

Strategy 1110474/saved

[See full search strategy](#)

## Contents 54 of 54 results on Saved Results

1. Systematic review and evidence based recommendations on texture modified foods and thickened liquids for adults (above 17 years) with oropharyngeal dysphagia - An updated clinical guideline.....	Page 3
2. A survey of thickened fluid prescribing and monitoring practices of Australian health professionals.....	Page 3
3. Use of Textured Thin Liquids in Patients With Dysphagia.....	Page 4
4. Nutrient intake from thickened beverages and patient-specific implications for care.....	Page 4
5. Comparison of the rheological properties of ready-to-serve and powdered instant food-thickened beverages at different temperatures for dysphagic patients.....	Page 4
6. Modifying the consistency of food and fluids for swallowing difficulties in dementia.....	Page 5
7. Inadequate fluid intakes in dysphagic acute stroke.....	Page 6
8. Quality of care issues for dysphagia: modifications involving oral fluids.....	Page 7
9. Effects of oral intake of water in patients with oropharyngeal dysphagia.....	Page 7
10. Effect of Bolus Viscosity on the Safety and Efficacy of Swallowing and the Kinematics of the Swallow Response in Patients with Oropharyngeal Dysphagia: White Paper by the European Society for Swallowing Disorders (ESSD).....	Page 8
11. Clinical Aspects of Thickeners for Pediatric Gastroesophageal Reflux and Oropharyngeal Dysphagia.....	Page 9
12. Use of fluid thickener to reduce dysphagia risk.....	Page 9
13. Improving care for patients with dysphagia.....	Page 9
14. Food polysaccharides and roles of rheology and tribology in rational design of thickened liquids for oropharyngeal dysphagia: A review.....	Page 10
15. Use of modified diets to prevent aspiration in oropharyngeal dysphagia: is current practice justified?.....	Page 10
16. Applicability of the two-step thickened water test in patients with poststroke dysphagia: a novel assessment tool for paste food aspiration.....	Page 11
17. Thickened liquids: do they still have a place in the dysphagia toolkit?.....	Page 11
18. Variations in tongue-palate swallowing pressures when swallowing xanthan gum-thickened liquids.....	Page 12
19. Plugging the patient evidence gap: what patients with swallowing disorders post-stroke say about thickened liquids.....	Page 12
20. Parent perception of the impact of using thickened fluids in children with dysphagia.....	Page 13
21. Viscosity differences between thickened beverages suitable for elderly patients with dysphagia.....	Page 13
22. Thickened fluids: investigation of users' experiences and perceptions.....	Page 14
23. A systematic review and meta-analysis of pneumonia associated with thin liquid vs. thickened liquid intake in patients who aspirate.....	Page 14
24. Effect of human saliva on the consistency of thickened drinks for individuals with dysphagia.....	Page 15
25. The Relationship between Texture-Modified Diets, Mealtime Duration, and Dysphagia Risk in Long-Term Care.....	Page 15
26. Formulating protein-based beverages for the dysphagia diets of the elderly: viscosity, protein quality, in vitro digestion, and consumers acceptability.....	Page 15
27. A randomised trial of the effect of different fluid consistencies used in the management of dysphagia on quality of life: a time trade-off study.....	Page 16
28. Evaluation of the benefits of monitoring fluid thickness in the dietary management of dysphagic stroke patients.....	Page 16

---

29. Risk of excessive sodium intake in the use of a thickener for dysphagia.....	Page 17
30. The efficacy of pre-thickened fluids on total fluid and nutrient consumption among extended care residents requiring thickened fluids due to risk of aspiration.....	Page 17
31. A computational fluid dynamics simulation of liquid swallowing by impaired pharyngeal motion: bolus pathway and pharyngeal residue.....	Page 17
32. Free water or thickened fluids for patients with dysphagia: A systematic review.....	Page 18
33. Food characteristics and dysphagia: What do nutritionists say?.....	Page 18
34. The Influence of Food Texture and Liquid Consistency Modification on Swallowing Physiology and Function: A Systematic Review.....	Page 19
35. Assessment of tomato-based thick fluid diet for patients with dysphagia using a simple and cheap test.....	Page 19
36. Thickened Liquids Using Pureed Foods for Children with Dysphagia: IDDSI and Rheology Measurements.....	Page 20
37. Effects of texture properties of semi-solid food on the sensory test for pharyngeal swallowing effort in the older adults....	Page 20
38. Acceptance of different types of thickeners, with and without flavouring, in hospitalized patients with dysphagia. A pilot study.....	Page 21
39. Thickened liquids and management of dysphagia: The influence of time and liquid base.....	Page 21
40. How to get food & liquid in despite swallowing problems?.....	Page 22
41. Dysphagia & modified drinks: Examining patient preference of commercially available thickening powders.....	Page 22
42. What level are you on? Let's go with the flow: Testing and quantifying the consistency of thickened oral nutritional supplements (ONS) using the IDDSI framework.....	Page 23
43. Determination of therapeutic viscosity range of a gum-based thickener in post stroke patients with oropharyngeal dysphagia.....	Page 23
44. Modified textures for adults (above 17 years) with oropharyngeal dysphagia: An updated clinical guideline of the evidens in relation to three critical and seven important outcomes.....	Page 24
45. Videofluoroscopic evidence of aspiration predicts pneumonia and death but not dehydration following stroke.....	Page 24
46. Clarity and contradictions: speech and language therapists' insights regarding thickened liquids for post-stroke aspiration.....	Page 25
47. Low technology audit methods of pre-packaged thickened fluids using the Bostwick Consistometer, the Line Spread Test and the Flow Test: A comparison of compliance.....	Page 25
48. Just add water: Can water protocols improve dysphagia management outcomes?.....	Page 25
49. Thickener and beyond: an individualised approach to dysphagia management.....	Page 26
50. Risks associated with thickening powder.....	Page 26
51. Apply study results to cut dysphagia risk...'Use of fluid thickener to reduce dysphagia risk,' nursingtimes.net.....	Page 26
52. Risk Factors for Aspiration Pneumonia After Receiving Liquid-Thickening Recommendations.....	Page 26
53. Treatment burden associated with the intake of thickened fluids.....	Page 27
54. Role of fluid cohesiveness in safe swallowing.....	Page 27
Full search strategy.....	Page 29

## Results Saved Results

54 of 54 saved results

### 1. Systematic review and evidence based recommendations on texture modified foods and thickened liquids for adults (above 17 years) with oropharyngeal dysphagia - An updated clinical guideline.

**Authors** Beck, Anne Marie; Kjaersgaard, Annette; Hansen, Tina; Poulsen, Ingrid  
**Source** Clinical nutrition (Edinburgh, Scotland); Dec 2018; vol. 37 (no. 6)  
**Publication Date** Dec 2018  
**Publication Type(s)** Meta-analysis Journal Article Systematic Review  
**PubMedID** 28939270  
**Database** Medline  
Available at [Clinical nutrition \(Edinburgh, Scotland\)](#) from ScienceDirect Available to PHE and Local Authority staff

**Abstract** BACKGROUND & AIMS Oropharyngeal dysphagia (OD) has significant consequences for both the person with dysphagia and the society. An often-used treatment for OD is the recommendation of the texture of food and liquids. This recommendation seems to be based more on best practice than on evidence from a systematic review of existing scientific evidence. The aim of this paper was to report the result of an up-date of an original national guideline focussing on whether thickened liquids (review question 1) and modified foods (review question 2) are beneficial for adults above 17 years with OD in relation to three critical outcomes (aspiration, pneumonia and death) and seven important outcomes (dehydration, weight loss, mealtime performance, patient preferences, intervention adherence and quality of life). METHODSThree steps were used. First: An updated systematic literature search. Second: An assessment of the quality of the evidence for each review question by means of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. Third: Development of clinical recommendations based on the evidence, assessment of the risk benefit ratio, and perceived patient preferences. RESULTSThe body of evidence consisted of two RCTs for review question 1 both using nectar thickened liquids or honey-thickened liquids. No evidence was found for two important outcomes, mealtime performance and quality of life. With regard to risk of pneumonia, death, aspiration, dehydration, weight loss and intervention adherence no significant differences were found. The outcome addressing patient preferences, found a non-significant increased dissatisfaction with nectar thickened liquids (RR 1.11; 95% CI 0.95-1.30) and a significant increased dissatisfaction with honey thickened liquids compared to thin liquids/chin down (RR 1.18; 95% CI 1.01-1.37). No evidence was identified for review question 2. CONCLUSIONSBased on the quality of the evidence, assessment of the risk benefit ratio, and perceived patient preferences a weak recommendation against the use of texture modified liquids and good clinical practice pointing for the use of texture modified foods in patients with OD were made.

### 2. A survey of thickened fluid prescribing and monitoring practices of Australian health professionals.

**Authors** Murray, Jo; Doeltgen, Sebastian; Miller, Michelle; Scholten, Ingrid  
**Source** Journal of evaluation in clinical practice; Oct 2014; vol. 20 (no. 5); p. 596-600  
**Publication Date** Oct 2014  
**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article  
**PubMedID** 24814509  
**Database** Medline  
Available at [Journal of evaluation in clinical practice](#) from Wiley Online Library Medicine and Nursing Collection 2019  
Available at [Journal of evaluation in clinical practice](#) from Ovid (Journals @ Ovid)  
Available at [Journal of evaluation in clinical practice](#) from Unpaywall

**Abstract** RATIONALE, AIMS AND OBJECTIVESThis study aimed to describe (1) how thickened fluids are supplied to clients with dysphagia; (2) how clients' consumption of thickened fluids and hydration status is monitored; and (3) the impact of institutional factors on thickened fluid intake and hydration in Australian health care settings. METHODSSpeech pathologists, dietitians and nurses working in Australian health care settings were asked to voluntarily participate in an online survey that was advertised through their respective professional associations. The questions required a self-report of their practice with respect to thickened fluids. RESULTSFew health care facilities (17%) monitored thickened fluid consumption routinely even though, in the opinion of 51% the respondents, clients on thickened fluids at their facility do not drink enough. Palatability of the thickened fluid products and patients' dependence on others for drinking were thought to have a major impact on fluid intake. Respondents also highlighted institutional factors such as inadequate assistance from staff and inconsistent systems for monitoring fluid intake and signs of dehydration. The most common way to address inadequate intake was for nurses to 'push fluids' (87%). Free water protocols were used only 14% of the time and setting small oral fluid targets throughout the day was the least common strategy (11%). CONCLUSIONSThere is a need for Australian health care facilities to educate all clinical staff about the risks of dehydration and develop clinical pathways for clients with dysphagia, which include routine monitoring of oral fluid consumption and dehydration and timely intervention.

**3. Use of Textured Thin Liquids in Patients With Dysphagia.**

**Authors** Howard, Melissa M; Nissenson, Paul M; Meeks, Lauren; Rosario, Emily R  
**Source** American journal of speech-language pathology; May 2018; vol. 27 (no. 2); p. 827-835  
**Publication Date** May 2018  
**Publication Type(s)** Journal Article  
**PubMedID** 29710346  
**Database** Medline  
 Available at [American journal of speech-language pathology](#) from ProQuest (Health Research Premium) - NHS Version  
 Available at [American journal of speech-language pathology](#) from ProQuest (MEDLINE with Full Text) - NHS Version

**Abstract** PurposeThe goals of this article are to explore the use of textured thin liquids for dysphagic patients who require thickened liquids and to illustrate their impact on hydration and patient satisfaction.MethodA retrospective evaluation of textured thin liquids was completed using patient data looking at laboratory values relevant to the detection of dehydration (blood urea nitrogen, creatinine, sodium) and patient satisfaction (using a clinician-generated questionnaire) on different modified liquid textures. In addition, the viscosity for all liquids was tested using a rheometer.ResultsMeasurements show that the viscosity of the textured thin liquids examined in this pilot study are significantly lower than the viscosity of nectar-thick liquids and fall within the "thin" category as defined by the National Dysphagia Diet guidelines. Patients on honey- and nectar-thick liquids had laboratory values signifying dehydration, whereas those receiving the textured thin liquid consistency were within the normal range for all laboratory values. Importantly, when consuming textured thin liquids, patients reported significant improvement in their satisfaction related to their thirst.ConclusionThe results of this pilot study highlight the consequences of common thickened liquid dietary recommendations and of the potentially beneficial clinical application of textured thin liquids for patients with dysphagia as well as the need for future prospective research.

**4. Nutrient intake from thickened beverages and patient-specific implications for care.**

**Authors** Joyce, Amanda; Robbins, JoAnne; Hind, Jacqueline  
**Source** Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition; Jun 2015; vol. 30 (no. 3); p. 440-445  
**Publication Date** Jun 2015  
**Publication Type(s)** Journal Article  
**PubMedID** 25547337  
**Database** Medline  
 Available at [Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition](#) from Ovid (Journals @ Ovid)

**Abstract** Dysphagia, or difficulty swallowing, affects more than 15 million Americans and can result in adverse and potentially fatal consequences, including poor quality of life, depression, dehydration, malnutrition, aspiration pneumonia, and airway obstruction. Although many treatment options are available, provision of thickened liquids is a common intervention for achieving slower, more controlled bolus manipulation and propulsion. To meet this therapeutic demand, commercially available products containing starch and/or gum-based components have been developed for use by patients and institutions. The nutrient content of thickened products has been neglected, although dysphagic patients are often at significant nutrition risk. Thus, there are no clinical guidelines for selection of thickened products based on patient characteristics. To consider whether such guidelines are warranted, it is necessary to quantify nutrition differences among common thickened beverages. An analysis was conducted to quantify energy, carbohydrate, and sodium provided through daily consumption of thickened beverages. To determine the relevance of these nutrition contributions in the context of total dietary intake, we compared values with dietary recommended intakes. This analysis revealed that there are substantial disparities in the nutrient content of thickened beverages. These differences suggest that product selection can be optimized based on patient-specific characteristics such as weight status and presence of comorbidities. Future research focusing on the effect of this strategy on patient outcomes will facilitate the development of evidence-based recommendations to elevate the standard of care for this population.

