ThickenUp™ Clear

Let's celebrate!
ThickenUp Clear has support from 7 published studies

Nestlé Health Science

Here at Nestlé Health Science, we have been a trusted partner in dysphagia care for over 25 years

Over the years we've demonstrated our leadership by developing **innovative solutions** to help improve quality of life for dysphagia patients, as well as **pioneering tools** for effective screening, treatment and monitoring of patients with dysphagia.

This is why **we've launched ThickenUp Clear,** a science-based thickening agent specially designed to help improve dysphagia management.

The result of years of research, **ThickenUp Clear is an exclusive formula from Nestlé Health Science based on xanthan gum**. Unique features include preserving the natural appearance of the food and drink being thickened, ease of preparation and efficacy reported in 7 published studies. **ThickenUp Clear** can improve **safety in swallowing and benefit quality of life for patients.**

The unique evidence-based thickener

EVIDENCE from **7 PUBLISHED STUDIES**[1-6,21 22]

Excellent compliance[1]

Easy to prepare[1]

Improved swallowing safety[2-5]

Nestlé Health Science

Clinical concerns about oropharyngeal dysphagia...

...is more common than you think

Oropharyngeal dysphagia affects:

47% of **elderly in** acute care[7]

49-69% of nursing home residents[10,23]

14% of elderly who **live in the community**[24]

50% of **head and neck** cancer patients[12]

29% to 81% of **stroke** patients[26]

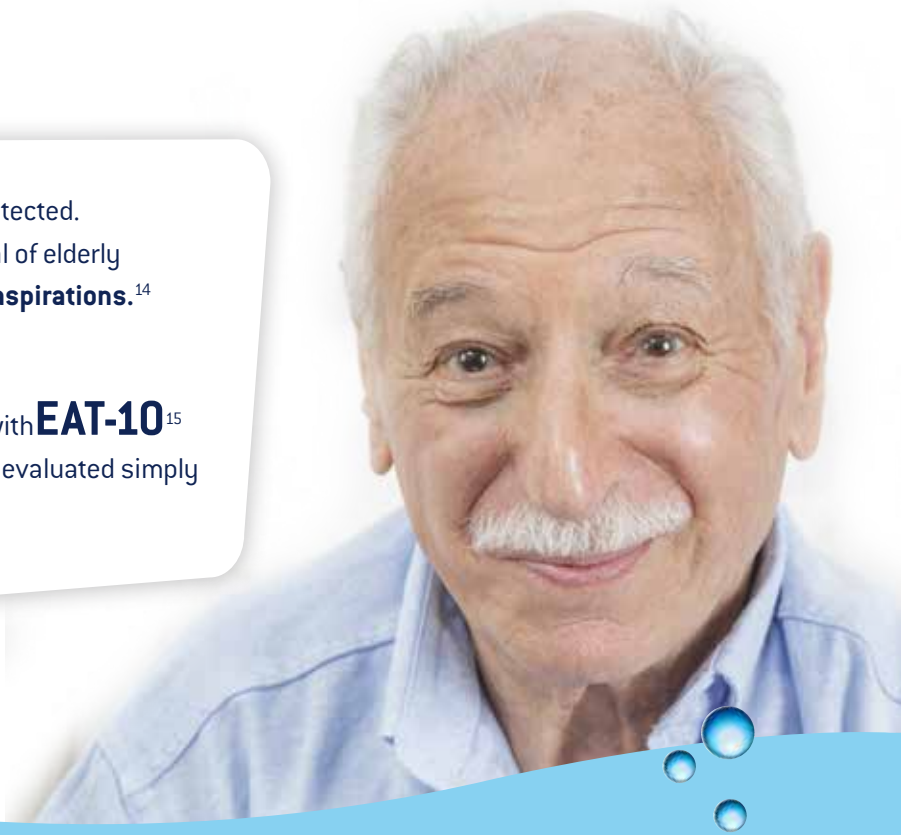
15 to 87% of **Parkinson's** disease patients[13]

7 to 29% of **Alzheimer's** disease patients[13]

...is under-diagnosed

Swallowing difficulties can often go undetected.
40% of patients in a rehabilitation hospital of elderly patients with pathologies display **silent aspirations.**[14]

Dysphagia symptoms can be identified with **EAT-10**[15] and clinical signs and care needs can be evaluated simply using **V-VST.**[5]



... has serious consequences

Oropharyngeal dysphagia can cause:

- **Malnutrition** or nutritional risk of malnutrition in **7/10 of patients.**[25]
- **Up to 2/3 of dysphagia patients** have impared swallowing safety, clinical signs of aspiration or penetration.[17]
- Risk of death in older adults **with malnutrition**. In patients suffering both conditions, 2/3 die within 1 year.[18]

... can be effectively treated by changing the bolus viscosity

Experts conclude there is grade A evidence for **increasing the viscosity of fluids** for patients with oropharyngeal dysphagia to improve swallowing safety and reduce the risk of aspiration pneumonia[26].

