Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

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European Society for Swallowing Disorders

Nature and Assessment of Chronic Dysphagia in Oesophageal Cancer: A Preliminary Cross-Sectional Study

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15/09/2022

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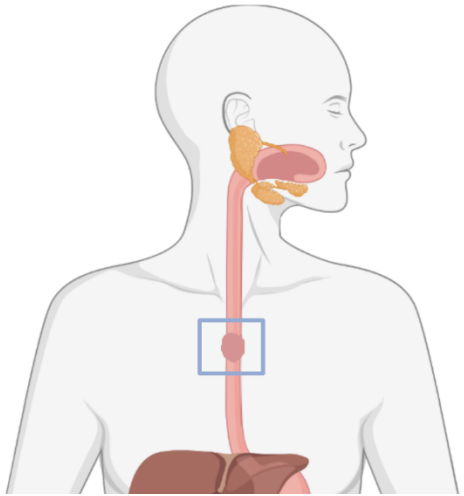
Disclosure:

Our team has nothing to disclose.

Dysphagia is a common symptom of oesophageal cancer

(Hambreus et al 1987, Roy et al 1988, Peters et al 1995, Heitmiller & Jones 1991)



Prevalence: 93% of patients with scc, 79% of patients with adenocarcinoma

(Gibbs et al 2007)

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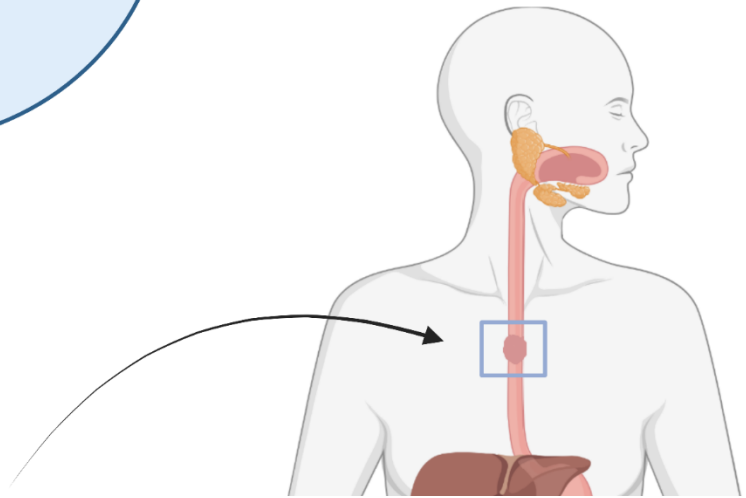

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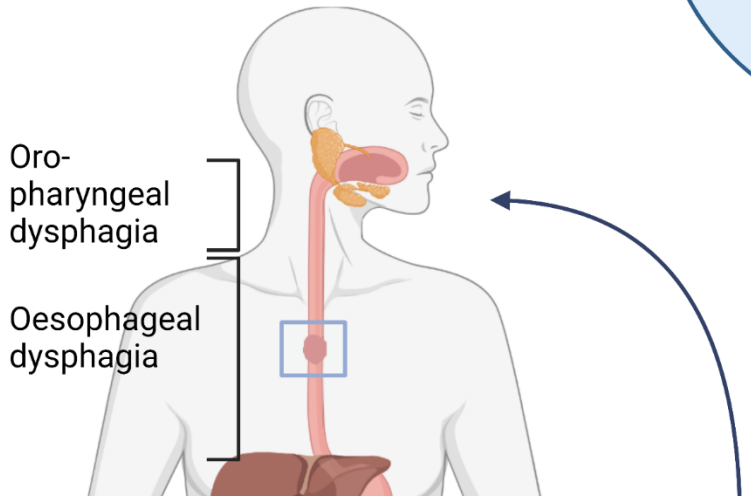


Pharyngeal Dysphagia pre-oesophageal resection

- Mildly reduced pharyngeal contraction (n=6)
- Mild delay in initiation (N = 8).
- Postswallow pharyngeal residue (N = 10)
- Laryngeal penetration/ aspiration (n=2)

Martin et al, 2001

Pharyngeal Dysphagia acutely post-resection

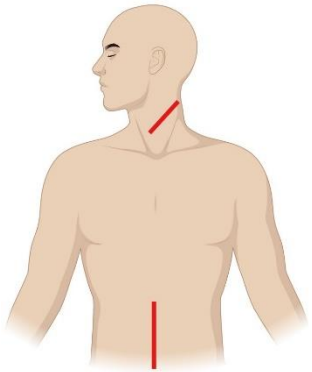
- Vocal fold immobility (12.7%-76%)
- Delayed onset of swallowing
- Reduced hyolaryngeal elevation
- Reduced maximum Anterior-posterior diameter during UES opening
- Overt aspiration (0-81%)
- Silent aspiration (14.4%)
- Pharyngeal residue