**5. Comparison of the rheological properties of ready-to-serve and powdered instant food-thickened beverages at different temperatures for dysphagic patients.**

**Authors** Adeleye, Bernice; Rachal, Corryn  
**Source** Journal of the American Dietetic Association; Jul 2007; vol. 107 (no. 7); p. 1176-1182  
**Publication Date** Jul 2007  
**Publication Type(s)** Journal Article  
**PubMedID** 17604748  
**Database** Medline  
 Available at [Journal of the American Dietetic Association](#) from ScienceDirect

**Abstract**

**BACKGROUND**Dysphagia, or difficulty swallowing, affects an estimated 15 million Americans. Its management may include use of instant food thickener (IFT) to modify beverage consistency to minimize the risk of aspiration and prevent dehydration. However, inconsistencies with the desired viscosity of these thickened liquids occur both within and across product lines for both ready-to-serve commercially packaged prethickened (CPPT) and IFT-thickened beverages.**OBJECTIVES**To examine the rheological property differences between CPPT and similar IFT-thickened beverages, and to assess the stability of these products at two temperature ranges using three viscosity measurement techniques.**DESIGN**The rheological properties of five CPPT and IFT-thickened beverages at both nectar- and honey-like consistencies were evaluated at 10 degrees C (50 degrees F) and 20 degrees C (68 degrees F) using the line spread, funnel, and viscometry methods.**STATISTICAL ANALYSIS**One-way analysis of variance was used for data analysis. When a significant difference was observed, Tukey's test was used to separate the means.**RESULTS**Each viscosity measurement technique showed the CPPT nectar- and honey-like consistency beverages were significantly more viscous ( $P < 0.0001$ ) at both temperatures compared with their IFT counterparts. Moreover, CPPT beverages at nectar and honey consistencies were almost always more viscous than the National Dysphagia Diet Task Force-defined standards, whereas the IFT-thickened beverages were more frequently within those standards.**CONCLUSIONS**A reevaluation of the viscosity of CPPT beverages with reference to the National Dysphagia Diet Task Force set standard ranges needs to be considered. A strong need also exists for development of a standard protocol on product labels that includes the expected rheological properties of CPPT and IFT-thickened beverages. To the clinicians, especially registered dietitians, it is an important clinical consideration to recognize that CPPT products may be thicker than IFT-thickened products and also may be more viscous than the National Dysphagia Diet Task Force-defined standards.

**6. Modifying the consistency of food and fluids for swallowing difficulties in dementia.**

**Authors** Flynn, Eadaoin; Smith, Christina H; Walsh, Cathal D; Walshe, Margaret  
**Source** The Cochrane database of systematic reviews; Sep 2018; vol. 9 ; p. CD011077  
**Publication Date** Sep 2018  
**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article Review Systematic Review  
**PubMedID** 30251253  
**Database** Medline  
Available at [The Cochrane database of systematic reviews](#) from Cochrane Collaboration (Wiley)  
Available at [The Cochrane database of systematic reviews](#) from Unpaywall

**Abstract**

**BACKGROUND** People with dementia can have feeding and swallowing difficulties (dysphagia). Modification of the consistency of food or fluids, or both, is a common management strategy. However, diet modification can affect quality of life and may lead to dehydration and malnutrition. Evidence on the benefits and risks of modifying food and fluids is mandatory to improve the care of people with dementia and dysphagia. **OBJECTIVES** To determine the effectiveness and adverse effects associated with modifying the consistency of food and fluids in improving oral intake and eliminating aspiration in adults with dysphagia and dementia. **SEARCH METHODS** We searched ALOIS (the Specialised Register of the Cochrane Dementia and Cognitive Improvement Group), the Cochrane Library, MEDLINE via Ovid SP, Embase via Ovid SP, PsycINFO via Ovid SP, CINAHL via EBSCOhost, LILACS via BIREME, ClinicalTrials.gov and the World Health Organization (WHO) Portal on 9 May 2018. We also checked the reference lists of relevant articles to identify any additional studies. **SELECTION CRITERIA** We included randomised controlled trials (RCTs), quasi-RCTs and cluster-RCTs published in any language that measured any of the outcomes of interest. We included trials with adults with a clinical diagnosis of dementia with symptoms and signs of dysphagia confirmed on instrumental assessment. We included participants with all types, stages and severities of dementia. Control groups received either no intervention or interventions not involving diet modification or modification to sensory properties of food. **DATA COLLECTION AND ANALYSIS** Two review authors independently assessed for inclusion all potential studies identified. Data were extracted independently along with assessment of methodological quality using standard Cochrane methods. We contacted study authors for additional unpublished information. **MAIN RESULTS** No trials on modification of food met the inclusion criteria. We included two studies that examined modification to fluids. Both were part of the same large multicentre trial and included people with dementia and people with or without dementia and Parkinson's disease. Participation in the second trial was determined by results from the first trial. With unpublished data supplied by study authors, we examined data from participants with dementia only. The first study, a cross-over trial, investigated the immediate effects on aspiration of two viscosities of liquids (nectar thick and honey thick) compared to regular liquids in 351 participants with dementia using videofluoroscopy. Regular liquids with a chin down head posture, as well as regular liquids without any intervention were also compared. The sequence of interventions during videofluoroscopy may have influenced response to intervention. The second study, a parallel designed RCT, compared the effect of nectar and honey thick liquids with a chin down head posture over a three-month period in a subgroup of 260 participants with dementia. Outcomes were pneumonia and adverse intervention effects. Honey thick liquids, which are more consistent with descriptors for 'spoon thick' or 'extremely thick' liquids, showed a more positive impact on immediate elimination of aspiration during videofluoroscopy, but this consistency showed more adverse effects in the second follow-up study. During the second three-month follow-up trial, there were a greater number of incidents of pneumonia in participants receiving honey thick liquids than those receiving nectar thick liquids or taking regular liquids with a chin down posture. There were no deaths classified as 'definitely related' to the type of fluids prescribed. Neither trial addressed quality of life. Risk of bias for both studies is high. The overall quality of evidence for outcomes in this review is low. **AUTHORS' CONCLUSIONS** We are uncertain about the immediate and long-term effects of modifying the consistency of fluid for swallowing difficulties in dementia as too few studies have been completed. There may be differences in outcomes depending on the grade of thickness of fluids and the sequence of interventions trialled in videofluoroscopy for people with dementia. Clinicians should be aware that while thickening fluids may have an immediate positive effect on swallowing, the long-term impact of thickened fluids on the health of the person with dementia should be considered. Further high-quality clinical trials are required.

**7. Inadequate fluid intakes in dysphagic acute stroke.**

**Authors** Whelan, K  
**Source** Clinical nutrition (Edinburgh, Scotland); Oct 2001; vol. 20 (no. 5); p. 423-428  
**Publication Date** Oct 2001  
**Publication Type(s)** Research Support, Non-u.s. Gov't Randomized Controlled Trial Clinical Trial Journal Article  
**PubMedID** 11534937  
**Database** Medline  
 Available at [Clinical nutrition \(Edinburgh, Scotland\)](#) from ScienceDirect Available to PHE and Local Authority staff



**Abstract** BACKGROUND AND AIMSTo investigate the fluid intakes of patients with dysphagic acute stroke and to evaluate the effect of disability, the ward speciality and the type of fluid given on oral intake.METHODSPatients were prospectively recruited and randomly assigned to receive powder-thickened fluids or ready prepared pre-thickened fluids. Parenteral, enteral and oral fluid intakes, urine output, clinical sequelae and the frequency of requests for biochemical measures of hydration were recorded for a maximum of fourteen days.RESULTS24 patients with dysphagic acute stroke requiring thickened fluids were recruited from a large teaching hospital. Mean thickened fluid intake was 455 ml/d (SEM+/-70) resulting in the use of an extra 742 ml/d (+/-132) of supplementary fluids. This did not result in an adequate total intake due to insufficient volumes being given for too short a period. Patients not on specialist stroke units who received pre-thickened fluids drank almost 100% more than those on powder-thickened fluids (P=0.04).CONCLUSIONSFluid intakes in this patient group are insufficient to achieve requirements. Hospital staff must ensure adequate fluid intakes in patients at risk of dehydration, which should include both an adequate prescription and provision of supplementary fluids. Pre-thickened drinks improve oral fluid intake in patients with dysphagic acute stroke on non-specialist wards.

#### 8. Quality of care issues for dysphagia: modifications involving oral fluids.

**Authors** Garcia, Jane M; Chambers, Edgar; Clark, Megan; Helverson, Jennifer; Matta, Ziad

**Source** Journal of clinical nursing; Jun 2010; vol. 19 (no. 11-12); p. 1618-1624

**Publication Date** Jun 2010

**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article

**PubMedID** 20384670

**Database** Medline

Available at [Journal of clinical nursing](#) from Wiley Online Library Medicine and Nursing Collection 2019

Available at [Journal of clinical nursing](#) from Ovid (Journals @ Ovid)

**Abstract** AIMS AND OBJECTIVESThis study examined practices of health care providers who thicken oral fluids for patients with impaired swallowing (dysphagia). It contrasts viscosity (thickness) of nectar-like and honey-thick consistencies prepared and measured in a laboratory setting to actual practices in health care settings and to guidelines of the National Dysphagia Diet.BACKGROUNDThe care plans for many patients include changes to fluid thickness to maintain safe intake of oral fluids. Serving patients improperly prepared beverages may contribute to medical complications such as dehydration if patients consume less fluid, or aspiration of overly thin or thickened liquids, which may increase the risk of pneumonia.DESIGNDescriptive analysis of group trends for viscosity measurements of liquids prepared by health care providers in four care settings to laboratory measurements and the National Dysphagia Diet.METHODSForty-two health care providers participated. Each prepared thickened samples in their natural work environment using typical procedures.RESULTSViscosity measurements of modified liquids prepared by health care providers did not compare favourably to published findings of laboratory viscosity measures or to the ranges of the National Dysphagia Diet. Participants who prepared overly thick or overly thin nectar-like liquids followed a similar pattern with honey-like samples. Many participants failed to use product label information in sample preparation.CONCLUSIONSResults suggest that many patients are served modified liquids that are too thick or too thin in relation to their target level of thickness, possibly increasing risk of further medical complications for those who consume them. Product directions that are too vague or general also may contribute to inaccurate results.RELEVANCE TO CLINICAL PRACTICEThe patient's nursing staff typically oversees nutritional care plans that may include modifications to oral fluids to enable their patients to safely drink by mouth. Additional consideration should be given to training procedures and possible noncompliance with preparation guidelines.

#### 9. Effects of oral intake of water in patients with oropharyngeal dysphagia.

**Authors** Karagiannis, Martha J P; Chivers, Leonie; Karagiannis, Tom C

**Source** BMC geriatrics; Mar 2011; vol. 11 ; p. 9

**Publication Date** Mar 2011

**Publication Type(s)** Comparative Study Journal Article Research Support, Non-u.s. Gov't Randomized Controlled Trial

**PubMedID** 21356121

**Database** Medline

Available at [BMC geriatrics](#) from BioMed Central

Available at [BMC geriatrics](#) from Europe PubMed Central - Open Access

Available at [BMC geriatrics](#) from SpringerLink

Available at [BMC geriatrics](#) from ProQuest (Health Research Premium) - NHS Version

Available at [BMC geriatrics](#) from Unpaywall

**Abstract** BACKGROUND Dysphagia is associated with numerous medical conditions and the major intervention to avoid aspiration in people with dysphagia involves modifying the diet to thickened fluids. This is associated with issues related to patient quality of life and in many cases non-compliance leading to dehydration. Given these concerns and in the absence of conclusive scientific evidence, we designed a study, to further investigate the effects of oral intake of water in people with dysphagia. METHODS We monitored lung related complications, hydration levels and assessed quality of life in two groups of people with dysphagia. The control group was allowed only thickened fluids and patients in the intervention group were allowed access to water for a period of five days. RESULTS Our findings indicate a significantly increased risk in the development lung complications in patients given access to water (6/42; 14.3%) compared to the control group (0/34; no cases). We have further defined patients at highest risk, namely those with degenerative neurologic dysfunction who are immobile or have low mobility. Our results indicate increased total fluid intake in the patients allowed access to water, and the quality of life surveys, albeit from a limited number of patients (24% of patients), suggest the dissatisfaction of patients to diets composed of only thickened fluids. CONCLUSION On the basis of these findings we recommend that acute patients, patients with severe neurological dysfunction and immobility should be strongly encouraged to adhere to a thickened fluid or modified solid consistency diet. We recommend that subacute patients with relatively good mobility should have choice after being well-informed of the relative risk. TRIAL REGISTRATION Australia and New Zealand Clinical Trials Register (ANZCTR): ACTRN12608000107325.

**10. Effect of Bolus Viscosity on the Safety and Efficacy of Swallowing and the Kinematics of the Swallow Response in Patients with Oropharyngeal Dysphagia: White Paper by the European Society for Swallowing Disorders (ESSD).**

**Authors** Newman, Roger; Vilarde, Natàlia; Clavé, Pere; Speyer, Renée  
**Source** Dysphagia; Apr 2016; vol. 31 (no. 2); p. 232-249  
**Publication Date** Apr 2016  
**Publication Type(s)** Editorial Review  
**PubMedID** 27016216  
**Database** Medline  
Available at [Dysphagia](#) from SpringerLink  
Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.  
Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version  
Available at [Dysphagia](#) from Unpaywall

**Abstract** BACKGROUND Fluid thickening is a well-established management strategy for oropharyngeal dysphagia (OD). However, the effects of thickening agents on the physiology of impaired swallow responses are not fully understood, and there is no agreement on the degree of bolus thickening. AIM To review the literature and to produce a white paper of the European Society for Swallowing Disorders (ESSD) describing the evidence in the literature on the effect that bolus modification has upon the physiology, efficacy and safety of swallowing in adults with OD. METHODS A systematic search was performed using the electronic Pubmed and Embase databases. Articles in English available up to July 2015 were considered. The inclusion criteria swallowing studies on adults over 18 years of age; healthy people or patients with oropharyngeal dysphagia; bolus modification; effects of bolus modification on swallow safety (penetration/aspiration) and efficacy; and/or physiology and original articles written in English. The exclusion criteria consisted of oesophageal dysphagia and conference abstracts or presentations. The quality of the selected papers and the level of research evidence were assessed by standard quality assessments. RESULTS At the end of the selection process, 33 articles were considered. The quality of all included studies was assessed using systematic, reproducible, and quantitative tools (Kmet and NHMRC) concluding that all the selected articles reached a valid level of evidence. The literature search gathered data from various sources, ranging from double-blind randomised control trials to systematic reviews focused on changes occurring in swallowing physiology caused by thickened fluids. Main results suggest that increasing bolus viscosity (a) results in increased safety of swallowing, (b) also results in increased amounts of oral and/or pharyngeal residue which may result in post-swallow airway invasion, (c) impacts the physiology with increased lingual pressure patterns, no major changes in impaired airway protection mechanisms, and controversial effects on oral and pharyngeal transit time, hyoid displacements, onset of UOS opening and bolus velocity-with several articles suggesting the therapeutic effect of thickeners is also due to intrinsic bolus properties, (d) reduces palatability of thickened fluids and (e) correlates with increased risk of dehydration and decreased quality of life although the severity of dysphagia may be an confounding factor. CONCLUSION The ESSD concludes that there is evidence for increasing viscosity to reduce the risk of airway invasion and that it is a valid management strategy for OD. However, new thickening agents should be developed to avoid the negative effects of increasing viscosity on residue, palatability, and treatment compliance. New randomised controlled trials should establish the optimal viscosity level for each phenotype of dysphagic patients and descriptors, terminology and viscosity measurements must be standardised. This white paper is the first step towards the development of a clinical guideline on bolus modification for patients with oropharyngeal dysphagia.