There are currently 2 broad types of thickening agents that have been studied:

- **Starch-based thickening agents:** added to an aqueous solution, the starch granules capture water inside a polymer structure, increasing in size and establishing physical-chemical interactions with the components of the structure to raise viscosity: The final viscosity depends on the time that passes after preparation and the temperature of the mixture.
- **Thickening agents based on xanthan gum**: added to an aqueous solution, the soluble fiber dissolves and hydrates[5] very rapidly,- once dispersed - producing high viscous mixtures in low concentrations. Uniform, highly stable solutions result under different temperature and pH conditions.

ThickenUp™ Clear

EFFICACY SHOWN IN 7 PUBLISHED STUDIES[1-6]

Science-based solution gives confidence in the diagnosis and treatment of dysphagia

Accurate diagnosis

ThickenUp Clear, may **be used as thickener in the assessment** of dysphagia[5,6]

(page 8-9)

Safe, effective dysphagia management

Therapeutic effect of ThickenUp Clear **has shown to increase swallowing safety**[2,4]

(page 10-13)

Excellent compliance and tolerance

ThickenUp Clear: **highly satisfactory** real world evidence[1]

(page 14)

Indications

- Patients with **oropharyngeal dysphagia** (chewing and/or swallowing difficulty)
- **Compatible** with specific diets for patients **with dysphagia and:**
  - **Impaired glucose tolerance**
  - **Overweight or obese**
  - **Hypertension**

STUDY 1

ThickenUp™ Clear

Exclusive formula based on xanthan gum designed for dysphagia management

Herentry K, et al. . European Geriatric Medicine. 2011;2(S24-S206.).

Excellent compliance[1]

Does not affect colour, taste and odour of hot or cold liquids or foods.

98% OF PROFESSIONALS STATE THAT IT HELPS IMPROVE COMPLIANCE[22]

- **Flavourless Odourless**
- **No lumps in various liquids**
- **Practically transparent in water**

Easy to prepare[22]

Achieves **a uniform level of viscosity in all hot or cold liquids**

8 of 10 PROFESSIONALS LIKE HOW IT PREPARES THE RIGHT IN-MOUTH CONSISTENCY[22]

- **Dissolves rapidly in all liquids**
- **Same quantity for a given level of viscosity in all liquids**

Improves swallowing safety[2-5]

Allows **more effective management of swallowing** difficulties

80% OF PROFESSIONALS PREFER IT OVER THE THICKENING AGENTS THEY RECOMMENDED BEFORE[22]

Uniform viscosity, stable over time

- Forms a bolus without residues[2]
- Withstands salivary amylase[3,20]
- No over-thickening with time[20]

Fewer penetrations and aspirations[2-4]

Reduces the amount of oral and pharyngeal residue as compared to a starch-based thickening agent[3]

STUDY 2

ThickenUp™ Clear

Accurate diagnosis

ThickenUp Clear can be used as thickener in tools used for diagnosing dysphagia

Sensitivity and specificity of the Eating Assessment Tool and the Volume-Viscosity Swallow Test for clinical evaluation of oropharyngeal dysphagia

Rofes L, Arreola V, Mukherjee R, Clavé P
Neurogastroenterol Motil 2014 Sep;26:1256-65.

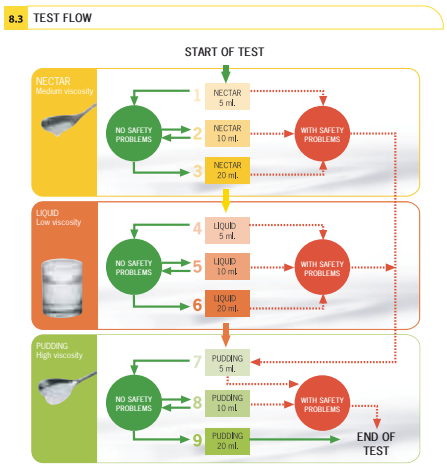
PRINCIPAL AIM

To re-validate the accuracy of the Volume-Viscosity Swallow Test (V-VST) for Clinical Assessment by using a new thickening agent with an exclusive formula (**ThickenUp Clear**) on 120 patients with oropharyngeal dysphagia associated with age and neurological pathology.