Kaneoka et al, 2018

Oesophagectomy

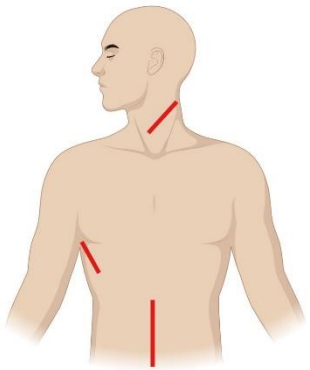
- Oesophageal resection is one of the most invasive cancer surgeries. (Low et al 2019, Konda et al 2017, Ahmadinehad et al 2015)
- Various surgical approaches are used for oesophageal resection. Two of the main types:

Transhiatal Resection

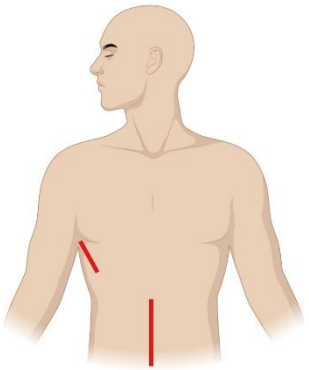


Transthoracic Resections

(3 stage)



(2 stage)



What do we know about dysphagia throughout survivorship?

Impact on QOL 10 years post surgery

- Eating problems, choking, and trouble swallowing saliva. (Kauppila et al, 2019, Low et al 2019, Taioli et al 2017)
- Strong negative effect on HRQoL measures for dysphagia and ‘eating difficulties’. (Lagergren et al, 2017)

Little research has investigated chronic dysphagia in this population…

Koh et al, 2004

Pharyngeal swallow was **relatively intact** on VFS in **9 participants** a median of **18 months** (range 6-40 months) post-surgery.

Yuen et al, 2019

Chronic **mild to moderate** pharyngeal dysphagia on VFS in **29 participants** a **mean of 4.3 years** (range 0.5 – 18.4 years) post-surgery.

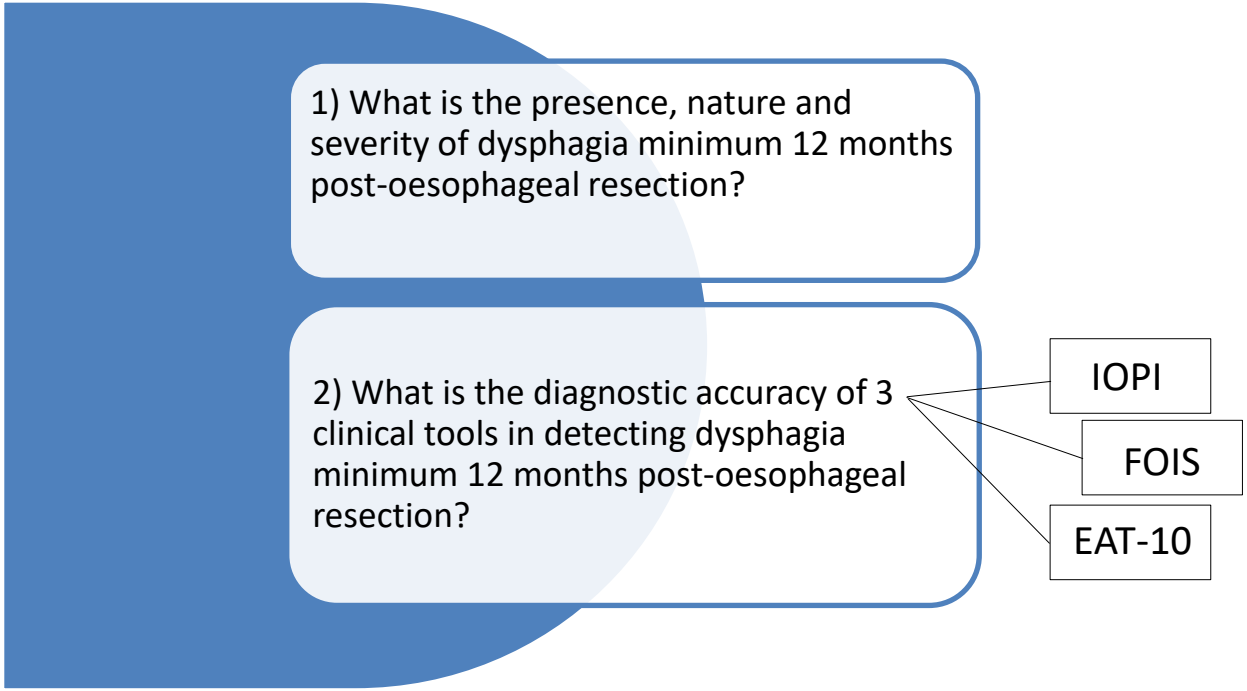
5 year survival rate has significantly increased in the last 20 years