**11. Clinical Aspects of Thickeners for Pediatric Gastroesophageal Reflux and Oropharyngeal Dysphagia.**

**Authors** Duncan, Daniel R; Larson, Kara; Rosen, Rachel L  
**Source** Current gastroenterology reports; May 2019; vol. 21 (no. 7); p. 30  
**Publication Date** May 2019  
**Publication Type(s)** Review Journal Article  
**PubMedID** 31098722  
**Database** Medline

Available at [Current gastroenterology reports](#) from SpringerLink

**Abstract** PURPOSE OF REVIEWThe purpose of this review is to discuss current knowledge and recent findings regarding clinical aspects of thickeners for pediatric gastroesophageal reflux and oropharyngeal dysphagia. We review evidence for thickener efficacy, discuss types of thickeners, practical considerations when using various thickeners, and risks and benefits of thickener use in pediatrics.RECENT FINDINGSThickeners are effective in decreasing regurgitation and improving swallowing mechanics and can often be used empirically for the treatment of infants and young children. Adverse effects have been reported, but with careful consideration of appropriate thickener types, desired thickening consistency, and follow-up in collaboration with feeding specialists, most patients have symptomatic improvements. Thickeners are typically well tolerated and with few side effects, but close follow-up is needed to make sure patients tolerate thickeners and have adequate symptom improvement.

**12. Use of fluid thickener to reduce dysphagia risk.**

**Authors** Bridget, Penney  
**Source** Nursing times; 2014; vol. 110 (no. 12); p. 16-18  
**Publication Date** 2014  
**Publication Type(s)** Journal Article  
**PubMedID** 24923007  
**Database** Medline

Available at [Nursing times](#) from ProQuest (MEDLINE with Full Text) - NHS Version

Available at [Nursing times](#) from Ovid (Journals @ Ovid)

Available at [Nursing times](#) from ProQuest (Health Research Premium) - NHS Version

**Abstract** Swallowing difficulties are common among care home residents, and increase their risks of a range of conditions. A care home provider evaluated the use of fluid thickeners to reduce these risks, and implemented an initiative to improve understanding of dysphagia among both care and catering staff. This included changing the thickeners used and ensuring there was some consistency with regard to the terminology used undertaking staff training. related to food textures, as well as the Francis report (Francis, 2013) states people must have access to

**13. Improving care for patients with dysphagia.**

**Authors** Rosenvinge, Sally K; Starke, Ian D  
**Source** Age and ageing; Nov 2005; vol. 34 (no. 6); p. 587-593  
**Publication Date** Nov 2005  
**Publication Type(s)** Journal Article  
**PubMedID** 16267184  
**Database** Medline

Available at [Age and ageing](#) from HighWire - Free Full Text

Available at [Age and ageing](#) from Ovid (Journals @ Ovid)

Available at [Age and ageing](#) from Unpaywall

**Abstract** BACKGROUND Early diagnosis and effective management of dysphagia reduce the incidence of pneumonia and improve quality of care and outcome. Dysphagic stroke patients rarely perceive that they have a swallowing problem, and thus carers have to take responsibility for following the safe swallow recommendations made by the Speech and Language Therapist (SLT). Published work and observations in our own Trust indicated that patients with dysphagia may be fed in a manner which places them at significant risk of aspiration, despite SLT advice for safe swallowing. OBJECTIVE To determine compliance with swallowing recommendations in patients with dysphagia and to investigate the effectiveness of changes in practice in improving compliance. DESIGN Sequential observational study before and after targeted intervention. SETTING An acute general and teaching hospital in an inner city area. SUBJECTS All patients with dysphagia on the caseload of the speech and language therapy department at the time of the study. METHODS Observations were made on compliance with the recommendations of SLTs regarding consistency of fluids, dietary modifications, amount to be given at a single meal/drink, swallowing strategies, general safe swallow recommendations and whether supervision was required. A dysphagia link nurse programme was established, together with modification of an in-house training scheme, use of pre-thickened drinks and modification of swallowing advice sheets. The same observations were repeated after this intervention. RESULTS Thirty-one patients were observed before and 54 after the intervention. There was improvement in compliance with the recommendations on consistency of fluids (48-64%,  $P < 0.05$ ), amount given (35-69%,  $P < 0.05$ ), adherence to safe swallow guidelines (51-90%,  $P < 0.01$ ) and use of supervision (35-67%,  $P < 0.01$ ). There were no significant differences in compliance with dietary modifications or swallowing strategies. Improvement in compliance was demonstrated in medical and geriatric wards and the stroke unit, but not in the surgical wards. Compliance with 'nil by mouth' instructions was 100% throughout. CONCLUSIONS Relatively simple and low-cost measures, including an educational programme tailored to the needs of individual disciplines, proved effective in improving the compliance with advice on swallowing in patients with dysphagia. It is suggested that this approach may produce widespread benefit to patients across the NHS.

#### 14. Food polysaccharides and roles of rheology and tribology in rational design of thickened liquids for oropharyngeal dysphagia: A review.

**Authors** Methacanon, Pawadee; Gamonpilas, Chaiwut; Kongjaroen, Akapong; Buathongjan, Chonchanok  
**Source** Comprehensive reviews in food science and food safety; Jul 2021; vol. 20 (no. 4); p. 4101-4119  
**Publication Date** Jul 2021  
**Publication Type(s)** Review Journal Article  
**PubMedID** 34146451  
**Database** Medline

Available at [Comprehensive reviews in food science and food safety](#) from Unpaywall

**Abstract** In today's market environment, an aging society is recognized as one of the megatrends in the world. The demographic change in the world population age structure has driven a huge demand in healthcare products as well as services that include the technological innovation for the health and wellness of the elderly. Dysphagia or swallowing difficulty is a common problem in the elderly as many changes in swallowing function come with aging. The presence of a strong relationship between swallowing ability, nutritional status, and health outcomes in the elderly leads to the importance of dysphagia management in the population group. Modification of solid food and/or liquid is a mainstay of compensatory intervention for dysphagia patients. In this regard, texture-modified foods are generally provided to reduce risks associated with choking, while thickened liquids are recommended for mitigating risks associated with aspiration. In this review, we discuss thickened liquids and other issues including the importance of their rheological and tribological properties for oropharyngeal dysphagia management in the elderly. The review focuses on both commercial thickeners that are either based on modified starch or xanthan gum and other potential polysaccharide alternatives, which have been documented in the literature in order to help researchers develop or improve the characteristic properties of thickened liquids required for safe swallowing. Furthermore, some research gaps and future perspectives, particularly from the nutrition aspect related to the interaction between thickeners and other food ingredients, are suggested as such interaction may considerably control the rate of nutrient absorption and release within our body.

#### 15. Use of modified diets to prevent aspiration in oropharyngeal dysphagia: is current practice justified?

**Authors** O'Keeffe, Shaun T  
**Source** BMC geriatrics; Jul 2018; vol. 18 (no. 1); p. 167  
**Publication Date** Jul 2018  
**Publication Type(s)** Journal Article Review  
**PubMedID** 30029632  
**Database** Medline

Available at [BMC geriatrics](#) from BioMed Central  
 Available at [BMC geriatrics](#) from Europe PubMed Central - Open Access  
 Available at [BMC geriatrics](#) from SpringerLink  
 Available at [BMC geriatrics](#) from ProQuest (Health Research Premium) - NHS Version

**Abstract** Available at [BMC geriatrics](#) from Unpaywall

**BACKGROUND** Although modifying diets, by thickening liquids and modifying the texture of foods, to reduce the risk of aspiration has become central to the current management of dysphagia, the effectiveness of this intervention has been questioned. This narrative review examines, and discusses possible reasons for, the apparent discrepancy between the widespread use of modified diets in current clinical practice and the limited evidence base regarding the benefits and risks of this approach. **DISCUSSION** There is no good evidence to date that thickening liquids reduces pneumonia in dysphagia and this intervention may be associated with reduced fluid intake. Texture-modified foods may contribute to undernutrition in those with dysphagia. Modified diets worsen the quality of life of those with dysphagia, and non-compliance is common. There is substantial variability in terminology and standards for modified diets, in the recommendations of individual therapists, and in the consistency of diets prepared by healthcare staff for consumption. Although use of modified diets might appear to have a rational pathophysiological basis in dysphagia, the relationship between aspiration and pneumonia is not clear-cut. Clinical experience may be a more important determinant of everyday practice than research evidence and patient preferences. There are situations in the management of dysphagia where common sense and the necessity of intervention will clearly outweigh any lack of evidence or when application of evidence-based principles can enable good decision making despite the absence of robust evidence. Nevertheless, there is a significant discrepancy between the paucity of the evidence base supporting use of modified diets and the beliefs and practices of practitioners. **CONCLUSION** The disconnect between the limited evidence base and the widespread use of modified diets suggests the need for more careful consideration as to when modified diets might be recommended to patients. Patients (or their representatives) have a choice whether or not to accept a modified diet and must receive adequate information, about the potential risks and impact on quality of life as well as the possible benefits, to make that choice. There is an urgent need for better quality evidence regarding this intervention.

#### 16. Applicability of the two-step thickened water test in patients with poststroke dysphagia: a novel assessment tool for paste food aspiration.

**Authors** Momosaki, Ryo; Abo, Masahiro; Kakuda, Wataru; Kobayashi, Kazushige

**Source** Journal of stroke and cerebrovascular diseases : the official journal of National Stroke Association; Aug 2013; vol. 22 (no. 6); p. 817-821

**Publication Date** Aug 2013

**Publication Type(s)** Research Support, Non-u.s. Gov't Evaluation Study Journal Article

**PubMedID** 22721820

**Database** Medline

Available at [Journal of stroke and cerebrovascular diseases : the official journal of National Stroke Association](#) from ScienceDirect Available to PHE and Local Authority staff

**Abstract** This study evaluated the clinical usefulness of the newly developed Two-Step Thickened Water Test (TTWT) in identifying patients with poststroke dysphagia at risk of aspiration of paste food. The study subjects were 110 poststroke patients (mean age, 73 ± 10 years). The TTWT comprises a bedside pretest (tongue protrusion, vocalization, voluntary cough, and dry swallow) and a direct swallowing test using 4 mL of thickened water. Fiberoptic endoscopic evaluation of swallowing determined the subject's ability to swallow the paste food. Based on the test results and endoscopic evaluation, we calculated the TTWT's sensitivity and specificity in identifying paste food aspiration. We also calculated these values when normal water was used instead of thickened water in a direct swallowing test. The prevalence of dysphagia for paste food was 41% in our study group. The sensitivity and specificity of the TTWT in identifying dysphagia for paste food was 93% and 88%, respectively. The specificity decreased to 78.5% when normal water was used, with no decrease in sensitivity. The test was completed in less than 10 minutes, with no adverse events in any subject. Our data suggest that the TTWT might be a useful assessment tool for evaluating the risk of paste food aspiration in patients with poststroke dysphagia.

#### 17. Thickened liquids: do they still have a place in the dysphagia toolkit?

**Authors** Lazenby-Paterson, Tracy

**Source** Current opinion in otolaryngology & head and neck surgery; Jun 2020; vol. 28 (no. 3); p. 145-154

**Publication Date** Jun 2020

**Publication Type(s)** Journal Article Review

**PubMedID** 32332203

**Database** Medline

Available at [Current opinion in otolaryngology & head and neck surgery](#) from Ovid (Journals @ Ovid)

**Abstract** PURPOSE OF REVIEWThe use of commercially or naturally thickened liquids is a well-established treatment for patients with dysphagia to fluids, the aim of which is to improve swallow safety by minimizing risk of aspiration. Although the most recent systematic reviews conclude that this treatment lacks evidential support and leads to patient-reported worsening health and quality of life, thickened liquids continue to be used with patients with dysphagia across clinical settings. This review briefly summarizes the evidence and considers potential reasons for the apparent mismatch between the evidence and clinical practice.RECENT FINDINGSContinuing practice with thickened liquids is influenced by a range of factors, including gaps in clinical knowledge, inadequate patient involvement, a culture of common practice and a reliance on invalid surrogate studies or research lacking a credible association between thickened liquids and clinically meaningful endpoints.SUMMARYWhile awaiting further research, clinical decision-making about thickened liquids can be improved by considering the evidence of clinically meaningful endpoints, promoting shared decision-making with patients and underpinning practice with knowledge about the complex relationship between dysphagia, aspiration and pneumonia.

