



SYMPOSIUM ABSTRACT BOOK

Dysphagia Patient Care. What does science say?

Satellite Symposium

13th Annual Congress of the European Society
for Swallowing Disorders (ESSD). Toulouse, France

FOR HEALTHCARE PROFESSIONALS ONLY

NMI **Nestlé**
Nutrition
Institute

AGENDA

Introduction

CHAIRPERSON:

Prof. Bruno Vellas, MD, PhD.

Chair of the Gérontopôle & Department of Geriatric Internal Medicine, IHU HealthAge at the Toulouse University Hospital, France.



Discussing the scientific evidence supporting the EAT-10 validity and its use in routine clinical practice

Dr. Ana Cantón, MD, PhD.

Specialist in Endocrinology and Nutrition Division of Endocrinology and Nutrition, Complejo Hospitalario Universitario de Santiago, Santiago de Compostela, Spain. Associate Professor of Health Sciences. University of Santiago de Compostela, Spain.



Scientific evidence of the impact of thickened liquids on penetration and aspiration

Prof. Catriona M. Steele, SLP, PhD.

President-Elect, Dysphagia Research Society. Senior Scientist and Director, Swallowing Rehabilitation Research Laboratory at the KITE Research Institute – University Health Network, Canada.



Discussion & Closure





Prof. Bruno Vellas, MD, PhD.

Introduction

Chair biography

Prof Vellas is the Founder of the Institut Hospitalier Universitaire (IHU) HealthAge in healthy aging, prevention and geroscience, Toulouse, France and the chair of the G rontop le & Department of Geriatric Internal Medicine at the Toulouse University Hospital and is member of INSERM UMR 1295. He is the founder of the G rontop le to develop innovation and research for older adults. He is adjunct professor at the Department of Internal Medicine, University of New Mexico, Albuquerque, NM, USA. He is the chair of the WHO Collaborating Center for Frailty, Clinical Research and Geriatric Training since September 2017. IAGG past president, he is President of the Scientific Committee of the French National "Great Age", and Coordinator of the INSPIRE program in the field of Gerosciences.





Dr. Ana Cantón, MD, PhD.

Discussing the scientific evidence supporting the EAT-10 validity and its use in routine clinical practice

Speaker biography

Dr. Ana Cantón, MD, PhD. obtained her Medical Degree (MD) in 1992 at the University of Santiago de Compostela. She developed her residency in Endocrinology and Nutrition at the Hospital Vall d'Hebron, Barcelona (1993-1996). She received a grant from the British Council in 1996 and spent a fruitful period at the St Bartholomew's Hospital, London (1997-1998). She obtained her Doctorate of Philosophy (PhD) in 2001 at the Universitat Autònoma de Barcelona. She is Senior Consultant in Endocrinology and Nutrition and Head of the Clinical Nutrition Unit at the University Clinical Hospital of Santiago de Compostela. She is Assistant Professor of Medicine, Endocrinology, at the School of Medicine at the University of Santiago de Compostela. She is the author of several scientific publications and book chapters that are indexed. She has been a speaker in several national and international congresses and scientific meetings.



Abstract

Oropharyngeal dysphagia (OD) is a highly prevalent medical condition with severe complications such as dehydration, malnutrition, and respiratory infections.

Recognition of dysphagia in the medical community is very poor¹, health services rarely screen older patients for dysphagia and do not train their staff to diagnose it². Symptoms of dysphagia such as coughing may not be recognized as a problem by older subjects themselves or their caregivers and are often considered a trivial finding². Among others, these are the reasons why many patients are diagnosed during hospitalization, after developing respiratory infections or pneumonia due to an impairment of the safety of their swallowing. Undiagnosed swallowing problems put this group of people at risk, leading to complications and high health system costs. In a recent systematic review, the presence of dysphagia added 40.36% to health care costs and 8 days to length of stay during hospitalization³. Therefore, it is time to take action!

