

## Beyond thickened liquids: for your consideration

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DISCUSSION



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## Beyond thickened liquids: for your consideration

Arlene McCurtin<sup>a,b,c</sup> , Lindsey Collins<sup>c,d</sup>, Lizzie King<sup>e</sup>,  
Tracy Lazenby-Paterson<sup>c,f</sup>, Dominika Lisiecka<sup>c,g</sup>, Paula Leslie<sup>c,h,i</sup>,  
Michelle McInerney<sup>c,j,k</sup>, Aoife Moran<sup>l</sup>, Shaun O’Keeffe<sup>c,m</sup> and  
Alison Smith<sup>c,n</sup>

<sup>a</sup>School of Allied Health, University of Limerick, Limerick, Ireland; <sup>b</sup>Health Research Institute, Implementation Research Group, University of Limerick, Limerick, Ireland; <sup>c</sup>Swallow Perspectives, Advocacy and Research Collective (SPARC), University of Limerick, Limerick, Ireland; <sup>d</sup>Centre for Applied Dementia Studies, Faculty of Health Studies, University of Bradford, Bradford, UK; <sup>e</sup>Oxford Health NHS Foundation Trust, Oxford, UK; <sup>f</sup>Intellectual (learning) disability service, NHS Lothian, Edinburgh, UK; <sup>g</sup>Department of Nursing and Healthcare Sciences, Munster Technological University, Tralee, Ireland; <sup>h</sup>Newcastle External Assessment Group, Northern Medical Physics & Clinical Engineering, Newcastle upon Tyne Hospitals NHS Trust, Newcastle upon Tyne, UK; <sup>i</sup>Center for Bioethics & Health Law, University of Pittsburgh, Pittsburgh, PA, USA; <sup>j</sup>CP- ACHIEVE in Murdoch Children’s Research Institute, Melbourne, Australia; <sup>k</sup>Psychology and Language Sciences, University College London, London, UK; <sup>l</sup>Speech and Language Therapy Department, Galway University Hospital, Galway, UK; <sup>m</sup>Department of Geriatric Medicine, Galway University Hospitals, Galway, Ireland; <sup>n</sup>NHS Hertfordshire and West Essex Integrated Care Board, Hertfordshire, UK

### ABSTRACT

Aspiration and pneumonia are common in people with eating, drinking and swallowing difficulties. Thickened liquids are often used as a first-line measure by speech-language pathologists and other health and social care professionals to reduce aspiration and pneumonia in people with eating, drinking and swallowing difficulties. This approach, and the relative lack of evidence of benefit, has come under increased criticism in recent years. This aim of this review is to examine alternatives—or complementary approaches—that might be considered by SLPs and other professionals treating people with eating, drinking and swallowing difficulties. We examined the current research evidence and will discuss medical factors, bolus modification approaches, rehabilitation approaches, hygiene and residue reduction interventions, physical and postural interventions, common sense strategies, and other issues to consider when using thickened liquids. We conclude that there are many options available to health and social care professionals who are supporting people with eating, drinking and swallowing difficulties, some of which have a less, equal or more supportive evidence base than thickened liquids. A

**CONTACT** Arlene McCurtin  [arlene.mccurtin@ul.ie](mailto:arlene.mccurtin@ul.ie)

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broad multidisciplinary and multifactorial approach is beneficial, and more acceptable to, people with eating, drinking and swallowing difficulties.

**KEYWORDS** Aspiration; drinking and swallowing; eating; intervention; rehabilitation; thickened liquids

## Introduction

Aspiration, the entry of food or fluid into the airways below the true vocal folds, is common in people with eating, drinking and swallowing difficulties (PwEDS). Pneumonia is also common in such individuals and is often labelled presumptively as ‘aspiration pneumonia’ (Gupte et al., 2022). However, this presumption has been increasingly challenged in recent years. Smithard and Yoshimatsu (2022), for example, note that ‘this diagnosis has no clear definition and no clinical consensus’ (p. 115) and suggested that frailty-associated pneumonia would be a more appropriate label.

Speech-language pathologists (SLPs), as well as other health and social care professionals, in their efforts to moderate aspiration in PwEDS typically employ the intervention of thickened liquids (TL). Thickened drinks flow more slowly, assisting in the organisation of a more refined swallow response, and positive influences of viscosity on swallowing are reported (e.g. Garand et al., 2024; Newman et al., 2016). According to a recent international survey, fewer SLPs are using TL than previously with only 3% believing it to be the best treatment for aspiration (McCurtin et al., 2024). Use of thickeners is still a financial burden; in the year 2022/2023 for example, TL prescriptions by just one group—general practitioners in England—cost the NHS £17 million (Open prescribing.Net, 2024).

Evidence and opinion suggest that TL may not be as broadly effective as is assumed and this is reflected in a position paper by the Royal College of Speech and Language Therapists (RCSLP, 2024). Wallace et al. (2023), in providing a critique of TL evidence, make the argument that TL may be beneficial only for certain PwEDS. As with any intervention, evidence should be assimilated in decision-making, as should clinical and patient perspectives and contextual and ethico-judicial factors (McCurtin et al., 2019). It is incumbent upon evidence-informed disciplines to critically reflect on TL practice, specifically the habitual use and potential overapplication of TL both within the SLP discipline specifically and health and social care professions generally.

As we discuss below, TL is often used as the first-line, or even only, approach for aspiration by SLPs and other health and social care professionals. The aim of this paper is to examine what other approaches or interventions we might reasonably consider either in combination with, or instead of, TL. To preface, let us summarise some current debates regarding TL.

## Why alternatives to TL are needed

### *Aspiration and pneumonia*

Ferguson et al. (2018) associated aspiration with 13 different disease states, of which EDS-related aspiration applies to only two out of four non-infectious syndromes. Further, penetration and aspiration (PA) should not always be pathologised, being observed in healthy individuals, typically increasing with age, fluid volume and liquid fat content (Butler et al., 2018). Coughing observed during mealtimes may be provoked by PA but may also not be directly aspiration-related as it may be triggered by pharyngeal residue or reflux. Many individuals have cough hypersensitivity—excessive cough in response to a range of stimuli—(Chung et al., 2022), and some PwEDS manage PA events with a functional cough after swallow, without TL. Other PwEDS who aspirate do not go on to develop pulmonary infections (Lazenby-Paterson, 2020).

### *Research evidence*

There is some evidence for the positive effects of TL in different populations (e.g. Barbon et al., 2022; Masuda et al., 2022). There is also evidence that some PwEDS still aspirate and get pneumonia while consuming TL (Nativ-Zeltzer et al., 2021) and there are risk factors other than EDS that increase the risk of PA. Despite some limitations in design as noted by Wallace et al. (2023), a recent systematic review update resulted in no change to a previous weak recommendation *against* TL, citing no convincing evidence that TL prevents death or pneumonia, nor does it improve QoL, nutritional status, or oral intake (Hansen et al., 2022).

### *Unintended consequences*

Use of TL to manage aspiration results in PwEDS not meeting their fluid intake needs. Bond et al.'s (2023) systematic review concludes that TL may unintentionally lead to dehydration and related complications such as urinary tract infections and constipation. Likewise, Abrams et al.'s (2023) systematic review identified adverse events (including dehydration, pneumonia, hospitalisation and death) and adverse effects (aspiration, reduced QoL, reduced intake, increased residue and reduced bioavailability of medication).