- approximately 50% of patients who receive curative treatment survive

(Donlon et al 2020, Van Hagen et al 2012, Cunningham et al, 2006, Homann et al 2019)

Pexels.com

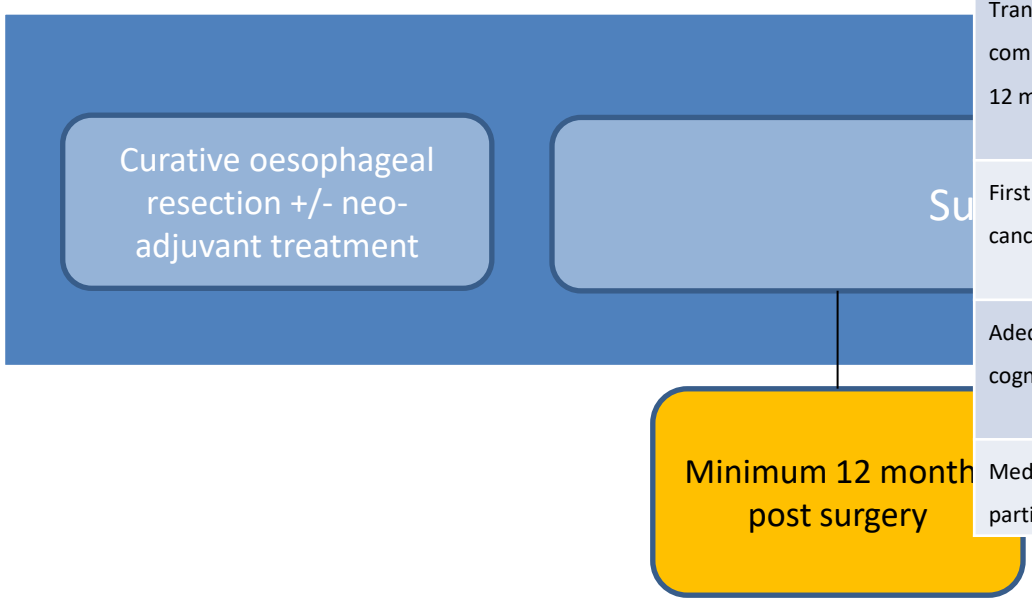
Research Questions



Methodology

Design: Cross-sectional prospective observational study

Recruitment: Purposive Sampling



Inclusion Criteria	Exclusion Criteria
Transhiatal or transthoracic surgery completed with curative intent at least 12 months prior.	History of neurological impairment, head and neck cancer, or oral/pharyngeal dysphagia.
First time diagnosis of oesophageal cancer.	Evidence of metastatic or recurrent disease.
Adequate language comprehension / cognition to participate.	Formal diagnosis of severe Chronic Obstructive Pulmonary Disease.
Medical approval received to participate in our study.	Receiving palliative treatment.

Patient and Public Involvement (PPI)

Our research team's PPI Committee assisted with the selection of Outcome Measures for this study.