In frail, institutionalized and hospitalized older adult, or when an acute condition develops, possibly impairing patient's swallowing function, or in adults when risk factors are present, dysphagia should be systematically screened.

Dysphagia should be systematically screened in frail, institutionalized, and hospitalized older adults, when an acute condition develops (possibly impairing the patient's swallowing function), or in adults, when risk factors are present.

There are multiple screening tools available to detect the risk of OD in adults. Bernardes et al. performed a review to map screening tools and found that the Eating Assessment Tool (EAT-10) was the most commonly used tool for dysphagia screening⁴. The "European Guidelines for the Assessment of Voice Quality in Clinical Practice" recently developed by the European Laryngological Society and The Union of the European Phoniaticians, recommended the use of the EAT-10 as one of the valid screening tools for the assessment of dysphagia, Grade of Recommendation B⁵.

The Eating Assessment Tool (EAT-10) is a symptom-specific outcome tool for dysphagia designed for rating the degree of self-perceived swallowing impairment. It is a 10-item questionnaire with a Likert scale response option (0 no problem to 4 severe problems) with a direct scoring analogue instrument for swallowing disorders (0-2 normal range and 3-40 indicative of swallowing problems) that has demonstrated excellent internal consistency and reproducibility¹.

The EAT-10 has been used in multiple studies evaluating the elderly population neurological disorders, neuromuscular disorders, head and neck cancer, multiple sclerosis, chronic obstructive pulmonary disease, apnea, and high-risk hospitalization patients².



Transcultural adaptation and translation studies have shown the validity and reliability of EAT-10 in relation to the gold standard and other validated instruments⁷. The internal consistency (Cronbach's α) between different versions ranged from 0.84 to 0.96 and intraclass correlation coefficients (ICCs) ranged from 0.70 to 1.00³. The psychometric properties of the EAT-10 have been tested also in some studies and produced good overall results, thus encouraging its use in real clinical practice⁷. Over 15 translations, cultural adaptations, and validations have been developed for the EAT-10: Spanish (Spain, Chile, and Colombia), French, Italian, Portuguese (European and Brazilian), German, Chinese, Japanese, Arabic, Dutch, Greek, Hebrew, Swedish, and Turkish⁷.

In a systematic review and meta-analysis published in 2023, Zhang et al evaluated the diagnostic accuracy of EAT-10 cutoff value to better guide clinical use. A flexible endoscopic evaluation or a video fluoroscopic swallowing study was used as the gold standard. The cutoff of 3 was recommended, as previously demonstrated by Belafsky et al⁸ in 2008). Different cutoff points can predict the aspiration risk in patients with OD^{7,8} in specific populations (neurological disorders, head and neck cancer, COPD, and obstructive sleep apnea).

Although the EAT-10 is a self-administered screening tool, it cannot be used by some people who have certain diseases that affect handwriting (Parkinson's disease, etc.) or who are unable to read (age-related macular degeneration, glaucoma, etc.). In these cases, when the individuals maintain their cognitive function, the EAT-10 requires the participation of a third-party as demonstrated in some publication's healthcare professionals, clinical staff, researchers, family members or caregivers could help the patient to complete the EAT-10⁹⁻¹⁵.

In conclusion,

The EAT-10 is a quick, easy to understand, valid and reliable test applicable in patients with dysphagia of several etiologies in different settings. The EAT-10 stands as an important tool for early detection of dysphagia, contributing to improve public health care and quality of life of those affected by OD.



