

## BACKGROUND:

Although it is reported that most people with ALS (pALS) develop dysphagia and dysarthria during disease progression, it is currently unclear the relationship between commonly used clinical tests and underlying oropharyngeal pathophysiologic mechanisms.

## AIMS:

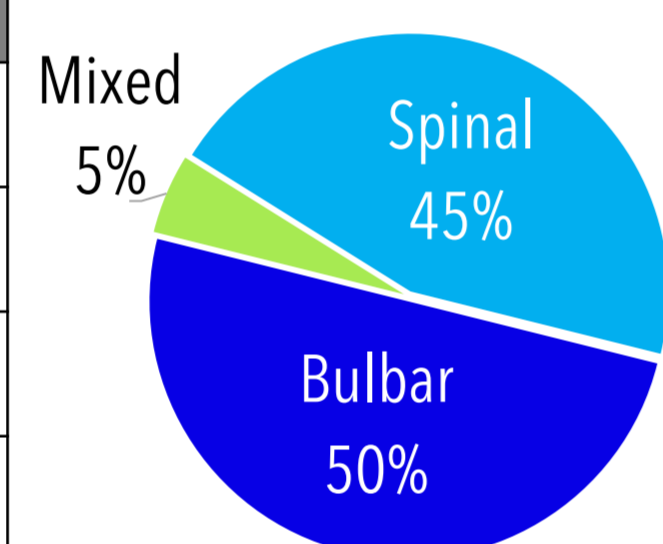
Examine relationships between oral intake, patient perceived deficits, speech, and bulbar strength with radiographically confirmed oropharyngeal swallowing.

## METHODS:

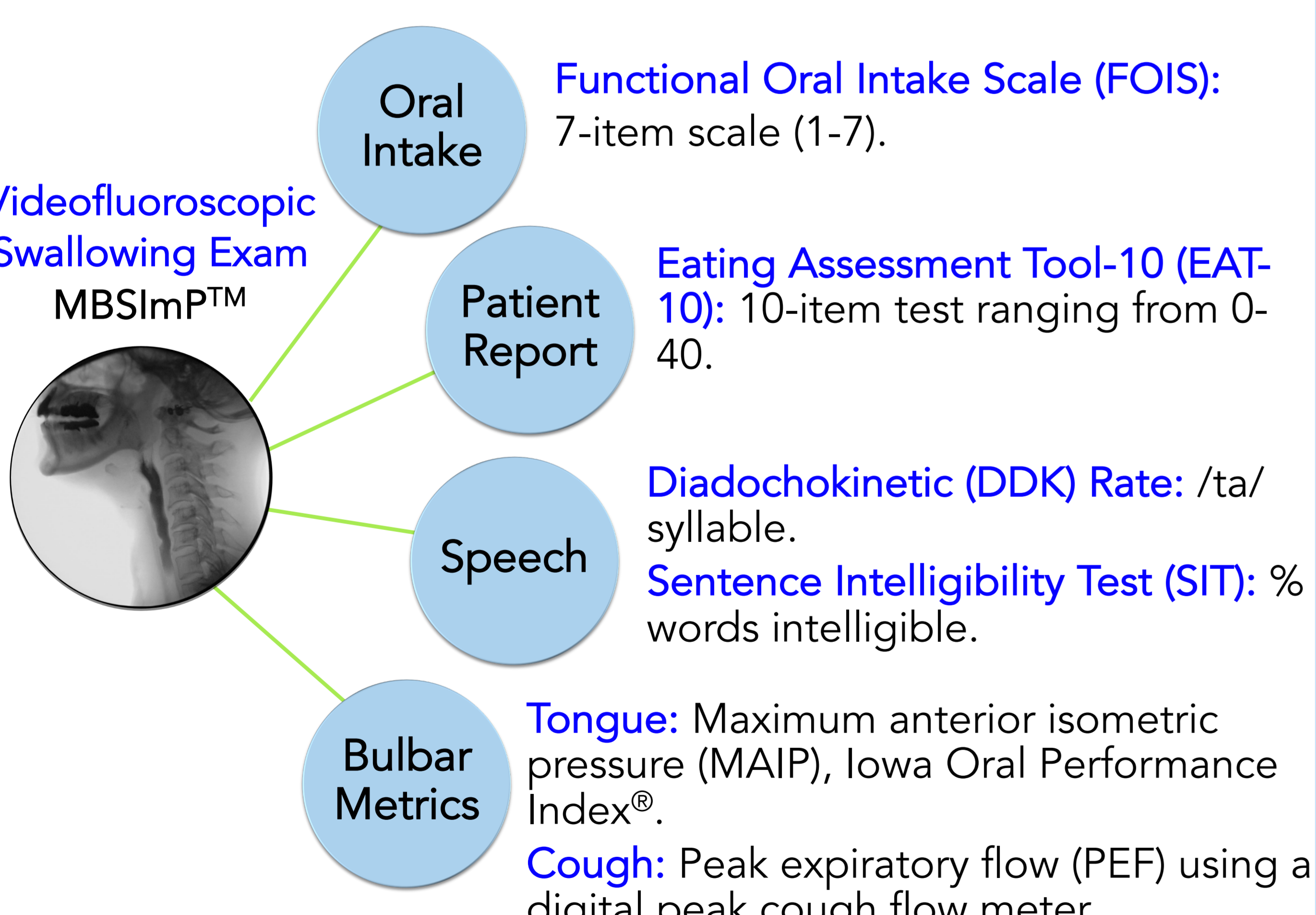
Table 1. Participant demographics.



