Maximizing Safety, Nutrition, Hydration and Quality of Life in Dysphagia Patients: Clinical Decision Making Guide

Description and Purpose

A clinical best practice decision making / clinical reasoning guide to assist the dysphagia therapist in finding a balance between recommending the safest solids and liquids to reduce aspiration and maximizing nutrition, hydration and quality of life.

Evidence for proving the efficacy of thickened liquids to prevent aspiration is absent. How does the dysphagia therapist minimize the recommendation of thick liquids / modified diets - or use them as a last option. What can we implement alternatively to consider all factors, options and techniques; to consider the big picture in our patients' lives.

Issues and Barriers

- Dysphagia education does not consistently include the evidence against the effectiveness of thickened liquids
- Many new and some experienced SLPs are very conservative and recommend thickened liquids and modified diets excessively
- Fear of liability if the most conservative solid and liquid option is not recommended
- Nursing's first course of action is to downgrade and place on thick liquids and/or modified diets if patient is demonstrating difficulty. If the patient is left on these consistency options without following up with the dysphagia therapist, the decision is definite.

'To Thicken' - Physiological Evidence In Support of Thickened Liquid Recommendations:

- Lingual pressure rises in response to increased viscosity
- Duration and force on the bolus increases as viscosity increases
- Reduced pharyngeal delay for stroke patients moving from 1ml of liquid to 1ml of pudding
- Thicker material yielded fewer instances of aspiration but only on 5ml swallows.

'Or Not To Thicken' - Physiological Evidence Against Thickened Liquid Recommendations:

- Thick liquids may worsen the symptoms of dysphagia due to prolonged time in the esophagus
- Thicker material yields greater residue
- Frequency of pneumonia did not significantly increase among patients who aspirated thin liquids and those who did not aspirate (Feinberg et al 1996)
- Patients with esophageal motility disorders often experience increased difficulty and risk of aspiration with thickened liquids, increasing esophageal backflow and a potential for aspiration after the swallow.

Date / Completed	Factors to Consider When Determining Least Restrictive Solid / Liquid Consistencies:
	Whenever possible, implement a goal / target of < 10% of the patients in your facility to have orders for modified consistencies and / or thickened liquids. In this way patients will not be left on a more restrictive diet than absolutely necessary.
	Screen or review in some capacity every 3-4 months
	Diagnostic treatment best practices: cervical auscultation, cranial nerve assessment, pulse oximetry
	Become familiar with as many patients as possible; obtain QI reports for thick liq modified diets, weight loss
	Dysphagia instrumentation conducted with strategies trialed
	Patient compliance with strategies is considered and / or addressed
	Consider for how long your patient is expected to use strategies and what is the realistic nature of follow through with recommended strategies; what are the consequences if your patient chooses not to follow
	Adaptive or control flow cups: Provale, Rika Sure-Grip Cup, Flexi-Cut Cups, Kennedy Spillproof Cup, Gravity-Assisted Drinking Cup, Wonder-Flo® Cup, No-Tip Weighted Base Cup, Flo-Trol™ Vacuum Cup, Weighted Base Dysphagia Cup, Wedge Cup, No Spill Cup, Pre-Set Drinking Cup, Novo Cup, Sip-Tip (available via Alimed or Sammons-Preston)
	Provale cup - used to gradually upgrade thin liquids from 1cc to 10 cc per drinking motion
	Vital Stim
	Effortful / Valsalva swallows in conjunction with Vital Stim
	Masako maneuver
	Use spoon for thin and then gradually increase size of spoon then small sips
	MDTP- McNeill Dysphagia Therapy Program – A comprehensive exercise based dysphagia therapy program – Offered through Ciao Seminars, www.ciaoseminars.com
	Free Water Protocol The free water protocol may be used for various types of patients: end of life stage patients, NPO patients as well as those on thickened liquids. Consistently, patients placed on a free water protocol are selected by the SLP and verified by the physician to be able to tolerate aspirating water or ice chips following oral care. The DWP greatly reduces our "issues" with dehydration and assists in patient satisfaction. A free water protocol greatly reduces the risks and consequences of dehydration and assists in patient satisfaction. Some Peoplefirst sites have called their free water protocol a “dysphagia water protocol” in order to signal to all departments that consultation with the dysphagia therapist is the first step to initiating the protocol. Refer to the Peoplefirst Clinical Services Bulletin, “Unthickened Water Protocol” for more information.