References

1. Dziewas R., et al. Recognizing the Importance of Dysphagia: Stumbling Blocks and Stepping Stones in the Twenty-First Century. *Dysphagia* 2017; 32(1): 78–82.
2. Fedecostante, M., Dell'Aquila, G. & Cherubini, A. Screening for Dysphagia: Time Is Now!. *J Nutr Health Aging* 2023; 27, 593–594.
3. Arnold M, Liesirova K, Broeg-Morvay A, Meisterernst J, Schlager M, Mono ML, El-Koussy M, Kägi G, Jung S, Sarikaya H. Dysphagia in Acute Stroke: Incidence, Burden and Impact on Clinical Outcome. *PLoS One* 2016; 11(2):e0148424.
4. Bernardes R.A., et al. Screening Tools Designed to Assess and Evaluate Oropharyngeal Dysphagia in Adult Patients: A Scoping Review. *Nurs. Rep.* 2022, 12, 245-258.
5. Zabrodsky M., et al. Consensus for voice quality assessment in clinical practice: guidelines of the European Laryngological Society and Union of the European Phoniaticians. *Eur Arch Otorhinolaryngol.* 2023;280:5459-5473.
6. Belafsky PC., et al. Validity and reliability of the Eating Assessment Tool (EAT-10). *Ann Otol Rhinol Laryngol.* 2008;117:919-24.
7. Schindler, A., et al. History and Science behind the Eating Assessment Tool-10 (Eat-10): Lessons Learned. *J Nutr Health Aging* 2023; 27, 597–606.
8. Zhang P.P., et al. Diagnostic Accuracy of the Eating Assessment Tool-10 (EAT-10) in Screening Dysphagia: A Systematic Review and Meta-Analysis. *Dysphagia.* 2023;38(1):145-158.
9. Igarashi K., et al. Survey of suspected dysphagia prevalence in home-dwelling older people using the 10-Item Eating Assessment Tool (EAT-10) *PLoS One* 2019 Jan 23;14(1):e0211040.
10. Mandysová P., et al. Criterion validity of the self-report dysphagia assessment tool EAT-10 among neurological patients. *Cent Eur J Nurs Midw* 2014;5(4):137-44.
11. Regan J., et al. The Eating Assessment Tool-10 Predicts Aspiration in Adults with Stable Chronic Obstructive Pulmonary Disease. *Dysphagia* 2017;32(5):714-20.
12. Shapira-Galitz Y., et al. Does the Hebrew Eating Assessment Tool-10 Correlate with Pharyngeal Residue, Penetration and Aspiration on Fiberoptic Endoscopic Examination of Swallowing? *Dysphagia* 2019;34(3):372-81.
13. Tenekeci E.G., et al. Validity and Reliability of the Turkish Version of the Questionnaire for the Assessment of Dysphagia in Multiple Sclerosis. *Noro Psikiyatrs Ars* 2016;20;55(3):243-247.
14. Tufan Aslı. Screening oropharyngeal dysphagia in hospitalized older adults: A prevalent problem associated with mortality. *Marmara Medical Journal* 2016; 29: 152-156.
15. Gonçalves R., et al. Cross-cultural adaptation of the Brazilian version of the Eating Assessment Tool - EAT-10. *Codas* 2013;25(6):601-604.





Prof. Catriona M. Steele, SLP, PhD.

Scientific evidence of the impact of thickened liquids on penetration and aspiration

Steele, C. M. & Borders, J. C.

Speaker biography

Catriona M Steele is a clinician-scientist working in the area of swallowing and swallowing disorders. She has a background as a medical speech-language pathologist and is Director of the Swallowing Rehabilitation Research Laboratory (www.steeleswallowinglab.ca) at the KITE Research Institute, the research arm of the Toronto Rehabilitation Institute – University Health Network. Dr Steele holds a Canada Research Chair in Swallowing and Food Oral Processing and is a Professor in the Department of Speech-Language Pathology, Rehabilitation Sciences Institute, Temerty Faculty of Medicine at the University of Toronto. She also teaches in the Master of Deglutology programme at the Katholiek University of Leuven in Belgium.