	Mean (SD)
Age (years)	65 (10.5)
ALSFERS-R Total	34 (7.8)
ALSFERS-R Bulbar	8 (2.8)
ALS Duration (months)	30.4 (23.7)



### Procedures & Validated Outcomes:

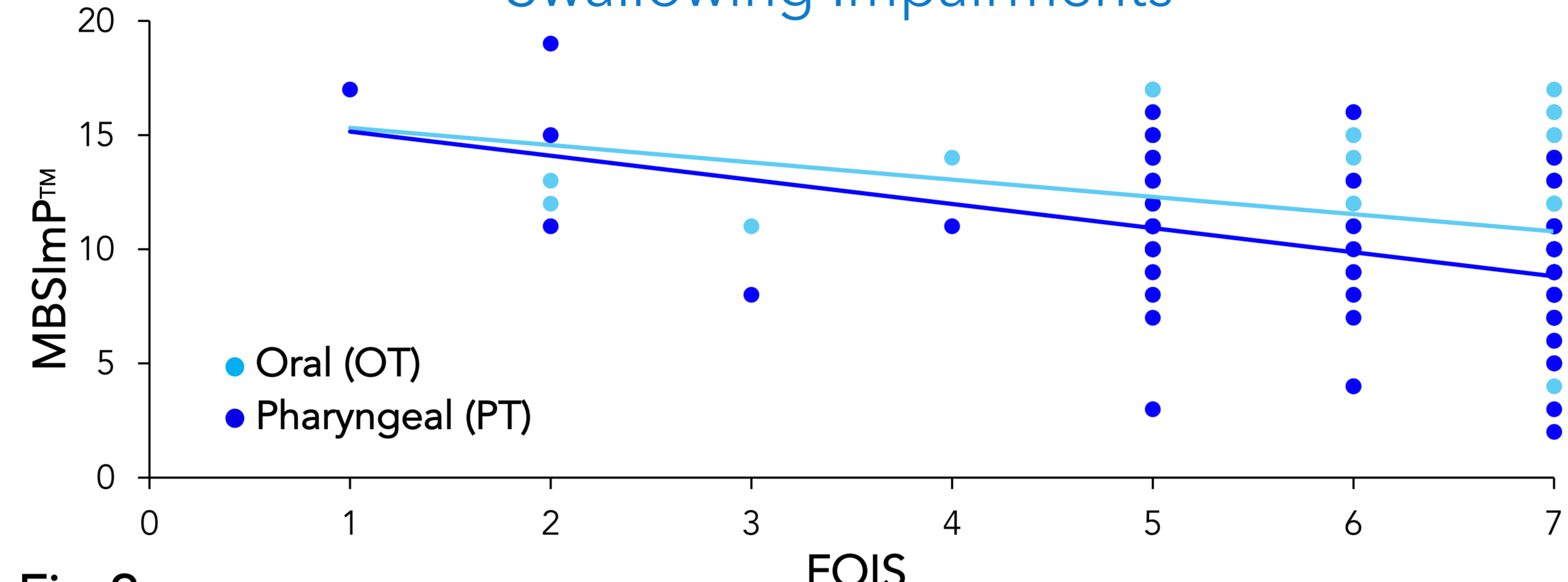


**Fig 1.** Summary of study procedures and validated outcomes. Modified Barium Swallowing