Post-Extubation Dysphagia: Considerations for Implementation of a Nursing Dysphagia Screen

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Personal Disclosure

I do not have financial or nonfinancial relationships relevant to the content of the presentation.
Purpose

- The purpose of this project was to develop a post-extubation dysphagia screening instrument for nurses.

- Today’s Objectives:
  - Describe anatomical and physiological changes associated with prolonged intubation.
  - Describe the risk factors for dysphagia with patients following extubation.
  - Discuss criteria utilized in the development of a post-extubation dysphagia nursing screen.
A Special Thanks to:

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  - Amber Valentine, M.S., CCC-SLP, BRS-S
  - Ashley Wright, M.S., CCC-SLP
  - Yasmin Al-Kabandi, M.S., CCC-SLP
Indications for Mechanical Ventilation

- Cardiac or respiratory arrest
- Failure of noninvasive ventilation
  - Severe dyspnea
  - Persistent hypoxemia
  - Worsening respiratory acidosis
  - Respiratory rate > 35 breaths/min
- Vascular or pulmonary complication
  - Heart failure, hypotension
  - Severe pneumonia, pulmonary thromboembolism
- Surgical procedure
  - Elective or emergent
Structures Vulnerable to Injury

- **Arytenoid**: medial surface of the cartilage and cricoarytenoid joint, and at the vocal process
- **Posterior glottis**: posterior commissure in the interarytenoid region
- **Cricoid cartilage**: subglottic region, especially the anterior surface of the posterior lamina
- **Supraglottic Structures**: false vocal folds
Laryngeal Trauma

- Incidence of laryngeal complications after prolonged intubation is between 4% and 13% (Stroud, 1999)
- Inflammation, edema
- Ulceration
- Granulated tissue
- True vocal fold paralysis
- Glottic stenosis
Factors Responsible for Laryngeal Injuries

- **Extrinsic factors**
  - Diameter, shape and contour of endotracheal tube
  - Traumatic or multiple intubations
  - Duration of intubation
  - Presence of NG tube

- **Patient factors**
  - Poor general health: acute or chronic disease
  - Gastroesophageal reflux
  - State of larynx: abnormal (congenital stenosis, croup)
  - Preintubation status: **SMOKING!!!**

- **Movement**
  - Patient movement during light anesthesia
  - Coughing
  - Swallowing
  - Transport of patient
Review of the Literature

- Impaired swallow function identified in > 50% of pts intubated for > 48 hours, including those following cardiac surgery (Leder et al., 1998; Ajermian et al., 2001; Barker et al., 2009).

- Silent aspiration reported in 25% of pts intubated > 48 hours (Leder et al., 1998; Ajermian et al., 2001).

- Patients intubated for > 24 hours demonstrate severe but temporary delayed swallow response following extubation; greatest delay seen 0-24 hours post extubation (de Larminat et al., 1995).

- Aspiration occurred in 80% of pts traumatically intubated (Leder et al., 1998)
In alert postoperative cardiac surgery pts, laryngeal ability to prevent aspiration is adversely affected after tracheal extubation, particularly within the first eight hours (Burgess et al., 1979).

In a recent systematic literature review, studies that reported the highest incidence of dysphagia also reported prolonged intubation times (Skoretz et al., 2010).

Aspiration detected with Fiberoptic Endoscopic Evaluation of Swallowing (FEES) in 69% of critically-ill ICU patients post extubation who demonstrated s/s of aspiration during bedside eval (Hafner et. al., 2007).
Review of the Literature

- Aspiration occurs more frequently & persistently in the elderly (≥65) (El Solh et. al., 2003).
- Functional status prior to admit in the elderly highly correlate with increased risk and slow recovery of swallowing (El Solh, et. al., 2003).
- Neurological abnormalities and cognitive deficits are seen to increase frequency and severity of dysphagia in patients post extubation (Padovani et al., 2008).
- Low Glasgow Coma Scale* (GCS) score on admission or traumatic intubation correlated to an increased risk for aspiration (Leder et. al., 1998).
*Glasgow Coma Scale*

Based on a 15 point scale of brain injury on the basis of overall social capability or dependence on others.

