

## Things We Do for No Reason: The Use of Thickened Liquids in Treating Hospitalized Adult Patients with Dysphagia

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The “Things We Do for No Reason” (TWDFNR) series reviews practices that have become common parts of hospital care but may provide little value to our patients. Practices reviewed in the TWDFNR series do not represent “black and white” conclusions or clinical practice standards but are meant as a starting place for research and active discussions among hospitalists and patients. We invite you to be part of that discussion.

### CLINICAL SCENARIO

A 74-year-old man with Alzheimer’s dementia and chronic dysphagia with a history of aspiration pneumonia presents with urinary tract infection, hypovolemia, and hypernatremia. He has been on thickened liquids at home for the past several months. As his overall condition improves with intravenous fluids and antibiotics, he requests to drink thin liquids.

### BACKGROUND

Dysphagia is defined as difficulty or discomfort with feeding or swallowing<sup>1</sup> and is a common clinical problem facing hospitalists. The prevalence of swallowing difficulties is estimated to affect 13 million people in the United States, which is likely to increase as the population ages.<sup>2</sup> Dysphagia often results in inadequate fluid consumption, resulting in complications such as dehydration.<sup>1</sup> However, the most dreaded complication is pneumonia from aspiration. Aspiration, the entry of material from the oropharynx or the gastrointestinal tract into the larynx and lungs, can be problematic since it is often colonized with pathogens.<sup>3-5</sup> It constitutes 5%-15% of the four and a half million cases of community-acquired pneumonia per year with a mortality rate as high as 21%.<sup>5,6</sup>

Dysphagia is a clinical diagnosis, and assessment tools are available to help establish the mechanism and severity.<sup>3</sup> For example, the bedside swallow evaluation uses the administration of water by the clinician to the patient to assess for the presence and severity of dysphagia.<sup>1,7</sup> The evaluation is performed by making the patient sit upright at up at 90° and administering

either single sips of ≤20 ml of water, consecutive sips with intake up to 100 ml of water, or progressively increasing volumes of water. The clinician then observes for clinical signs of aspiration such as choking or coughing. This evaluation is inexpensive, noninvasive, and time-efficient with a sensitivity as high as 91%, if conducted using the consecutive sips technique.<sup>7</sup> A video fluoroscopic swallowing exam (VFSE) includes the administration of various barium consistencies that may be helpful in determining the precise mechanism of dysphagia, particularly in the pharyngeal stage of swallowing.<sup>3,8</sup> VFSE is often considered as the standard for dysphagia evaluation, although it is expensive, time-consuming, exposes the patient to radiation, and its translation to functional ability to safely eat and drink is unproven.<sup>8</sup>

### WHY YOU MIGHT THINK THICKENED LIQUIDS ARE HELPFUL FOR ADULT PATIENTS WITH DYSPHAGIA

Modifying oral liquid intake using thickened liquids has been the cornerstone of clinical practice in treating adults with dysphagia.<sup>4,9-11</sup> Water, a thin liquid with a low viscosity, flows rapidly from the mouth into the oropharynx. The rapid rate may be too fast for the patient’s pharyngeal muscles to compensate, thus allowing aspiration.<sup>10</sup> Thickening the liquids is meant to slow the flow of liquids to allow more time for airway closure, which could potentially reduce the risk of aspiration.<sup>10,11</sup>

The strongest evidence for thickened liquids originates from a study based on videofluoroscopy findings. Clave et al. studied patients with stroke or traumatic brain injury, patients with neurodegenerative diseases, and healthy volunteers using videofluoroscopy while swallowing liquid, nectar, and pudding boluses.<sup>11</sup> Of the 46 patients with stroke or traumatic brain injury, 21.6% had aspiration of liquid into the airway, but this incidence was reduced to 10.5% and 5.3% when the diet was modified to nectar and pudding, respectively. Of the 46 patients with neurodegenerative diseases, 16.2% had aspiration of liquid into the airway, which was reduced to 8.3% and 2.9% when given nectar and pudding boluses, respectively. Thus, thickened liquids significantly improved the videofluoroscopy results, leading to a presumptive decrease in the rate of respiratory complications. Other authors have reached similar conclusions in different settings and selected patient populations.<sup>9</sup> These results, although mostly based on imaging findings and in only narrow populations, have been widely extrapolated to routine clinical practice.<sup>1,9,12</sup>

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## WHY THICKENED LIQUIDS ARE NOT HELPFUL FOR ADULT PATIENTS WITH DYSPHAGIA

Evidence against thickened liquids dates back to 1994, when a comparative effectiveness trial of stroke patients found that family instruction on appropriate compensatory swallowing techniques without the use of thickened liquids carried no increased risk of pneumonia, dehydration, malnutrition, or death when compared with thickened liquids.<sup>13</sup> Recent evidence has established the risk for harm with thickened liquids. Specifically, patients assigned to thickened liquids in one study had a higher rate of dehydration (6%-2%), fever (4%-2%), and urinary tract infections (6%-3%) than those assigned to thin liquids.<sup>14</sup> This is presumed to be related to poor fluid and nutritional intake resulting from the thickened liquids.<sup>1,9,14</sup>

Patients' perceived quality of life is also lower when on thickened liquids. Studies typically measured this using the validated Swallowing Quality of Life (SWAL-QOL), which is a quality-of-life and quality-of-care outcomes tool designed for patients with oropharyngeal dysphagia.<sup>1,15</sup> One study found that those started on thickened liquids had a significant reduction in their SWAL-QOL score by nearly 14 points ( $P < .05$ ).<sup>15</sup> Perhaps because of this reduced quality of life, patient compliance has been reported to be as low as 35% at five days.<sup>16</sup>

