Oral feeding in ventilated patients

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Conflict of interest

None to declare

* All patient material in the talk is used with permission
What do we know about swallowing?

### PEOPLE SWALLOW
900 TIMES PER DAY
(on average)

Swallowing uses
26 muscles

More than 1 million
Australians have difficulty swallowing

### Dysphagia
(dis-fay-juh)
noun, difficulty or discomfort in swallowing.

A swallowing disorder may affect:

- **15-30%** of people aged 65+ living in the community
- **50%** of older adults in nursing homes
- **84%** of people with Parkinson’s disease
- **100%** of people with Alzheimer’s, at some point in their disease progression
- **20%** of adults with mental health disorders
- **45%** of patients with head and neck cancer, post chemoradiotherapy
- **40%** of stroke survivors have an ongoing need for support for swallowing
- **25%** of patients with Multiple Sclerosis have swallowing difficulties increasing to as many as 85% of those with severe Multiple Sclerosis.
What happens during swallowing?

- A chain of movements from mouth to velopharynx, to pharynx to oesophagus
- Coordination of all 26 muscles needed
- Airway is protected on several layers:
  - Epiglottis
  - Arytenoids
  - False cords
  - Vocal folds (subglottic pressure)
- Co-ordination with respiration
Swallow-resp coordination

Swallowing usually occurs during expiration (96% of adults)
• 20-40% of COPD population
• 43% of stroke

Breathing stops momentarily during the swallow
• What if the patient is ventilated via a tracheostomy tube with an inflated cuff?

Image: Nagami et al BMJ Open Resp Research 2017
Dysphagia in ICU?

- Oropharyngeal and laryngeal trauma
- Altered sensorium
- Neuromuscular weakness
- Reduced laryngeal sensation
- Gastroesophageal reflux
- Dyssynchronous breathing and swallowing

Six potential mechanisms for the development of ICU-acquired swallowing disorders.

Macht M et al, CCM 2013
Impact of invasive ventilation on swallowing

- Airflow bypasses upper airway - desensitisation
- Oedema, trauma from tubes
- Often sedated

*Use it or lose it!*

- Impact of ETT on swallow
  - No data
  - Airway persistently open
  - Post-extubation dysphagia
Impact of TT on swallowing

Conflicting data...

• Overinflated cuff
• TT position
What do patients say?

**THIRST** - whilst ventilated
Assessment and screening methods

- **Assessments (Speech Pathology)**
  - Fibreoptic endoscopic evaluation of swallowing (FEES)
  - Videofluoroscopic swallow study (VFSS)

- **Screening methods (SP and rest of team)**
  - Oromotor examination
  - Use of blue dye???
  - 3 oz swallow test etc.
FEES
FEES - Clinical benefits

• Primary goal - evaluate physiology of swallowing

• Early instrumental Ax of swallow at bedside

• Ability to visualise pharyngeal/laryngeal anatomy, premature spillage, pharyngeal residue, laryngeal penetration and aspiration

• Ax of secretion management

• Safe commencement of oral intake
VFSS

• “x-ray swallow”
• Ability to visualise deep structures (hyolaryngeal excursion, UES opening)
• No Ax of mucosa, secretions, laryngeal function
• Exposure to radiation
• Not at bedside
How to ensure the safest swallow for a ventilated patient with TT?

- SP input
- Try ‘normalise’ upper airway
- Instrumental Ax desirable
Oral intake for ventilated patients at TPCH

- 28 bed ICU, primarily cardio-thoracic casemix
- Including VAD, ECMO and transplant service
- 0.6 FTE -> 1.6FTE of Speech Path service in ICU
- Up until 2012 pts were fed with TT cuffs inflated
- 2012 saw the introduction of PMVs into TPCH ICU
## Tracheostomised patients in TPCH ICU

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pts with TT</td>
<td>56</td>
<td>73</td>
<td>68</td>
<td>77</td>
</tr>
<tr>
<td>Mean age</td>
<td>58.5</td>
<td>59</td>
<td>59</td>
<td>57</td>
</tr>
<tr>
<td>Male</td>
<td>81.4%</td>
<td>68.5%</td>
<td>63.2%</td>
<td>63.6%</td>
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<tr>
<td>Survived ICU</td>
<td>83.9%</td>
<td>80.8%</td>
<td>88.2%</td>
<td>77.9%</td>
</tr>
</tbody>
</table>

*Sutt et al, JoCC 2015*
Average ETT and TT duration

Range for ETT: 0-34 days
Range for TT: 2-130 days (217 days for one patient in 2011, excluded)
Oral intake vs speaking valve use at TPCH ICU

- Days from TT to oral intake
- Days from TT to SV use

<table>
<thead>
<tr>
<th>Year</th>
<th>Days from TT to oral intake</th>
<th>Days from TT to SV use</th>
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</thead>
<tbody>
<tr>
<td>2011</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>2012</td>
<td>7</td>
<td>9</td>
</tr>
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<td>2013</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>2014</td>
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</table>
Oral diet whilst tracheostomised - TPCH

![Bar chart showing the percentage of puree, minced, soft, and full diets from 2011 to 2014.]

- **2011**: 14.3% puree, 21.4% minced, 22.1% soft, 42.2% full
- **2012**: 14.3% puree, 27.4% minced, 13.7% soft, 44.6% full
- **2013**: 23.5% puree, 19.1% minced, 8.8% soft, 48.6% full
- **2014**: 26.0% puree, 26.0% minced, 14.3% soft, 33.7% full
Oral fluids whilst tracheostomised - TPCH

2011: 32.1%
2012: 31.5%
2013: 7.4%
2014: 16.9%

- extr thick
- mod thick
- mildly thick
- thin
Conclusions

• Mechanical ventilation (via TT) should not stop patients from eating and drinking

• Good screening and assessment tools are essential in guaranteeing success with oral intake

• More research is needed on dysphagia