RESULTS

The study showed the V-VST using ThickenUp Clear has **high sensitivity in detecting patients with swallowing difficulty.**

- Sensitivity of 0.94 and specificity of 0.88 in detecting oropharyngeal dysphagia
- Sensitivity of 0.79 and specificity of 0.75 in detecting impaired efficacy
- Sensitivity of 0.87 and specificity of 0.81 in detecting impaired safety
- Sensitivity of 0.91 and specificity of 0.28 in detecting aspirations



CONCLUSIONS

The **V-VST is a validated method of Clinical Assessment of dysphagia**, a sequence of 3 sizes of bolus of 3 different viscosities thickened with **ThickenUp Clear, is reliable** in detecting and guiding management of patients with oropharyngeal dysphagia.

STUDY 3

Matching the rheological properties of videofluoroscopic contrast agents and thickened liquid prescriptions

Popa Nita S, Murith M, Chisholm H, Engmann J.
Dysphagia 2013;28(2):245-52.

PRINCIPAL AIM

To assess the rheological properties of 3 common videofluoroscopic contrast agents and liquids thickened with 2 commercial thickening agents (**ThickenUp and ThickenUp Clear**) used in the instrumental diagnosis of dysphagia.

RESULTS

It is feasible (but not always straight forward) to match the viscosities of diagnostic fluids and thickened beverages if certain precautions are taken. **The time taken** to reach the desired viscosity levels **may vary depending on the contrast and thickening agents used.**

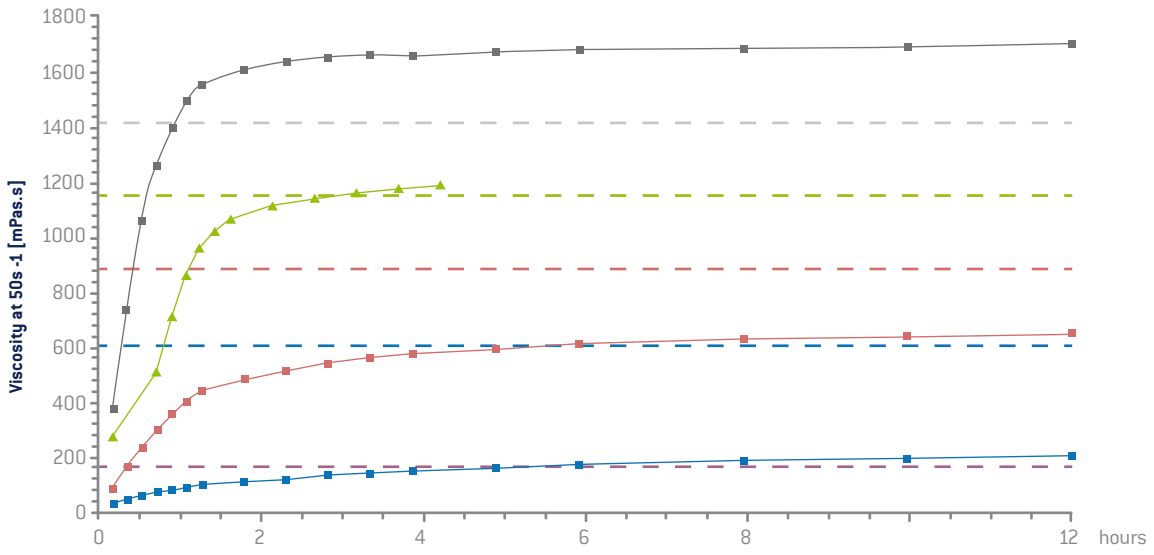


Fig: Viscosity values measured at a shear rate of 50s-1 over time
(**TUC: Resource® ThickenUp Clear; GG: Gastrografin**)

CONCLUSIONS

For accurate, dependable diagnosis of dysphagia, use only diagnostic contrast materials and thickening agents for which reliable, rheological data are available, like **ThickenUp Clear.**

STUDY 4

Efficacy of ThickenUp™ Clear *on swallowing function*

The effects of a xanthan gum-based thickener on the swallowing function of patients with dysphagia

Rofes L, Arreola V, Mukherjee R, Swanson J, Clavé P.
Aliment Pharmacol Ther 2014;39(10):1169-79.

PRINCIPAL AIM

To assess the **efficacy** of a **thickening agent with an exclusive** formula based on xanthan gum (**ThickenUp Clear**) using a clinical method (V-VST) and videofluoroscopy (VFS), on 120 adults with dysphagia associated with age and/or neurological pathology and on 14 healthy volunteers. The study explored the effect of the new thickening agent on swallowing physiology.