Impairment Profile™ (MBSImP) ratings were performed by two independent blinded raters (100% agreement required). Oral Total (OT) & Pharyngeal Total (PT) scores were derived.

**Statistical Analyses:**  
Spearman's Rho and ANOVA analyses.

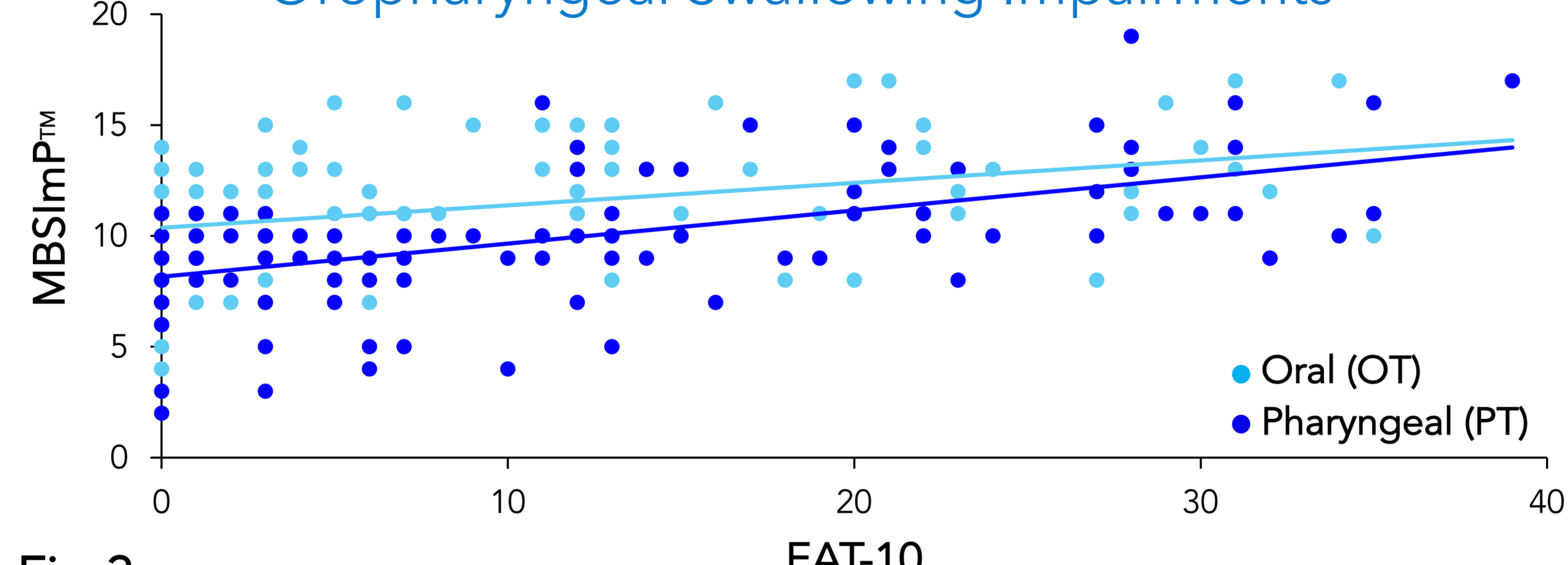
## RESULTS:

### More Restrictive Diets Associated with Oropharyngeal Swallowing Impairments



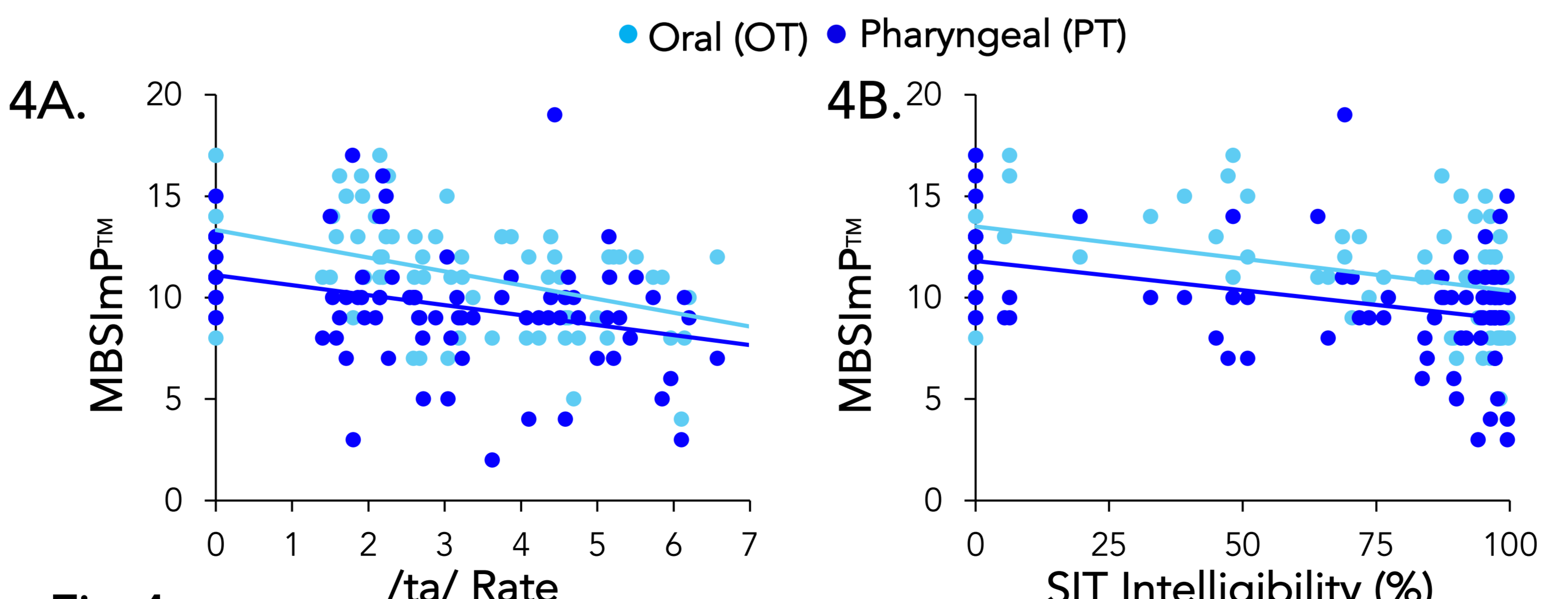
**Fig 2.** pALS on more restrictive diets (lower FOIS scores) demonstrated more severe oral ( $r=-0.35$ ) and pharyngeal ( $r=-0.41$ ) swallowing deficits,  $p<0.001$ .

