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DYSPHAGIA PRODUCT UPDATE

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This is now the second update of this article (first published in NHD in 2011). Since the last update in 2013, a few new products have become available, but what feels most significant to me is the first advertisement I have ever seen in a national, mainstream magazine for pureed food, suggesting that recognition of the need for modified texture food is growing.

Many older people who suffer from dementia or a number of other conditions, or who have had a stroke continue to live with dysphagia, and an Australian review study found that dysphagia in older adults occurs in:

- 13% of free living population
- 25% of those in hospital
- 60% of those resident in nursing homes[1]

Understanding the food and fluid textures required for people with dysphagia is, therefore, important for any dietitian working with older people. It is also important to have some knowledge and understanding of the products currently available, to help achieve both advised texture and an adequate nutritional intake. However, evidence of the benefits of texture modification of both fluid and food and the most advantageous textures is surprisingly scant[2].

THICKENERS

Prescribed thickeners are used to thicken fluids to a more viscose consistency than normal, because drinking thicker fluids has long been thought to reduce risk of aspiration for people with dysphagia. A recent systematic review has identified that thickening liquids can reduce risk of aspiration, but thickened fluids can also increase risk of residue remaining in the pharynx after swallowing (Steele et al 2015) which could then be aspirated at a later stage. Other studies have suggested use of a 'free water protocol' for people with dysphagia who meet certain criteria, but this is only likely to be appropriate for those who are both mobile and have 'relatively healthy cognitive function'[3, 4] which may rule out the majority of older people with dysphagia. Having said all of this, at least for the time being, thickened fluids remain a cornerstone of dysphagia management in the UK.

Thickeners can also be used to provide consistency in pureed food, preventing purees from splitting into solid and liquid once pureed.

Alison specialises in appropriate prescribing of nutritional products and in appropriate identification and treatment of malnutrition, especially in older people living in the community and in care homes. Alison is a committee member of the BDA Older People Specialist Group.

Starch based thickeners (see Table 1)

The majority of thickeners are still made from modified starch which, when mixed with fluid, can have several less than desirable characteristics. Mouth feel can be 'granular' rather than smooth, which can be off-putting for patients, and most starch based thickeners also have the disadvantage of being sensitive to amylase (a component of saliva). This can be a significant issue because saliva will be introduced to the thickened drink from the first sip. If, as is common in dysphagic patients, it takes a long time to finish a drink, the action of amylase on the thickener can result in the drink in the glass or cup separating into two or more textures over a period of time, or can result in the action of the thickener being lost altogether[5] - both of which may increase risk of aspiration. However, the action of amylase on starch-based thickeners is also dependent on pH of drinks and Hanson et al[6] found that, while amylase broke down thickener in water very quickly, it did not have the same action when thickener was mixed with orange juice.

Starch-based thickeners can take a few minutes to thicken to the correct texture and it is not uncommon when a drink does not thicken instantly, for patients or carers to add extra thickener, thinking that the amount they added initially was insufficient. This can obviously result in the drink becoming significantly thicker than the advised consistency, which can impact on the safety of swallowing[2] and is likely to reduce palatability, as the thicker a drink is, the less well it tends to be tolerated[5, 7].

The way that starch-based thickeners work also means that a drink thickened with a starch-based thickener tends to continue to thicken over time, so that even if the correct texture is achieved initially, the drink may become thicker the longer it is left[8]. Again, as people with dysphagia can take a long time to consume a drink, this is of real concern if intake of thicker drinks can increase risk of residue remaining in the pharynx[2].

Gum based thickeners (see Table 2)

In the last few years, several thickeners containing gums, either instead of or in addition to starch, have been launched. There can be some significant advantages to these products in terms of safety and palatability - gums are not broken down by amylase, making them potentially safer products and gum-based thickeners may not cause the same 'granular' texture in thickened drinks as starch-based thickeners. The thickening process of gums is also different to that of starch, so that they tend to thicken more quickly and maintain their texture for longer, so that drinks containing gum-based thickeners should not get thicker over time.

However, introduction of saliva (and therefore amylase) to a drink thickened with a combination of starch and gums, may still result in the fluid breaking down into a thinner consistency[5].

It is also important to note that not all gum-based thickeners will thicken drinks immediately, and because gum-based thickeners behave differently to starch-based thickeners, a different technique may need to be used when adding them to drinks. This is particularly pertinent when considering thickeners prescribed for use in care homes, as without training, staff may be unaware that gum-based thickeners require a different mixing technique.