RESULTS FOR SWALLOWING SAFETY

Increasing the viscosity of the bolus to nectar and pudding texture using ThickenUp Clear resulted in:

- Increased swallowing safety in patients by reducing the prevalence of clinical signs of cough and voice effects measured by V-VST.
- A higher proportion of patients able to swallow safely, demonstrated by VFS measures and reduced number of aspirations and penetrations.

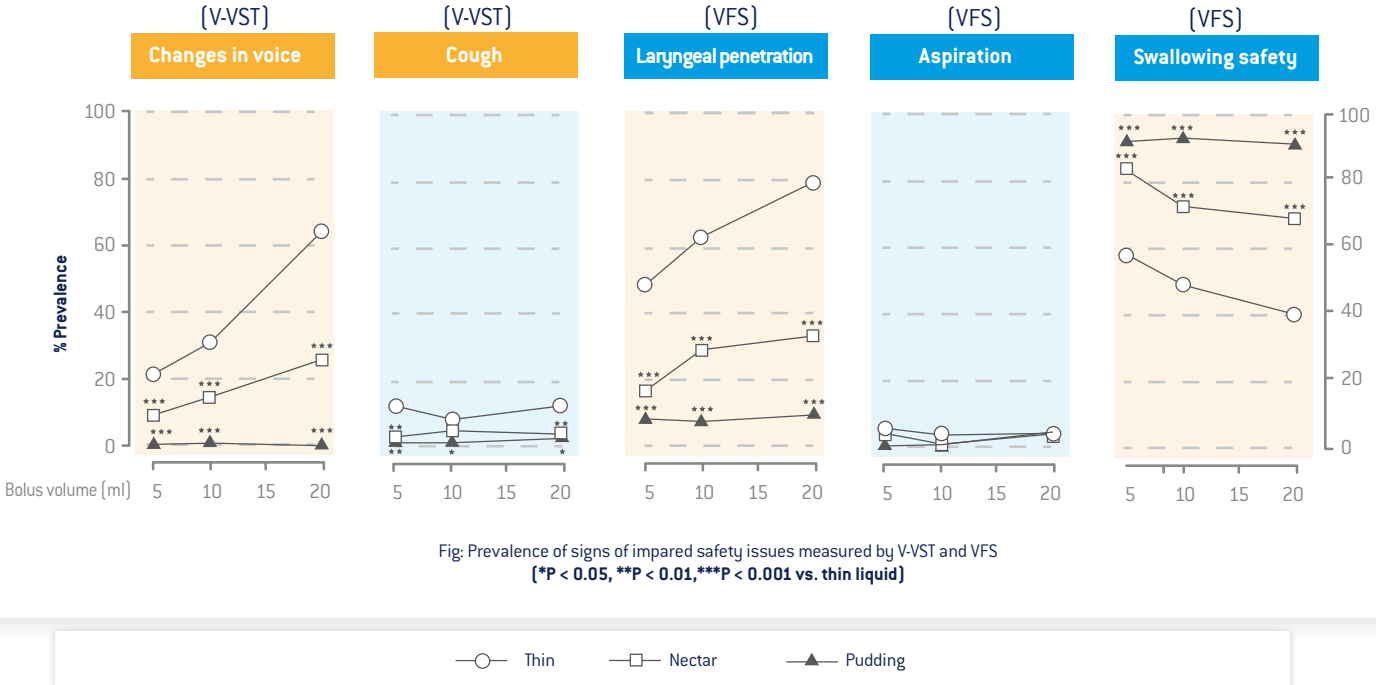


Fig: Prevalence of signs of impared safety issues measured by V-VST and VFS
(*P < 0.05, **P < 0.01,*P < 0.001 vs. thin liquid)**

Safe, effective dysphagia management

ThickenUp™ Clear

RESULTS FOR SWALLOWING EFFICACY

The increased viscosity of the bolus from thin to pudding texture showed a significant improvement in **patients' effective lip closure** ($p<0.05$). The results of the VFS study showed that increased viscosity using ThickenUp Clear **did not increase oropharyngeal residue, either oral vallecular or in the pyriform sinuses**. In healthy volunteers it was observed that increasing the viscosity to pudding slowed the time to open the upper oesophageal sphincter, eliciting changes in physiology.