### Patient Reported Swallowing Deficits Associated with Oropharyngeal Swallowing Impairments



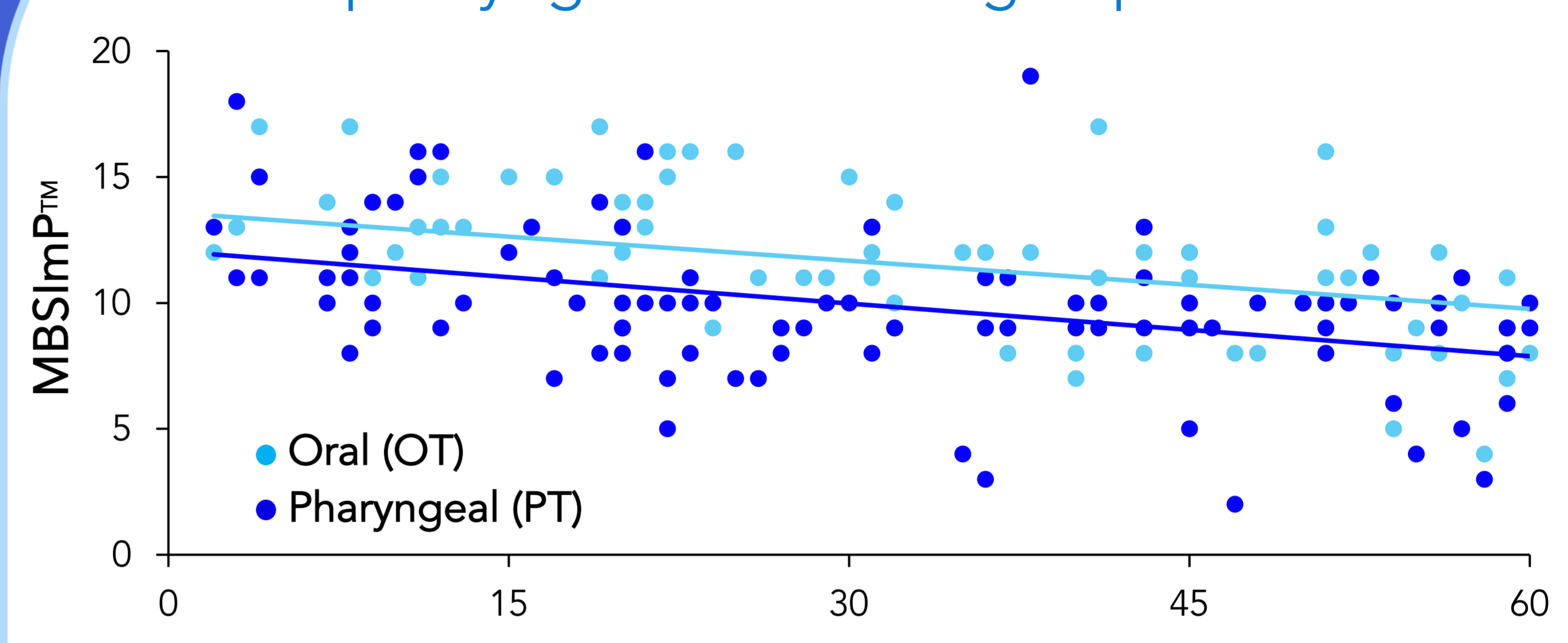
**Fig 3.** Higher (worse) EAT-10 scores were associated with radiographically confirmed oral ( $r=0.42$ ) and pharyngeal ( $r=0.51$ ) impairment,  $p<0.001$ .