Professor Steele holds research funding from the National Institutes of Health (USA), as well as several active industry partnerships. A full list of her publications can be accessed at <https://www.orcid.org/0000-0002-4294-6561>. She is an associate editor for the Dysphagia journal and a member of the editorial board for the Journal of Texture Studies. She is also a founding and current member of the Board of Directors for the International Dysphagia Diet Standardisation Initiative (www.iddsi.org). Catriona is a current board member of the Dysphagia Research Society, and will serve as President for 2024-2025.



Abstract

Oropharyngeal dysphagia (OD) is prevalent in several at-risk populations. In the United States, OD affects 6.7% of hospitalized patients¹. In post-acute care patients, compared to those without OD, is associated with: longer length of stay (8.8 days vs 5.0 days), more in-hospital mortality (1.7 times) and a higher likelihood of discharge to a post-acute care facility (33%)^{1,2}. Similar results have been reported for Europe³.

Individuals with dysphagia are often advised to use thickened liquids as a therapeutic strategy to limit the risk of penetration and aspiration⁴. However, questions persist regarding the impact of bolus consistency on swallowing safety, and whether thickened liquids effectively reduce either the frequency or severity of aspiration and silent aspiration. The standard method for grading the severity of penetration and aspiration is using the 8-point Penetration-Aspiration Scale (Table 1)⁵. Scores of 1 and 2 are seen in healthy swallowing involve either no airway invasion, or transient entry of material into the laryngeal vestibule leaving no residue behind. Scores of 3-5 are assigned for penetration of material into the laryngeal vestibule, while scores of 6-8 involve aspiration of material below the true vocal folds^{5,6}.

In both clinical practice and research, it is common to summarize swallowing safety based on the worst PAS score seen for each consistency, and to summarize scores across repeated bolus trials. These summarization practices represent bias in prior analyses. In this talk, Professor Steele will share the results of a recent analysis, using a Bayesian multilevel ordinal regression model approach^{7,8} to evaluate the impact of liquid consistency on PAS scores, considering all 8 levels of the scale across repeated bolus trials.

This analysis combined data from two prior studies funded by Nestlé Health Science, involving a total of 678 adults with suspected dysphagia (289 female; mean age 68 years, range 20-100). All participants underwent videofluoroscopy involving ≥3 boluses of 20% w/v barium prepared using a xanthan-gum thickener (ThickenUp® Clear, Nestlé Health Science) to the following consistencies as defined by the International Dysphagia Diet Standardisation Initiative (IDDSI) Framework⁸:

- thin liquid barium without thickener (IDDSI Level 0);
- mildly thick barium (IDDSI Level 2);
- moderately thick barium and (IDDSI Level 3); and
- extremely thick barium (IDDSI Level 4).



Duplicate blinded rating yielded PAS scores for 8,135 boluses, with discrepancies resolved by consensus. A Bayesian multilevel ordinal regression model approach examined PAS patterns across consistencies. At least one score of concern (i.e., PAS > 2) was seen on thin liquids in 299 participants (44.1%). Across repeated trials, the first score of concern was most likely to be seen on the first thin liquid bolus (n = 155, 51.84%) with slightly lower frequencies on subsequent thin bolus presentations. Among participants with at least one trial of airway invasion, multiple scores of concern across repeated trials were more common for thin liquids (62.22%) compared to mildly (49.47%), moderately (35.20%), and extremely thick (9%) consistencies. Across all consistencies, the probability of a PAS score of concern (>2) was highest for thin liquids and decreased significantly with mildly thick liquids. Further non-significant decreases were seen with thickening to moderately and extremely thick consistencies. Silent aspiration (i.e., PAS = 8) was seen on 9.7% of thin and 9.5% of mildly thick boluses, but was extremely rare on moderately (3.8%) and extremely thick (0.9%) liquids. A similar pattern was seen for the frequency of silent aspiration by consistency among participants with at least one PAS score of concern.

These results confirm that the probabilities of penetration, aspiration and silent aspiration are greatest on thin liquids. Significant reductions in PAS frequency and severity were seen with mildly thick liquids (IDDSI level 2). Silent aspiration was exceptionally rare on moderately thick (IDDSI level 3) and extremely thick liquids (IDDSI level 4).