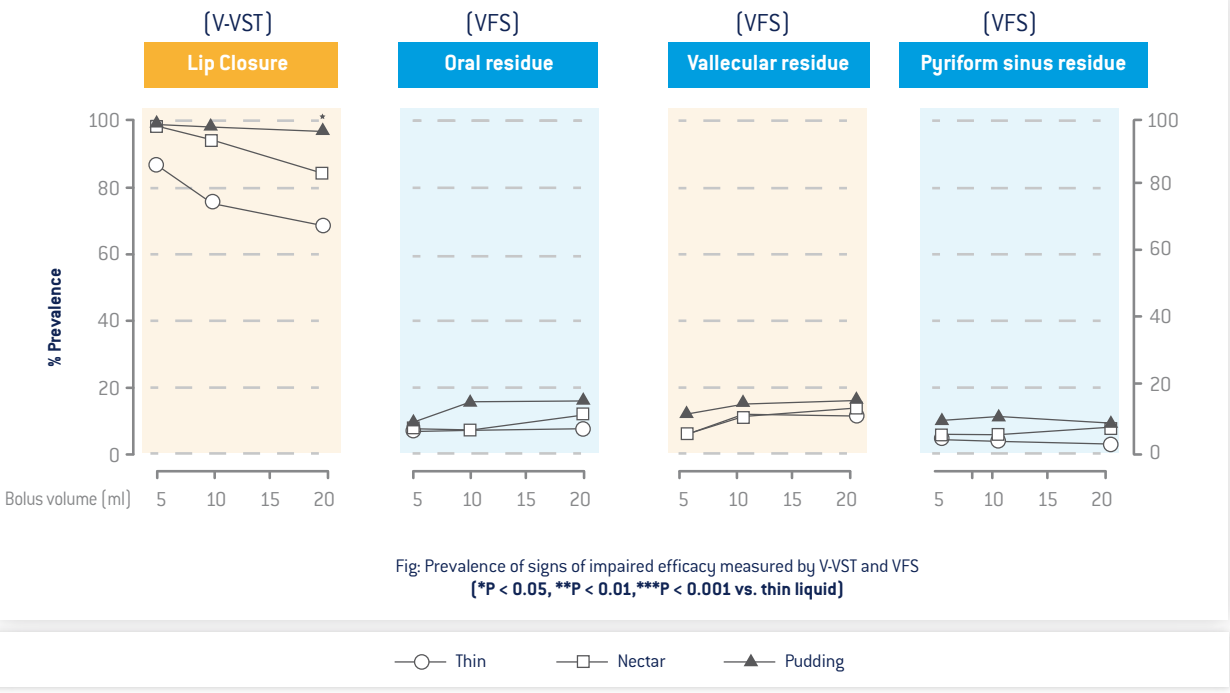


Fig: Prevalence of signs of impaired efficacy measured by V-VST and VFS
(*P < 0.05, **P < 0.01,*P < 0.001 vs. thin liquid)**

CONCLUSIONS

Use of ThickenUp Clear for dysphagia management effectively:

- Improves swallowing efficacy oral control and the ability to form a bolus.
- Improves swallowing safety: protects against aspiration and penetration without increasing oropharyngeal residue, a unique benefit of this exclusive thickening agent formula.

STUDY 5

Dysphagia management and comparative efficacy

ThickenUp™ Clear *on swallowing safety*

A comparative study between modified starch and xanthan gum thickeners in post-stroke oropharyngeal dysphagia

Vilardell N, Rofes L, Arreola V, Speyer R, Clavé P
Dysphagia 2016; 31(2):169-79

PRINCIPAL AIM

To compare the efficacy of **ThickenUp** and an exclusive formula, **ThickenUp Clear,** using clinical (V-VST) and videofluoroscopic (VFS) exploration of **swallowing safety and efficacy** in 122 post-stroke patients with oropharyngeal dysphagia.

RESULTS

Both thickening agents reduce the number of penetrations as compared to thin liquid, by increasing the viscosity of the bolus administered to patients, as well as significantly improving the penetration-aspiration scale (PAS) score.

- Greater efficacy in improving swallowing safety and efficacy was supported by **ThickenUp Clear** compared with a starch-based thickening agent **without increasing the prevalence of oral and pharyngeal residues**.