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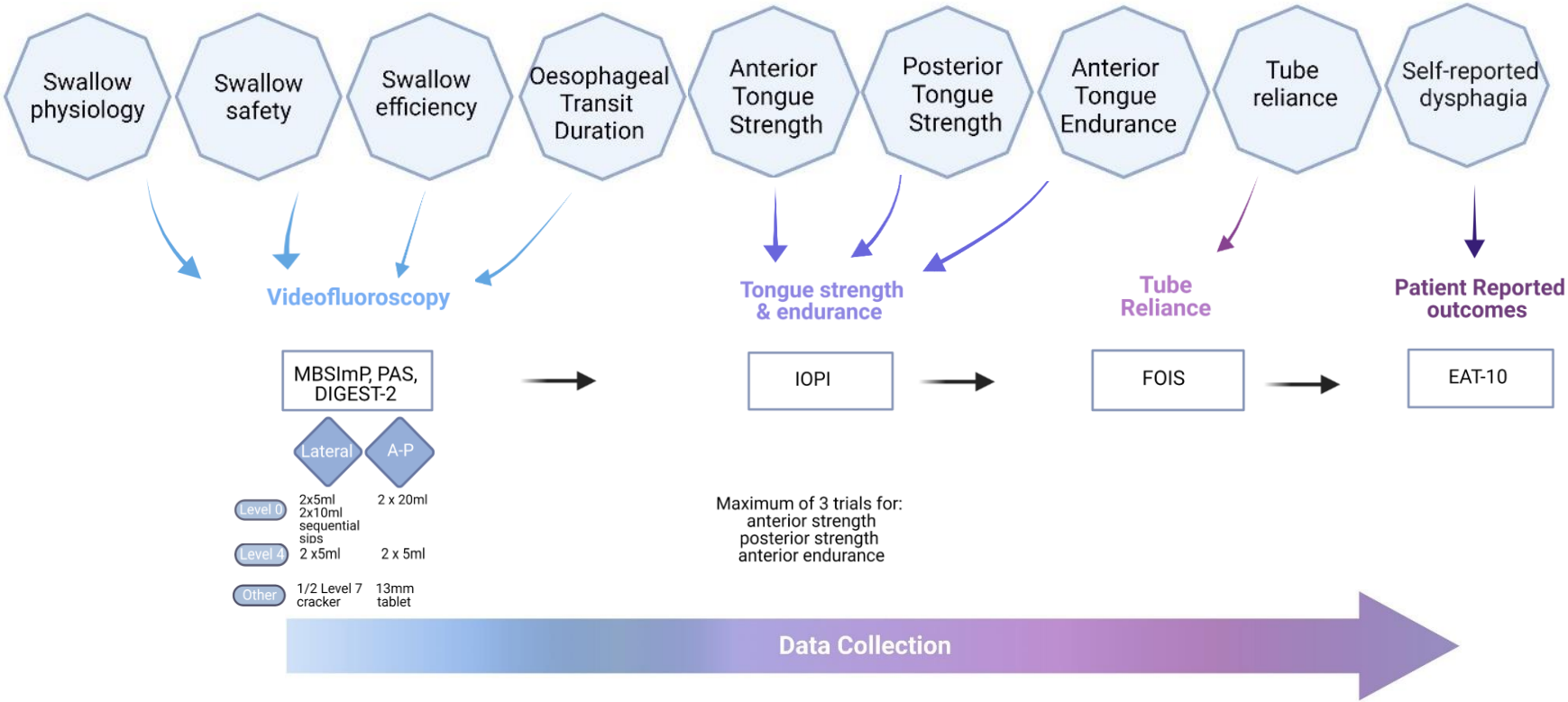
Question 1: Outcomes


Swallow physiology
Swallow safety
Swallow efficiency
Oesophageal Transit Duration
Anterior Tongue Strength
Posterior Tongue Strength
Anterior Tongue Endurance
Tube reliance
Self-reported dysphagia
Videofluoroscopy
Tongue strength & endurance
Tube Reliance
Patient Reported outcomes
MBSImP, PAS, DIGEST-2
IOPI
FOIS
EAT-10
Lateral
A-P
Level 0
2x5ml 2x10ml sequential sips
2 x 20ml
Level 4
2 x5ml
2 x 5ml
Other
1/2 Level 7 cracker
13mm tablet
Maximum of 3 trials for:
anterior strength
posterior strength
anterior endurance
Data Collection

Question 2: Diagnostic Accuracy Outcomes

Index Tests

- IOPI
- FOIS
- EAT-10

Reference Standard Test

- Oral Dysphagia
- Pharyngeal Dysphagia

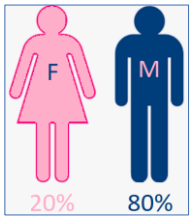
Videofluoroscopy

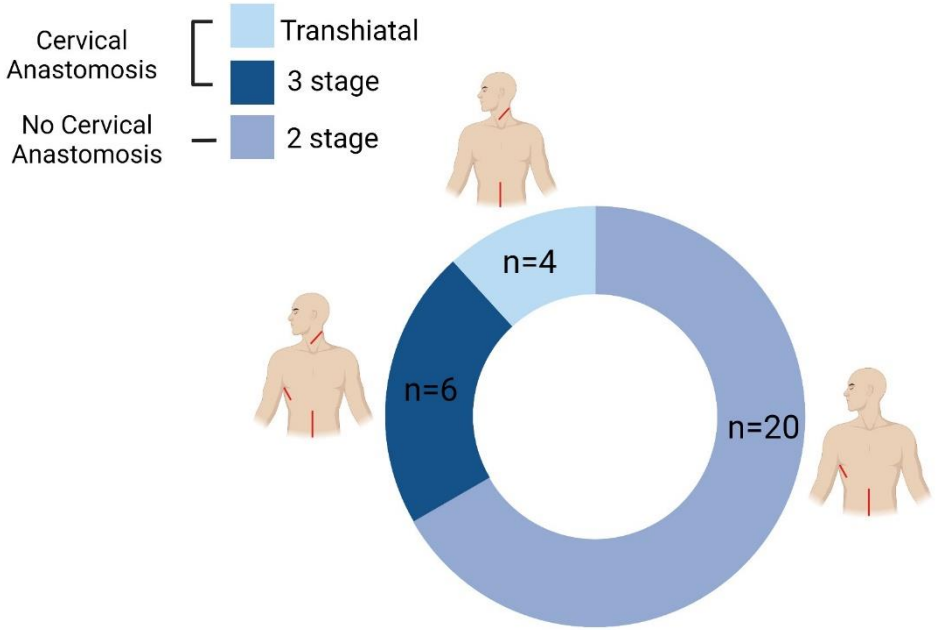
STARD 15 Diagnostic Accuracy Reporting Guidelines (Bossuyt et al 2015)