### 18. Variations in tongue-palate swallowing pressures when swallowing xanthan gum-thickened liquids.

**Authors** Steele, Catriona M; Molfenter, Sonja M; Péladeau-Pigeon, Melanie; Polacco, Rebecca C; Yee, Clemence  
**Source** Dysphagia; Dec 2014; vol. 29 (no. 6); p. 678-684  
**Publication Date** Dec 2014  
**Publication Type(s)** Research Support, N.i.h., Extramural Journal Article Research Support, Non-u.s. Gov't  
**PubMedID** 25087111  
**Database** Medline  
 Available at [Dysphagia](#) from SpringerLink  
 Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.  
 Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version  
 Available at [Dysphagia](#) from Unpaywall

**Abstract** Thickened liquids are frequently recommended to reduce the risk of aspiration in patients with oropharyngeal dysphagia. Although it has previously been reported that tongue-palate pressures increase when swallowing spoon-thick and semi-solid consistencies compared to thin liquids, relatively little is known about how swallowing behaviors differ when swallowing liquids of nectar- or honey-thick consistency. Furthermore, previous studies have primarily used starch-based thickeners, and little is known about swallowing behaviors with xanthan gum-thickened liquids, which have recently been introduced for dysphagia management. In this study, we measured variations in tongue-palate pressures during the swallowing of liquids thickened to apparent viscosities of 190, 250, and 380 mPa s at 50/s using increasing concentrations of xanthan gum (0.5, 0.63 and 0.87 w/w%). The viscosity differences between these nectar- and honey-thick stimuli were confirmed to exceed sensory perceptual discrimination thresholds. Data were collected from 78 healthy adults in two sex-balanced age-groups (young; mature) and compared to reference values obtained during water swallowing. The results confirm that increased amplitudes of tongue-palate pressure were used when swallowing the thickened liquid stimuli, compared to swallows of water, and for the honey-thick liquid compared to the two nectar-thick liquids. Age-related reductions were seen in tongue strength but not in swallowing pressures, which fell below 40 % of maximum isometric pressure values. Thus, the use of xanthan gum-thickened liquids is unlikely to tax the swallowing system in terms of tongue pressure generation requirements, even in seniors with reduced maximum isometric tongue pressure measures.

### 19. Plugging the patient evidence gap: what patients with swallowing disorders post-stroke say about thickened liquids.

**Authors** McCurtin, Arlene; Healy, Chiara; Kelly, Linda; Murphy, Fiona; Ryan, Jean; Walsh, Joanne  
**Source** International journal of language & communication disorders; Jan 2018; vol. 53 (no. 1); p. 30-39  
**Publication Date** Jan 2018  
**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article  
**PubMedID** 28621030  
**Database** Medline  
 Available at [International journal of language & communication disorders](#) from Wiley Online Library Medicine and Nursing Collection 2019  
 Available at [International journal of language & communication disorders](#) from Unpaywall

**Abstract** BACKGROUND Oropharyngeal dysphagia post-stroke is well known, with its presence increasing the risk of poor outcomes in particular aspiration and aspiration pneumonia. Management to minimize the risk of aspiration and improve swallow safety post-stroke includes the treatment of thickened liquids (TL), an established bolus modification intervention. Despite widespread use, there is a lack of robust empirical evidence and minimal patient evidence as to the experience and acceptability of using thickeners by people who experience dysphagia after a stroke. AIM To explore people with swallowing disorders post-stroke experiences of and acceptability regarding the bolus modification treatment of thickened liquids. METHODS & PROCEDURES A qualitative, descriptive study exploring the experiences of individuals given TL after their stroke. A purposive sample of 14 adults was obtained with data collection and generation through the medium of individual semi-structured interviews. Inductive thematic analysis was used to analyse the data. OUTCOMES & RESULTS Three overarching themes of 'uncertainty', 'an unpleasant experience' and 'a trade-off' were identified. These themes highlight that participants disliked TL and this dislike may have impacted clinically in terms of adherence, hydration and quality of life. Lack of sensory appeal was important in framing patient dislike. Participants' involvement in and understanding of reasons for prescription of TL was poor leading to uncertainty regarding the treatment. Notwithstanding, some participants felt it was necessary for their stroke recovery. CONCLUSIONS & IMPLICATIONS TL can be considered a burdensome treatment from multiple perspectives including product palatability, treatment uncertainty and treatment adherence issues. Despite intensely disliking this treatment, some patients ultimately understand why the treatment is prescribed. Improvements in product palatability are required in order to improve adherence and patient quality of life. Consideration of other treatment options and newer products to manage aspiration post-stroke is also warranted.

## 20. Parent perception of the impact of using thickened fluids in children with dysphagia.

**Authors** Krummrich, Patricia; Kline, Barbara; Krival, Kate; Rubin, Michael  
**Source** Pediatric pulmonology; Nov 2017; vol. 52 (no. 11); p. 1486-1494  
**Publication Date** Nov 2017  
**Publication Type(s)** Journal Article  
**PubMedID** 28436603  
**Database** Medline

Available at [Pediatric pulmonology](#) from Wiley Online Library Medicine and Nursing Collection 2019  
 Available at [Pediatric pulmonology](#) from Ovid (Journals @ Ovid)

**Abstract** BACKGROUND Oropharyngeal dysphagia occurs in children without known neurological disorders, increasing their risk for respiratory problems and inadequate intake. Clinicians may recommend thickening nutritive fluids; however, there is little research regarding the impact of thickening nutritive fluids on clinical outcomes in children. METHODS We used a parental reporting tool to determine whether parents identified changes in signs of dysphagia or volume of intake when thickened fluids were incorporated into an individualized feeding program for dysphagic children without known neurological problems. Fifty-five children diagnosed with dysphagia, for whom thickened fluids had been recommended per radiographic and clinical exam, qualified for the study. Parents of 44 children (24 females, 20 males) aged 2 weeks to 14 months completed baseline and post-thickening (within 90 days) rating scales. RESULTS Compared to baseline, parents reported significant decreases in the frequency of apnea ( $W = -219, P < 0.0001, r = 0.399$ ), congestion ( $W = -450, P < 0.0001, r = 0.579$ ), coughing/choking with drinking ( $W = -485, P < 0.0001, r = 0.603$ ), resistance to feeding ( $W = -344.5, P < 0.0001, r = 0.476$ ), vomiting during feeding ( $W = -409, P < 0.0001, r = 0.565$ ), and wheezing ( $W = -337, P < 0.001, r = 0.449$ ). For those children whose parents initially reported inadequate levels of intake, there was a significant ( $Z = 3.15, P = 0.0029, r = 0.47$ ) increase (+49.63 mm) in the rated adequacy of liquid intake, as well as a significant increase (+1.41 oz.) in the estimated volume per feeding ( $Z = 224, P = 0.29, r = 0.33$ ). CONCLUSION These results provide information for clinicians and physicians to incorporate when considering the use of thickened fluids in the dysphagia management of children without a known neurological diagnosis.

## 21. Viscosity differences between thickened beverages suitable for elderly patients with dysphagia.

**Authors** Garin, Noé; De Pourcq, Jan Thomas; Martín-Venegas, Raquel; Cardona, Daniel; Gich, Ignasi; Mangues, Maria Antònia  
**Source** Dysphagia; Aug 2014; vol. 29 (no. 4); p. 483-488  
**Publication Date** Aug 2014  
**Publication Type(s)** Journal Article  
**PubMedID** 24842337  
**Database** Medline  
 Available at [Dysphagia](#) from SpringerLink  
 Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.  
 Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version



**Abstract** Dysphagia has been associated with a high risk of undernutrition and aspiration pneumonia in the elderly. It is commonly managed by adding commercial thickening agents to thicken liquids. The rheological behavior of these thickeners in water is known but there is lack of information with regard to other liquids. The aim of this study was to determine the viscosity of 11 beverages after adding commercial thickeners and to compare their viscosity with that of thickened water and also with the reference limits of the National Dysphagia Diet (NDD). We added starch-based and gum-based thickeners to 11 beverages to achieve a honey-like consistency. The 11 beverages were five juices (apple, orange, grape, peach-grape, and pineapple), two teas (black tea and chamomile), milk (whole and skimmed), instant coffee, and a vegetable milk (tigernut milk). Viscosity measurements were made in a controlled environment for the resulting 22 samples. Compared to thickened water, significant changes were found for all beverages except apple juice, with both starch- and gum-based thickeners, and orange juice, pineapple juice, and chamomile with the gum-based thickener. Results with respect to the NDD reference limits showed significant changes in viscosity only for peach-grape juice and pineapple juice with starch-based thickener. These findings show that changes arise in the viscosity of some thickened beverages compared to thickened water and also compared to the range recommended by the NDD. Further studies are needed to describe the rheological behavior of other beverages, thickeners, and consistencies. Recommendations to ensure feeding safety may be required for elderly patients with dysphagia.

## 22. Thickened fluids: investigation of users' experiences and perceptions.

**Authors** Smith, Christina H; Jebson, Emma M; Hanson, Ben  
**Source** Clinical nutrition (Edinburgh, Scotland); Feb 2014; vol. 33 (no. 1); p. 171-174  
**Publication Date** Feb 2014  
**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article  
**PubMedID** 24176128  
**Database** Medline  
 Available at [Clinical nutrition \(Edinburgh, Scotland\)](#) from ScienceDirect Available to PHE and Local Authority staff

**Abstract** BACKGROUND & AIMS Fluid thickeners are an important and commonly-used strategy to manage swallowing difficulties however there are no reports of the perceptions and experiences of parents of children using thickeners. METHOD Semi-structured interviews of 14 parents having a child using fluid thickeners due to swallowing difficulties. RESULTS Parents reported improvements in quality of life and health through the use of thickeners. They also reported persistent difficulties in the use of thickeners. CONCLUSIONS Results showed unanimous goodwill and positive attitudes towards thickeners and their observed benefits, tempered by common difficulties with thickeners (variability and unpredictability). There remains scope for improvements of commercial thickeners and in information conveyed to users.

## 23. A systematic review and meta-analysis of pneumonia associated with thin liquid vs. thickened liquid intake in patients who aspirate.

**Authors** Kaneoka, Asako; Pisegna, Jessica M; Saito, Hiroki; Lo, Melody; Felling, Katey; Haga, Nobuhiko; LaValley, Michael P; Langmore, Susan E  
**Source** Clinical rehabilitation; Aug 2017; vol. 31 (no. 8); p. 1116-1125  
**Publication Date** Aug 2017  
**Publication Type(s)** Meta-analysis Journal Article Review Systematic Review  
**PubMedID** 28730887  
**Database** Medline  
 Available at [Clinical rehabilitation](#) from SAGE Journals (Premier Health Sciences 2019)  
 Available at [Clinical rehabilitation](#) from Ovid (Journals @ Ovid)

**Abstract** OBJECTIVE To investigate whether drinking thin liquids with safety strategies increases the risk for pneumonia as compared with thickened liquids in patients who have demonstrated aspiration of thin liquids. DATA SOURCES Seven electronic databases, one clinical register, and three conference archives were searched. No language or publication date restrictions were imposed. Reference lists were scanned and authors and experts in the field were contacted. REVIEW METHODSA blind review was performed by two reviewers for published or unpublished randomized controlled trials and prospective non-randomized trials comparing the incidence of pneumonia with intake of thin liquids plus safety strategies vs. thickened liquids in adult patients who aspirated on thin liquids. The data were extracted from included studies. Odds ratios (OR) for pneumonia were calculated from the extracted data. Risk of bias was also assessed with the included published trials. RESULTS Seven studies out of 2465 studies including 650 patients met the inclusion criteria. All of the seven studies excluded patients with more than one known risk factor for pneumonia. Six studies compared thin water protocols to thickened liquids for pneumonia prevention. A meta-analysis was done on the six studies, showing no significant difference for pneumonia risk (OR = 0.82; 95% CI = 0.05-13.42; p = 0.89). CONCLUSIONSThere was no significant difference in the risk of pneumonia in aspirating patients who took thin liquids with safety strategies compared with those who took thickened liquids only. This result, however, is generalizable only for patients with low risk of pneumonia.



**24. Effect of human saliva on the consistency of thickened drinks for individuals with dysphagia.**

**Authors** Vallons, Katleen J R; Helmens, Harold J; Oudhuis, A A C M  
**Source** International journal of language & communication disorders; 2015; vol. 50 (no. 2); p. 165-175  
**Publication Date** 2015  
**Publication Type(s)** Research Support, Non-u.s. Gov't Comparative Study Journal Article  
**PubMedID** 25298105  
**Database** Medline  
 Available at [International journal of language & communication disorders](#) from Wiley Online Library Medicine and Nursing Collection 2019  
 Available at [International journal of language & communication disorders](#) from Unpaywall

**Abstract** BACKGROUNDThickening of foods and fluids is commonly used in the management of dysphagia to reduce the risk of aspiration. The use of starch-based thickeners is established. However, the use of gums in thickeners is gaining interest as they are resistant to salivary amylase, which may promote safer swallowing.AIMSTo compare the effect of human saliva on the consistency of drinks thickened with a gum-containing (GC) thickener with that of drinks thickened with four starch-based (SB) thickeners.METHODS & PROCEDURESThree drinks (artificial tap water, hot coffee and full-fat milk) were thickened to custard consistency with the different thickeners. Compression force and amount of thin liquid formed were determined after 10 and 50 min of contact with human saliva with standardized amylase activity and compared with a control inoculated with water.OUTCOMES & RESULTSDrinks thickened with GC thickener were significantly less sensitive to thinning by human saliva compared with drinks thickened with all four SB thickeners ( $p < 0.05$ ). Moreover, incubation of SB-thickened drinks with human saliva resulted in the formation of at least 10 g of decantable liquid, while for GC-thickened drinks, almost no liquid was formed.CONCLUSIONS & IMPLICATIONSThese results show that GC thickeners contain their consistency better in contact with human saliva than SD thickeners. This may enhance the swallowing safety of people with dysphagia.