**I. Motor Response**
- 6 – Obeys commands fully
- 5 - Localizes to noxious stimuli
- 4 - Withdraws from noxious stimuli
- 3 - Abnormal flexion
- 2 - Extensor response
- 1 - No response

**II. Verbal Response**
- 5 - Alert and Oriented
- 4 - Confused, yet coherent, speech
- 3 - Inappropriate words/jumbled phrases
- 2 - Incomprehensible sounds
- 1 - No sounds

**III. Eye Opening**
- 4 - Spontaneous eye opening
- 3 - Eyes open to speech
- 2 - Eyes open to pain
- 1 - No eye opening
Severity of illness (APACHE II*) was found to be a significant risk factor for slow or non-recovery of swallowing function following prolonged endotracheal intubation (Laryea, et al., 2006).

Laryngeal edema and mucosal ulcerations of the vocal folds were found in 94% of patients who had been intubated for more than 4 days (Colice et al., 1989).

Dysphagia due to prolonged intubation can last for up to 3 weeks (Goldsmith, 2000).

Dysphagia has been identified as an independent factor associated with delayed hospital discharge (Barker et al., 2009).
APACHE II

- Acute Physiology & Chronic Health Evaluation II
- Severity-of-disease classification system, one of several ICU scoring systems.
- Applied within 24 hours of admission of a patient to an intensive care unit
- An integer score from 0 to 71 is computed based on several measurements
  - Calculated from 12 routine physiological measurements, e.g., blood pressure, body temperature, heart rate
- Higher scores correspond to more severe disease and a higher risk of death.
To Sum it Up

Patients post extubation at risk for dysphagia include:
- Age > 65
- “Prolonged” intubation
- Traumatic intubation
- Presence of tracheostomy
- Stroke or other central nervous system injuries
- Congestive Heart Failure
- Altered Mental Status
- Low Glasgow Coma Scale (GCS) score on admission
- 0-24 hour window post extubation
Who Do We Assess?

- All patients post extubation?
- Select patients based on factors described in the literature?
- Hold PO for all patients within the first 24 hours?
- Our next step, look at what the data from our hospital was telling us...
Central Baptist Hospital

- 383 Bed
- 5 ICU
  - Surgical
  - Cardiac
  - Neuro
  - Two Medical
- Population
  - CVA
  - Cardiac
  - Pulmonary
Retrospective Study

- IRB approved study
- Retrospective chart review
- All inpatients discharged from Central Baptist Hospital in Lexington, KY between August 2010 and July 2011 who received any length of mechanical ventilation during admit.
- N = 1029
- Patients were divided into two groups for further analysis based on +/- consultation for speech-language pathology post extubation.
22 Factors Reviewed

- Primary Diagnosis Acute Respiratory Failure
- Secondary Diagnosis Acute Respiratory Failure
- Chronic Obstructive Pulmonary Disease (COPD)
- Congestive Heart Failure (CHF)
- Neurological Disease
- History of Documented dysphagia
- Co-morbidity Pneumonia
- Pneumonia Present on Adm
- Pneumonia Hosp-Acquired
- Total Days of Mech Vent
- Age (> 65)
- Functional Assessment Prior to Admit
- Total Glasgow Coma Scale (GCS) on Admit
- Verbal CGS on Admit
- Total GCS post-extubation
- Verbal GCS post-extubation
- Level of Conscious (LOC) post-extubation
- Change in Speech
- Change in Voice
- Altered Mental Status
- Secretion Management
- Overt s/s aspiration
Inclusion criteria:
- Patients discharged from Central Baptist Hospital between August 2010 and July 2011
- Received any length of mechanical ventilation during admit.
- Received SLP consult post extubation
- N = 213

Exclusion criteria:
- Intubated at outside facility (50)
- Received tracheostomy (12)
- Direct instrumental swallow study (5)
- Refused SLP services (1)

Further review: 145 patients
Group B: Period of mechanical ventilation and NO SLP Referral

**Inclusion criteria:**
- Patients discharged from Central Baptist Hospital between August 2010 and July 2011
- Received any length of mechanical ventilation during admit
- Received SLP referral post extubation
- N = 816

**Exclusion criteria:**
- Intubated at outside facility (37)
- Received tracheostomy (32)
- Discharged from facility on vent or expired on vent (260)
- Palliative/Hospice consult prior to PO post extubation (34)
- Discharged from facility NPO; no PO post extubation (5)

**Further review:** 448 patients
Group A: Period of mechanical ventilation AND SLP referral

- N = 145
- Patients were divided into two groups based on SLP recommendation for further intervention:
  - Group A1: Recommendation for further dysphagia intervention
    - N = 117 (80%)
  - Group A2: NO recommendation for further dysphagia intervention
    - N = 28 (20%)
ALL pts on vent

SLP Referral (A)

Further intervention (A1)

No SLP Referral (B)

No further intervention (A2)
Interesting Finding

- 80% referred to SLP by RN/MD for dysphagia were also recommended by SLP for further intervention.