### *Patient evidence and outcomes*

PwEDS view EDS difficulties and associated interventions as reducing QoL and highlight changes to oral intake as influential in this regard (Smith

et al., 2023). Degree of diet modification predicted EDS-related reduced QoL in stroke survivors (Namasivayam-MacDonald et al., 2022). Other papers emphasise person-centred issues including treatment burden, treatment dislike, informed consent and shared decision-making shortfalls (e.g. O’Keeffe et al., 2023a; Steele et al., 2021). Dislike of TL by PwEDS results chiefly from impacts on their independence, QoL and palatability concerns giving rise to poor motivation and physiologic drive to consume thickened drinks (Cichero, 2013; McCurtin et al., 2018).

### ***Instrumental assessment***

While instrumentation provides clinical evidence of the immediate impact of TL, SLPs in particular should be cognisant of some issues regarding videofluoroscopic swallow studies (VFS) as it pertains to TL. Many SLPs do not have access to nor employ videofluoroscopic (VFS) or endoscopic procedures as standard when recommending TL (McCurtin et al., 2024). When employed, reliability of VFS interpretations has poor to modest agreement in swallowing impairment identification and frequent false positives occur, for example, incorrectly labelling swallowing events as impaired (Vose et al., 2018). Further, there is some evidence of an immediacy effect in some populations—the effect of thickening is reduced on subsequent trials (Logemann et al., 2008). A variety of confounders exist beyond the moment of instrumental examination including age, co-morbidities, medications, time of day, fatigue and characteristics of the bolus, such as volume and temperature (RCSLT, 2024). Chronic silent aspiration is also rarely identified, undermining the reliability of instrumental examinations (Ferguson et al., 2018) and even when aspiration is demonstrated on VFS, PwEDS who consume thin liquids often do not develop aspiration (Gaidos et al., 2023). Thus, short-term reduction in aspiration with TL identified on VFS does not equate to longer-term reduction in negative outcomes but shows an increase in negative outcomes including pneumonia risk, hospital admissions and UTIs (Robbins et al., 2008).

### ***Implementation and contextual issues***

SLP recommendations regarding TL are often beset by contextual issues including in initiating, changing or discontinuing the treatment. In OKen et al.’s (2024) survey of nurses ( $n = 77$ ) working in the Irish health services for example, 70% reported that TL and modified texture diets were often started in the absence of SLP assessment. A recent study by Bice et al. (2023) of people in continuing acute care ( $n = 120$ ), found that two thirds of those receiving a modified solid/liquid diet did not actually have an eating drinking and swallowing (EDS) problem. This has clear implications for resources, patient

burden and quality of life (QoL). SLP TL recommendations are also often altered or discontinued. Oken et al. (2024) for example found that where SLP recommendations were in place, a third of nurses would both alter the recommended consistency—most often to a thicker level—and provide unmodified water to the PwEDS. In addition to modifications made by health and social care professionals, McCurtin et al. (2018) found that PwEDS themselves may adjust the amount of thickener they use and prematurely cease the TL treatment. It is likely such practices are widespread in nature.

Logemann (1998) maintained that TL should be employed only when other treatment alternatives have been comprehensively explored. Despite this, TL is often employed as a first-step treatment (McCurtin et al., 2020) and other possible strategies, even those well-known, receive less consideration. While an alternative is not required prior to de-adopting a low-value, poorly-evidenced practice (Niven et al., 2015), there is benefit to considering other approaches in this treatment space. This paper is not a recommendation for certain interventions nor to forgo TL. Instead, it aims to provide room for SLPs and other health and social care professionals to explore and harness the potential of other ways of supporting PwEDS with PA. The relatively limited research for a variety of interventions is notable but should not limit our contemplation of them as possible options going forward, particularly if they carry fewer burdens than TL.

The body of this paper is divided into seven sections: (1) Medical influences; (2) Bolus modification approaches which are not TL; (3) Rehabilitation approaches; (4) Hygiene and residue interventions; (5) Physical and postural interventions; (6) Common sense strategies, and (7) Other things to consider when using TL.

## **Intervention considerations other than TL**

### ***Medical influences***

We commence this section by reviewing mainly medical factors, given their influence on EDS and which SLPs and other health professionals would benefit from deliberating on to provide treatment direction.

### ***Aspiration risk factors***

Multiple factors – some of them preventable or treatable—predict difficulty with EDS which in turn is only one predictor of aspiration.

### ***Factors related to the aspiration event***

DeLegge (2002) advises that aspiration pathogens can be divided into three separate aetiologies: oropharyngeal bacteria, particulate matter, and

acidified gastric contents. This underlines the particular importance of employing oral hygiene and gastro-oesophageal reflux treatments in potentially managing aspiration in PwEDS.

### **Conditions**

Nativ-Zeltzer et al. (2021) identified COPD, hypertension and tracheotomy status as all significantly associated with an elevated risk of aspiration pneumonia. Ball et al.'s (2023) recent study looked at all known predictors and found eight factors to be *individually* significant with 84.93% sensitivity and 91.03% specificity. Most significant were recurrent chest infections and current sepsis or delirium, followed by insensate larynx. Other documented factors cumulative in the prediction of aspiration pneumonia were being immunocompromised, TL and a gastro-oesophageal component (i.e. oesophageal dysmotility and hiatus hernia). Given the delayed transit time associated with TL, Cichero (2013) cautions about use of TL in people who already have baseline conditions that slow gastric emptying, e.g. Parkinson's, and diabetes. Gupte et al. (2022) retrospectively investigated over a million deaths from aspiration pneumonia and identified a number of potential risk factors including neurologic, upper gastrointestinal, and pulmonary conditions as well as conditions associated with sedative substances. Advancing age was also significant in Gupte et al.'s (2022) study with individuals 75 years old or older accounting for 76% of aspiration pneumonia deaths. Iatrogenic impacts on swallow efficacy and safety also merit consideration. For example, Devlin and O'Bryan (2021) report there is emerging, though varying research on the impact high-flow oxygen delivery may have on adult oropharyngeal swallowing function.

### **Oropharyngeal factors**

Delayed oropharyngeal transit time, poor mechanical clearance and the presence of pharyngeal residue are highlighted as important aspiration risk factors (e.g. Nativ-Zeltzer et al., 2021; Newman et al., 2016). As TL is known to require greater tongue and pharyngeal pressures for oral transport and to increase pharyngeal residue and the subsequent risk of aspiration, avoidance of thicker consistencies in relevant cases has merit (Wallace et al., 2023). Both Daniels et al. (2008) and Ball et al. (2023) highlight coughing—weak or no cough, abnormal volitional cough and cough after swallow as associated with aspiration risk. Other predictors are vocal cord palsy, swallow disuse atrophy, abnormal gag reflex, dysphonia, dysarthria and voice change after swallow ((Ball et al., 2023; Daniels et al., 2008)

## **Medications**

Several medications and medication classes can contribute to or exacerbate symptoms in PwEDS thus, medication review is crucial in the management of EDS (Specialist Pharmacy Service, 2021). Rationalizing and, if possible, discontinuing medications that contribute to, or worsen swallowing difficulties including aspiration, can significantly improve a patient's QoL. This will usually require communication and collaboration between different health-care professionals, including general practitioners and pharmacists.