Concerns have been raised regarding the bioavailability of water when gum-based thickeners are used because, unlike starches, gums tend not to be broken down until they reach the large intestine. A review by Cichero found only two studies which had investigated this concern and both found no impact of thickening on bioavailability of water, regardless of the type of thickener used[1].

Usually, fluid needs to be added to a gum-based thickener and, once mixed, no further thickener can be added. Most scoop sizes for gum-based thickeners will thicken 100ml fluid to stage 1, which is appropriate for drink volumes.

NEW MyNutilis

Nutilis Clear has been designed to maintain the original appearance of drinks, which may support compliance and improved fluid intake.

The new **MyNutilis.co.uk** website aims to inspire patients and carers to cook delicious meals with Nutilis Clear.

Visit the website for recipes, news items and videos of Chef Neil making meals that look and taste appealing to patients.

	Tin Size (g)	FP10 Price*	Cost per Stage 1 drink**	No. of Stage 1 drinks** per tin
Nutilis Clear	175	£8.46	£0.15	58
Nutilis Powder	300	£4.92	£0.13	37
Thick & Easy™	225	£5.06	£0.20	25
Resource ThickenUp® Clear	125	£8.46	£0.16	52

*MIMS, March 2015; **200ml drinks as per manufacturer dosage instructions.

Transparent results
MyNutilis.co.uk

NUTRICIA Nutilis Clear

Table 1: Starch based thickeners

Product	Manufacturer	Thickener ingredients	Cost per tub (£)	Quantity of thickener required per month to thicken 1600ml fluid per day to stage 1 (kg)	Prescription cost per month of thickening 1600ml fluid per day to stage 1 (prepared according to manufacturer's instructions (13) (Costs from MIMS June 2015) (£)
Multi-Thick	Abbott	Modified maize starch	4.83/250g	1.814	35.05
Nutilis Powder	Nutricia	Maltodextrin, modifed starch, tara gum, xanthan gum, guar gum	4.92/300g	1.792 – 2.688	29.39 - 44.08
Resource ThickenUp	Nestlé	Modified maize starch	4.55/227g	2.016	40.41
Thick and Easy	Fresenius Kabi	Modified maize starch	5.06/225g	2.016	45.34
Thicken Aid	M & A Pharmachem	Modified maize starch Maltodextrin	3.71/225g	2.016	33.24
Thixo-D Original	Sutherland	Modified maize starch	5.79/375g	2.24	34.59
Vitaquick	Vitaflo	Modified maize starch	7.05/300g	1.500	35.25

However, liquid medications are also likely to need to be thickened and, although the volume per dose tends to be significantly smaller than 100ml, a smaller measure is not currently provided to accommodate this requirement. This means that liquid medications may be given in their unthickened state or, alternatively, thickened to a different texture than that advised.

OTHER CONSIDERATIONS

Mertz Garcia et al[8] and Sopade et al[9] found that many different factors (including pH, fat and protein content) can influence how thickeners interact with different fluids. This means that different types of fluid may need different amounts of thickener added in order to achieve the same texture.

Thickening fluid can slow its transit through the mouth which, as well as potentially helping to achieve a safe swallow, can also affect how taste is perceived. This means that the person who requires thickened fluid may find that drinks they would normally enjoy now taste less pleasant, which of course can put people off drinking adequate fluid or using thickener as advised.

Several studies have demonstrated that people with dysphagia frequently fail to consume adequate fluid, and that increased fluid viscosity correlates with lower fluid intake[7, 10].

It is also interesting to note that when stage 3 fluids are taken as small spoonfuls (as may be advised by speech and language therapists), this, together with the increased oral transit time, means that even those without dysphagia tend to consume 1.2 to 1.3 times less fluid than if the fluid was taken as larger mouthfuls and if the fluid had a shorter oral transit time[1]. Dehydration can, therefore, be a significant risk for those requiring thickened fluids.

Reducing risk of aspiration may reduce the likelihood of chest infections and aspiration pneumonia and, therefore, reduce or avoid the costs of treating these conditions (prescription of antibiotics with or without acute admission). However, it is also important to remember the other potential costs of failing to thicken fluids adequately or palatably. If thickened fluids are unpalatable, patients may choose to drink unthickened fluids or to drink an inadequate volume of thickened fluids, thereby increasing their risk of aspiration and/or dehydration, UTIs and constipation, all of which can result in healthcare costs, as well as reduced quality of life for the patient.