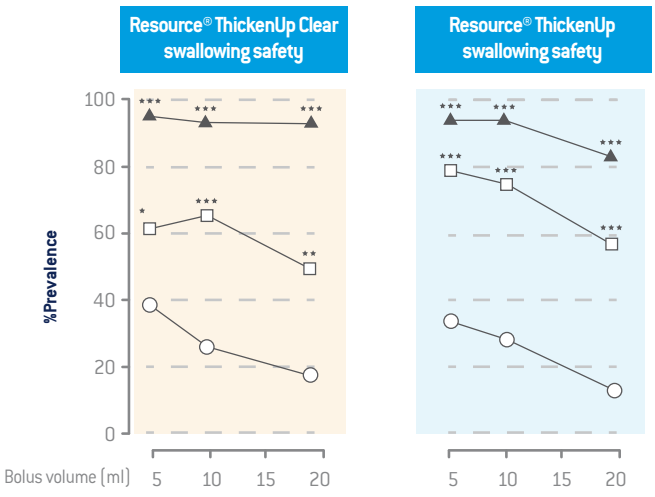


Fig: Prevalence of signs of impaired safety measured by VFS
(*P < 0.05, **P < 0.01,* P < 0.001 vs. thin liquid)**

CONCLUSIONS

Both **ThickenUp and ThickenUp Clear are proven effective to improve swallowing safety in post-stroke patients**. However, thanks to its exclusive composition, **ThickenUp Clear shows greater efficacy than a modified starch based thickening agent,** as it does not increase the prevalence of oral and pharyngeal residue, better avoiding the risk of aspiration after the swallow.

STUDY 6

ThickenUp™ Clear

Safe, effective dysphagia management

Effects of bolus rheology on aspiration in patients with dysphagia

Leonard RJ, White C, McKenzie S, Belafsky PC.
J Acad Nutr Diet. 2014;114(4):590-4

AIM

To compare the **effects of modified viscosity** using nectar-thick liquids prepared with commercial thickening agents on swallowing safety in 100 dysphagia patients using videofluoroscopy (VFS) a modified starch-based thickening agent (**ThickenUp**) and xanthan gum-based formula (**ThickenUp Clear**).

RESULTS

The study revealed that **both thickeners reduced the number of aspirations** in dysphagia patients, with a **statistically significant reduction in the incidence of penetration and aspiration using the xanthan gum-based thickener** ($p < 0.05$), **ThickenUp Clear**. Likewise, the mean penetration-aspiration scale (PAS) scores were significantly lower with the xanthan gum-based thickener better avoiding aspiration/penetration than the thin liquid ($p < 0.001$), while the difference between the starch-based thickener and the thin liquid was not significant .

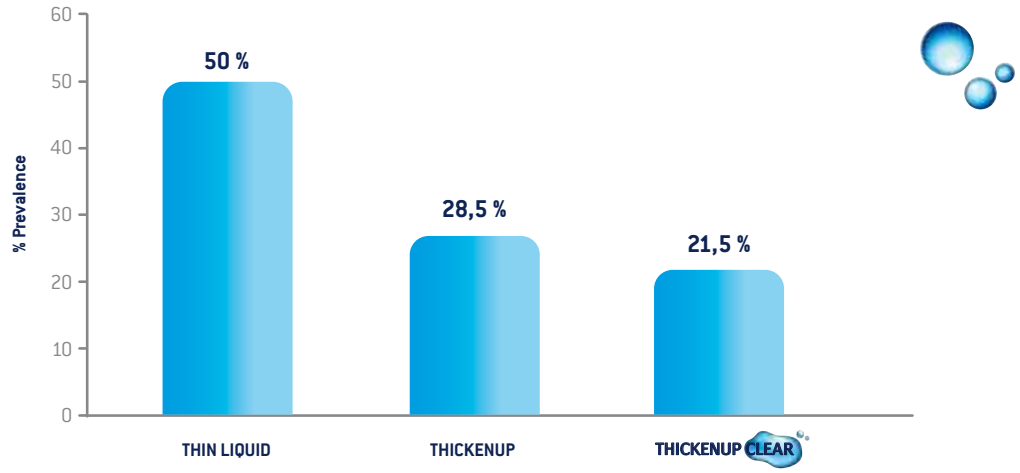


Fig: Prevalence of aspiration episodes, measured by VFS

CONCLUSIONS

Increasing the viscosity of the bolus with **ThickenUp Clear** improves swallowing safety in dysphagia patients as it reduces the number of aspirations and the penetration-aspiration scale (PAS) score.

STUDY 7

ThickenUp™ Clear

highly satisfactory real world evidence

Excellent compliance and tolerance

Acceptance, compliance, and tolerance of a novel xanthan gum-based thickener on oropharyngeal dysphagia patients

Hibberd.
Dysphagia 2011;26:432–475.

PRINCIPAL AIM

To assess the **acceptance, compliance and gastrointestinal (GI) tolerance** of a xantan gum-basedthickening agent with an exclusive formula, **ThickenUp Clear**, elderly with dysphagia.