	Oral motor and pharyngeal exercises
	Shaker exercises
	Thermal gustatory stimulation and use of cyclic ingestion (alternating cold / sour bolus with regular meal bolus)
	Swallowing Treatment Equipment: Ice Finger, TheraSIP™ Swallowing Trainer, Textured Spoons, oral motor / Nuk massagers, Glossectomy spoon
	Progression of solids: Puree to banana and canned soft fruit and soft, moistened graham cracker
	Use of thin liquids during dysphagia treatment – Progress from: 1) Thick 2) Free water in isolation 3) 1 meal per day with thin liquids for one week with vitals taken and monitored
	Consider silent versus audible aspiration. Silent aspiration is more comfortable which may equate to a better quality of life
	Consider patient activity level, mobility, sitting and bed position, respiratory disease, respiratory support
	Consider patient right to refuse, patient priorities, and that an altered diet is a form of restriction
	Consider real life food preferences; honor and incorporate these – cookies and milk, McDonald's – natural environment food items for each individuals ethnic background increases motivation – If patient does well it may be time to upgrade
	Consuming pureed solids for long periods is putting patients at risk for reduced oral motor strength, tone and endurance – it may be a set up for failure later when the SLP tries to upgrade at a later date
	Use of a "3-day trial" potential upgraded consistencies to assess how our patients are managing various liquid/texture changes prior to writing telephone orders to change the diet
	A restorative dining program may also be critical to follow-through with various positioning and swallowing techniques with our patients

Date / Completed	**Treatment Strategies to Utilize to Progress From More ⇒ Less Restrictive Consistencies - Clinical Indicators for Potential Solid or Liquid Upgrade:**
	Screen or review in some capacity every 3-4 months
	Become familiar with as many patients as possible; obtain QI reports for thick liquids, modified diets, weight loss
	Consistent success for a long time on same diet without difficulty
	Improved medical status
	Improved strength
	Pneumonia free
	Increased mobility
	Increased alertness
	Reduced meds (psychotropic)

	Increased safety awareness and insight related to food safety, independently elects not to eat specific items as they are too difficult (chicken is too tough) – thus the SLP has an increased trust. We would be able to upgrade because we trust patient decision making in that if a texture is too difficult the patient would choose something else and leave behind the more difficult item. 'Successful cheating' after consuming solids and liquids not ordered by the physician
	Ask your patient, how much are you cheating? (In a non-accusatory manner)
	Improved dental status

References and Resources

Potential Issues / Consequences when starting Thickened Liquids

- Denial or Depression
  - Refusal or decreased intake of liquids resulting in:
    - Dehydration
    - Decreased Activity
    - Impaired Judgement
    - Weight loss

Potential Health Issues Related to Thickened Liquids

- Direct Conditions – Dehydration, Weight Loss, Pressure Ulcers
- Indirect Conditions – Falls, Decline in Functional Activity

Dehydration

- Persons aged 85 to 99 are six times more likely to be hospitalized for dehydration
- 19% of high discretionary discharges of nursing home residents to the hospital are due to dehydration
- More than 18% of those hospitalized for dehydration will die within 30 days
- Hospitalization costs for dehydration in 1998 were $1.36 billion
- Dehydration of as little as 2% loss of body weight results in impaired physiology and performance

Patients are at Risk for Dehydration Because…

- Decreased thirst
- Decreased ability to concentrate urine
- Prevalence of treatments and conditions that may promote water loss
- Difficulty swallowing
- Dislike of thickened liquids
- Dependent on others to offer fluids

Health concerns with Dehydration

- Urinary tract infections, decreased urinary output
- Pneumonia
- Renal failure
- Electrolyte imbalances
- Decubitus ulcers
- Confusion, disorientation, delirium
- Decreased oxygen to blood
- Increased heart rate; decreased blood pressure
- Decreased nutrients to muscles
- Increased body temperature

Hydration: The Breakdown

Thickened Liquid fluid availability = 95 – 98%

- 95% Hydration release from thick liquids
- As viscosity increases, patient acceptance decreases
- Not all fluid requirements are met thru drinking
  - 50% Fluid intake
  - 38% Foods
  - 12% Byproduct of metabolism
- Poor PO solids intake = automatic dehydration risk

Dehydration Signs

- Why are the elderly chronically dehydrated?
- Difficult to diagnose until too late….
- Dry, cracked lips
  Medications: Patients on medications with xerostomia as a side effect (some anti-anxiety, anti-depressants); Patients on medications with anorexia as a side effect may cause poor PO intake
- Check skin turgor (forehead or sternum)
  - Hand and arm unreliable in elderly
- Vital signs with apical heart rate
  - If dehydrated HR, RR increase
  - If dehydrated BP decreases
- Check for dry oral mucosa, sunken eyes
- Additional signs:
  - Increased confusion
  - Lethargy

- Labs: Hematocrit, Hemoglobin, Electrolytes, Serum Osmolality, Urine Specific Gravity; BUN: Creatinine ratio

Dehydration Signs, Symptoms, Causes

- Delirium
- Dementia
- Depression
- Desert-like environmental conditions
- Dependency for feeding
- Diagnosis > 4
- Decade of Age > 70
- Drugs > 4
- Digestive problems
- Diuretics
- Draining Wounds
- Dysphagia
- Diet feeding formulas
- Diabetic or Renal Dx

Hydration

- Hydration carts, stations and supplies per facility programs and protocols

The CNA Component

- Ask: Why do CNAs Feed as They Do?
- Assessment of CNA knowledge
- Rapport Building
- Effective, innovative and fun training programs

Importance of Water

- Minimum of eight 8-ounce cups of water required daily
  - Institutionalized elderly need between 1700 and 2500 ml of fluid daily
  - Physical activity and warm weather increases the need for fluids
    - 40 to 50% of the body is muscle
    - Muscle is 70% water
    - Exercise consumes water, so it is important to hydrate during activity
  - Higher levels of protein or salt in the diet require more with water to maintain electrolyte balance
  - With age, total body water and thirst sensation decrease