These findings demonstrated the therapeutic benefits of a unique xanthan gum based thickening agent (ThickenUp® Clear) reported previously in patients with dysphagia¹⁰⁻¹⁴.



References

1. Altman KW, Yu GP, Schaefer SD. Consequence of dysphagia in the hospitalized patient: impact on prognosis and hospital resources. *Arch Otolaryngol Head Neck Surg* 2010;136(8):784-9.
2. Patel DA, Krishnaswami E, Steger E, Conover E, Vaezi MF, Ciucci MR et al. Economic and survival burden of dysphagia among inpatients in the United States. *Dis Esophagus* 2018; 31(1):1-7.
3. Arnold M, Liesirova K, Broeg-Morvay A, Meisterernst J, Schlager M, Mono ML, El-Koussy M, Kägi G, Jung S, Sarikaya H. Dysphagia in Acute Stroke: Incidence, Burden and Impact on Clinical Outcome. *PLoS One* 2016; 11(2):e0148424.
4. Robbins J, Nicosia MA, Hind JA, Gill GD, Blanco R, Logemann JA. Defining physical properties of fluids for dysphagia evaluation and treatment. *Perspectives on Swallowing and Swallowing Disorders (Dysphagia)*. Perspectives of the American Speech-Language Hearing Association Special Interest Division 13. 2002; 11(June):16-19.
5. Rosenbek JC, Robbins JA, Roecker EB, Coyle JL, Wood JL. A penetration-aspiration scale. *Dysphagia*. 1996;11(2):93-8.
6. Steele CM, Grace-Martin K. Reflections on Clinical and Statistical Use of the Penetration-Aspiration Scale. *Dysphagia*. 2017; 32(5):601-616.
7. Matuschek H, Kliegl R, Vasisht S, Baayen H, Bates D. Balancing Type I error and power in linear mixed models. *Journal of Memory and Language*. 2017;94(June):305-15.
8. Barr DJ, Levy R, Scheepers C, Tily HJ. Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language*. 2013;68(3):255-578.
9. <https://iddsi.org/Framework>
10. Rofes, L., Arreola, V., Mukherjee, R., Swanson, J. and Clavé, P. The effects of a xanthan gum-based thickener on the swallowing function of patients with dysphagia. *Aliment Pharmacol Ther*; 2014; 39: 1169-1179.
11. Vilardell N, Rofes L, Arreola V, Speyer R, Clavé P. A Comparative Study Between Modified Starch and Xanthan Gum Thickeners in Post-Stroke Oropharyngeal Dysphagia. *Dysphagia*. 2016;31(2):169-79.
12. Leonard RJ, White C, McKenzie S, Belafsky PC. Effects of bolus rheology on aspiration in patients with Dysphagia. *J Acad Nutr Diet* 2014 Apr;114(4):590-4.
13. Barbon CEA, Chepeha DB, Hope AJ, Peladeau-Pigeon M, Waito AA, Steele CM. Determining the Impact of Thickened Liquids on Swallowing in Patients Undergoing Irradiation for Oropharynx Cancer. *Otolaryngol Head Neck Surg*. 2022;166(3):511-514.
14. Steele CM, Mukherjee R, Kortelainen JM, Pölönen H, Jedwab M, Brady SL, Theimer KB, Langmore S, Riquelme LF, Swigert NB, Bath PM, Goldstein LB, Hughes RL, Leifer D, Lees KR, Meretoja A, Muehleman N. Development of a Non-invasive Device for Swallow Screening in Patients at Risk of Oropharyngeal Dysphagia: Results from a Prospective Exploratory Study. *Dysphagia*. 2019;34(5):698-707.





Dysphagia Patient Care. What does science say?

NNI Nestlé
Nutrition
Institute