**25. The Relationship between Texture-Modified Diets, Mealtime Duration, and Dysphagia Risk in Long-Term Care.**

**Authors** Namasivayam-Macdonald, Ashwini M; Steele, Catriona M; Carrier, Natalie; Lengyel, Christina; Keller, Heather H  
**Source** Canadian journal of dietetic practice and research : a publication of Dietitians of Canada = Revue canadienne de la pratique et de la recherche en dietetique : une publication des Dietetistes du Canada; Sep 2019; vol. 80 (no. 3); p. 122-126  
**Publication Date** Sep 2019  
**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article  
**PubMedID** 30907128  
**Database** Medline  
 Available at [Canadian journal of dietetic practice and research : a publication of Dietitians of Canada = Revue canadienne de la pratique et de la recherche en dietetique : une publication des Dietetistes du Canada](#) from ProQuest (Health Research Premium) - NHS Version  
 Available at [Canadian journal of dietetic practice and research : a publication of Dietitians of Canada = Revue canadienne de la pratique et de la recherche en dietetique : une publication des Dietetistes du Canada](#) from ProQuest (MEDLINE with Full Text) - NHS Version

**Abstract** Many long-term care (LTC) residents have an increased risk for dysphagia and receive texture-modified diets. Dysphagia has been shown to be associated with longer mealtime duration, and the use of texture-modified diets has been associated with reduced nutritional intake. The current study aimed to determine if the degree of diet modification affected mealtime duration and to examine the correlation between texture-modified diets and dysphagia risk. Data were collected from 639 LTC residents, aged 62-102 years. Nine meal observations per resident provided measures of meal duration, consistencies consumed, coughing and choking, and assistance provided. Dysphagia risk was determined by identifying residents who coughed/choked at meals, were prescribed thickened fluids, and/or failed a formal screening protocol. Degree of texture modification was derived using the International Dysphagia Diet Standardization Initiative Functional Diet Scale. There was a significant association between degree of diet modification and dysphagia risk ( $P < 0.001$ ). However, there was no association between diet modifications and mealtime duration, even when the provision of physical assistance was considered. Some residents who presented with signs of swallowing difficulties were not prescribed a texture-modified diet. Swallowing screening should be performed routinely in LTC to monitor swallowing status and appropriateness of diet prescription. Physical assistance during meals should be increased.

**26. Formulating protein-based beverages for the dysphagia diets of the elderly: viscosity, protein quality, in vitro digestion, and consumers acceptability.**

**Authors** Štreimikytė, Paulina; Keršienė, Milda; Eisinaitė, Viktorija; Jasutienė, Ina; Lesauskaitė, Vita; Damulevičienė, Gytė; Knašienė, Jurgita; Leskauskaitė, Daiva  
**Source** Journal of the science of food and agriculture; Aug 2020; vol. 100 (no. 10); p. 3895-3901  
**Publication Date** Aug 2020

**Publication Type(s)** Journal Article  
**PubMedID** 32323329  
**Database** Medline  
**Abstract** BACKGROUND Dysphagia is defined as a disorder of the swallowing mechanism. The most common management of dysphagia is diet modification by thickening food and beverages. This study aimed to obtain protein-based beverages for the dysphagia diets of the elderly, corresponding to the 'honey' (III) level of dysphagia fluids according to the National Dysphagia Diet classifications, and containing 100 g kg<sup>-1</sup> of good-quality proteins with a high rate of hydrolysis during digestion. RESULTS Four protein formulations made from pea proteins, milk proteins, a mixture of milk and pea proteins, and milk proteins with added konjac glucomannan, were evaluated on the basis of rheological characterization and proteolysis kinetics during in vitro digestion. The mixture of milk proteins and pea proteins, and the mixture of milk proteins with added konjac glucomannan, showed typical yielding pseudoplastic fluid behavior with similar apparent viscosity but different structural characteristics. These differences were the reason for the differences in proteolysis kinetics during digestion. The mixture of milk and pea proteins showed viscous liquid behavior and was more rapidly hydrolyzed under gastrointestinal conditions than mixtures containing milk proteins and konjac glucomannan acting as a weak gel system. CONCLUSION We presume that geriatric consumers with swallowing difficulties may benefit from 'honey'-level viscosity, protein-based beverages containing pea and milk proteins through faster proteolysis and better bioaccessibility of amino acids during digestion. © 2020 Society of Chemical Industry.

### 27. A randomised trial of the effect of different fluid consistencies used in the management of dysphagia on quality of life: a time trade-off study.

**Authors** Lim, Daniel J H; Mulkerrin, Siofra Maire; Mulkerrin, Eamon C; O'Keeffe, Shaun T  
**Source** Age and ageing; Mar 2016; vol. 45 (no. 2); p. 309-312  
**Publication Date** Mar 2016  
**Publication Type(s)** Research Support, Non-u.s. Gov't Comparative Study Randomized Controlled Trial Journal Article  
**PubMedID** 26744360  
**Database** Medline  
 Available at [Age and ageing](#) from HighWire - Free Full Text  
 Available at [Age and ageing](#) from Ovid (Journals @ Ovid)  
 Available at [Age and ageing](#) from Unpaywall  
**Abstract** BACKGROUND thickened fluids are commonly advised to minimise the risk of aspiration in people with dysphagia, although many do not comply with this treatment. In health economics, utilities are values that reflect an individual's preferences for different health states. We examined the healthcare utilities, elicited using a time trade-off approach (TTO), from healthcare professionals and non-dysphagic patients, associated with long-term use of thickened fluids. METHODS the risk of aspiration with thin fluids was explained to consecutive hospital patients without dysphagia (n = 76) and to a convenience sample of healthcare professionals (n = 75) who were then randomly allocated to drink as much as possible of 200 ml of pre-prepared water of Grade 1 (very mildly thick) or Grade 2 (mildly thick) consistency. A standardised script with a ping-pong approach was then used to elicit TTO utilities for use of thickened fluids using a 10-year horizon. RESULTS median (inter-quartile range) utilities were 0.7 (0.5-0.9) for those receiving Grade 1 and 0.5 (0.3-0.7) for those receiving Grade 2 consistency fluid (Mann-Whitney test, P = 0.001). Thus, for example, on average those allocated to Grade 2 fluid would be willing to sacrifice 5 years of a 10-year lifespan not to be restricted to fluid of that consistency. There were no significant differences between patient and professional values. CONCLUSION patients and professionals judge that long-term use of thickened fluids would significantly impair quality of life. Utilities associated with more viscous fluids are particularly low.

### 28. Evaluation of the benefits of monitoring fluid thickness in the dietary management of dysphagic stroke patients.

**Authors** Goulding, R; Bakheit, A M  
**Source** Clinical rehabilitation; Apr 2000; vol. 14 (no. 2); p. 119-124  
**Publication Date** Apr 2000  
**Publication Type(s)** Research Support, Non-u.s. Gov't Randomized Controlled Trial Clinical Trial Journal Article  
**PubMedID** 10763787  
**Database** Medline  
 Available at [Clinical rehabilitation](#) from SAGE Journals (Premier Health Sciences 2019)  
 Available at [Clinical rehabilitation](#) from ProQuest (Health Research Premium) - NHS Version  
 Available at [Clinical rehabilitation](#) from ProQuest (MEDLINE with Full Text) - NHS Version  
 Available at [Clinical rehabilitation](#) from Ovid (Journals @ Ovid)

**Abstract** OBJECTIVESafe swallowing may be achieved in most patients with neurogenic dysphagia by manipulating the viscosity of ingested fluids. However, in clinical practice fluids are thickened using subjective judgement. This may lead to errors in the preparation of drinks to the prescribed viscosity. The aim of the present study is to examine whether the use of a viscometer improves the dietary management of dysphagic stroke patients. STUDY DESIGNA randomized controlled study design was used. The speech and language therapist determined the optimal fluid thickness for each patient. The prescribed fluid viscosity for the study group was obtained using a viscometer. Patients in the control group received fluids prepared according to current practice, i.e. the amount of thickener required to produce the prescribed viscosity was judged subjectively by the nursing staff. The two methods of fluid thickening were used for seven consecutive days. Assessment was made blind to randomization. MAIN OUTCOME MEASUREPulmonary aspiration, assessed clinically and with pulse oximetry. If the patient did not drink all the fluid that was offered the residue was measured. RESULTSTen patients in the study group (n = 23) and nine in the control group (n = 23) aspirated. The mean viscosity of fluids offered to patients in the control group was significantly higher than that of the study patients. There was a statistically significant correlation between the viscosity and the residual volume of fluid (Pearson's test:  $r = 0.7$ ,  $p < 0.02$ ). The findings of the study suggest that fluids prepared by subjectively assessing the amount of thickener required to produce a given consistency tend to have a higher viscosity than those prepared using the viscometer. However, the higher viscosity does not appear to protect against pulmonary aspiration and may lead to a reduced fluid intake. CONCLUSIONManipulation of fluid thickness using objective measurements with a viscometer may improve the dietary management of dysphagic stroke patients.

### 29. Risk of excessive sodium intake in the use of a thickener for dysphagia.

**Authors** Almeida, Tatiana Magalhães de; Germini, Michele F Canfld; Kovacs, Cristiane; Soares, Ana Margaret N G F; Magnoni, Daniel; Sousa, Amanda G M R  
**Source** Arquivos brasileiros de cardiologia; Jul 2013; vol. 101 (no. 1); p. e15  
**Publication Date** Jul 2013  
**Publication Type(s)** Journal Article  
**PubMedID** 23917513  
**Database** Medline  
 Available at [Arquivos brasileiros de cardiologia](#) from Europe PubMed Central - Open Access

### 30. The efficacy of pre-thickened fluids on total fluid and nutrient consumption among extended care residents requiring thickened fluids due to risk of aspiration.

**Authors** McCormick, Siobhán Erin; Stafford, Kathleen Mary; Saqib, Ghulam; Chroinin, Danielle Ni; Ni Chronin, Dannielle; Power, Dermot  
**Source** Age and ageing; Nov 2008; vol. 37 (no. 6); p. 714-715  
**Publication Date** Nov 2008  
**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article  
**PubMedID** 19004963  
**Database** Medline  
 Available at [Age and ageing](#) from HighWire - Free Full Text  
 Available at [Age and ageing](#) from Ovid (Journals @ Ovid)  
 Available at [Age and ageing](#) from Unpaywall

### 31. A computational fluid dynamics simulation of liquid swallowing by impaired pharyngeal motion: bolus pathway and pharyngeal residue.

**Authors** Ohta, Jun; Ishida, Shunichi; Kawase, Tetsuaki; Katori, Yukio; Imai, Yohsuke  
**Source** American journal of physiology. Gastrointestinal and liver physiology; Dec 2019; vol. 317 (no. 6); p. G784  
**Publication Date** Dec 2019  
**Publication Type(s)** Research Support, Non-u.s. Gov't Journal Article  
**PubMedID** 31566413  
**Database** Medline  
 Available at [American journal of physiology. Gastrointestinal and liver physiology](#) from HighWire - Free Full Text  
 Available at [American journal of physiology. Gastrointestinal and liver physiology](#) from Unpaywall

**Abstract** Common practices to improve the ability to swallow include modifying physical properties of foods and changing the posture of patients. Here, we quantified the effects of the viscosity of a liquid bolus and patient posture on the bolus pathway and pharyngeal residue using a computational fluid dynamics simulation. We developed a computational model of an impaired pharyngeal motion with a low pharyngeal pressure and no pharyngeal adaptation. We varied viscosities from 0.002 to 1 Pa·s and postures from -15° to 30° (from nearly vertical to forward leaning). In the absence of pharyngeal adaptation, a honey-like liquid bolus caused pharyngeal residue, particularly in the case of forward-leaning postures. Although the bolus speed was different among viscosities, the final pathway was only slightly different. The shape, location, and tilting of the epiglottis effectively invited a bolus to two lateral pathways, suggesting a high robustness of the swallowing process. **NEW & NOTEWORTHY** Thickening agents are often used for patients with dysphagia. An increase in bolus viscosity not only reduces the risk of aspiration but also can cause a residual volume in the pharynx. Because information obtained from videofluoroscopic swallowing studies is only two-dimensional, measurement of pharyngeal residue is experimentally difficult. We successfully quantified the three-dimensional bolus pathway and the pharyngeal residual volume using computational modeling and simulation.

### 32. Free water or thickened fluids for patients with dysphagia: A systematic review

**Authors** Grocott J.  
**Source** International Journal of Stroke; 2019; vol. 14 (no. 4); p. 55  
**Publication Date** 2019  
**Publication Type(s)** Conference Abstract  
**Database** EMBASE

Available at [International Journal of Stroke](#) from SAGE Journals (Premier Health Sciences 2019)

Available at [International Journal of Stroke](#) from Unpaywall

**Abstract** Introduction: For many years patients with dysphagia have been prescribed thickened fluids, kept nil by mouth or had a nasogastric tube inserted. Evidence is emerging that suggests thickened fluids are detrimental to patients rather than beneficial by reducing fluid intake or prolonging hospital stay. The aim of this systematic review is to determine whether patients with dysphagia can tolerate unthickened liquids safely. Method(s): This systematic review will search AMED, CINAHL and Medline databases for randomised or non-randomised controlled trials and observational studies that compare thickened fluids with free water. Result(s): A search resulted in 25 papers that included terms dysphagia, deglutition disorders, stroke (or CVA) and oral intake by either thickened fluids or free water. In relation to the safety of unthickened fluids there have been very few trials undertaken to test validity. The Frazier Free Water protocol was a review of 234 patients that ascertained that free water did not increase pneumonia rates. Similarly, Carlow, et al., (2012) and Murray, et al., (2016) found that free water was not a cause of aspiration pneumonia. Trials so far have suggested that no adverse effects developed from the provision of free water but actually increased fluid intake. Conclusion(s): It was concluded that dysphagia recovered faster for patients taking free water reducing hospital admission plus decreasing occurrence of dehydration. The trials suggested that further research was necessary, by development of a randomised controlled trial, to confirm or deny these early findings.

### 33. Food characteristics and dysphagia: What do nutritionists say?

**Authors** MacHado A.S.; Paula L.D.; Endringer D.C.  
**Source** Dysphagia; 2019; vol. 34 (no. 5); p. 792  
**Publication Date** 2019  
**Publication Type(s)** Conference Abstract  
**Database** EMBASE

Available at [Dysphagia](#) from SpringerLink

Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.

Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version

Available at [Dysphagia](#) from Unpaywall

**Abstract** Introduction: Dysphagia affects quality of life for increasing the risks of aspiration pulmonary alterations and nutritional deficiencies. Modification of diet can be necessary to reach efficient and safe feeding. For such behavior speech therapist modifies diet viscosity and texture for dysphagic patients considering food characteristics and its influence in swallowing. The nutritionist elaborates an adequate program of nutrition preventing dehydration and malnutrition. The goal of this study was to investigate the knowledge of nutritionists on food characteristics and its influence in swallowing disorders.