### ***Drugs which generally exacerbate EDS symptoms***

In a recent cross-sectional retrospective study of 200 patients admitted to a geriatric hospital where the prevalence of EDS problems was 29%, Wolf et al. (2021) found that even after adjusting for neurological diseases, antipsychotics, benzodiazepines, anti-Parkinson drugs, antidepressants, and antiepileptics were associated with 1.4 to 4.4-fold higher prevalence of EDS problems, emphasising the necessity of actively considering medication review as part of the treatment plan.

### ***Dry mouth (xerostomia)***

Dry mouth is particularly associated with perceived swallowing difficulties (Rogus-Pulia et al. 2018). Insufficient saliva production makes it harder to form a bolus and lubricate food for swallowing, leading to discomfort and swallowing difficulties. Dry mouth may also occur in dehydration so recommending TL to manage EDS problems may result in lack of fluid intake causing dry mouth and exacerbating the swallowing impairment. Dry mouth is associated with many medical conditions and becomes more common in later life. Hyposalivation also leads to reduced frequency of swallowing and increased risk of reflux (Tan et al., 2018; Thomson et al., 2021).

Medication classes (and examples) associated with xerostomia include: Anticholinergics (Atropine, Tolterodine); Antihistamines (Diphenhydramine, Loratadine); Antidepressants (Amitriptyline, Fluoxetine); Antiemetics (Domperidone); Antihypertensives (Diuretics, ACE inhibitors, calcium channel blockers, beta blockers); Antiparkinsonian medications (Levodopa, Bzotropine); Antispasmodics (Dicyclomine); Benzodiazepines (Diazepam ex. Amytal, Valium, Lunesta) and Proton pump inhibitors (Omeprazole).

Anticholinergic medications are particularly prone to cause severe xerostomia and thus drugs with major anticholinergic properties are now used less often. However, many of the other drug classes noted above have some anticholinergic action and this explains their link to xerostomia. It is important to also consider the 'total anticholinergic burden'—the additive effect of different drugs and metabolites with individual anticholinergic



activity—most likely to cause a dry mouth, swallowing impairment and issues with airway protection (Thompson et al., 2021, Marco et al., 2016).

### ***Sialorrhea (increased salivary flow)***

Excessive saliva, often with drooling and pooling, is both a consequence of the swallowing impairment but can itself overwhelm the swallowing mechanism and result in aspiration. A number of pro-cholinergic drugs can aggravate this problem include the antipsychotic agent clozapine drugs used to treat Alzheimer's disease and myasthenia gravis (Boyce & Backheet, 2005).

### ***Sedatives***

Medications that cause sedation, impair consciousness or that reduce concentration while eating and drinking, such as some antipsychotic agents, benzodiazepines, z-drugs, antiepileptic drugs or opioids, can increase the risk of aspiration (Herzig et al., 2017)

### ***Reduced muscle coordination***

Antipsychotics, muscle relaxants and sedatives can affect the coordination of the muscles involved in swallowing, including the tongue and throat muscles. Antipsychotic drugs can cause muscular rigidity, bradykinesia and dyskinesias and many also sedate or have anticholinergic effects. These drugs have been particularly associated with an increased risk of fatal and near-fatal choking and increased risk of aspiration pneumonia (Herzig et al., 2017).

### ***Bioavailability impact of TL***

Bioavailability of some medications can be impaired when combined with TL—particularly with thicker consistencies—including for example, antibiotics, drugs used to treat inflammatory, autoimmune disorders and congestive heart failure (Cichero, 2013; Steele et al., 2021). Cichero (2013) also suggests caution with corrosive medicines due to the slower transit of TL as well as prescribing the minimal level of thickness, as the thicker the liquid, the more they will contribute to poor bioavailability of solid dose medication. Thus, administration of medication with TL needs careful thought.

### **Bolus modification approaches which are not TL**

Other options to modify the bolus exist beyond the alteration of viscosity but are less employed by SLPs in supporting PwEDS (Jones et al., 2018, McCurtin and Healy, 2017).

### ***Unmodified water/thin liquids***

Evidence suggests that the content of aspirate is important (DeLegge, 2002) thus it is legitimate to consider drinks with fewer fats (e.g. oils, butter) and unmodified water as an option when managing PA.

### ***Free water protocols (FWPs)***

FWPs allow PwEDS to have unthickened water with supervision (Gaidos et al 2023). The intention is to improve oral hydration, QoL, and co-operation with TL (e.g. Langmore, 2011; Gillman et al., 2017). There is some evidence from animal studies, given the neutral pH of water, that there may be a lesser risk of infection with small amounts of aspirated water than TL (e.g. Nativ-Zeltzer et al., 2018). Frey and Ramsberger (2011) in a retrospective chart review of PwEDs poststroke showed that even in individuals known to aspirate on thin liquids, offering water did not increase incidence of aspiration pneumonia. FWPs are not recommended for certain individuals, for example, those with unstable medical conditions, severe cognitive impairments, active pulmonary disease, poor oral hygiene and excessive coughing with oral intake (e.g. Karagiannis & Karagiannis, 2014; Bronson-Lowe et al., 2008).

Gillman et al.'s (2017) systematic review concluded that the evidence for FWPs is low-quality but promising for increased fluid intake, improvements in QOL and reduced chest infections. Small case studies such as Gaidos et al. (2023) suggest benefits in terms improved fluid intake, QoL and swallow function with no adverse events. However, in a pilot study by Kokush et al. (2024), 33% of surveyed nurses felt that providing the required level of oral care would impact their other priorities due to lack of time and staffing levels. Good oral hygiene/oral infection control is a core component of FWPs to reduce the amount of bacteria potentially being aspirated. Gaidos et al (2023) suggest that the absence of PA in research studies may, in part, be due to this practice of good oral hygiene.

### ***Eating & drinking with acknowledged risks (EDAR)***

EDAR refers to the decision to continue eating and drinking as normal despite what are described as the associated risks (e.g. aspiration, malnutrition, dehydration and choking) from having EDS difficulties (RCSLT, 2021). The RCSLT (2021) discussion paper on EDAR advises professionals to understand the interests and wishes of the PwEDS, engage in appropriate assessments, take steps to minimise risks that exist, and to document protocols to cover all situations, including foreseeable emergencies. It suggests that EDAR can be employed in a number of situations including where the PwEDS has capacity to fully understand the potential risks of eating and drinking and wishes to continue to eat and drink despite these, where the person is

nearing the end of their life and where the focus moves away from medicalisation to maximising quality of life and, where the person is meeting their nutritional requirements and chooses to eat and drink with acknowledged risks for pleasure. (RCSLT, 2021).

EDAR policies have become more common in recent years. However, Murray et al. (2019) argue that such policies are unnecessary and may be counter-productive. They note that while the idea of EDAR is well intentioned in seeking to avoid unnecessary restriction of eating and drinking, the term 'risk' implies that aspiration could be avoided if eating and drinking is avoided, perpetuating the misperception of a clear and preventable link between aspiration and pneumonia while eating and drinking, while also failing to acknowledge the risks associated with dietary modifications such as use of TL.