Storage of thickeners on wards and within care homes may also needs careful consideration

Table 2: Gum based thickeners

Product	Manufacturer	Thickener ingredients	Cost per tub (£)	Quantity of thickener required per month to thicken 1600ml fluid per day to stage 1 (kg)	Prescription cost per month of thickening 1600ml fluid per day to stage 1 (prepared according to manufacturer's instructions (13) (Costs from MIMS June 2015) (£)
Nutilis Clear	Nutricia	Dried glucose syrup, xanthan gum, guar gum	8.46/175g	0.672	32.49
Resource ThickenUp Clear	Nestlé	Maltodextrin (corn, potato) xanthan gum, potassium chloride	8.46/125g	0.537	36.34
Thick and Easy Clear	Fresenius Kabi	Maltodextrin,xanthan gum, carageenan, erythritol	8.80/126g	0.627	43.79
Thixo-D Cal-Free	Sutherland	Xanthan gum	2.57/30g	0.280	23.99

Table 3: Pre-thickened drinks

Product	Manufacturer	Consistency available	Volume	Nutritional content per serving	Prescription cost per serving (and cost per month if 1600ml fluid provided per day) (MIMS June 2015) (£)
Resource Thickened Drinks	Nestlé	'Syrup' 'Custard'	114ml cup	101-103 kcal (both textures)	0.71 (279.02)
Slõ Drinks	Slõ Drinks	Stage 1 (cold/hot) Stage 2 (cold/hot) Stage 3 (cold)	115ml cup (requires addition of water)	24-57 kcal 30-63 kcal 56-57 kcal	0.30 (116.87)

following publication of an NHS Patient Safety Alert[11] earlier this year regarding the need to safeguard patients who could be at risk of ingesting thickener powder, following the unfortunate death of one patient who did this.

Considerations when requesting or reviewing prescriptions

Cost pressures within the NHS continue to be significant and as health professionals we all need to be mindful of the costs of the products which we may discuss with patients or request GPs to prescribe. As in the previous versions of this article, I have included current prescription costs of all the products listed below to aid consideration of cost effectiveness. It is important though to note that, in many acute settings and in some community settings too, contracts with nutrition companies may render specific products significantly cheaper than the FP10 (prescription) prices quoted.

GPs are likely to need guidance so that they understand the quantity of thickener required to thicken an adequate amount of fluid each day to the recommended consistency. I regularly come across prescription of only one or two tubs of thickener per month due to GPs' lack of knowledge of these products. To thicken the minimum daily fluid requirement of 1600ml[12] to stage 1 each day for one month will require four to five tubs of a gum-based thickener and six to nine tubs of a starch-based thickener.

In my experience, GPs can be surprised when asked to prescribe an adequate amount of thick-

Table 4: Thickened ONS - Stages 1 and 2

Product	Manufacturer	Consistency available	Volume	Nutritional content per serving	Prescription cost per serving (MIMS June 2015) (£)
Fresubin Thickened	Fresenius Kabi	Stage 1 Stage 2	200ml	300kcal 20g protein	2.28
Nutilis Complete	Nutricia	Stage 1 Stage 2	125ml	306kcal 12g protein	2.21

Table 5: ONS - Stage 3

Product	Manufacturer	Volume	Nutritional content per serving	Prescription cost per serving (MIMS June 2015) (£)
Ensure Plus Crème	Abbott	125g	171kcal 7.1g protein	1.88
Forticreme Complete	Nutricia	125g	200kcal 11.9g protein	1.96
Nutilis Fruit Stage 3	Nutricia	150g	206kcal 10.5g protein	2.36
Fresubin 2kcal Creme	Fresenius Kabi	125g	250kcal 12.5g protein	1.93
Fresubin Yocreme	Fresenius Kabi	125g	187kcal 9.3g protein	1.98
Nutricrem	Nualtra	125g	225kcal 12.5g protein	1.40
Resource Dessert Energy	Nestlé	125g	200kcal 6g protein	1.59

ener, but may then realise that their previous inadequate prescribing could have been putting patients at risk.

GPs are also likely to need clear advice regarding exactly which product is required (and which is not), as the similarity of many of the thickener names (when both starch- and gum-based thickeners are produced by the same company) may otherwise result in the wrong product being prescribed – again, I come across this error in prescribing very frequently and care home staff and patients may not notice that the product which is prescribed is not correct.