Material(s) and Method(s): Descriptive quantitative study with sample for convenience enlisted through invitations sent to the Brazilian nutritionists who take care of or not dysphagic patients. Research carried through electronic questionnaire in SurveyMonkey-site with questions applied to the area of the research. Data was analyzed by descriptive statistics.

Result(s): Sample was composed by 519 nutritionists of 22 Brazilian states being 61.23% who works with dysphagia. The consistency considered safest to be offered was cream (61.43%) after that thickened liquid (33.57%) and fine liquid (5.00%) in accordance with literature. The ideal food temperature to offer was considered ambient temperature (52.01%) after that warm (30.40%) temperature does not interfere (12.09%) and cold (5.49%). Data diverge of researches that bring cold temperature as being safer to be offered by influencing positively in deglutition process.

Conclusion(s): The nutritionists answered correctly about the consistency indicating creamy viscosity. Concerning the correct temperature (cold) the nutritionists did not answered properly.

#### 34. The Influence of Food Texture and Liquid Consistency Modification on Swallowing Physiology and Function: A Systematic Review

**Authors** Steele C.M.; Chen J.; Cichero J.A.Y.; Dantas R.O.; Duivesteyn J.; Hanson B.; Lam P.; Lecko C.; Barbon C.E.A.; Giosa L.; Leigh C.; Nagy A.; Namasivayam A.M.; Wang H.; Alsaney W.A.; Ayanikalath S.; Coutts K.; Nascimento W.V.; Odendaal I.; Smith C.H.

**Source** Dysphagia; Feb 2015; vol. 30 (no. 1); p. 2-26

**Publication Date** Feb 2015

**Publication Type(s)** Article

**PubMedID** 25343878

**Database** EMBASE

Available at [Dysphagia](#) from SpringerLink

Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.

Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version

Available at [Dysphagia](#) from Unpaywall

**Abstract** Texture modification has become one of the most common forms of intervention for dysphagia, and is widely considered important for promoting safe and efficient swallowing. However, to date, there is no single convention with respect to the terminology used to describe levels of liquid thickening or food texture modification for clinical use. As a first step toward building a common taxonomy, a systematic review was undertaken to identify empirical evidence describing the impact of liquid consistency and food texture on swallowing behavior. A multi-engine search yielded 10,147 non-duplicate articles, which were screened for relevance. A team of ten international researchers collaborated to conduct full-text reviews for 488 of these articles, which met the study inclusion criteria. Of these, 36 articles were found to contain specific information comparing oral processing or swallowing behaviors for at least two liquid consistencies or food textures. Qualitative synthesis revealed two key trends with respect to the impact of thickening liquids on swallowing: thicker liquids reduce the risk of penetration-aspiration, but also increase the risk of post-swallow residue in the pharynx. The literature was insufficient to support the delineation of specific viscosity boundaries or other quantifiable material properties related to these clinical outcomes. With respect to food texture, the literature pointed to properties of hardness, cohesiveness, and slipperiness as being relevant both for physiological behaviors and bolus flow patterns. The literature suggests a need to classify food and fluid behavior in the context of the physiological processes involved in oral transport and flow initiation.

Copyright © 2014, The Author(s).

#### 35. Assessment of tomato-based thick fluid diet for patients with dysphagia using a simple and cheap test

**Authors** Maieves H.A.; Teixeira G.L.

**Source** Journal of texture studies; Jun 2021

**Publication Date** Jun 2021

**Publication Type(s)** Article

**PubMedID** 34101187

**Database** EMBASE



**Abstract** Swallowing difficulty, also known as dysphagia, is a health condition that can be managed by different approaches, such as changing the viscosity of fluid foods with thickener agents. Tomato-based beverages such as "gazpacho" and "salmorejo" are common foods much appreciated by the populations that adopt a Mediterranean diet, mainly in Spain. These beverages usually present a low viscosity, challenging to include in diets for dysphagia patients. Thus, this work aimed at evaluating the flow properties of tomato-based beverages with or without the addition of thickener agents (based on maltodextrin or gum) using a simple and cheap method proposed by the International Dysphagia Diet Standardization Initiative (IDDSI) to verify the suitability of using those products in a diet of patients with dysphagia. The study also evaluated the differences in using BD-type syringes on the test. Results indicated that the type of thickener significantly ( $p < 0.05$ ) affects the samples' flow properties, enhancing their rheological behavior. The type of syringe can also affect the results, as they present different Luer slip tips. The results revealed that tomato-based beverages may have their properties improved simply by using low amounts of thickener agents (1.2-3.0 g 200 mL<sup>-1</sup>) and that the IDDSI test can be an alternative, cheap and straightforward method for evaluating these types of foods in hospital environments. Including tomato-based beverages in the diet of patients with dysphagia may present many benefits as these products have a rich nutritional composition (fiber) in addition to biocompounds such as lycopene and phenolic compounds.  
Copyright This article is protected by copyright. All rights reserved.

### 36. Thickened Liquids Using Pureed Foods for Children with Dysphagia: IDDSI and Rheology Measurements

**Authors** Brooks L.; Harmon S.; Liao J.; Breedveld V.; Ford J.  
**Source** Dysphagia; 2021  
**Publication Date** 2021  
**Publication Type(s)** Article  
**PubMedID** 33954811  
**Database** EMBASE

Available at [Dysphagia](#) from SpringerLink

**Abstract** Children with dysphagia, or swallowing disorder, are at an increased risk for developing respiratory compromise, failure to thrive, and aversion. Thickened liquids can be recommended for children with dysphagia, if shown to be effective on instrumental examination and if strategies/interventions with thin liquids are not successful. Thickened liquids have many benefits, including creating a more cohesive bolus, slowing oropharyngeal transit time, and reducing aspiration. However, preparing thickened liquids with commercially available thickeners can result in poor compliance due to concerns regarding taste, texture, accessibility, cost, thickness variability, and potential negative impact of these substances on a child's immature digestive tract. The purpose of this study was to determine if liquids could be successfully thickened with widely available, commercial pureed foods, and to assess how these mixtures compare to starch and gum based thickening agents. The International Dysphagia Diet Standardisation Initiative (IDDSI) flow test was performed for each sample of puree thickened liquids, gum based thickened water, and cornstarch based thickened water. In addition, rheology testing was performed on each category of the samples to measure viscosity at various shear rates and temperatures, and to assess the presence of yield stress. Results revealed that liquids thickened with smooth textured purees were comparable to commercial starch and gum based thickeners, and may be offered as a viable alternative.  
Copyright © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

### 37. Effects of texture properties of semi-solid food on the sensory test for pharyngeal swallowing effort in the older adults

**Authors** Park J.-W.; Nam K.; Lee S.; Yoo B.  
**Source** BMC geriatrics; Nov 2020; vol. 20 (no. 1); p. 493  
**Publication Date** Nov 2020  
**Publication Type(s)** Article  
**PubMedID** 33228540  
**Database** EMBASE  
 Available at [BMC geriatrics](#) from BioMed Central  
 Available at [BMC geriatrics](#) from Europe PubMed Central - Open Access  
 Available at [BMC geriatrics](#) from SpringerLink  
 Available at [BMC geriatrics](#) from ProQuest (Health Research Premium) - NHS Version  
 Available at [BMC geriatrics](#) from Unpaywall



**Abstract** BACKGROUND: Increasing viscosity can reduce the risk of aspiration into the airway, but excessively thickened food may require more force and effort. We assumed that semi-solid foods with similar viscosities will behave differently in the oropharynx and there might exist the possibility that properties other than viscosity may have clinical relevance. This study aimed to find out the texture of semi-solid foods that affects the effort of pharyngeal swallow in the older adults.

METHOD(S): Nine kinds of semi-solid foods not requiring mastication were selected for texture profile analysis (TPA), and included whipped cream, mayonnaise, soft tofu, mango pudding, boiled mashed pumpkin, boiled mashed potatoes, boiled mashed sweet potatoes, red bean paste, and peanut butter. Hardness, adhesiveness and cohesiveness of each food were measured three times by using the rheometer. A blinded sensory test using a 9-point hedonic scale was also conducted in eighteen older adults people to investigate how much effort was required to swallow food, and how much of the food remained in the pharynx after swallowing. The correlation between texture and sensory outcome was statistically analyzed.

RESULT(S): Foods that belonged to the same viscosity category showed different texture values, and the participants also rated different scores respectively. Only adhesiveness among three properties was significantly correlated with the sensory test. ( $r=0.882$ ,  $p=0.002$  for difficult to swallow,  $r=0.879$ ,  $p=0.002$  for sense of residue).

CONCLUSION(S): Adhesiveness was the most important property of the semi-solid foods, requiring most efforts in pharyngeal swallow in the older adults. If we select and provide food having low adhesiveness value in the same viscosity category, there might be the possibility to make it easier to swallow in older adults.

### 38. Acceptance of different types of thickeners, with and without flavouring, in hospitalized patients with dysphagia. A pilot study

**Authors** Vidal Casariego A.; Pita Gutierrez F.; Lugo Rodriguez G.; Martinez Ramonde T.; Gonzalez Nunez S.  
**Source** Clinical Nutrition ESPEN; Dec 2020; vol. 40 ; p. 674-675  
**Publication Date** Dec 2020  
**Publication Type(s)** Conference Abstract  
**Database** EMBASE

**Abstract** Available at [Clinical Nutrition ESPEN](#) from ScienceDirect Available to PHE and Local Authority staff

Rationale: Dysphagia may affect both nutritional and hydration status, as well as the prognosis of patients. Thickeners have been developed to adapt the viscosity of liquids, allowing safe and effective swallowing, reducing the risk of aspiration, and ensuring a [GM1] proper state of hydration. The objective of this work was to evaluate the acceptance of different types of thickeners, with and without flavouring.

Method(s): A randomized sample of 40 hospitalized patients with oropharyngeal dysphagia was recruited. They received a structured questionnaire about the sensory evaluation of different thickeners. Taste, smell, appearance, and the volume of liquid ingested by the patients were evaluated for each type of thickener (modified starch thickener vs. gum thickener, with or without added flavouring).

Result(s): The overall punctuation of gum thickener was significantly higher than that obtained by modified starch [7.45 (1.57) vs. 5.10 (2.43), respectively;  $p = 0.001$ ]. When a food flavouring was added to the thickened water, the overall rating was higher than when nothing was added [7.70 (1.53) vs. 4.85 (2.16);  $p < 0.001$ ]. The differences between the daily volume of water consumed by patients who received gum thickeners [928.33 (331.27) ml] and those who received starch thickeners [670.00 (288.35) ml] were statistically significant ( $p = 0.012$ ). The consumption was also higher when flavouring was added than when not [943.33 (302.45) ml vs. 655.00 (304.60) ml;  $p=0.005$ ].

Conclusion(s): The acceptance of the thickener and the intake of water by patients with dysphagia were significantly higher when gum thickeners were used compared with starch thickeners. Acceptance and intake of thickened water were also significantly higher when a food flavouring was added to the preparation.

References: Calleja Fernandez A, Pintor de la Maza B, Vidal Casariego A, Villar Taibo R, Urioste Fondo A, Cano Rodriguez I, et al. (2014) Características técnicas de los productos alimentarios específicos para el paciente con disfagia. *Nutr Hosp* 32:1401-1407. Disclosure of Interest: None declared  
 Copyright © 2020

### 39. Thickened liquids and management of dysphagia: The influence of time and liquid base

**Authors** MacHado A.S.; Barros A.M.; Endringer D.C.; Pereira T.C.  
**Source** Dysphagia; 2020; vol. 35 (no. 1); p. 163  
**Publication Date** 2020  
**Publication Type(s)** Conference Abstract  
**Database** EMBASE

Available at [Dysphagia](#) from SpringerLink  
 Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.  
 Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version  
 Available at [Dysphagia](#) from Unpaywall

**Abstract** Introduction: This study aimed further understanding of the influence of time and liquid base in the viscosity of thickened liquids.  
 Material(s) and Method(s): No human or animal was a subject for this study; therefore no submission to Ethical Committee was necessary. Four beverages (water, orange juice, whole milk, and coffee) were thickened with Resource ThickenUp Clear. Flow Test proposed by Dysphagia Diet Standardization Initiative (IDDSI) was used to investigate the influence of liquid base and time in the final viscosity, testing 0, 30, and 60 min (0', 30', 60').  
 Result(s): The amount of thickener needed to reach the desired viscosity showed an important variation between liquids. Water presented the lowest and coffee the highest amount, with difference of 59.31%. Regarding time after preparation, water, orange juice, coffee, and milk increased viscosity after 60' reaching 10% difference. None of the samples showed viscosity drop after 60'.  
 Discussion/Conclusion: The variables type of base liquid and waiting time after thickening influenced viscosity values of the thickened liquids. Considering the adequate management of thickened liquids offered to patients with dysphagia, such viscosity variations represents risks and may lead to a negative impact on supply efficiency and safety. The methods of measuring the thickness of these drinks must be accessible, and IDDSI Flow Test is a good choice. Considering the influence of liquid and time it is suggested that thickened liquids should be measured by patients and caregivers with IDDSI Flow Test exactly before it is consumed.