Meaning:
- Only 20% referred were NOT recommended by SLP for further dysphagia intervention

- RN/MD in 80% agreement with SLP... current system working??
Of Those Who Were Recommended for Further SLP Intervention (Group A1)

- N = 117
  - 80% (94) went on for FEES/MBS
  - 11% (13) advanced at bedside by SLP
  - 9% (10) remained NPO 2’ severity of s/s aspiration. Not ready for FEES/MBS
    - 5% (6) remained NPO until palliative or Hospice consult
Of Those Who Had Instrumental Swallow Study (FEES/MBS)

- N = 94
- Days between extubation and study:
  - Average 3.17 days, range 0-18
- Aspiration: 42% (39)
- Silent aspiration: 27% (25)
- Penetration: 30% (28)
- Residue: 65% (61)
Chi-Square Analysis

Chi-square was used to test for associations with patient factors and recommendation for further dysphagia intervention.

Used to test the differences between:
- Group A1 (SLP BS and intervention) and
- Group A2 (SLP BS and no further intervention)
<table>
<thead>
<tr>
<th>Factors</th>
<th>Group 1 (n=117) n(%) or M(SD)Range</th>
<th>Group 2 (n=28) n(%) or M(SD)Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Respiratory Failure Primary Diagnosis</td>
<td>15 (12.8)</td>
<td>3 (10.7)</td>
</tr>
<tr>
<td>Acute Respiratory Failure Secondary Diagnosis</td>
<td>50 (42.7)</td>
<td>14 (50.0)</td>
</tr>
<tr>
<td>COPD</td>
<td>51 (43.6)</td>
<td>12 (42.9)</td>
</tr>
<tr>
<td>CHF</td>
<td>22 (18.8)</td>
<td>3 (10.7)</td>
</tr>
<tr>
<td>Neurologic Disease</td>
<td>36 (30.8)</td>
<td>6 (21.4)</td>
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<tr>
<td>Dysphagia History</td>
<td>3 (2.6)</td>
<td>1 (3.6)</td>
</tr>
<tr>
<td>Pneumonia History</td>
<td>39 (33.3)</td>
<td>8 (28.6)</td>
</tr>
<tr>
<td>Pneumonia on Admission</td>
<td>20 (17.1)</td>
<td>4 (14.3)</td>
</tr>
<tr>
<td>Pneumonia - Hospital Acquired</td>
<td>2 (1.7)</td>
<td>2 (7.1)</td>
</tr>
<tr>
<td>Factors</td>
<td>Group 1 (n=117)</td>
<td></td>
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<tr>
<td>----------------------------------------------</td>
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<tr>
<td></td>
<td>n(%) or M(SD)</td>
<td>Range</td>
</tr>
<tr>
<td>Total Days on Ventilator</td>
<td>4.479(4.038)</td>
<td>0.05 – 17.25</td>
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<tr>
<td>Mechanical Ventilation Surgery (on or following)</td>
<td>56(47.9)</td>
<td>12(42.9)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>65.22(14.185)</td>
<td>22-92</td>
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<td>Functional Assessment</td>
<td></td>
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<tr>
<td>Independent</td>
<td>91(77.8)</td>
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<tr>
<td>Assisted</td>
<td>19(16.2)</td>
<td></td>
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<tr>
<td>Dependent</td>
<td>7(6.0)</td>
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<tr>
<td>Glasgow Coma Scale Verbal</td>
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<tr>
<td>2 hours post extubation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oriented, converses</td>
<td>51(43.6)</td>
<td></td>
</tr>
<tr>
<td>Disoriented, converses</td>
<td>39(33.3)</td>
<td></td>
</tr>
<tr>
<td>Uses inappropriate words</td>
<td>6(5.0)</td>
<td></td>
</tr>
<tr>
<td>Incomprehensible sounds</td>
<td>15(12.8)</td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td>6(5.1)</td>
<td></td>
</tr>
<tr>
<td>Factors</td>
<td>Group 1 (n=117)</td>
<td>Group 2 (n=28)</td>
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<tr>
<td></td>
<td>n(%) or M(SD)</td>
<td>n(%) or M(SD)</td>
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<tr>
<td></td>
<td>Range</td>
<td>Range</td>
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<tr>
<td><strong>Level of Consciousness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alert</td>
<td>46(39.3)</td>
<td>17(60.7)</td>
</tr>
<tr>
<td>Arousable</td>
<td>11(9.4)</td>
<td>1(3.6)</td>
</tr>
<tr>
<td>Slow to Respond</td>
<td>9(7.7)</td>
<td>0</td>
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<tr>
<td>Drowsy</td>
<td>41(35.0)</td>
<td>9(32.1)</td>
</tr>
<tr>
<td>Restless</td>
<td>4(3.4)</td>
<td>0</td>
</tr>
<tr>
<td>Agitated</td>
<td>4(3.4)</td>
<td>1(3.6)</td>
</tr>
<tr>
<td>Withdraws from stimulation</td>
<td>2(1.7)</td>
<td>0</td>
</tr>
<tr>
<td><strong>Age greater than 65(years)</strong></td>
<td>72(61.5)</td>
<td>19(67.9)</td>
</tr>
<tr>
<td><strong>Altered Mental Status</strong></td>
<td>51(45.1)</td>
<td>7(25.0)</td>
</tr>
<tr>
<td>Factors</td>
<td>Group 1 (n=117)</td>
<td>Group 2 (n=28)</td>
</tr>
<tr>
<td>---------------------------------------</td>
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</tr>
<tr>
<td></td>
<td>n(%) or mean(SD)</td>
<td>n(%) or mean(SD)</td>
</tr>
<tr>
<td>Extubation to Bedside Dysphagia Eval (days)</td>
<td>1.95(2.505) 0 - 19</td>
<td>2.18(2.326) 1 - 11</td>
</tr>
<tr>
<td>PO Prior to Bedside Dysphagia Eval*</td>
<td>16(13.7)</td>
<td>11(39.3)</td>
</tr>
<tr>
<td>Decreased Secretion Management*</td>
<td>18(15.4)</td>
<td>0</td>
</tr>
<tr>
<td>Change in Vocal Quality*</td>
<td>70(63.6)</td>
<td>6(21.4)</td>
</tr>
<tr>
<td>Signs &amp; Symptoms of Aspiration</td>
<td>103(88.0)</td>
<td>0</td>
</tr>
</tbody>
</table>