Over two weeks, a real worls study was conducted to observe the use of **ThickenUp Clear** as part of every day dysphagia management. The following measures were recorded: type of liquids and temperatures at which they were offered, compliance assessed according to the amount offered vs. the amount consumed, acceptance by the patient on ratings of preference and assessment of tolerance by monitoring for 8 symptoms commonly associated with GI intolerance.

RESULTS

The results with the xanthan gum-based thickening agent **ThickenUp Clear**, showed:

- It is useful to thicken a **wide range of liquids** at different temperatures.
- 94% of patients expressed a **high level of acceptance** of the thickened drink they consumed (maximum rating on the scale of acceptance proposed)
- 86% of patients consumed ≥**75% of all** liquids offered. (See figure)
- **No symptoms of GI intolerance** were reported in the sample studied.

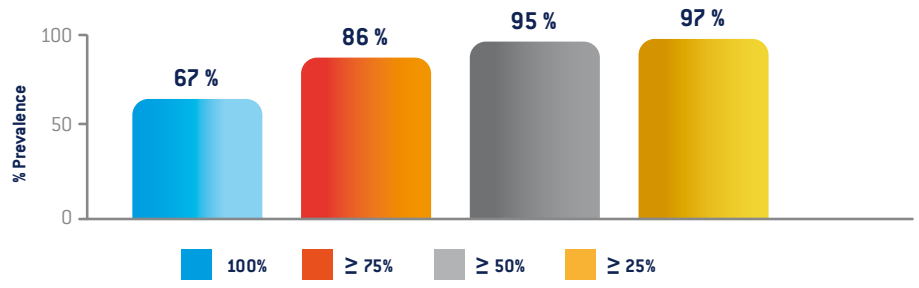


Fig: Degree of compliance according to the amount of thickened liquids prescribed.

CONCLUSIONS

A high degree of satisfaction was observed with **Resource® ThickenUp Clear** on the basis of its sensory characteristics, good compliance, excellent gastrointestinal tolerance and wide versatility in use with different drinks at different temperatures.

Instructions for use

1. Put the recommended amount of ThickenUp Clear in an empty glass.

2. Add the liquid to be thickened

3. Stir until you have an even mixture

(20-30 s)

4. Leave to stand for 1-2 mins

- **Waiting time can vary** from 30 seconds for water, to several minutes for concentrated, acidic or very cold liquids.
- **To thicken nutritional supplements** use **a cocktail shaker** for best results. The desired viscosity may be reached after 10 to 15 minutes.
- **Adding more thickener to drinks already thickened is not recommended** as lumps may form.
- Once the thickened drink has been prepared **it can be heated**; do not boil.

Thickens all liquids, hot or cold

Nectar	Honey	Pudding
1	2	3

1 dosing spoon = 1.2 g

ThickenUp™ Clear

Nutritional information

		per 1.2 g (nectar*)	per 2.4 g (honey*)	per 3.6 g (pudding*)	per 100 g
Energy value	kJ	15.5	31	46.5	643.5
	kcal	3.5	7.5	11	153
Fats	g	0	0	0	0
Carbohydrates	g	0.75	1.5	2.25	31
Sugars	g	0.02	0.045	0.65	0.9
Fibre	g	0.33	0.65	0.95	13,50
Protein	g	0.01	0.025	0.035	0.5
Sodium	mg	12.5	25.5	38	530
Potassium	mg	4.8	9.51	14.5	200

*Prepared in 100 ml of liquid

Instant Food for Special Medical Purposes for the dietary management of patients with dysphagia (swallowing difficulties) - instant food and drink thickener

Ingredients

Maltodextrin, xanthan gum, potassium chloride.
May contain traces of milk.

Recommendations

Store in a cool, dry place. Once open, use within two months.

Must be used under medical supervision.

For oral consumption only when mixed with food or drink. Suitable for individuals over 3 years of age.

Format:	Box of 6 x 250 g tins

1 tin = approx. 10 days' consumption

(1l of liquid thickened to honey texture per day)