### Reduced Articulatory Precision Associated with Oropharyngeal Swallowing Impairments



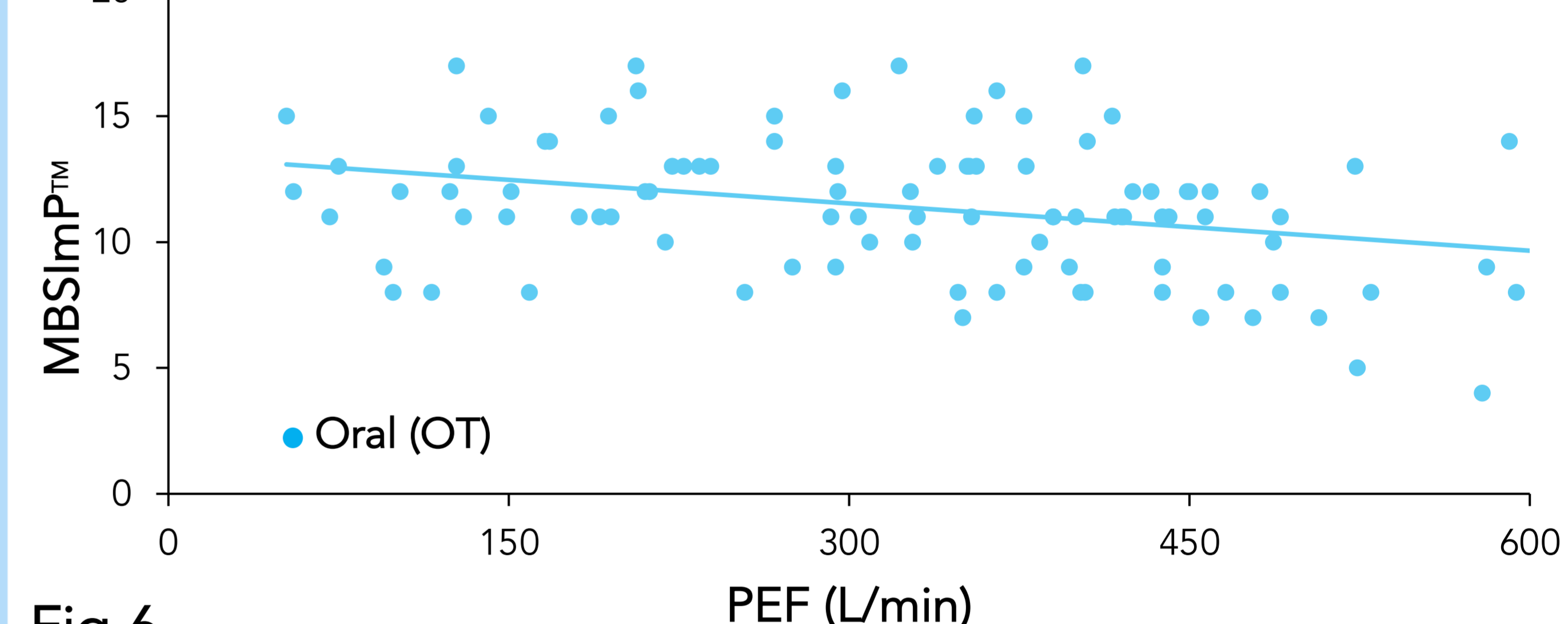
**Fig 4.** pALS with reduced DDK rate of the /ta/ syllable (4A) had more severe oral ( $r=-0.48$ ) and pharyngeal ( $r=-0.35$ ) swallowing impairments,  $p<0.001$ . pALS with reduced speech intelligibility (4B) also demonstrated more severe oral ( $r=-0.42$ ) and pharyngeal deficits ( $r=-0.31$ ),  $p<0.003$ .

### Reduced Lingual Strength Associated with Oropharyngeal Swallowing Impairments



**Fig 5.** pALS with reduced tongue strength had more severe oral ( $r=-0.40$ ) and pharyngeal ( $r=-0.30$ ) swallowing impairments,  $p<0.002$ .

### Reduced Cough Strength Associated with Oral Swallowing Impairments



**Fig 6.** Cough peak expiratory flow was associated with oral ( $r=-0.2$ ,  $p<0.01$ ) but not pharyngeal ( $p>0.05$ ) swallowing deficits.

## CONCLUSIONS:

- pALS who were on a more restricted diet and reported more swallowing deficits had more severe oral and pharyngeal phase swallowing impairments.
- Reduced articulatory precision and reduced lingual strength were also associated with more impaired oropharyngeal swallowing deficits.
- Reduced cough strength was associated with confirmed oral, but not pharyngeal phase swallowing impairment.
- Common simple clinical outcomes can provide useful information regarding the integrity of the underlying swallowing mechanisms during a clinical screen or evaluation.

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