*p ≤0.5
Chi-Square Results

- Three factors found to be statistically significant to whether or not patients received further intervention, i.e., SLP concerned for dysphagia
  - Changes in vocal quality and decreased secretion management were significantly more likely to be recommended for further intervention
  - Patients having PO prior to evaluation were significantly less likely to be recommended for further intervention
Why Further Analysis Needed for Group A

- Not enough factors provided with Chi-Square analysis
- Limitations to retrospective study
- Could not further analyze Group B
  - Cannot determine whether they did or did not have dysphagia
Demographics of Group A1 (N = 117)

- Population:
  - Cardiac: 37
  - Pulmonary: 20
  - Other Surgery: 13
  - Infectious Disease: 9
  - Neurological: 8
  - Gastrointestinal: 8
  - Orthopedic Surgery: 5
  - Substance Abuse: 3
  - Other: 4

- Age:
  - Range of 22-92
  - Mean of 65

- Days Admit:
  - Range of 4-53
  - Mean of 19

- Days in ICU:
  - Range of 2-35
  - Mean of 11
Using Same 22 Factors…

- Primary Diagnosis Acute Respiratory Failure
- Secondary Diagnosis Acute Respiratory Failure
- Chronic Obstructive Pulmonary Disease (COPD)
- Congestive Heart Failure (CHF)
- Neurological Disease
- History of Documented dysphagia
- Co-morbidity Pneumonia
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- Change in Speech
- Change in Voice
- Altered Mental Status
- Secretion Management
- Overt s/s aspiration
Principal Components Analysis (PCA)

- Nine out of twenty-two of the factors explained 71.4% of the variance:
  - Primary diagnosis acute respiratory failure
  - Secondary diagnosis of acute respiratory failure
  - Verbal GCS on Admission
  - Total GCS on Admission
  - Neurologic disease
  - Change in speech
  - History of dysphagia
  - History of Congestive Heart Failure
  - Functional assessment level prior to admit
Excluded Factors

