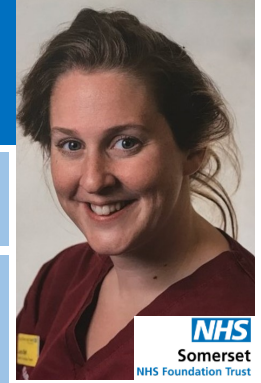


Predictors of Developing a Pneumonia with Known Prandial Aspiration: A New Matrix



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Question: Can we propose a prognostic tool to predict the development of pneumonia for people who aspirate food and drink?

Background

There is **no** tool to support people who are known to aspirate (and clinicians working with them) to enable truly informed decisions regarding *eating and drinking with known aspiration* and the associated risk of developing a **pneumonia** ("aspiration pneumonia").

Predictive factors of *aspiration pneumonia* need **weighting**, and **cumulative**, scores.

Methods

152 cases who had had a **videofluoroscopy** and made a decision to ***eat and drink with known aspiration***

**Full oral intake, oral trials for swallow rehabilitation, or tastes for pleasure*

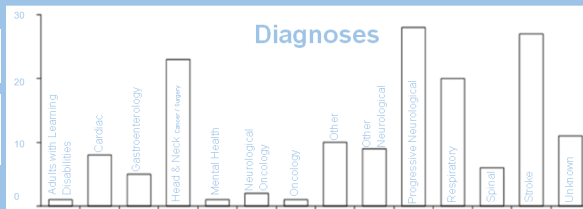
- Were any of the **24 variables** present?
- Was there a diagnosis of **pneumonia** within 3 months?

Logistic regression and random forest analysis

Results

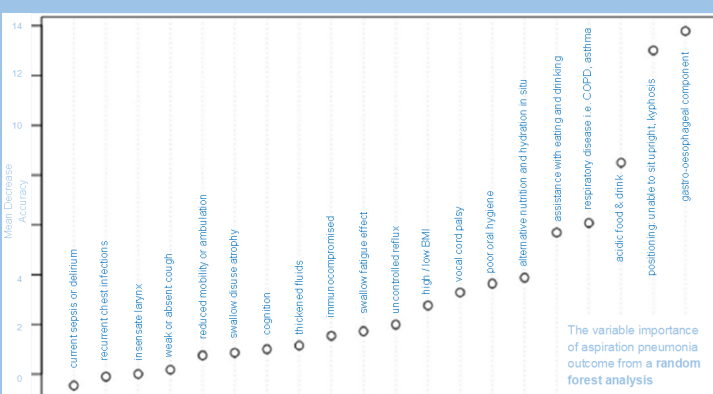
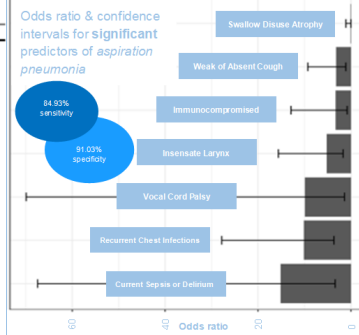
34% female
66% male

Age (years old)
Mean: **72.78**
Range: **22 to 96**



Logistic regression analysis: 18 predictors of aspiration pneumonia

Parameter	Odds Ratio	95% Confidence Interval	Z Value	p (p < 2)
sex	1.0		-2.48	p=0.0123
current sepsis or delirium	60.12	(6.92 to 522.35)	3.71	p=0.0002
insensate larynx	9.07	(1.87 to 44)	2.74	p=0.0062
vocal cord palsy	29.37	(1.87 to 462.3)	2.4	p=0.0162
weak or absent cough	4.19	(1.09 to 16.08)	2.09	p=0.0366
swallow fatigue effect	3.64	(0.95 to 21.51)	1.42	p=0.1547
swallow disuse atrophy	4.03	(0.90 to 18.6)	2.07	p=0.0041
positioning: unable to sit upright, kyphosis	1.04	(0.19 to 5.71)	0.05	p=0.9694
reduced mobility or ambulation	4.81	(0.73 to 31.54)	1.64	p=0.1013
assistance with eating and drinking	1.83	(0.66 to 5.18)	0.34	p=0.7306
cognition	0.71	(0.14 to 3.47)	-0.45	p=0.6705
uncontrolled reflux	0.77	(0.05 to 16.9)	-0.17	p=0.8673
respiratory disease i.e. COPD, asthma	0.52	(0.05 to 1.92)	-1.25	p=0.2115
high / low BMI	1.02	(0.1 to 10.92)	0.02	p=0.9866
immunocompromised	4.1	(0.89 to 11.4)	1.85	p=0.0059
gastro-oesophageal component i.e. oesophageal dysmotility, hiata hernia	13.96	(1.59 to 122.4)	2.38	p=0.0174
recurrent chest infections	21.93	(4.47 to 107.51)	3.81	p=0.0001
thickened fluids	5.2	(0.82 to 33.63)	1.75	p=0.0808
alternative nutrition and hydration in situ i.e. NGT or PEG/RIG	1.33	(0.33 to 5.42)	0.4	p=0.6911



Matrix

Oropharyngeal Swallow Anatomy and Physiology					
Insensate larynx	Vocal cord palsy	Weak or absent cough	Swallow disuse atrophy	Swallow fatigue effect	
12	10	10	5	3	
					Total
Nutrition and Hydration					
Thickened fluids	Alternative nutrition and hydration in situ i.e. NGT or PEG/RIG				
4	2				
					Total
Presentation, Medical History and Activity Status					
Transient					
Current sepsis or delirium	Poor oral hygiene	Uncontrolled reflux			
14	2	3			
					Total
Transient or Static					
Reduced mobility or ambulation	Positioning: Unable to sit upright Kyphosis	Assistance with eating and drinking	Cognition	Immuno-compromised	High / low BMI
7	1	2	5	10	3
					Total
Static					
Recurrent chest infections	Gastro-oesophageal component i.e. oesophageal dysmotility, hiata hernia	Respiratory disease i.e. COPD, asthma			
14	1	1			
					Total
Overall Total					
12 and over Very high risk of developing an aspiration pneumonia					
8 to 11 High risk of developing an aspiration pneumonia					
4 to 7 Medium risk of developing an aspiration pneumonia					
0 to 3 Low risk of developing an aspiration pneumonia					

Conclusion

Logistic regression and random forest analyses led to the proposal of **a new matrix of predictors of aspiration pneumonia for people with an oropharyngeal dysphagia who are likely to aspirate food and drink (right centre)**. The matrix has respective scoring weights for individual and cumulative contributors.

Implications of the Matrix

- Supporting decision making regarding eating & drinking (including alternative nutrition and hydration)
- Informing timing, intensity & type of dysphagia therapy

Next steps

A study to determine the Matrix's validity and reliability

Reference

Ball, L., Meteyard, L., and Powell, R. J. (2023) *Predictors of aspiration pneumonia: developing a new matrix for speech and language therapists*. European archives of oto-rhino-laryngology, 280 (11). pp. 5101-5114. ISSN 1434-4726