#### 40. How to get food & liquid in despite swallowing problems?

**Authors** Nozaki S.  
**Source** Journal of Parkinson's Disease; 2019; vol. 9 (no. 1); p. 51  
**Publication Date** 2019  
**Publication Type(s)** Conference Abstract  
**Database** EMBASE

Available at [Journal of Parkinson's Disease](#) from Unpaywall

**Abstract** Swallowing problems are common in Parkinson disease (PD). Dysphagia in PD is a prognostic determinant and significantly reduces quality of dietary habits. Dysphagia is present in the majority of PD patients; it sometimes manifests in the early stages of the disease, but is not necessarily limited to any specific Hoehn- Yahr stage. PD patients consequently have poor awareness of dysphagia and silent aspiration is common. Long-term consumption of L-DOPA can cause an off phenomenon that leads to worsening dysphagia during the "off" phase. Consequently, the medication becomes more difficult to administer and residual drugs in the oropharynx lead to reduced effectiveness. In PD, a variety of disorders affect the voluntary movements, reflex actions, and autonomous movements that occur during swallowing. Abnormal posture, hesitation of tongue movement, decreased swallowing action, nasopharyngeal reflux and attenuation of esophageal peristalsis further complicate dysphagia. Neuroleptic malignant syndrome can also result in severe dysphagia. The drooling occurs as a result of decreased salivary deglutition. The efficacy of deep brain stimulation as treatment for this form of dysphagia remains unclear. Complications can result due to decreased cough volume acceleration which increases the risk of aspiration, and postprandial hypotension which sometimes induces suffocation during or after meal consumption. Basic management of dysphagia symptoms consists of adjusting the timing of medication administration and mealtimes during the "on" phase; dietary modification to include thickeners to aid liquid consumption; adjusting food textures in accordance with evaluations of swallowing; and adjusting patients' seating positions. As posture support for patients with Pisa syndrome, the patient is sat up straight and encouraged to swallow with their chin facing downwards so that aspiration can be avoided. Evidence of intervention to improve the swallowing function of PD patients was reported to comprise positioning the chin face-down, food texture modification, expiratory muscle strength treatment, rhythm treatment using a metronome, and Lee Silverman Voice Treatment. Treatment aims to ensure that swallowing is safe and requires less effort while maintaining optimal nutritional intake. With appropriate management, quality of dietary habits can be maintained at better levels for patients in all stages of PD.

#### 41. Dysphagia & modified drinks: Examining patient preference of commercially available thickening powders

**Authors** Devenney A.D.; Lawlor A.L.  
**Source** Dysphagia; 2019; vol. 34 (no. 5); p. 776  
**Publication Date** 2019  
**Publication Type(s)** Conference Abstract  
**Database** EMBASE

Available at [Dysphagia](#) from SpringerLink

Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.

Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version

Available at [Dysphagia](#) from Unpaywall

**Abstract** Introduction: Dysphagia can negatively affect quality of life nutritional status and respiratory status of individuals. A common intervention for dysphagia is the use of thickening powder in drinks to improve swallow safety (Castellanos, Butler, Gluch, and Burke 2004). Despite the intended health benefits of thickened drinks patients may decline to follow thickener recommendations due to dislike of the look taste or texture of thickened drinks. The aim of the current investigation was to determine whether there was a significant difference between individual preference for different commercial thickener brands available in the Irish market.

Method(s): Participants were randomly recruited from a Primary Care mixed aetiology dysphagia caseload. The study included five persons with a diagnosis of oropharyngeal dysphagia and five persons with no known history of dysphagia. This study investigated the taste preference for drinks using three commercial thickener brands; including two starch based and three xanthan gum based thickeners. All participants were blinded to the thickener brand and trialed the thickened drinks in a random order. Drinks were rated on a scale from most preferable to least preferable.

Result(s): Results demonstrated a statistically significant difference between the personal preference across the five thickeners trialed. Difference between thickener of choice also varied across the type of drink thickened (i.e. water cold fruit juice beverages milk hot drinks and carbonated beverages). Every participant rated at least one of the thickener drinks as having an acceptable taste with the cold fruit juice beverages milk hot drinks and carbonated drinks. A minority of participants rated any thickener as having an acceptable taste in water.

Conclusion(s): With recent changes in available thickeners exploring individual preferences is critical when selecting a thickener product to optimise compliance with clinical recommendations.

#### 42. What level are you on? Let's go with the flow: Testing and quantifying the consistency of thickened oral nutritional supplements (ONS) using the IDDSI framework

**Authors** Rowland S.; Kidney D.; Downes S.; Karam G.; Cahillane S.; De Zwarte D.; Flaherty K.; Tynan J.; Molloy J.; Casey A.M.; Mulgrew C.; Conway A.; Tracey L.

**Source** Dysphagia; 2019; vol. 34 (no. 5); p. 781

**Publication Date** 2019

**Publication Type(s)** Conference Abstract

**Database** EMBASE

Available at [Dysphagia](#) from SpringerLink

Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.

Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version

Available at [Dysphagia](#) from Unpaywall

**Abstract** Introduction: According to HIQA (2016) malnutrition affects over 1 in 4 patients admitted to Irish hospitals. Patients identified by Speech & Language Therapists (SLTs) as presenting with dysphagia are at an increased risk of same given frequent symptoms of reduced appetite slow eating and weight loss (Mingsong et al. 2017). Thus oral nutritional supplements (ONS) are commonly prescribed by dieticians to assist patients in meeting nutrition/hydration requirements. It is important that these two professionals liaise across healthcare settings to ensure the consistency of prescribed ONSs mirror safe swallow recommendations. At present no standardised ONS thickening guidelines exist. The International Dysphagia Diet Standardisation Initiative (IDDSI) presents a framework defined terminology and means to objectively evaluate the consistency of texture modified foods and thickened liquids which promote standardisation across international healthcare settings. Methodology: An SLT and Dietetic representative from each Dublin Academic Teaching Hospital took part in a testing session. 24 commonly prescribed ONSs across these sites were tested prior to and post the addition of varying amounts of a commercial thickening agent using the IDDSI flow test to evaluate all levels of flow.

Result(s): Please see attached tables.

Conclusion(s): This quality improvement initiative is proactive and timely in promoting safer cross-site continuity of patient care and improved inter-professional communication. Given the amount of thickener required to reach the IDDSI levels may exceed what is reasonably expected the introduction of pre-thickened ONSs in accordance with described levels may provide a time-saving and costefficient solution to improve patient compliance and reduce risk. Exploration of patient perceptions along with further testing of prethickened ONSs videofluoroscopy guidelines and liquid medications corresponding to IDDSI levels at different standing times is indicated.

#### 43. Determination of therapeutic viscosity range of a gum-based thickener in post stroke patients with oropharyngeal dysphagia

**Authors** Bolivar-Prados M.; Rofes L.; Arreola V.; Nascimento Viviane W.; Martin A.; Vilardell N.; Ortega O.; Clave P.; Guida S.; Ripken D.; Lansink M.

**Source** European Stroke Journal; May 2019; vol. 4; p. 708

**Publication Date** May 2019

**Publication Type(s)** Conference Abstract  
**Database** EMBASE  
 Available at [European Stroke Journal](#) from SAGE Journals (Premier Health Sciences 2019)  
**Abstract** Background and Aims: Oropharyngeal dysphagia (OD) is highly prevalent following stroke (upto 45.6% in acute phase) and is associated with malnutrition, respiratory infections and increased mortality. Thickening agents are a valid strategy to increase safety of swallowing. However, the therapeutic viscosity range of thickeners in stroke patients is unknown. The therapeutic range of a xanthan gum-based thickener (Nutilis ClearVR) was defined by testing 6 viscosities compared to thin liquid in post-stroke OD (PSOD).  
 Method(s): One hundred-twenty patients with OD were included ( $\geq 28$  days post-stroke) in this reference controlled, multiple dose, fixed order (liquid, 2000, 1400, 800, 450, 250 and 150 mPa.s), single-blind and singlecentre study. Boluses (10 mL) were given in duplicate with a stop rule for safety. Each swallow was evaluated with Videofluoroscopy and Penetration Aspiration Scale. Nutritional status was determined with MNA-SF.  
 Result(s): Only 41.2% of patients swallowed thin liquid safely, and this percentage significantly increased to 71.9% at 150mPa.s ( $p < 0.05$ ) and to maximal therapeutic effect (92.1%) at 800mPa.s. Increasing bolus viscosity further did not significantly increase the swallowing safety. Prevalence of patients with pharyngeal residue at each viscosity (37.7- 44.7%) did not significantly differ from thin liquid (41.2%). 54.4% of patients were (at risk of becoming) malnourished.  
 Conclusion(s): Prevalence of unsafe swallow with thin liquids is very high in PSOD patients. Prevalence of (risk of) malnutrition is also very high and underlines the importance of nutritional screening and management in PSOD. Safe swallowing significantly increased with increasing viscosity with a specific gum-based thickener. The therapeutic effect was between 150-800mPa.s.

#### 44. Modified textures for adults (above 17 years) with oropharyngeal dysphagia: An updated clinical guideline of the evidens in relation to three critical and seven important outcomes

**Authors** Beck A.M.; Kjaersgaard A.; Hansen T.; Poulsen I.  
**Source** Dysphagia; Aug 2018; vol. 33 (no. 4); p. 575  
**Publication Date** Aug 2018  
**Publication Type(s)** Conference Abstract  
**Database** EMBASE  
 Available at [Dysphagia](#) from SpringerLink  
 Available at [Dysphagia](#) from ProQuest (Health Research Premium) - NHS Version Full text from Jan 1997 to Dec 1999, then Jan 2002 to present.  
 Available at [Dysphagia](#) from ProQuest (MEDLINE with Full Text) - NHS Version  
**Abstract** Introduction: A well-established management strategy for Oropharyngeal dysphagia (OD) is the modification of the texture of food and liquids. This strategy is primarily based on best practice and not on a systematic review. The aim of this paper was to report the result of an up-date of an original national guideline focussing on whether thickened liquids (review question 1) and modified foods (review question 2) are beneficial for adults above 17 years with OD in relation to aspiration pneumonia and death & hydration nutritional status mealtime performance patient preferences adherence and quality of life.  
 Material(s) and Method(s): The first step was to update the systematic literature search. Then as a second step the quality of the body of evidence for each review question was assessed using the GRADE system. Finally as a third step clinical recommendations were developed on the basis of the evidence assessment of the risk benefit ratio and perceived patient preferences.  
 Result(s): The body of evidence consisted of two RCTs for review question 1 both using nectar thickened liquids or honey-thickened liquids. No evidence was found for two important outcomes mealtime performance and health-related quality of life. With regard to risk of pneumonia death aspiration dehydration weight loss and intervention adherence no significant differences were found. The outcome addressing the patient perspective found a non-significant increased dissatisfaction with nectar thickened liquids (RR 1.11; 95% CI 0.95-1.30) and a significant increased dissatisfaction with honey thickened liquids compared to thin liquids/chin down (RR 1.18; 95% CI 1.01-1.37). No evidence was identified for review question 2.  
 Conclusion(s): Based on the quality of the identified evidence and a balance between desirable and undesirable consequences the recommendations were not in favour of using texture modified liquids and a good practice point was made in favour of offering texture modified foods.

#### 45. Videofluoroscopic evidence of aspiration predicts pneumonia and death but not dehydration following stroke

**Authors** Schmidt J.; Holas M.; Halvorson K.; Reding M.  
**Source** Dysphagia; 1994; vol. 9 (no. 1); p. 7-11  
**Publication Date** 1994  
**Publication Type(s)** Article  
**PubMedID** 8131429  
**Database** EMBASE  
 Available at [Dysphagia](#) from SpringerLink

**Abstract** In order to assess the risk of pneumonia, dehydration, and death associated with videofluoroscopic evidence of aspiration following stroke, the clinical records of 26 patients with aspiration and 33 randomly selected, case-matched, dysphagic controls without videofluoroscopic evidence of aspiration were reviewed. The videofluoroscopic modified barium swallow technique included 5 ml-thin and thick liquid barium, 5 ml barium pudding, and 1/4 cookie coated with barium, plus additional 20 and 30 ml of thin liquid barium. Patients were assessed a mean of 2 +/- 1 SD months poststroke and were followed for a mean of 16 +/- 8 SD months poststroke. The odds ratio for developing pneumonia was 7.6 times greater for those who aspirated any amount of barium irrespective of its consistency ( $p = 0.05$ ). The odds ratio for developing pneumonia was 5.6 times greater for those who aspirated thickened liquids or more solid consistencies compared with those who did not aspirate, or who aspirated thin liquids only ( $p = 0.06$ ). Dehydration was unrelated to the presence or absence of aspiration. The odds ratio for death was 9.2 times greater for those aspirating thickened liquids or more solid consistencies compared with those who did not aspirate or who aspirated thin liquids only ( $p = 0.01$ ). Aspiration documented by modified videofluoroscopic barium swallow technique is associated with a significant increase in risk of pneumonia and death but not dehydration following stroke.

#### 46. Clarity and contradictions: speech and language therapists' insights regarding thickened liquids for post-stroke aspiration.

**Authors** McCurtin ; Brady, Ronan; Coffey, Katherine; O'Connor, Anne  
**Source** International Journal of Therapy & Rehabilitation; Jun 2020; vol. 27 (no. 6); p. 1-15  
**Publication Date** Jun 2020  
**Publication Type(s)** Academic Journal  
**Database** CINAHL  
**Abstract** Background/Aims: Oropharyngeal dysphagia is a common condition following stroke, with adverse consequences including aspiration pneumonia. Internationally, aspiration risk is typically managed using thickened liquids, an intervention with limited empirical support and associated treatment adherence issues. This study explores speech and language therapists' perceptions of and reasons for employing this intervention. Methods: A total of 22 speech and language therapists working with people with dysphagia post-stroke in hospital settings participated in three focus groups. Participants were recruited through gatekeeper managers and data were analysed using inductive thematic analysis. Results: Three themes were identified: primary justifications for treatment use, acute implementation issues, and having doubts. Use of thickened liquids is pivoted on safety-first reasoning, employed as a first step on the treatment ladder and in the context of limited perceived alternatives. Both clarity and contradictions are revealed by therapists, who acknowledge multiple factors that impact treatment effectiveness, including hospital, patient and product issues. Conclusions: The findings from this study provide a basis for understanding clinical decision making for a widely-used gateway treatment that requires further empirical support. The data suggest that, similar to other professions, safety-first reasoning is paramount for speech and language therapists. The dominance of thickened liquids in treating aspiration is reflected internationally and warrants ongoing discussion.

#### 47. Low technology audit methods of pre-packaged thickened fluids using the Bostwick Consistometer, the Line Spread Test and the Flow Test: A comparison of compliance.