Results

n = 30 adults

Mean age = 64.8 +/- 9.661 years
Mean months post op = 38.4 +/- 19.35



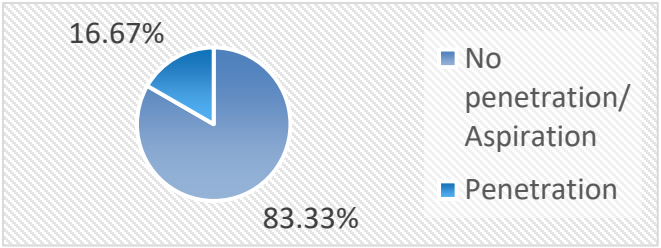


Results

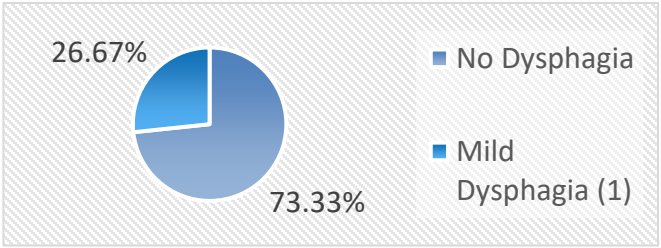
Question 1: What is the presence, nature and severity of dysphagia?

Results Q1

Penetration/Aspiration (PAS)



Dysphagia (DIGEST-2)



Oropharyngeal Physiology (MBS ImP)

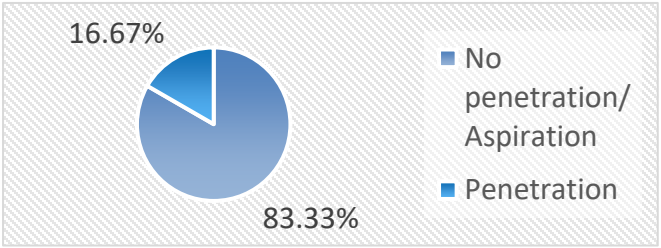
Mean MBS ImP Total Oral Score:	5.23+/-2.32 (Mean +/- Std Dev) (Median 5, Range 8)
Mean MBSImP Total Pharyngeal Score:	6.4+/-3.15 (Mean +/- Std Dev) (Median 7, Range 10)

Oesophageal Transit Duration (s)

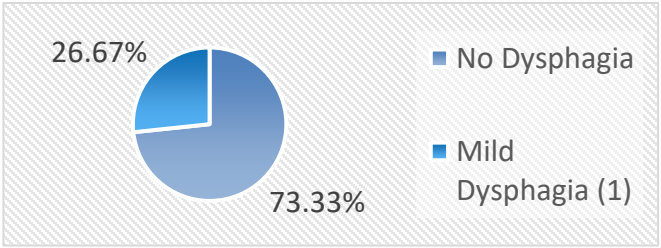
Level 0:	36.7+/- 42.93 (Mean +/- Std Dev)
Level 4:	43.67+/-41.395 (Mean +/-Std Dev)

Results Q1

Penetration/Aspiration (PAS)



Dysphagia (DIGEST-2)