### ***Sensory enhancement strategies (SES)***

The bolus can be modified by enhancing its sensory properties to help improve the ability of the PwEDS to manage it more effectively. SES manipulate the bolus via the addition of sensory and/or chemesthetic agents.

#### ***Tastes***

Taste is often cited as the greatest significant factor in food choice and preference (Feeney et al., 2011), emphasizing the potential of tastes for managing EDS difficulties. As taste affects thresholds of swallow elicitation, altering a bolus through increasing sensory characteristics should facilitate aspects of swallowing favourably (Mistry et al., 2006). Taste perception declines with age; thus, enhanced foods may help compensate for sensory loss in older people (Methven et al. 2012) while also having potential benefits in those with neurodegenerative conditions. SES are more palatable than TL and require less time and effort especially for people with cognitive and communication deficits, low levels of observance and general fatigue (Sdravou et al., 2012; Bülow et al., 2003). Importantly, individuals react to tastes and taste intensities differently, including due to genetic taster status, gender, cultural factors, life experience and various impairments.

Sour tastes have been found to be most effective in initiating the swallow and reducing PA in clinical populations (e.g. Pelletier & Lawless, 2003). However, high-sour tastes have palatability constraints. Chee et al. (2005) collected palatability and intensity rating in non-dysphagic adults and found glucose the only palatable solution. Wierenga et al.'s (2020) participants also showed a preference for sweet drinks amongst carbonated beverages. Pelletier & Dhanaraj's (2006) exploration of lingual-palatal swallowing pressures suggest that moderately-sweet stimuli may be effective at changing the swallowing pattern. Sweet SES may have applications for particular

populations such as people with Alzheimer's disease who show an increased preference for such tastes (e.g. Contri-Degiovanni et al., 2020). Umami tastes are associated with increased salivation – important for mastication and food palatability (e.g. Beauchamp, 2009). More recently, flavoured/edible foam tastes have come to the attention of SLPs working with people who are Nil-by-mouth (Hepper & Patterson, 2023).

### ***Chemesthesis***

Chemesthesis is the sensitivity of mucosal surfaces to chemicals. A chemical irritant provokes temperature or pain receptors (Daniels et al., 2019) and is responsible for the sensations of coolness (menthol), carbonation (soda) and hotness (chilli pepper) (Pelletier & Dhanaraj, 2006). Chilli peppers contain capsaicin which has been found to improve the swallow reflex in older people and PwEDS (e.g. Ebihara et al., 2005). Menthol lozenges consumed before meals were reported effective in reducing aspiration and improving the swallow in older people (Ebihara et al., 2006). A range of studies and reviews demonstrate benefits from carbonation including regarding the severity of pharyngeal residue (improved clearance) and Penetration-Aspiration Scale (PAS) scores (e.g. Turkington et al., 2017; Shapira-Galitz et al., 2021). Sdravou et al. (2012) suggest that carbonation activates sensory fibres in the nucleus tractus solitarius of the brainstem, which is the main structure responsible for swallow initiation.

### ***Temperature***

Introducing cold temperature through thermal tactile stimulation (TTS) involves stroking the faucial pillars (where the sensory receptors of the glossopharyngeal nerve are situated) with an iced mirror to change sensitivity, evoke activity in the compromised motor output and elicit a quicker, more effective swallow response (Rosenbek, 2014). Studies using a cold-modified bolus suggest some promise in reducing PA (e.g. Ferrara et al., 2018) but there remains uncertainty regarding the efficacy, application and transience of this approach (e.g. Regan et al., 2010).

Although a variety of studies provide positive evidence for SES, this is as yet limited. It is worth considering whether a multicomponent SES approach may produce most impact by combining stimuli e.g. cold and sour, thus arousing a greater number of receptive fields to induce a stronger reflex (Steele and Miller, 2010).

### ***Volume regulation***

Volume regulation strategies are used to standardize the rate of presentation and amount of liquid/food taken by PwEDS (Logemann, 1998).

Development of aspiration pneumonia is related not only to content but accumulated volume of aspirate (DeLegge, 2002) in the lungs and it is known that PA in healthy individuals increases with volume (Butler et al. 2018). Managing bolus volume may help to counteract this. Reducing bolus size may help pharyngeal pooling and PA while also increasing sensory input and the timing/organization of physiological events of the normal swallow (Dantas et al., 1990). Adapted modified utensils (AMUs) such as valved beakers which provide a set amount of liquid—usually 5 or 10 mLs for each mouthful—offer a standardised means of achieving this strategy. Other AMUs such as nose cut-out cups or double handled cups may also assist in this regard.

## **Rehabilitation approaches**

There is evidence of benefit regarding swallow rehabilitation programmes from systematic reviews and individual studies. Intensive swallow therapy, for example, reduces chest infections in PwEDS with acute stroke (e.g. Carnaby and Madhavan, 2013; Carnaby et al., 2006). Huckabee et al. (2023b) argue that traditional models of swallowing motor control reinforce the theory that swallowing is a reflex with the result that ‘our clinical thinking did not consider this to be a deficit that would be amenable to behavioural rehabilitation’ (p. 146). As a result, approaches evolved that sought to compensate for deficits rather than rehabilitate the swallowing patterns themselves (Robbins et al., 2008). Swallowing rehabilitation approaches should be based on the principles of motor learning and neural plasticity (changes or adaptations in the brain that occur that lead to associated behavioural changes), and tenets such as specificity and repetition (Kleim & Jones, 2008).

### ***Skill-based training***

Skill training is defined as the acquisition of skill through functional repetition and refinement of movement patterns that can lead to cortical reorganisation of motor networks (Lefebvre et al., 2014).

### ***Swallow training***

Huckabee et al. (2023a) advocate a skill-based swallow training approach to maximising swallow recovery. In a swallowing context, the primary goal of skill-based intervention is to acquire skill in the execution of specific aspects of swallowing biomechanics at a neural level (Huckabee & Lamvik-Gozdzikowska, 2018). More specifically, skill-training involves voluntarily modulating ‘the timing, force, and/or coordination of multiple muscles in the performance of these tasks, resulting in efficient ingestive behaviour which

successfully adapts for variations in bolus size, consistency and other variables' (Huckabee et al., 2023a, p. 760). Identifying and setting clear rehabilitative targets (*specificity*) that are incrementally and sufficiently challenging (*salience*) is critical. Providing opportunities for practice (*repetition*) helps to build the person's swallowing capacity, and providing *feedback* to the person on their performance is necessary to optimize motor learning/re-learning. In PwEDS post-stroke, there is evidence that intensive exercise-based therapy (McNeill Dysphagia programme) produces positive outcomes in terms of oral intake and functional outcome three months post-stroke compared to usual care. (Carnaby et al., 2020). Recently, attention has also been given to bio-feedback tools using methods such as Surface electromyography (sEMG) to help optimise performance-accuracy (Huckabee et al., 2023b).