- Acute respiratory failure
  - Determined well after extubation by hospital coders, not nursing.
- Glasgow Coma Scale on Admit:
  - Though quite indicative in the literature, inconsistent timing of charting by nursing (usually done once in ICU)
- Both pulled as potential screen factors
PCA Analysis: Take 2

- With acute respiratory failure and GCS removed as factors, repeated analysis
- Results added 2 more factors:
  - COPD
  - History of pneumonia
Remaining Factors

- Given small sample size, looked back to the literature:
  - Prolonged* intubation
  - Age > 65
  - Altered Mental Status
  - Change in speech
  - Change in vocal quality
Defining “Prolonged” Intubation at CBH

As length of mechanical ventilation increased, so did SLP recommendation for further intervention

◆ Average mechanical vent of Group A1 (received consult and further intervention recommended by SLP): 4.5 days
  – 60% were on ventilator > 2 days
Defining “Prolonged” Intubation at CBH

- Average mechanical vent of Group A2 (received consult and not recommended further intervention by SLP): 2.6 days
  - Over 95% were on ventilator < 2 days
- When looking back at pts with NO initial SLP referral (Group B), more than 95% were on also on ventilator < 2 days
- Based on our data, “prolonged” intubation established as 48 hours
Selected Factors at this Point

- Predictive Factors from PCA:
  - Neurologic disease
  - Change in speech
  - History of dysphagia
  - History of CHF
  - Functional assessment level prior to admit
  - COPD
  - History of pneumonia

- Predictive Factors from Chi-Square Analysis:
  - Decreased Secretion Management
  - Change in vocal quality

- Predictive Factors from Literature:
  - Prolonged intubation, set as 48 hours (CBH data)
  - Age > 65
  - Altered Mental Status
Weighting the Factors

- From PCA (analysis still in progress):
  - Most significant predictors of those needing further dysphagia intervention:
    - Functional Assessment
    - History of Dysphagia
    - Neurologic Disease
    - Change in Speech
  - Next most significant predictors:
    - Congestive Failure
    - COPD
    - History of Pneumonia
- Remaining factors weighted for significance based on evidence in literature and clinical knowledge
## Weighting Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mode of Selection</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Intubation &gt; 48 hrs</td>
<td>Literature/CBH data</td>
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<tr>
<td>Age &gt; 65 years</td>
<td>Literature</td>
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<tr>
<td>Altered Mental Status</td>
<td>Literature</td>
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<tr>
<td>Functional Assessment</td>
<td>PCA</td>
<td>3</td>
</tr>
<tr>
<td>History of dysphagia</td>
<td>PCA</td>
<td>3</td>
</tr>
<tr>
<td>Neurologic disease</td>
<td>PCA/Literature</td>
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<td>Change in Speech</td>
<td>PCA</td>
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<td>Change in Vocal Quality</td>
<td>Chi-Square</td>
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<td>Congestive Heart Failure</td>
<td>PCA/Literature</td>
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<td>COPD</td>
<td>PCA</td>
<td>2</td>
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<tr>
<td>History of Pneumonia</td>
<td>PCA</td>
<td>2</td>
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</tbody>
</table>
Weighted Factor Cut Off Point

- What sum of factor points indicates need for further intervention?
- Applied the factor values to those patients SLP recommended further intervention (Group A1)
- Goal is to find the total factor point value that would capture $\geq 80\%$
<table>
<thead>
<tr>
<th>Weighted Factor</th>
<th>With Pneumonia Score</th>
<th>Without Pneumonia Score</th>
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<tbody>
<tr>
<td></td>
<td>SLP Follow up (%)</td>
<td>No SLP Follow (%)</td>
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<tr>
<td></td>
<td>M = 10.03</td>
<td>M = 8.75</td>
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<td>Range 1-23</td>
<td>Range 0-16</td>
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<tr>
<td>2</td>
<td>100</td>
<td>96</td>
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<tr>
<td></td>
<td>26</td>
<td>21</td>
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</tbody>
</table>
Pneumonia Removed as Factor

- No significant difference between whether pneumonia was or was not included
- Inconsistent reporting of this historical item
  - Judgment call placed on nursing as to whether pneumonia at age 5 would be included?
  - Would pt/family even think to report remote history of pneumonia?
Factors Selected Based on PCA and Literature Review