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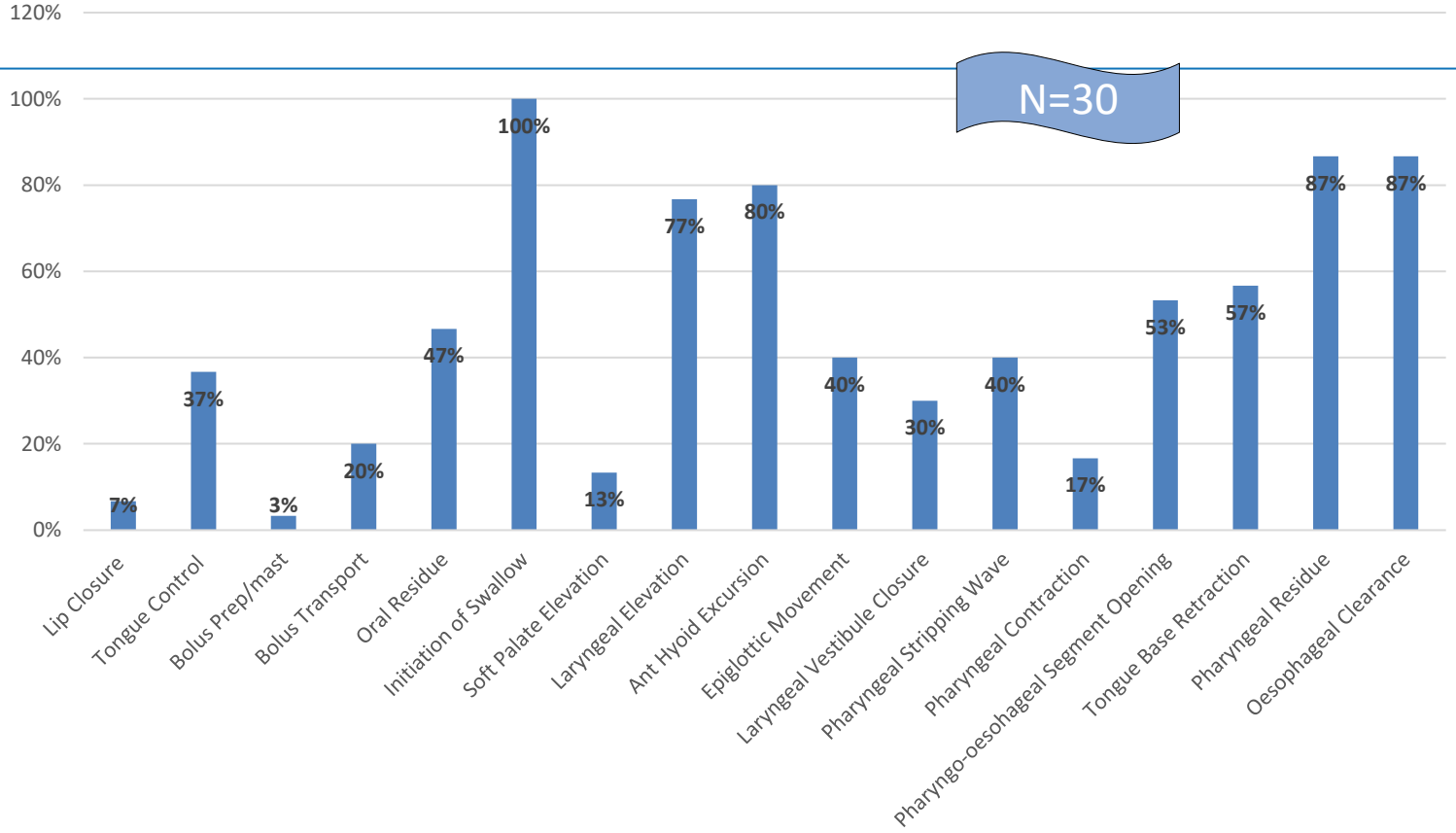
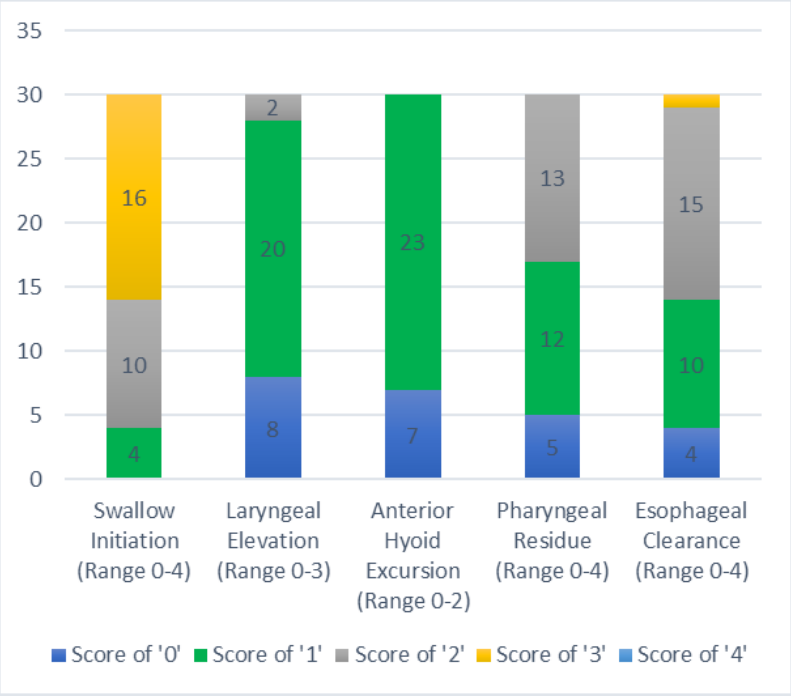
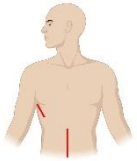
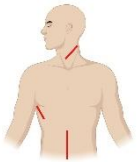
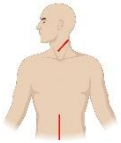
MBSImP breakdown