### **Cough/throat clear training**

In the event of penetration, healthy individuals are able to achieve airway clearance through the defence mechanism of coughing. Coughing is an important protective skill to remove foreign material and secretions from the airway (Chang, 2006) and a weak cough is associated with aspiration risk (Ball et al., 2023). Although the cough is a complex co-ordinated behaviour dependent on sensory, respiratory and motor competencies, Troche et al. (2023) has demonstrated success with cough skill training (reflexive and voluntary) in people with Parkinson's disease. This suggests the cough as a potential rehabilitation target for PwEDS. Borders & Troche (2022) suggest that while an unproductive reflexive cough may be a challenging treatment target, the voluntary cough may be a more achievable clinical goal (Borders & Troche, 2022).

### **Strength training**

Strength training is a well-known strategy being found to significantly improve muscle strength in a range of populations for example, people with Parkinson disease and multiple sclerosis (Cruickshank et al., 2015). In swallowing rehabilitation, strength training approaches include respiratory interventions such as Expiratory and Respiratory muscle strength training (EMST, RMST), conventional manoeuvres such as the Shaker Exercise and chin tuck and tongue strengthening exercises. Criticisms of strength training stem from the assumption of a primary deficit of muscle weakness and by the fact that maximal muscle contraction is not a requirement for adequate swallowing function (e.g. Todd et al, 2013). Potential adverse effects from strengthening exercises have also been reported in the literature such as fatigue and increased physical effort and muscle tone (Clark, 2003; Moldover & Borg-Stein, 1994).

### ***Oropharyngeal muscle strength training (OPMST)***

Research has shown that the Shaker (head lift) exercise, which is performed against gravity in supine position, has a number of effects which can improve swallowing and reduce the potential for PA. It can effectively activate the suprahyoid muscles, increase in the anterior excursion of the larynx and the anteroposterior diameter of the upper oesophageal sphincter opening, achieve epiglottis inversion and laryngeal vestibular closure, and reduce residue in the epiglottic valleculae and pyriform recess (Antunes and Lunet, 2012; Gao et al., 2023).

Concerns about fatigue resulting from the Shaker resulted in the evolution of the Chin Tuck Against Resistance (CTAR) exercise. CTAR is conducted in a sitting position and involves forcefully pressing the mandible against an elastic rubber ball thus activating the suprahyoid muscles but with less involvement of the sternocleidomastoid muscle (Park et al., 21). Although evidence is still limited, Gao et al.'s (2023) meta-analysis (n = 259), comparing the effect of OPMST (specifically the Shaker and CTAR) with conventional EDS therapy found that OPMST can improve the safety and performance of swallowing in PwEDS post-stroke.

### ***Respiratory muscle strength training (RMST)***

The respiratory pattern during swallowing is expiration-swallow-expiration with an apnoeic period sandwiched between expiratory flows. Aspiration is primarily influenced by the extent and timing of airway closure and the post-swallow exhalation may serve to expel any penetrated material out of the airway, all underlining the importance of a respiratory focus in swallowing (Curtis et al., 2020).

Chronic obstructive pulmonary disease (COPD) is the most common respiratory condition with a myriad of sequelae that may not respond to fluid modification and high instances of silent aspiration have been reported in the literature (Zheng et al., 2016). Dysfunction of laryngeal–pharyngeal musculature is common in COPD and implicates laryngeal–pharyngeal muscles involved in airway protection (Cvejic et al., 2021). Modification of fluids will not always be appropriate as the first line of defence and may not adequately address the underlying pathophysiological processes resulting in compromised swallow efficacy or efficiency. This holds true for multiple clinical populations.

RSMT can be defined as a technique that aims to improve the function of the respiratory muscles through specific exercises. Inspiratory Muscle Training (IMST) is demonstrating benefit across clinical cohorts and has been shown to increase inspiratory muscle strength, respiratory muscle function, and might help to reduce dyspnoea on exertion (e.g. Pitts et al., 2009). Expiratory muscle strength training (EMST) aims to increase the force generation capacity of the expiratory muscles and improve pulmonary

function and airway protection (Sapienza, 2008). In COPD, EMST is demonstrating benefits with respect to improved subglottal pressure, increased contraction of supralaryngeal muscles which has been shown to translate to decreased airway compromise (PA) and increased hyolaryngeal elevation (Patchett et al., 2017). Brooks et al.'s (2019) systematic review of EMST (five studies included) suggests increased the strength of expiratory muscles and improved airway safety during swallowing in PwEDS following treatment. Of note, Mancopes et al.'s (2020) review failed to find clear evidence regarding the effects of EMST using videofluoroscopic measures of swallowing.

### ***Tongue strength training (TST)***

Research evidence suggests that improvements in tongue strength could facilitate the recovery of pharyngeal motor function and reduce aspiration. Leder et al. (2013) found that an impairment in range of tongue movements and facial symmetry were independent risk factors for aspiration across a large in-patient cohort (4,000 participants). Butler et al. (2011) found isometric and swallowing tongue strength were lower in older adults presenting with aspiration. Tongue-pressure resistance training has been shown to be an effective approach to improve the overall swallowing function in patients with oral motor dysfunction post-stroke (Wang et al., 2022). St. Nurfatul et al.'s (2022) systematic review (n = 151) showed that TST (three times a week for eight weeks) increased tongue strength in older PwEDS.

### ***Oral motor interventions (OMIs)***

Swallowing is composed of multiple phases—although one dynamic event—and some research evidence suggests that targeting oral motor functions may assist with improved pharyngeal motor function and thus PA. As noted, Leder et al. (2013) identified oral issues (range of tongue movement, facial symmetry) as contributing to PA, highlighting the importance of oral phase interventions. In older adults, Takamoto et al. (2018) found therapy which focused on lip closure reduced the risk of aspiration. El Sharkawi et al.'s (2002) pilot study of the Lee Silverman Voice Treatment (LSVT) found improvements in oral tongue and tongue base function during the oral and pharyngeal phases of swallowing. SLPs considering an OMI approach where PA is present should be guided by the principles of neuroplasticity in selecting the optimal management (Arvedson et al., 2010).

### ***Muscle sensory stimulation***

Reduced laryngeal sensation is a known predictor of aspiration (Shapira-Galitz et al., 2019). In addition to the impact on sensory responses caused by neurological insults, clinical interventions such as intubations and



sedatives can depress reflexes. SES can provide a compensatory route to augmenting sensory input in the pre oral and oral phases. Direct techniques to improve swallow physiology using electrical stimulation (e-stim) have emerged, specifically neuromuscular electrical stimulation (NMES) of the base of the tongue and posterior pharyngeal wall, and direct pharyngeal muscle stimulation (pharyngeal electrical stimulation—PES).

Steele's (2004) review explored both the rationale and existing evidence for e-stim methods highlighting limited credible evidence and studies which suggest potential harms and advising against adoption of electrical stimulation into clinical practice at that time. Tarihci Cakmak et al.'s (2022) study comparing traditional EDS therapy and NMES combined with traditional therapy highlighted improvements in both groups and concluded that NMES as an adjunct therapy, while costly, can provide additional improvements in PA and residue levels. PES to induce the swallowing reflex in a sham-controlled clinical pilot study ( $n = 50$  people with stroke) demonstrated daily PES led to reduced aspiration severity rates and a shorter time to discharge from the hospital compared to the control group (Jayasekeran et al., 2010), implying that neuroplastic changes lead to clinically meaningful functional improvement. Miller et al.'s (2022) systematic review concluded that there is a considerable amount of level 2 studies which suggest that NMES is an effective treatment option, especially when combined with traditional EDS therapy. They also point to the need for clarification regarding which stimulation protocols, parameters and therapy settings are most beneficial.

