniels et al 2006)
- Small study with normals and stroke
- Pen/Asp is not the only important measure
- Looked at OTT, PTT and STD
- Importance of determining acute and protracted dysphagia with multiple measures of swallowing, not just airway invasion

FEES and stroke (Wamecke et al 2009)
- Prospective study in 300 acute stroke patients
- No airway compromise, decreased LOC, bradycardia, tachycardia, laryngospasm or epistaxis
- Self-limiting nosebleeds 6%
- Did not differ per type of stroke or treatment strategy or secondary prevention regimen
- Excellent tolerance (patient rating) in >80%

Endoscopic Assessment - Simple Dysphagia Score (Dziiewas et al 2008)
- 100 patients within 72 hours of stroke onset
- Secretion status evaluated
- No pooling of secretions
- Pooling w/o penetration or aspiration
- Pooling with penetration or aspiration

Endoscopic Assessment - Dysphagia Score
- When corrected for age and NIHSS score on admission, saliva penetration/aspiration was highly predictive of later need for orotracheal intubation
- Rate of aspiration as compared to penetration was significantly higher with liquids than with puree or soft solids

Order of items presented
- Handling of secretions
- Puree
- Liquids
- Soft solid food
Dysphagia Score
- They use the hierarchy to determine if the patient should have NGT and if fed, what kinds of food/liquid
- Some methodological problems
  - Exam was terminated when pen/asp occurred at any step
  - Selection bias - only patients with known risk factors for dysphagia were included (dysarthria, facial palsy)

Management of dysphagia
- Does management of dysphagia and specific treatment result in change?

Measuring change in physiology and quality of life
- The Effects of Lingual Exercise in Stroke Patients with Dysphagia
  - Outcomes measured:
    - Lingual strength—increase in maximum isometric pressures
    - Bolus flow—reduction in pharyngeal residue
    - Pen-Asp scores—reduced
    - Quality of life (SWAL-QOL)—All scores increased, with significant changes in: fatigue; communication; mental health

Measuring change in health status
- More direct impact on cost of care to the health care system
  - Elmstahl et al (1999)
  - Studied 38 stroke patients
  - After treatment, 60% of cases showed improved levels of albumin and total iron-binding capacity
  - Concluded swallowing treatment improves swallow functions, and improved swallow function associated with improvements in nutritional parameters

Reduced cost of care: pneumonia
- The average marginal cost of pneumonia on hospitalization was $27,633
- The data indicate that pneumonia after stroke is associated with higher mortality and hospitalization costs
  - Wilson 2012
Reduced cost of care: screening program to reduce aspiration pneumonia

Survey of 15 institutions over one year
Total of 2532 patients with stroke

**Overall adherence to dysphagia screen 61%**

<table>
<thead>
<tr>
<th>No formal screening program</th>
<th>Formal screening program</th>
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<tbody>
<tr>
<td>57% adherence to dysphagia screen</td>
<td>78% adherence to dysphagia screen</td>
</tr>
<tr>
<td>Pneumonia rate 5.4%</td>
<td>Pneumonia rate 2.4%</td>
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Reduced cost of care and reduced mortality

(Herrenkohl et al, 2012)

- Development of formal screening and evaluation program for patients with stroke
- Hospital in Germany
- After initiation of screening/evaluation protocol, mortality dropped from 7.4% to 4.2% Rate of pneumonia reduced from 9.0% to 2.8%
- Reduced rate of pneumonia resulted in less antibiotics
- Cost savings of 50% on medications

Dysphagia management

- Coordinated approach to dysphagia management
- Speech-Language Pathologist often the team leader
- Other members of the team:
  - Nursing
  - Patients and families
  - Physicians
  - Occupational therapists

Treating the patient following CVA with a swallowing disorder

- The speech-language pathologist must understand the patient’s cognitive abilities:
  - Attention
  - Language
  - Memory
  - Visuo-spatial ability
  - Executive functions
Goals of dysphagia management
- Rehabilitate the dysfunction
- Prevent aspiration, dehydration and malnutrition
- Re-establish oral intake
- Improve quality of life

Rehabilitation of the swallowing dysfunction
- Randomized clinical trial (Carnaby et al 2006)
- Acute dysphagic stroke patients (N=306)
  - Usual care per MD
  - Low-intensity treatment
  - High-intensity treatment
- Outcome: survival free of abnormal diet at 6 months
  - Cont'd

Swallowing treatment:
- Swallowing treatment was significantly associated with:
  - Obtaining functional swallowing
  - Reduced dysphagia-related medical complications
  - High-intensity treatment significantly associated with return to normal diet, functional swallow, and reduced chest infections as compared to usual care and low-intensity treatments

Systematic review Foley et al 2008
- Difficult to draw conclusions due to heterogeneity of treatments and outcomes assessed
- Emerging evidence that NG tube feeding is not associated with higher risk of death compared to PEG
- General dysphagia therapy programs are associated with reduced risk of pneumonia in the acute stage of stroke