Severity across key MBS Imp components (5 of 17)



Swallow safety, efficiency, physiology across surgical approach

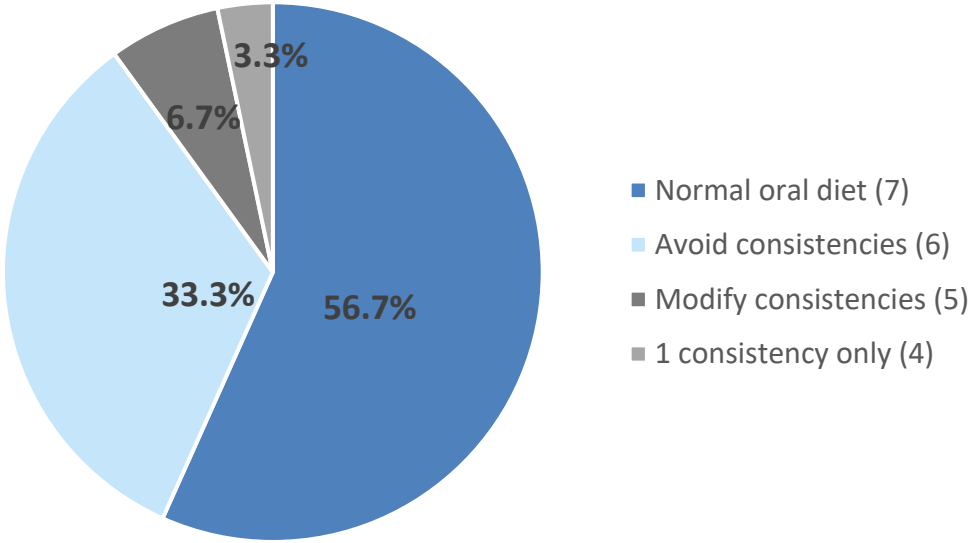




N=30

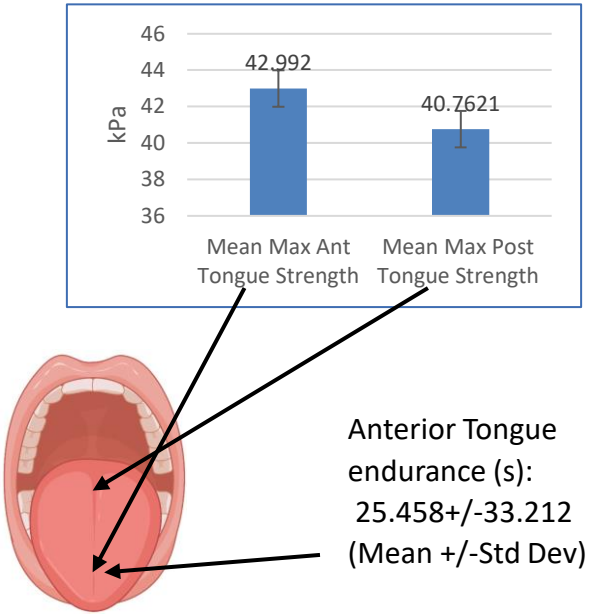
	Thoracic Anastomosis (Mean +/- Std Dev (95%CI)	Cervical Anastomosis (Mean +/- Std Dev (95%CI)		p Value
	2 stage (n =20)	**3 stage (n=6)**	**Transhiatal (n=4)**	
MBS Imp Total Oral	5.65+/-2.56	4+/-1.414	5+/- 1.633	p = .313.
MBSImp Total Pharyngeal	6.4+/-3.6	7+/-2.098	5.5+/-2.082	p = .774
Worst PAS	1.26 +/- .653	1.14 +/- .378	1.25 +/- .5	p =.897
DIGEST-2	.32+/- .478	.29 +/- .488	.00 +/-.00	p = .455

Descriptive Results

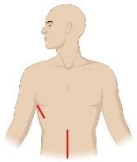
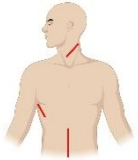
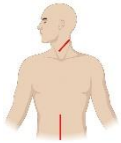
Tube Reliance (FOIS)



Tongue Strength & Endurance (IOPI)