## Hygiene and residue reduction approaches

Given the strong link of oral hygiene and residue to aspiration pneumonia (e.g. Nativ-Zeltzer et al., 2021; Smithard and Yoshimatsu, 2022), interventions targeting these areas should be integral to any PA treatment plan.

### *Mouth care*

Quality mouthcare contributes to improved overall health-related outcomes and QoL. Mouthcare that inhibits the colonisation of bacteria in the oropharynx is one of the most important, evidenced-informed interventions available in reducing the development or progression of respiratory infections in those at highest risk (e.g. Martín et al., 2018; Liu et al., 2022). Dependence on others for oral hygiene is correlated with a deterioration in oral health (e.g. Yoneyama et al., 2002). Higher rates of hospital-acquired infections and pneumonia, mortality and morbidity are seen in those with poorer oral health and oral frailty (e.g. Azarpazhooh & Leake, 2006; Foltyn, 2015). Ehrenzeller and

Klompas's (2023) meta-analysis of 15 randomized clinical trials ( $n = 2786$ ), for example, found that hospital-acquired pneumonia rates were lower among patients randomized to daily toothbrushing. Longer hospital stays, increased care costs and reduced intake of nutrition is also documented with poor oral care (Terezakis et al., 2011). The presence of EDS problems further compounds the risk of poor oral health due to reduced salivary clearance and an impaired cough reflex that retains microbes in the lower airway (Scannapieco, 2021). Adherence to oral hygiene programmes in residential and acute care settings is considered subpar (e.g. National Institute of Health Care and Excellence [NICE], 2016; Care Quality Commission, 2019). SLPs, alongside oral health professionals, are well placed to lead on initiatives and advocate the importance of oral care in addressing pneumonia risk factors.

### ***Residue reduction***

Strategies which focus on reducing/eliminating post-swallow residue have the potential to positively impact swallowing and thus PA.

### ***Pharyngeal residue***

Pharyngeal residue is a known predictor of aspiration for all consistencies examined (Shapira-Galitz et al. 2019), is widely considered to be a sign of swallowing impairment and is significantly associated with impaired swallowing safety on the subsequent clearing swallow for the same bolus (Molfenter and Steele, 2013). Newman et al. (2016) point to the risk of compounding pharyngeal residue with thicker viscosities thus increasing the risk of PA. Pisegna et al. (2020) report that residue is likely to lower QoL, result in weight loss and malnutrition and increase the risk of aspiration. Many people  $\geq 80$  years naturally perform more than one swallow per bolus to achieve clearance/eliminate residue without compromising swallow safety (Jardine et al., 2020). Thus, multiple swallows may function effectively to clear residue for PwEDS. A subsequent bolus may help to clear residue (Steele et al., 2020). Wang et al.'s (2022) study with PwEDS post-stroke suggests that tongue-pressure resistance training may facilitate clearance especially in the piriform sinus while the Shaker exercise has been shown to reduce residue in the epiglottic valleculae and pyriform recess, thereby reducing the risk of aspiration (Gao et al., 2023). Interventions might focus on overall weakness, reduced range of motion, reduced laryngeal sensation which is independently associated with residue (for all consistencies examined), pharyngeal constriction and coughing to clear residue (Curtis et al., 2020; Pisegna et al., 2020; Shapira-Galitz et al., 2019; Stokely et al., 2015). Biofeedback may have the potential to provide PwEDS with

more control in therapy and both compensatory (to increase sensation) and rehabilitation (skill-based training) strategies should be considered.

### ***Oral residue***

Although not technically linked to PA, residue in the oral phase has the potential to lead to dental decay, increase salivation, transit to the pharyngeal phase outside of a controlled swallow event, and is associated with poor QoL independent of PA in some clinical populations (Meyer et al., 2017). Thus, approaches to effectively reduce and clear oral residue should be considered. There is little research on oral phase residue, but it is logical that as for pharyngeal residue (Barbon et al., 2022), thinner liquids may be less likely to contribute to oral residue than thicker liquids/foods. Further, enhancing the sensory properties of a bolus through SES may facilitate improved bolus control and reduce piecemeal swallowing. Rehabilitation approaches to tongue and lip movements may improve oral phase function. Hind et al. (2001) found a trend of decreased oral residue with the effortful swallow (ES) manoeuvre in individuals without EDS problems.

## **Physical and postural interventions**

Well-aligned body posture supports the muscles involved in swallowing and helps to manage the PA event. Mealtime positioning is important as it influences the swallow mechanism. Rosen et al. (2018) for example, found that velopharyngeal pressures varied by position.

### ***Physical interventions***

Three quarters of SLPs frequently use positioning changes and just over a third employ physical support when managing EDS problems (McCurtin and Healy, 2017). An upright sitting position with the head neutrally positioned in the midline is typically considered optimal for meals, however optimal positioning is individual to each PwEDS. There is evidence that other positions, such as a reclined position for some people after stroke, can be useful in reducing aspiration and pharyngeal residue (Benjapornlert et al., 2020). A stable head position is important for effective, safe eating and drinking (Seikel et al., 2000). Optimal positioning should be explored and ideally confirmed by VFS, following an individualised multidisciplinary approach where any postural changes caused by the environment, AMUs, fatigue, or the level of concentration are carefully considered. The position of the person who is enabling PwEDS to eat and drink is also important as is their practice around facilitating eating and drinking generally.

Positioning to maintain eye contact with PwEDS has been linked to reduced aspiration (Chen et al., 2021)

### ***Postural manoeuvres***

A recent systematic review by Speyer and colleagues (2022) highlighted a sub-set of behavioural interventions which showed significant, large effect sizes including the Shaker (head lift) exercise and CTAR (chin tuck against resistance) suggesting promising effects in PwEDS. As noted, CTAR has been shown to be less strenuous than the Shaker exercise, requiring less physical burden and effort and thus enabling greater use by the PwEDS. (Park and Hwang, 2021). In managing EDS, a quarter of SLPs use the chin tuck (McCurtin and Healy, 2017) and it has been shown to have positive influences on aspiration with cup drinking (Fraser and Steele, 2012). Caution must be used however, as it has fallen out of favour due to potential worsening of swallow function in some PwEDS. The chin-up posture in patients with PwEDS may also have some benefits (e.g. Calvo et al., 2017).

In individuals without EDS problems, the ES manoeuvre resulted in significantly longer hyoid maximum anterior excursion, laryngeal vestibule closure, duration of upper oesophageal sphincter opening and increased pharyngeal pressure (e.g. Hind et al., 2001) suggesting potential for this exercise to reduce aspiration. The hyoid bone moved further in the superior direction with the ES. Gandhi et al. (2023) identified varied responses to the ES manoeuvre and no consistent trend in PA scores in a small-scale study.