**Authors** Ross ; Schwarz, Maria; Seabrook, Marnie; Coccetti, Anne  
**Source** Journal of Clinical Practice in Speech-Language Pathology; Jun 2020; vol. 22 (no. 2); p. 116-121  
**Publication Date** Jun 2020  
**Publication Type(s)** Periodical  
**Database** CINAHL  
**Abstract** It is critical for patient safety that patients with dysphagia are provided with thickened fluids at the appropriate level of thickness. The primary aim of this study was to use three commonly utilised low technology audit methods - the Bostwick Consistometer (the Bostwick), the Line Spread Test (LST) and the International Dysphagia Diet Standardisation Initiative (IDDSI) Flow Test (the Flow Test) - conduct an audit of pre-packaged thickened fluids to determine compliance against norms. Based on this small pilot study, approximately 61% of samples were compliant using the Bostwick, 62% of the samples were compliant using the LST, and 87% samples were compliant using the Flow Test. There were reduced levels of agreement between the three audit methods - only on 37% of occasions was there complete agreement regarding compliances. Low levels of agreement suggest that further research would be beneficial to ensure auditing conducted with low technology tools is valid and reliable.

#### 48. Just add water: Can water protocols improve dysphagia management outcomes?

**Authors** Murray ; Barker, Allison; Doeltgen, Sebastian  
**Source** Journal of Clinical Practice in Speech-Language Pathology; Oct 2018; vol. 20 (no. 3); p. 129-133  
**Publication Date** Oct 2018  
**Publication Type(s)** Periodical  
**Database** CINAHL



**Abstract** There have been many advances in the rehabilitation of dysphagia over the past decade, yet compensatory strategies, particularly food and fluid modification, tend to dominate speech-language pathology practice. This paper explores the evidence for the use of thickened fluids as one such compensatory strategy for managing the risk of aspiration pneumonia, and revisits the evidence for water protocols (WP) as an alternative. Findings from systematic reviews suggest water protocols do not increase the odds of pneumonia in carefully selected patients, particularly those in inpatient rehabilitation with acquired neurological conditions, with trends towards improved fluid intake, hydration and quality of life. Yet the uptake of WPs into clinical practice remains sporadic. In the second part of this paper we raise questions about the barriers to the uptake of WPs as a stimulus for discussion within the profession.

#### 49. Thickener and beyond: an individualised approach to dysphagia management.

**Authors** Atkinson ; O'Kane, Lorna  
**Source** British Journal of Neuroscience Nursing; Apr 2018; vol. 14  
**Publication Date** Apr 2018  
**Publication Type(s)** Academic Journal  
**Database** CINAHL  
**Abstract** Use of thickener is a widely-known intervention in the management of oropharyngeal dysphagia, aiming to reduce the incidence of aspiration pneumonia. Thickener can benefit some patients with dysphagia, but does not reduce aspiration pneumonia in all patients and can pose other risks for physical health and psychological well-being. This article draws together current research to explore the benefits and risks of thickener and a range of less well-known interventions, many of which are delivered by nurses. It highlights an individualised approach to dysphagia management and case studies provide a context for management decisions. It concludes that thickener is one of a range of interventions carefully assessed by a speech and language therapist on an individual basis. Nursing observations and interventions are also essential in dysphagia management, with joint working recommended, especially for oral hygiene, fluid intake monitoring and support with feeding. All interventions recommended by speech and language therapists that are delivered by nurses are equally important in providing holistic, individualised treatment for patients with dysphagia.

#### 50. Risks associated with thickening powder.

**Authors** Nazarko  
**Source** Nursing & Residential Care; Apr 2015; vol. 17 (no. 4); p. 127-127  
**Publication Date** Apr 2015  
**Publication Type(s)** Academic Journal  
**Database** CINAHL

#### 51. Apply study results to cut dysphagia risk...'Use of fluid thickener to reduce dysphagia risk,' nursingtimes.net

**Source** Nursing Times; Mar 2014; vol. 110 (no. 13); p. 9-9  
**Publication Date** Mar 2014  
**Publication Type(s)** Periodical  
**Database** CINAHL  
 Available at [Nursing Times](#) from ProQuest (MEDLINE with Full Text) - NHS Version  
 Available at [Nursing Times](#) from Ovid (Journals @ Ovid)  
 Available at [Nursing Times](#) from ProQuest (Health Research Premium) - NHS Version

#### 52. Risk Factors for Aspiration Pneumonia After Receiving Liquid-Thickening Recommendations.

**Authors** Masuda H; Ueha R; Sato T; Goto T; Koyama M; Yamauchi A; Kaneoka A; Suzuki S; Yamasoba T  
**Source** Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery; Sep 2021 ; p. 1945998211049114  
**Publication Date** Sep 2021  
**Publication Type(s)** Journal Article  
**PubMedID** 34582292  
**Database** PubMed  
 Available at [Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery](#) from SAGE Journals (Premier Health Sciences 2019)  
 Available at [Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery](#) from Ovid (Journals @ Ovid)



**Abstract** **OBJECTIVE:** We examined the influence of liquid thickness levels on the frequency of liquid penetration-aspiration in patients with dysphagia and evaluated the clinical risk factors for penetration-aspiration and aspiration pneumonia development.  
**STUDY DESIGN:** A case series.  
**SETTING:** Single-institution academic center.  
**METHODS:** We reviewed medical charts from 2018 to 2019. First, we evaluated whether liquid thickness levels influence the frequency of liquid penetration-aspiration in patients with dysphagia. Penetration-aspiration occurrence in a videofluoroscopic swallowing study was defined as Penetration-Aspiration Scale (PAS) scores  $\geq 3$ . Second, the association between liquid thickness level and penetration-aspiration was analyzed, and clinical risk factors were identified. Moreover, clinical risk factors for aspiration pneumonia development within 6 months were investigated.  
**RESULTS:** Of 483 patients, 159 showed penetration-aspiration. The thickening of liquids significantly decreased the incidence of penetration-aspiration ( $P < .001$ ). Clinical risk factors for penetration-aspiration were vocal fold paralysis (odds ratio [OR], 1.99), impaired laryngeal sensation (OR, 5.01), and a history of pneumonia (OR, 2.90). Twenty-three patients developed aspiration pneumonia while undertaking advised dietary changes, including liquid thickening. Significant risk factors for aspiration pneumonia development were poor performance status (OR, 1.85), PAS score  $\geq 3$  (OR, 4.03), and a history of aspiration pneumonia (OR, 7.00).  
**CONCLUSION:** Thickening of liquids can reduce the incidence of penetration-aspiration. Vocal fold paralysis, impaired laryngeal sensation, and history of aspiration pneumonia are significant risk factors of penetration-aspiration. Poor performance status, PAS score  $\geq 3$ , and history of aspiration pneumonia are significantly associated with aspiration pneumonia development following recommendations on thickening liquids.  
**LEVEL OF EVIDENCE:** 3.

### 53. Treatment burden associated with the intake of thickened fluids.

**Authors** Steele SJ; Ennis SL; Dobler CC  
**Source** Breathe (Sheffield, England); Mar 2021; vol. 17 (no. 1); p. 210003  
**Publication Date** Mar 2021  
**Publication Type(s)** Journal Article; Review  
**PubMedID** 34295407  
**Database** PubMed  
 Available at [Breathe \(Sheffield, England\)](#) from Europe PubMed Central - Open Access  
 Available at [Breathe \(Sheffield, England\)](#) from HighWire - Free Full Text  
 Available at [Breathe \(Sheffield, England\)](#) from Unpaywall

**Abstract** The implementation of thickened fluids in patients with dysphagia is widely considered an effective strategy for safe and physiologically improved swallow. However, there is limited evidence to suggest that this intervention reduces the risk of dysphagia-related complications including aspiration pneumonia. In addition, there is growing evidence that this approach is associated with adverse clinical effects including dehydration, malnutrition and reduced health-related quality of life. This review summarises the rationale for thickened fluids, the evidence base (or lack thereof) underpinning their use, and current guideline recommendations.  
**Educational aims:** To review the evidence base for thickened fluids in the management of dysphagia. To examine the evidence that thickened fluids reduce aspiration pneumonia. To provide an overview of the advantages and disadvantages of thickened fluids in the management of dysphagia.

### 54. Role of fluid cohesiveness in safe swallowing.

**Authors** Nishinari K; Turcanu M; Nakauma M; Fang Y  
**Source** NPJ science of food; 2019; vol. 3 ; p. 5  
**Publication Date** 2019  
**Publication Type(s)** Journal Article; Review  
**PubMedID** 31304277  
**Database** PubMed  
 Available at [NPJ science of food](#) from Nature (Open Access)  
 Available at [NPJ science of food](#) from Unpaywall

**Abstract**

In patients with dysphagia, it has been a practice to thicken fluid food to prevent aspiration—the transport of a bolus into the trachea instead of the oesophagus. In these patients, aspiration is a risk behaviour and is closely related to pneumonia (caused by the aspiration of oral bacteria into the lungs). Since excessive thickening of fluids can cause adverse effects, such as lowering the palatability of food, subsequent reduction of liquid intake, dehydration and malnutrition, identifying the optimum thickening level is vital. Thickening might not only increase fluid viscosity, but could also modify its cohesiveness, which is another key factor affecting aspiration. Even though cohesiveness is more of a concept than a well-defined measurable parameter, this property describes the degree of coherency provided by the internal structure of a material against its fractional breakup. In fluids, this concept is less explored than in solids, powders and granules, and during the last decade few scientists have tackled this topic. Although the role of cohesiveness in the swallowing of heterogeneous solid foods is briefly overviewed, the aim of the present paper is to introduce the concept of cohesiveness for a relatively homogeneous fluid bolus and its effect on swallowing. Cohesiveness is highly correlated with the extensibility and yield stress of the fluid, suggesting that a high cohesiveness could have an important role in preventing aspiration.

**Strategy** 1110474

#	Database	Search term	Results
1	Medline	"ESOPHAGEAL DISEASES"/ OR "PHARYNGEAL DISEASES"/ OR "DEGLUTITION DISORDERS"/ OR "ESOPHAGEAL MOTILITY DISORDERS"/	37798
2	Medline	(thicken*).ti,ab	58666
3	Medline	(risk*).ti,ab	2515196
4	Medline	(benefi*).ti,ab	1033472
5	Medline	(dehydration).ti,ab	32531
6	Medline	(3 OR 4)	3318910
7	Medline	(1 AND 2)	367
8	Medline	(6 AND 7)	70
9	Medline	(5 AND 8)	12
10	EMBASE	(risk*).ti,ab	3646741
11	EMBASE	(benefi*).ti,ab	1458195
12	EMBASE	(10 OR 11)	4753480
13	EMBASE	"ESOPHAGEAL DISEASES"/ OR "PHARYNGEAL DISEASES"/ OR "DEGLUTITION DISORDERS"/ OR "ESOPHAGEAL MOTILITY DISORDERS"/	43673
14	EMBASE	(thicken*).ti,ab	88277
15	EMBASE	(13 AND 14)	547
16	EMBASE	(12 AND 15)	109
17	EMBASE	(dehydration).ti,ab	40908
18	EMBASE	(risk*).ti,ab	3646741
19	EMBASE	(benefi*).ti,ab	1458195
20	EMBASE	(18 OR 19)	4753480
21	EMBASE	"ESOPHAGEAL DISEASES"/ OR "PHARYNGEAL DISEASES"/ OR "DEGLUTITION DISORDERS"/ OR "ESOPHAGEAL MOTILITY DISORDERS"/	43673

**Search Strategy** Risks of thickeners in dysphagia

22	EMBASE	(thicken*).ti,ab	88277
23	EMBASE	(21 AND 22)	547
24	EMBASE	(20 AND 23)	109
25	EMBASE	(17 AND 24)	15
26	CINAHL	(risk*).ti,ab	821612
27	CINAHL	(benefi*).ti,ab	339806
28	CINAHL	(26 OR 27)	1079717
29	CINAHL	"ESOPHAGEAL DISEASES"/ OR "PHARYNGEAL DISEASES"/ OR "DEGLUTITION DISORDERS"/ OR "ESOPHAGEAL MOTILITY DISORDERS"/	11539
30	CINAHL	(thicken*).ti,ab	7632
31	CINAHL	(29 AND 30)	208
32	CINAHL	(28 AND 31)	51
33	CINAHL	(dehydration).ti,ab	4325
34	CINAHL	(risk*).ti,ab	821612
35	CINAHL	(benefi*).ti,ab	339806
36	CINAHL	(34 OR 35)	1079717
37	CINAHL	"ESOPHAGEAL DISEASES"/ OR "PHARYNGEAL DISEASES"/ OR "DEGLUTITION DISORDERS"/ OR "ESOPHAGEAL MOTILITY DISORDERS"/	11539
38	CINAHL	(thicken*).ti,ab	7632
39	CINAHL	(37 AND 38)	208
40	CINAHL	(36 AND 39)	51
41	CINAHL	(33 AND 40)	9
42	PsycINFO	(risk*).ti,ab	422811
43	PsycINFO	(benefi*).ti,ab	249687
44	PsycINFO	(42 OR 43)	637269

**Search Strategy** Risks of thickeners in dysphagia

45	PsycINFO	"ESOPHAGEAL DISEASES"/ OR "PHARYNGEAL DISEASES"/ OR "DEGLUTITION DISORDERS"/ OR "ESOPHAGEAL MOTILITY DISORDERS"/	801
46	PsycINFO	(thicken*).ti,ab	854
47	PsycINFO	(45 AND 46)	15
48	PsycINFO	(44 AND 47)	0
49	PsycINFO	(dehydration).ti,ab	1078
50	PsycINFO	(risk*).ti,ab	422811
51	PsycINFO	(benefi*).ti,ab	249687
52	PsycINFO	(50 OR 51)	637269
53	PsycINFO	"ESOPHAGEAL DISEASES"/ OR "PHARYNGEAL DISEASES"/ OR "DEGLUTITION DISORDERS"/ OR "ESOPHAGEAL MOTILITY DISORDERS"/	801
54	PsycINFO	(thicken*).ti,ab	854
55	PsycINFO	(53 AND 54)	15
56	PsycINFO	(52 AND 55)	5
57	PubMed	(dysphagia).ti,ab	31241
58	PubMed	("DEGLUTITION DISORDER").ti,ab	111
59	PubMed	(thicken*).ti,ab	59019
60	PubMed	(risk*).ti,ab	2545037
61	PubMed	(benefi*).ti,ab	1055892
62	PubMed	(dehydration).ti,ab	33890
63	PubMed	(57 OR 58)	31287
64	PubMed	(60 OR 61)	3364166
65	PubMed	(59 AND 63 AND 64)	104
66	PubMed	(62 AND 65)	14