Do NG tubes worsen dysphagia? Dziewas et al 2008
- Correctly placed NGT did not cause worsening of stroke-related dysphagia.
- 2/100 cases in which swallowing material stuck to the NGT and then was penetrated
- Pharyngeal misplacement of NGT occurred in only 5/100

Do these patients return to eating?
- 65 acute stroke patients in VA system
- Initially, 63% recommended for oral intake
  - 37% for non-oral intake
- By discharge (3 days to 4 months after admission)
  - 75% receiving oral intake
  - 9% receiving non-oral intake
  - 16% had died
  - 6 of these 10 had aspiration pneumonia
  - Schroeder, et al 2008 (retrospective review)
Predictors of return to eating (Krieger et al 2010)

- Retrospective chart review
- 46.9% (67/143) returned to 3 meals/day prior to d/c from IP Rehab
- Mean days post stroke onset until eating 3 meals/day was 38.43 days
- 20% of patients (30/143) had FT removed before discharge

Factors associated with returning to eating 3 meals/day
- Female
- Longer IPR stay
- Higher admission FIM™ scores

Factors associated with removal of FT
- Longer IPR stay
- Younger
- Patients with FT removed were more likely to be d/c to home

FCM Start Score for Dysphagia Patients at Admission to Acute Inpatient Care

FCM Score for Dysphagia Patients at Conclusion of SLP Treatment in Acute Inpatient Care

FCM Start Score for Dysphagia Patients at Admission to Inpatient Rehab

FCM Score for Dysphagia Patients at Conclusion of SLP Treatment in Inpatient Rehab
Swallowing treatment

- Rehabilitative/facilitatory techniques
  - Designed to improve function
  - E.g. Mendelsohn maneuver, Shaker exercise
- Compensatory strategies
  - Designed to compensate for lost function
  - Postural
  - Diet

Diet modifications

- Based on clinical exam and instrumental exam, recommendations are usually made for modification in diet
  - Texture
  - Thickness of liquids

While swallowing treatment is occurring, necessary to ...

- Prevent aspiration
- Prevent dehydration
- Prevent malnutrition

A comprehensive approach is needed

What are the components of a comprehensive dysphagia management program?

- Aggressive and consistent oral care
- Appropriate positioning
  - Tube feeding
  - Oral Feeding
- Treatment plan for safe PO intake
  - Modified diet
  - Compensatory techniques to use when swallowing
- Treatment to improve swallowing function

Reducing the risk of aspiration

- Dependent for oral care is big risk factor for aspiration
- Oral care protocols
Oral care and health
- In all settings, number of decayed teeth associated with aspiration pneumonia
  - Langmore 1998
- Relationship between how often teeth are brushed and bacterial pneumonia
  - Azarpazhooh & Leake 2003
  - Scannapieco et al 2003

Relationship between periodontal inflammation and atherosclerosis and ischemic heart disease
- Fowler et al 2001

Exacerbation of COPD has been shown to be related to oral pathogens
- Scannapieco et al 1998; Heo et al 2008

Nursing view of oral care
- Nurses rate the importance of oral care as low priority compared to other pressing needs
  - Wardh et al 2000
- Demonstrated gaps in knowledge exist regarding oral health and correct procedures for performing oral care
  - Adams 1996; Boczko 2010

Even when nursing assistants demonstrate the knowledge that oral care is important, they still tend to perform oral care less than the optimal number of times/day and with less than optimal techniques
- Jablonski 2009

Oral care focus in acute care
- Oral care programs typically focused in the critical care units rather than on med-surg floors
- Studies of nurses in critical care also reveal lack of training and knowledge about oral hygiene
  - Jones 2004

Oral care on med surg floors
- Patients may not be dependent on others to perform oral care (as ventilator-dependent patients are)
- But... patients may be hampered by lack of access to supplies to brush teeth or dentures
- Nursing assistants in this setting likely view oral care as low priority as well
What SLP did with these patients at our facility

- Developed a patient/family education brochure on oral care
- Developed signs to hang above patient’s beds
- Developed oral care kits

SLP Department

- Includes “oral care BID & PRN” in recommendations
- Instruct patient and family in importance of and correct procedure for oral care
- Provides oral care at each treatment session
- Housewide training for PCTs

Reducing the risk of aspiration

- Positioning for tube feeding
  - Head of bed elevated
  - Care taken during transfers and transport
  - Turning off tube feeding does not necessarily eliminate risk of reflux and aspiration of tube feeding

Reducing the risk of aspiration

- Positioning for oral feeding
  - Specifics provided by the SLP’s recommendations
  - Upright
  - Remain upright after eating
  - If reflux is suspected, 1-2 hours

Questions?

- Anything else we should discuss?
- If you want a bibliography, please contact me at nswigert@bsi.com