Slõ Drinks, best known for producing pre-thickened drinks, have recently developed thickeners specific to types of fluid which tend to be more difficult to thicken safely and palatably - namely alcohol and fizzy drinks. These products are not currently ACBS listed, therefore cannot be prescribed, but are available to purchase.

PRE-THICKENED DRINKS

Pre-thickened drinks can be helpful for patients who find it difficult to prepare thickened drinks, for example due to limited manual dexterity or poor eyesight, and there are two products currently on the market, one of which requires the addition of water.

The cost of pre-thickened drinks can be an issue, but in some cases, these products may still be a cost-effective choice. Pre-thickened drinks tend not to have the 'granular' texture of an added starch-based thickener, which may aid compliance and thereby increase fluid intake. They should also automatically be the correct texture for the patient, which may help reduce risk of aspiration. Therefore, use of pre-thickened drinks may help to reduce common health risks (dehydration and aspiration) for the patient with dysphagia.

Having said that, the texture descriptors are different for each product which can be confusing and make choosing the correct consistency more difficult.

PRE-THICKENED ORAL NUTRITIONAL SUPPLEMENTS (ONS)

How to achieve a consistently thickened ONS has been an issue within all care settings for years, so pre-thickened sip feeds have certainly filled a gap in the market.

There are two companies currently producing pre-thickened ONS in Stage 1 and Stage 2 consistencies, and dessert type ONS made by all nutrition companies are usually suitable for patients requiring Stage 3 thickened fluids.

Pre-thickened ONS do cost more than non-thickened equivalent products, but the cost of the thickener and cost of the consequences of inappropriately thickened (or unthickened) sip feeds must also be taken into account when looking at the overall cost incurred. For example, Fresubin Thickened costs £2.28 per bottle compared with Fresubin Protein Energy which costs £2.02 per bottle; however, sufficient Thick and Easy or Thick and Easy Clear to thicken the latter to Stage 1 would cost approx 20p. In addition, pre-thickened ONS are guaranteed to be the correct texture without any preparation time or issues around consistency which may help reduce risks of both aspiration and malnutrition for the patient with dysphagia.

PUREED FOOD

Several companies, including Apetito/Wiltshire Farm Foods, Oakhouse Foods, Kealth and Simply Puree produce pureed meals for adults with dysphagia and most offer home delivery for individuals and some are also offered by Meals on Wheels services.

Thickener is added to most of these pureed foods to maintain texture and if the thickener used is starch based, the same concerns regarding maintaining consistency once the food comes into contact with saliva and, therefore, amylase exist as for drinks. Again if a patient takes a long time to swallow the food or transfers saliva from their mouth to the plated food, this can result in the food splitting into solid and liquid, potentially increasing risk of aspiration.

Many of the dishes available are moulded so that their appearance is better than can easily be achieved for food pureed in either a domestic environment or many care environments. Some of these companies also ensure that the energy and protein content of the meals is high. This is especially important as the nutritional intake of those consuming pureed food tends to be lower than that of equivalent patients consuming normal food, and patients having pureed food frequently fail to meet their nutritional requirements for either energy or protein[14].

CONCLUSION

Prevalence of dysphagia is high in the ageing population and as the ageing population grows, is likely to become more of an issue in the coming years.

Having an understanding of the dysphagia products available will help when advising patients with dysphagia and when working with colleagues, especially speech and language therapists and GPs.

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Questions relating to: *Dysphagia product update*
Type your answers below and then **print for your records** or print and complete answers by hand.

Q.1	Explain the advantages and disadvantages of using prescribed thickeners in fluids for patients with dysphagia.
A	
Q.2	How do starch based thickeners interact with amylase?
A	
Q.3	What are the advantages of using gum based thickeners?
A	
Q.4	Can amylase have an effect on gum based thickeners?
A	
Q.5	Why do gum based thickeners require a different mixing technique?
A	
Q.6	Explain the disadvantages of gum based thickeners on liquid medications
A	
Q.7	Describe how dysphagic patients can be at risk of dehydration when their fluids are thickened.
A	
Q.8	Outline why healthcare costs be affected by the inappropriate use of thickening fluids.
A	
Q.9	What are the benefits of pre-thickened drinks to patients who are suffering from dysphagia?
A	
Q.10	Why is it important for pureed foods to be high in energy and protein content?
A	

Please type additional notes here . . .