<table>
<thead>
<tr>
<th>Factors</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubated &gt; 48 hours</td>
<td>4</td>
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<tr>
<td>Age &gt; 65</td>
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<tr>
<td>Altered Mental Status</td>
<td>4</td>
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<tr>
<td>Functional Assessment</td>
<td>3</td>
</tr>
<tr>
<td>History of dysphagia</td>
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</tr>
<tr>
<td>Neurologic Disease</td>
<td>3</td>
</tr>
<tr>
<td>Change in speech</td>
<td>3</td>
</tr>
<tr>
<td>Change in vocal quality</td>
<td>3</td>
</tr>
<tr>
<td>CHF</td>
<td>2</td>
</tr>
<tr>
<td>COPD</td>
<td>2</td>
</tr>
</tbody>
</table>
Components of Screen

- Completed on all intubated ≥ 6 hrs*
- Alert and able to participate
- Factors predictive of suspected dysphagia
  - Weighted factors; Sum ≥ 7
  - Secretion Management (Chi-Square)
  - Swallow Trials*:
    - Small sip of water (cup or straw)
    - Teaspoon of applesauce
    - 2-3 consecutive sips of water (cup or straw)
National Standard for Extubation post Thoracic Surgery

- CBH uses Society of Thoracic Surgeons (STS) National Database as benchmark
- STS reports prolonged vent rate as >24 hours post-op
- CBH goal is to have pts weaned from the vent in <6 hours
  - Avg is 5.68% (Jan 1, 2012-Sept 30, 2012)
  - % of pts weaned in <6 hrs YTD is 36%; additional 37% weaned in 6-12 hrs
*Why Solids Not Included*

- Restrictions following CABG
  - High population of heart pts at CBH
- No PO meds or full diet until gut "wakes up"
  - Approximately 6 hours after extubation
- Clear liquids tray for first meal and then to advance as tolerated
  - Screen needs to reflect clear liquid diet
Retroactive Application of Dysphagia Screen

117 were recommended for further follow-up by SLP (Group A1):

- When screen applied, 97% (113/117) would still receive referral for SLP.
- Of the 4/117:
  - 3 intubated ≤ 6 hrs. All consulted for non-intubation related concerns
    - Neuro-based concerns (CVA pathway screen)
  - 1 with one factor (vocal quality); FEES same day revealed functional swallow
Retroactive Application of Dysphagia Screen

- 28 were NOT recommended for further follow-up by SLP (Group A2):
  - When screen applied, 79% (22/28) would receive referral for SLP (over-referral)

- 448 pts were NOT referred to SLP (Group B). Only factors portion of screen was applied:
  - 42% (189/448) would not be screened
  - ≤ 6 hours on vent
  - 31% (106/342) of those screened would then receive referral for SLP (¿ over-referral)
Weighted Factor Total Sum

- Score of $\geq 7$ seemed to have over-referral rate: Combination of:
  - Prolonged intubation (4) + Change in Vocal Quality (3)
  - Age $> 65$ years (4) + Change in Vocal Quality (3)

- Considering future application of sensitivity/specificity:
  - Results if increase total from $\geq 7$ to $\geq 8$?
Retroactive Application of Screen: Sum of Factors Adjusted to ≥8

117 were recommended for further follow-up by SLP (Group A1):

– When screen applied, SLP referral reduced only from 97% to 96% (112/117)

– Of the 5/117:
  
  4 as previously mentioned

  1 started on mechanical-soft diet secondary to general patient fatigue; advanced to regular diet the following day by SLP
Retroactive Application of Screen: Sum of Factors Adjusted to ≥8

- 28 were NOT recommended for further follow-up by SLP (Group A2):
  - When screen applied, SLP referral dropped from 79% to 61% (17/28)

- 448 pts were NOT referred to SLP (Group B). Only factors portion of screen was applied:
  - 42% (189/448) would not have been screened as period of mech vent ≤ 6 hours
  - Of those screened, SLP referral dropped from 31% to 17% (59/342)
### Screen Part 1: Factors

**POST-EXTUBATION DYSPHAGIA SCREENING**

Complete prior to any oral intake, including oral meds, with all patients intubated > 6 hours after admission to ICU. Complete only when patient is alert and able to participate. *Pts with tracheostomy should receive direct dysphagia consult.*

<table>
<thead>
<tr>
<th>Length of intubation: _______ hrs</th>
<th>Date/Time of extubation: ____________</th>
<th>Date/Time of screen: ____________</th>
</tr>
</thead>
</table>

Sit patient upright at 90 degrees with head in neutral position. Perform oral care prior to PO trials.

Ensure patient wearing all assistive devices (dentures, hearing aides, glasses, etc).