### ***Independent eating and drinking***

Eating and drinking dependence in PwEDS has been linked to the presence of aspiration pneumonia (e.g. Langmore et al., 2002). Where possible, PwEDS should be supported to eat and drink independently. Clinical evidence suggests that texture modifications, such as TL, often increase meal-time dependence on others due to the complexity of measuring the recommended amounts of liquids and the thickening powder. The fine motor requirements of opening and closing the container, using the measuring scoop, and mixing the thickener and the fluid may also increase dependence on others. Along with positioning changes, appropriate utensils can optimise independence, increase a sense of control and provide additional sensory input in the preoral phase (Logemann, 1997; Rosenbek and Jones, 2009). AMUs may also ensure less dependence on cognitive/communication skills. Research on AMUs tend to be focused on self-feeding but it can be hypothesised that improvements in independence should lead to improvements in oral and pharyngeal control.

## **Common-sense strategies**

Not all interventions need to be complex or highly specified. There are a number of common-sense strategies which SLPs should be encouraged to include in treatment plans where appropriate.

### ***Freely available thick options***

If thicker drinks are acceptable to PwEDS and align with the evidence-informed clinical opinion, then there are many regular, widely available food and drink items that can be used to make drinking easier and safer. Naturally thicker consistencies include yoghurts, smoothies and soups which can be integrated into trials at bedside and instrumentally. Food and drink items familiar to, and preferred by, PwEDS should be readily identified as individual preference is important for adherence, palatability and control. Baert et al. (2021) conducted a study with PwEDS secondary to Parkinson's disease comparing gum-based thickeners and starch-based freely available options (potato starch and quinoa flour). The starch-based thickeners were preferred for texture, taste and aroma. Readily-available options may offer a preferred way forward, help problem-solve palatability and adherence issues seen with TL and reduce healthcare spend on thickeners.

An exploration of different customs is helpful to guide food and liquid choice, for example, kisiel—pudding type which can be prepared to different consistency levels—is very popular in Poland across all age groups, but it is much less known across other countries. Many cultures reject infantilising older persons via treatments such as TL, seeing it as disrespectful. Freely available thick options may assist in navigating this concern. However, some of the issues which arise from commercial thickeners may also be seen with naturally thick fluids, for example, a naturally thick bolus may still impact bioavailability of medicines as it is the viscosity that has the effect rather than any ingredient.

### ***Odour and visual cues***

Food odour plays an important role in anticipating food, appetite and food preferences (Boesveldt and de Graaf, 2017). When eating, odours are perceived orthonasally via the nostrils and retronasally via the pharynx (Bojanowski and Hummel, 2012). Although PwEDS adult studies are few, paediatric studies suggest the value of odour in promoting EDS. Iranmanesh et al. (2015), for example, showed breast-milk odour stimulation can strengthen feeding competence in infants for example, support transition to oral feeding and reduce hospital stay duration.

Texture modification can have a negative influence on the visual appearance of food, which can reduce oral intake. This is particularly important in some cohorts, such as people with frailty, because it can exacerbate the risk of malnutrition, a risk already increased in frailty. (Pezzana et al., 2015; Dunne & Dahl, 2007). Mixed odour and visual cues have been found to increase appetite and intake in people without EDS problems. Studies found that combining odour and visual cues increase the amount of food participants plan to eat along with actual intake of food (e.g. Ferriday and Brunstrom, 2008). The use of visual and olfactory stimuli also facilitates swallowing mechanisms (e.g. Steele and Miller 2010).

### ***Focused eating and drinking***

Contextual factors can often be hard to control and addressing these may be under-recognised in some clinical settings as an intervention strategy. One reason may be that many swallow assessments are not completed in the natural meal environment. SLPs working with adults with learning disabilities routinely focus on environmental modification given the behavioural and sensory differences of this population. Approaches include removing auditory and visual distractions, recreating familiar/enjoyable environments, reserving eating and drinking to preferred times of day when PwEDS is more likely to be awake and alert, using of familiar drinking utensils, coloured cutlery and routinely setting up trays and tables. Focused eating may also benefit from the use of external triggers such as modelling, verbal cues, reminders and pacing. Clear communication by the person who is enabling the person to eat and drink has been linked to reduced aspiration (Chen et al., 2021). Improving self-regulation through for example, self-cuing, self-pacing and reduced talking when eating also has a place in the rehabilitation of skills in this area.

### ***Type and consistency of food/nutrition***

SLPs and other health professionals should consider what consistency of food/fluid might be least harmful to aspirate. This issue has a number of tangents, including less modified foods having increased sensory feedback thus promoting safer swallowing, water typically being considered to be safer to aspirate than modified fluids and, thinner fluids being safer than thicker ones. DeLegge (2002) underlines volume and content of aspirate as being significantly related to mortality and there is evidence for example, that increased fat content in liquids is more detrimental if a person aspirates (Butler et al., 2018). Wallace et al. (2023) argue that while the

frequency or amount of aspiration may be reduced with TL, the impact of TL on pulmonary health if aspirated warrants careful consideration.

Newman et al.'s (2016) systematic review reported that thicker consistencies led to more pharyngeal residue and thus PA. Robbins et al. (2008) noted increased pneumonia risk and severity with very thick fluids compared to thin fluids (plus chin tuck) and Miles et al. (2018) highlight a greater risk of silent aspiration with thicker fluids. SLPs advise thinner rather than thicker International Dysphagia Diet Standardisation Initiative (IDDSI, 2019) levels when recommending TL (McCurtin et al., 2024), thus incorporating this best practice into clinical decision making.

### ***Do nothing and watchful-waiting***

Clinical practice favours interventions, even when their perceived clinical benefits may be uncertain. Assessing *if* intervention is warranted and not actively intervening is a justifiable approach within a shared decision-making model (Dobler et al., 2018). Hoffman and Del Mar (2017) argue that clinicians' tendency to do something is influenced by inaccurate perceptions of the benefits and harms of interventions. Clinicians tend to overestimate treatment benefits and underestimate treatment harms, which may lead to overtreatment and unnecessary, invasive and potentially harmful interventions.

The pressure to do something can start early in clinical education, with rote learning of clinical guidelines and recommendations. This is insufficient preparation for the ambiguity and complexity of real-life clinical practice, where the evidence supporting most interventions is limited and continually changing (Gupta et al., 2017; Pan, 2019), and where patient opinion is an essential consideration in treatment decisions. Reflection about whether to recommend intervention is influenced by a range of interconnected factors related to the patient experience, including presenting symptoms, personal circumstances, culture, expectations, values and beliefs, future aspirations and quality of life (Leslie and Lisiecka, 2022).

The clinician has a duty to have ongoing conversations with PwEDS about their experiences, new symptoms to look out for, and the evidence and the uncertainties surrounding their condition. Active monitoring of PwEDS and their conditions in the absence of treatment is as important as measuring treatment impact, particularly as conditions and circumstances change. PwEDS feel more comfortable with the idea of waiting to see how a condition takes its course before considering an intervention.

The experience of the clinician is also important. Clinicians often act because they feel expected to do so and aim to be beneficent professionals. Supporting PwEDS and respecting autonomy can clash with the professional's learning and duty to do good. When the PwEDS listens carefully

to a clinician's wisdom and then decides to choose a different approach, the clinician might feel guilty – that they have somehow failed to explain things well enough. A clinician's role is not to convince a person to agree to their treatment advice but to provide information so that they can make an informed decision. Whatever direction the person chooses to follow after a supportive decision-making process is the right one. One measure of intervention success is the facilitation of a good decision by the person in our care.