Several systematic reviews support allowing access to free water rather than limiting patients to thickened liquids in the setting of dysphagia. Gillman et al., Kaneoka et al., and Loeb et al. found no statistical difference in the risk of developing aspiration pneumonia in patients granted access to free water when compared to those with thickened liquids.<sup>1,9,12,15</sup> In the meta-analysis of Gillman et al. of 206 patients, there was no significant increase in the odds of having lung complications when allowing patients access to free water in comparison to thickened liquids (odds ratio 1.51, 95% confidence interval 0.2-100.03).<sup>1</sup> The meta-analysis of Kaneoka et al. showed no significant difference in the odds of developing pneumonia in patients with access to free water compared with thickened liquids in a sample of 135 patients (odds ratio 0.82, 95% confidence interval 0.05-13.42).<sup>12</sup> However, the systematic reviews of Gillman et al. and Kaneoka et al. included studies with stringent exclusion criteria, including impaired cognition and mobility limitations, which limits their applicability.<sup>1,12</sup>

## IN WHAT CIRCUMSTANCES MIGHT THICKENED LIQUIDS BE HELPFUL

In patients who have extreme choking with water intake, restricting access to oral water may be reasonable to avoid the physical stress of coughing. Similarly, in end-of-life situations, if coughing is so bothersome to patients or families as to be inconsistent with goals of care, then thickened liquids for comfort measures may be reasonable. Finally, Foley et al. found that combining thickened liquids with texture-modified diets and intensive training sessions with speech-language pathologists focused on swallowing techniques led to a reduced risk for aspiration pneumonia during the first seven days following

an acute stroke. Since risk reduction did not persist after seven days, prolonged modification is likely not helpful.<sup>4</sup>

## WHAT WE SHOULD DO INSTEAD

Access to free water is important for hydration, quality of life, and delirium prevention. A collaborative approach with nurses, speech therapists, and caretakers should be employed to focus on strategies to prevent aspiration pneumonia via positioning, oral hygiene, and patient and family education. Postural adjustment with the chin-down posture alters the flow of the bolus during the pharyngeal phase of the swallow.<sup>14,17</sup> This technique has shown superior safety when directly compared with thickened liquids without any difference in aspiration pneumonia rates.<sup>14</sup> In addition, oral hygiene for patients who cannot perform oral care themselves should be implemented to decrease the amount of pathogenic bacteria in secretions.<sup>1,15</sup> Finally, ensuring that patients and families understand the risks and benefits of access to free water is paramount.

Tube feeding (eg, nasogastric and gastric tubes) allows for reliable delivery of enteral nutrition and medications. Tube feeding does not decrease aspiration events compared with oral diets. Moreover, the risk of developing aspiration pneumonia appears to be similar among gastrostomy, nasogastric, and postpyloric feeding tubes.<sup>5</sup> This approach may be preferable, though, when the dysphagia is the result of a structural abnormality such as stroke deficit, neoplastic changes, or surgical alteration of the larynx.

Free water protocols use an interdisciplinary approach to safely improve access to water for patients with dysphagia. Free water protocols involve screening high-risk populations such as the elderly, confused, or stroke patients with a bedside swallow evaluation. Those with difficulty following directions, who are unable to limit their drinking to manageable-sized sips, or with excessive cough are restricted to supervised water drinking with access to water only between meals (30 minutes after a meal) and with aggressive oral hygiene. Posturing techniques with the chin-down position may be employed. Patients and their families must be educated on protocol implementation and rationale.<sup>1,9,12</sup>

Overall, free water protocols have demonstrated an improvement in quality of life, no change in adverse events, and improved water intake. SWAL-QOL scores were significantly improved by nearly three points ( $P < .05$ ).<sup>15</sup> There was no significant difference in the odds of developing aspiration pneumonia when comparing those on thickened liquids to those with access to free water.<sup>1,9,12</sup> Furthermore, one study by Loeb et al. even found that those allocated to a thickened liquid group were more likely to develop aspiration pneumonia, although this difference was not statistically significant.<sup>9</sup> Finally, those given access to free water had higher amounts of fluid intake by a mean of 180 ml.<sup>1</sup>

## RECOMMENDATIONS

- Allow patients with dysphagia access to free water
- Initiate protocols to ensure adequate oral hygiene, patient and family education, and optimization of positioning strategies

## CONCLUSIONS

Our patient is assessed with a bedside swallow evaluation and has issues with minor coughing. Despite this, he repeatedly requests access to free water, and these requests are upsetting to his family. The risks of potential aspiration are explained to him, and he and his family express understanding. He is given supervised access to water between meals and is encouraged to sit upright and brush his teeth prior to drinking. He continues to improve throughout the hospitalization and at the time of discharge, his sodium level is within normal limits and he is delighted to be drinking regular water.

Patients with dysphagia are often restricted to thickened liquids. This approach does alter the liquid flow throughout the oropharynx and minimal clinical evidence supports this practice as a method to reduce aspiration pneumonia. Given the poten-

tial harm and the reduced quality of life, we recommend against thickened liquids in this setting. Taken as a whole, available evidence suggests that protocols to facilitate safe access to water,<sup>1</sup> family information and education,<sup>13</sup> and positioning techniques<sup>14</sup> are safe, effective, and preferable to thickened liquids.<sup>1,12</sup>

*Do you think this is a low-value practice? Is this truly a "Thing We Do for No Reason?" Share what you do in your practice and join in the conversation online by retweeting it on Twitter (#TWDFNR) and liking it on Facebook. We invite you to propose ideas for other "Things We Do for No Reason" topics by emailing TWDFNR@hospitalmedicine.org.*

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