References: **1.**Hibberd J. Acceptance, compliance, and tolerance of a novel xanthan gum-based thickener on oropharyngeal dysphagia patients. Dysphagia 2011;26:432 -475. **2.**Rofes L et al. The effects of a xanthan gum-based thickener on the swallowing function of patients with dysphagia. Aliment Pharmacol Ther 2014;39(10):1169-79. **3.**Vilardell N et al. A Comparative Study Between Modified Starch and Xanthan Gum Thickeners in Post-Stroke Oropharyngeal Dysphagia. Dysphagia 2016; 31(2):169-79 **4.**Leonard RJ et al. Effects of bolus rheology on aspiration in patients with Dysphagia. J Acad Nutr Diet. 2014;114(4):590-4 **5.**Rofes L et al. Sensitivity and specificity of the Eating Assessment Tool and the Volume-Viscosity Swallow Test for clinical evaluation of oropharyngeal dysphagia. Neurogastroenterol Motil 2014 Sep;26:1256-65. **6.**Popa Nita Set al. Matching the rheological properties of videofluoroscopic contrast agents and thickened liquid prescriptions).Dysphagia 2013;28(2):245-52. **7.** Cabré M et al. Oropharyngeal dysphagia is a risk factor for readmission for pneumonia in the very elderly persons: observational prospective study. J Gerontol A Biol Sci Med Sci 2014;69(3):330 **8.** Baine WB et al. Epidemiologic trends in the hospitalization of elderly Medicare patients for pneumonia, 1991–1998. Am J Public Health 2001;91:1121–1123 **9.** Leder SB et al. An epidemiologic study on aging and dysphagia in the acute care hospitalized population: 2000–2007. Gerontology 2009; 55:714–718 **10.** Sarabia MC et al. The incidence and prognostic implications of dysphagia in elderly patients institutionalized: A multicenter study in Spain. Applied Nursing Research 30 (2016) e6–e9 **11.**Salomon D et al. Disfagia orofaríngea en el anciano. En Abizanda P, Rodriguez-Mañas L (coord.), Tratado de medicina geriátrica (pp 237-244). Barcelona. Ed. Elsevier España **12.** García Peris P et al. Long-term prevalence of oropharyngeal dysphagia in head and neck cancer patients: Impact on quality of life. Clin Nutr 2007;26(6):710-7 **13.** Roden, D F et al. Causes of dysphagia among different age groups a systematic review of the literature. Otolaryngol. Clin N Am 2013;46:965–987 **14.** Julia Barroso-Disfagia orofaríngea y broncoaspiración. Rev Esp Geriatr Gerontol 2009;44(S2):22–28 **15.** Belafsky PC, et al. Validity and reliability of the Eating Assessment Tool (EAT-10). Ann Otol Rhinol Laryngol. 2008;117(12):919-24. **16.** Clavé P et al. Accuracy of the volume-viscosity swallow test for clinical screening of oropharyngeal dysphagia and aspiration. Clin Nutr 2008;27:806e81512 **17.** García-Peris P et al. Manejo de los pacientes con disfagia. Nutr Hosp 2012;5(1):33-40 **18.** Carrión S, et al. Oropharyngeal dysphagia is a prevalent risk factor for malnutrition in a cohort of older patients admitted with an acute disease to a general hospital. Clin Nutr. 2015;34(3):436-42. **19.** Clavé P . Tratamiento dietético de la disfagia orofaringea mediante cambios de textura y viscosidad del bolo alimenticio. En Clavé P, García-Peris P (coord). Guía de diagnóstico y tratamiento nutricional y rehabilitador de la disfagia orofaríngea (pp 113-123). Barcelona. Ed. Glosa 2011 **20.** Method of measuring amylase resistance properties of Resource® Thicken Up Clear and a leading Thickening agent. Nestlé Research Center. Data on file 2009. **21.** Carrión S, et al. Nutritional status of older patients with oropharyngeal dysphagia in a chronic versus an acute clinical situation. Clin Nutr. 2016. pii: S0261-5614(16)30175-3. **22.** Herentry K, et al. Performance-based preference for a novel xanthan gum-based thickener among clinicians treating dysphagia patients. Poster presentation clinical area. European Geriatric Medicine. 2011;2(S24-S206.). **23.** Argente Pla M, et al. [Prevalence of malnutrition in a mid-long term stay unit]. Nutr Hosp. 2014;31(2):900-7. **24.** Kawashima K, et al. Prevalence of dysphagia among community-dwelling elderly individuals as estimated using a questionnaire for dysphagia screening. Dysphagia. 2004;19(4):266-71. **25.** Galán Sánchez-Heredero MJ, et al. [Relationship between dysphagia and malnutritition in patients over 65 years of age]. Enferm Clin. 2014;24(3):183-90. **26.** Baijens LW, et al. European Society for Swallowing Disorders - European Union Geriatric Medicine Society white paper: oropharyngeal dysphagia as a geriatric syndrome. Clin Interv Aging. 2016;11:1403-1428. **27.** Wakasugi Y, et al. Screening test for silent aspiration at the bedside. Dysphagia. 2008;23(4):364-70.

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