Tongue pressure results across each surgical approach

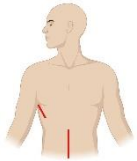
N=30

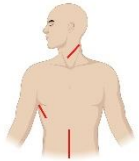
	Thoracic Anastomosis (Mean +/- Std Dev (95%CI)	**Cervical Anastomosis** (Mean +/- Std Dev (95%CI)		**p value**
	2 stage (n =20)	**3 stage (n=6)**	**Transhiatal (n=4)**	
IOPI Max Ant Strength	43.2877 +/- 12.635	43.992+/-8.17	40.125 +/-11.223	p = .865
IOPI Max Post Strength	39.7158 +/-11.8	46.3 +/-8.25	37.425 +/- 16.533	p = .427
IOPI Max Ant Endurance	28.79+/-40.5	22.32+/-9.7	14.45+/-8.07	p = .724

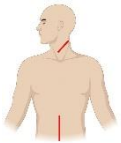
Descriptive results

Outcome	Result
Patient-reported Oropharyngeal Dysphagia (EAT-10)	7.55 +/- 8.356 (Mean +/- Std Dev)

Patient reported dysphagia outcome for each surgical approach







N=30

	Thoracic Anastomosis (Mean +/- Std Dev (95%CI)	**Cervical Anastomosis** (Mean +/- Std Dev (95%CI)		
	2 stage (n =20)	**3 stage (n=6)**	**Transhiatal (n=4)**	**p Value**
EAT-10	7.26+/-8.862	4.5+/- 7.4	13.5+/-4.79	p = .248

Question 2: What is the diagnostic accuracy of clinical tools and questionnaires?

Diagnostic Accuracy Results

1. **Is tongue strength/ endurance (IOPI) diagnostic of oral dysphagia (MBS Imp Total Oral score)?**

Not Diagnostic

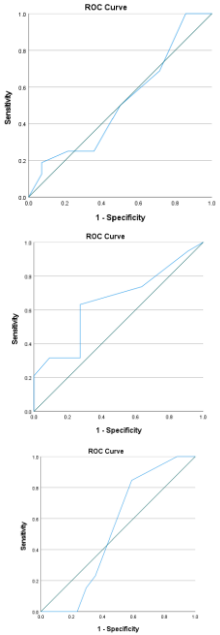
Anterior tongue strength
AUC = .516 (95%CI .303-.729) p = .884

Not Diagnostic

Posterior tongue strength
AUC = .648 (95%CI .447-.850) p = .182
Sensitivity 73.7%, specificity 63.6%

Not Diagnostic

Anterior tongue endurance
AUC = .532 (95%CI .319-.744) p = .770

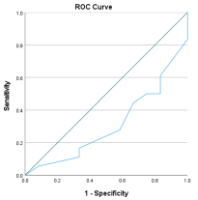


Diagnostic Accuracy Results

2. **Is the FOIS diagnostic of dysphagia (MBS Imp Total Pharyngeal score)**

Not Diagnostic

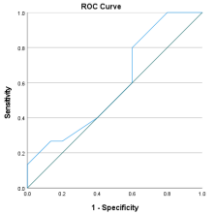
AUC = .310 (95%CI .118-.502) p = .083



3. **Is the EAT-10 diagnostic of dysphagia on instrumental (MBSImP Total Pharyngeal Score or DIGEST-2)?**

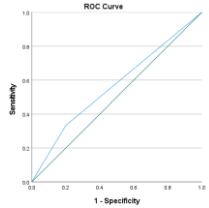
Not Diagnostic

MBS ImP
AUC = .591 (95%CI .383-.799) p = .395



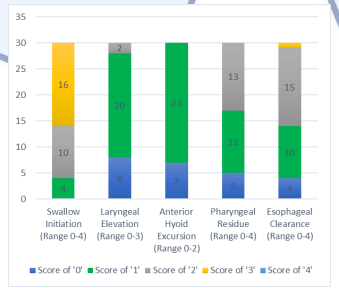
Not Diagnostic

DIGEST
AUC = .567 (95%CI .359-.775) p = .534



Conclusion

Swallow physiology



Oesophageal Transit Duration

Miles et al, 2016

Pharyngeal dysphagia despite no oesophageal stasis/prolonged transit

Tube reliance

Self-reported dysphagia

Belafsky et al 2008

Conclusion

Index Tests

IOPI

FOIS

EAT-10

- Clinical Implication:
  Clinicians should use instrumental assessment to establish a presence of dysphagia

- Future research:
  to better understand the nature, severity, trajectory, impact and treatment of dysphagia in this population.

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The University of Dublin

Thank You

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Not enjoying food
Difficulty concentrating
Choking
Weight loss
Dizziness & fainting
Nausea & vomiting
Voice Changes
Coughing
Painful cramps
Diarrhoea
Severe reflux
Fatigue


Choking
Dizziness & fainting
Coughing
Painful cramps
Severe reflux
Fatigue
Not enjoying food
Voice Changes
Difficulty concentrating
Nausea & vomiting
Weight loss
Diarrhoea


Choking
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Dizziness & fainting
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