For each Factor present in Patient, circle the corresponding Value Number. Then total the circled Value Numbers.

<table>
<thead>
<tr>
<th>Patient Factor</th>
<th>Value Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Intubated &gt; 48 hours</td>
<td>4</td>
</tr>
<tr>
<td>2) Age &gt; 65 years</td>
<td>4</td>
</tr>
<tr>
<td>3) Altered Mental Status</td>
<td>4</td>
</tr>
<tr>
<td>4) Level of Functional Assessment Prior to Admission was “Assisted” or “Dependent” (not Independent)</td>
<td>3</td>
</tr>
<tr>
<td>5) Change in Speech (slurred, garbled, not understandable)</td>
<td>3</td>
</tr>
<tr>
<td>6) Change in Vocal Quality (hoarse or wet)</td>
<td>3</td>
</tr>
<tr>
<td>7) History of Dysphagia (swallowing problems)</td>
<td>3</td>
</tr>
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<td>8) History or current Neurologic Disease</td>
<td>3</td>
</tr>
<tr>
<td>9) CHF</td>
<td>2</td>
</tr>
<tr>
<td>10) COPD</td>
<td>2</td>
</tr>
</tbody>
</table>

= Sum of Circled Values
Screen Part 2: Secretions and Sum of Weighted Factors

<table>
<thead>
<tr>
<th>Patient manages own secretions (no need for suctioning/not drooling)?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
<td>▼</td>
</tr>
</tbody>
</table>

If No - At risk! STOP SCREENING
- Keep NPO
- Refer to SLP for dysphagia assessment
- Call MD for medication instructions via NON-ORAL route

<table>
<thead>
<tr>
<th>Sum of Circled Values &lt; 8?</th>
<th>Yes</th>
<th>No</th>
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If No - At risk! STOP SCREENING
- Keep NPO
- Refer to SLP for dysphagia assessment
- Call MD for medication administration instructions
### SWALLOW SECTION

**Patient can swallow:**
- Without difficulty (see below**)
  - Small sip of water (cup or straw)
  - Teaspoon of applesauce
  - 2-3 consecutive sips of water (cup or straw)

**Note: signs patient is having difficulty swallowing:**
- Voice change after swallow (wet, gurgly, or change in quality/strength)
- Coughing or throat clearing after swallow
- Pocketing of food in cheek (leftover food in mouth)

<table>
<thead>
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<th>Yes</th>
<th>No</th>
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If all YES - call MD for diet order and advance as tolerated.

If No on ANY item - At risk! STOP SCREENING
- Keep NPO
- Refer to SLP for dysphagia assessment
- Call MD for medication administration instructions

If patient develops any signs of difficulty, contact Speech-Language Pathology at 6129.

---

Nurse's Signature: ___________________________ Date: ___________________________ Time: ___________________________
**POST-EXTUBATION DYSPHAGIA SCREENING**

Complete prior to any oral intake, including oral meds, with all patients intubated > 6 hours after admission to ICU.

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For each factor present in patient, circle the corresponding value number. Then total the circled value numbers.

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**SWALLOW SECTION**

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If all YES - call MD for diet order and advance as tolerated.

If patient develops any signs of difficulty, contact Speech-Language Pathology at 5129.

---

- Patient manages own secretions (no need for suctioning/not drooling)?
  - Yes
  - No

Sum of Circled Values < 8?
- Yes
- No

---

If No - **At risk** - STOP SCREENING
- Keep NPO
- Refer to SLP for dysphagia assessment
- Call MD for medication instructions via NON-ORAL route

If No on **ANY** item - **At risk** - STOP SCREENING
- Keep NPO
- Refer to SLP for dysphagia assessment
- Call MD for medication administration instructions
Limitations of Project

- Small sample size
- What about the pts who did NOT receive initial referral for Speech?
  - Statistically significant factors likely contained in comparison of these pts
- Difficult to maintain objectivity with many factors (e.g., altered mental status)
- Retrospective analysis, lacks control
Future Direction

- Meet with MDs and ICU nursing directors
- Nurse education and training
  - Pre and post knowledge survey
  - RNs to become competency-validated screener
- Implement use of screen in pilot ICU
  - SLP to rescreen all pts (whether pass or fail) to gauge and improve inter-rater reliability
- Continue data collection using 1st version of dysphagia screen
  - Need larger sample to better analyze data
  - Improve effectiveness of screen
References

References