## **Other things to consider when using TL**

### ***Multicomponent approaches***

There are limited high-quality studies showing positive effects for TL, but there are systematic reviews which report that thicker liquids improve swallow safety (e.g. Newman et al., 2016). There is also some evidence which point to the possible benefits of TL as part of a multicomponent approach i.e. when used alongside another intervention (e.g. Foley et al., 2008, Gillman et al., 2017). Tarihci Cakmak et al. (2023) demonstrated the benefits of a comprehensive traditional EDS approach which included diet modification, oral hygiene education, OMI, sensory approaches, postural/physical manoeuvres and swallow manoeuvres. We cannot isolate the effects of TL in multicomponent studies, but there may be advantages to combining strategies in EDS management. Multicomponent interventions to target key impairments leading to increased aspiration risk include combined compensatory and rehabilitation approaches such as chin tuck plus TL (Logemann et al., 2008) and thermal tactile stimulation and swallow manoeuvres (Malik et al., 2017). The use of chin tuck and LSVT LOUD® showed significant improvements in pharyngeal residue and pharyngoesophageal segment (PES) opening (Miles et al., 2017). Huckabee et al. (2023b) have argued for the integrated use of biofeedback with rehabilitation approaches to facilitate swallow recovery.

### ***A multidisciplinary approach***

In much the same way as combining strategies can be beneficial, so is the coming together of disciplines to support PwEDS. This is especially so for the use of TL, which has a number of unintended consequences. Given the general prevalence of dehydration in older people for example, EDS impairment independently predicting dehydration and constipation in some groups and dehydration-related TL complications such as urinary tract infections (UTIs) and constipation (Bannerman & McDermott, 2011; Bond et al., 2023; Parkinson et al., 2023), dehydration-risk evaluation and monitoring is critical. This is particularly so if PwEDS are already dehydrated due to



care setting or baseline condition. Murray et al (2014) advise that health care facilities educate all clinical staff about the risks of dehydration and develop clinical pathways for PwEDS, including routine monitoring of oral fluid consumption and dehydration and timely intervention. SLPs demonstrate a commitment to working with dietetic colleagues when recommending TL (McCurtin et al., 2024) and should be working closely with other colleagues to trial a range of non-TL and non-SLP solutions to optimize safe eating and drinking.

### ***A Phenomenological approach***

Phenomenology in simple terms is the study of how people experience things in the world and the meanings things have in their experience. Evidence-informed practice requires taking patient preferences into account when designing a treatment plan for PwEDS (McCurtin et al., 2019). The reported experience of PwEDS underscores TL as a burdensome treatment where other options are preferred and non-adherence is common (Colodny, 2005; McCurtin et al., 2018) and it is encouraging SLPs support person-centeredness and being open to the wishes of PwEDS when recommending TL (McCurtin et al., 2024). Health professionals need to be risk-aware *and* person-focused as EDS is more than the provision of nutrients and the texture of food is not always a healthcare treatment (O’Keeffe et al., 2023b; Royal College of Physicians, 2021). Meal satisfaction seems to play an important role in preventing both physical and mental health complications (Lee and Mo, 2019). The emotional needs of PwEDS (in terms of enjoyment) and recognizing eating and drinking as a highly personal activity should be factored into our treatment plans: drinking doesn’t simply hydrate, but fulfils social, cultural and spiritual roles. By intervening in EDS activities, clinicians run the risk of altering, or worse still, omitting, possible states such as joy, pleasure, reminiscence and familiarity and may even impact the quality of a person’s death (Askren & Kershner, 2020). Intervention should be proportional to the potential distress it could cause (Bogaardt et al., 2015) and the possible emotional, cultural, personal independence or spiritual consequences. Framing interventions from the perspective of a person’s lived experience will mitigate risk, as well as help recognise where ‘fixing’ something is less important than supporting PwEDS to adjust or reduce, where able, the suffering arising from their condition.

### ***Implementing change***

Wallace et al. (2023) argue that perhaps our problem lies in trying to find one answer—to thicken or not to thicken. We hope to facilitate and remind

SLPs and other health and social care professionals of the varied issues and possible solutions and to encourage SLPs to lead the charge on moving away from habitual use of TL. At the very least, health and social care professionals should engage in careful reflective, person-centred and critical reasoning in this treatment space. In a BMJ editorial, Doust and Del Mar (2004) asked why doctors use ineffective or harmful treatments which may give us insights when considering TL practice. Reasons included rationalisations based on clinical experience, over-reliance on a surrogate outcome, love of the pathophysiological model, ritual, a need to do something, no one asks the question (why) and patient's expectations (real or assumed). SLPs are agents of best practice and change who can help progress our overall approach to managing EDS and treating aspiration. More robust experimental research is needed to determine the value of *all* available interventions, but this does not negate TL-specific concerns. Until then, what should SLPs and other health and social care professionals do?

- Critically reflect on practice around the TL intervention both individually and with colleagues.
- Consider the issues and alternatives highlighted in this paper.
- Appraise the quality of all evidence and be cognisant of vested interests in published research and the significant associations between industry marketing practices and prescribing behaviours (Murayama, 2023).
- Engage in targeted use of TL and take advantage of the expertise of clinical leaders who have led change in practice.
- Choose interventions based on evidence-informed-decision-making, which includes weighing up research evidence, practice evidence and PwEDS wishes as well as contextual, pragmatic and judico-ethical concerns (McCurtin et al., 2019).
- Address clinically meaningful outcomes such as dehydration.
- Consider what (if any) resources might become out-dated and need reviewing because of changes in TL practice. This could include information leaflets, capacity assessments, policies or standard operating procedures.
- Engage in planning and modification of established processes e.g. a referral triage system that avoids condensing swallow-related risk into the presence of coughing and/or respiratory infection. The RCSLP (2024) position paper recommends asking questions such as whether coughing is affecting fluid intake/hydration or causing unacceptable distress, or whether addressing respiratory complications or quality of life is more important.
- Consider the issue of treatment burden and employ person-centred outcomes to reflect experiences and preferences of PwEDS.

- Be proactive in educating PwEDS, caregivers and other health and social care professionals regarding TL and the recent evidence.

## Conclusion

Recent papers have raised multiple questions about the use and overuse of TL. The reader is asked to reflect carefully on this high-cost intervention, a practice that does not provide PwEDS with significant benefit and can potentially cause harm (Fung & Hyzy, 2019). SLPs and other health professionals who are scrutinising use of TL often ask ‘what is there instead?’ While it is helpful to bear in mind that a default alternative is not needed, this paper facilitates the discussion by providing possible alternative and augmentative strategies and highlighting points for the reader’s consideration. Change can be a difficult process and it is acknowledged that discontinuing a practice is harder than adopting a new one (Ubel & Asch, 2015). The management of EDS difficulties is complex and warrants a multifaceted, collaborative inter-disciplinary response. SLPs have a myriad of skills available to them to promote safe and comfortable swallowing. It is time to redress the balance caused by the overdependence on one poorly-evidenced and patient-disliked intervention.

## Disclosure statement

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## ORCID

Arlene McCurtin  <http://orcid.org/0000-0002-0649-0448>

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