Impact of Various types of Thickener

- Gum-based
  - If aspirated, more difficult for the lungs to remove it
  - May lead to gut obstruction
- Starch-based
  - May lead to dehydration
  - Naturally thick liquids are preferred
    - Buttermilk
    - Eggnog
    - Drinkable yogurts
    - Fruit nectars
    - Cream soups
    - Tomato juice

Importance of Nutrition and Hydration of Wound Healing

- 21% of short-stay SNF residents have pressure sores that do not improved between the 5-day and 14-day MDS assessments
- 14% of long-term SNF residents are at high risk for developing pressure sores
  - High risk is associated with coma, lack of essential nutrients like water, vitamins, and minerals and inability to change position independently
- An additional 3% of long-term SNF residents are at low risk for developing pressure sores

Weight Loss

- Weight loss can be planned…
  - Initiated and care planned with the exception of positive health gains
- Or Unplanned…
  - Not planned or care planned
  - Significant weight loss as defined on the MDS
  - Unplanned loss of 5% or more in last 30 days or 10% in last 180 days
  - Weight loss and bed rest lead to muscle wasting
  - The SLP addresses the cognitive or swallowing deficits resulting in weight loss, reduced nutrition and hydration status

Effects of Nutrition on Muscle Wasting and Strength

- Reduced functional capacity
  - Less physical activity, decreased ADLs
  - Further muscle loss
  - Decreased coordination
  - Reduced use of calories
    - Slower metabolism

- Decreases in bone density and muscle strength lead to bone fractures

When to refer to the RD?

Examples of when to consult with a Dietician (including, but not limited too)

- Abnormal lab values
- Weight loss or underweight
- Self feeding status change
- Initiation of recreational or trial PO intake
- Initiation of small meals so that adjustments can be made to the tube feeding schedule, rate, amount and physician order as per RD
- Chewing/ swallowing/ feeding difficulties
- Pressure sore risk or existence
- Fluid restriction
- Diet texture change
- New admission, MDS initial assessment or re-assessment
- Dysphagia therapy initiation

Preventing Nutritional Issues

- Hydration Protocol
  - Include offerings on…
    - Hydration cart for between meals
    - Beverages at activities
    - Medication pass
    - Scheduled snack times
  - Product delivery
  - Training of staff on preparation by standardized recipes or portioning from prepared bulk
  - Clear instructions on chilling and holding
  - Follow up regularly on acceptance and status and update strategies

The Research: The Effects of Viscosity on Swallowing

Lof, G. L., & Robbins, J. (1990). Test-retest variability in normal swallowing. Dysphagia, 4, 236-242.

- Greater variability for 7 of 9 duration variables for paste-consistency compared to liquid barium swallows

Lazarus, C. L., Logemann, J. A., Rademaker, A. W., Kahrilas, P. J., Pajak, T., Lazar, R., et al. (1993). Effects of bolus volume, viscosity, and repeated swallows in nonstroke subjects and stroke patients. Archives of Physical Medicine and Rehabilitation Arch.Phys.Med.Rehabil, 74(10), 1066-1070.

– longer durations of tongue-base to posterior pharyngeal wall contact and of P-E segment opening for pasteconsistency compared to liquid barium swallows

Miller, J. L. (1993). The influence of volume and viscosity on the distribution of anterior lingual force during oral stage swallowing. Unpublished Masters, McGill University, Montreal.
– higher peak force in tongue for high viscosity (pudding, applesauce) versus low (water)

Pouderoux, P., & Kahrilas, P. J. (1995). Deglutitive tongue force modulation by volition, volume, and viscosity in humans. Gastroenterology., 108(5), 1418-1426.
– 3 ml boluses of pudding and mashed potato elicited higher amplitudes and later onset of tongue base peak pressure than 3 ml boluses of water; peak pressures were significantly higher for mashed potato than for pudding

Nicosia, M. A., Hind, J. A., Roecker, E. B., Carnes, M., Doyle, J., Dengel, G. A., et al. (2000). Age effects on the temporal evolution of isometric and swallowing pressure. Journals of Gerontology Series A-Biological Sciences & Medical Sciences., 55(11), M634-640.
– Higher lingual pressures observed for 3 ml semi solid bolus (esophacat) compared to 3 ml and 10 ml liquid (thin barium) boluses

Perlman, A. L., Vandaele, D. J., & Otterbacher, M. S. (1995). Quantitative assessment of hyoid bone displacement from video images during swallowing. J Speech Hear.Res., 38(3), 579-585.
– Larger hyoid movements for paste vs. thin liquid barium stimuli

Steele, C. M., & Van Lieshout, P. H. (2004).
Influence of bolus consistency on lingual behaviors in sequential swallowing. Dysphagia, 19(3), 192-206.
– Swallowing frequency (swallows per second) was reduced for thicker items (? longer transit times)
– A trend towards greater variability in the amplitude and duration of downward tongue dorsum movement was seen with thicker consistencies (honey-thick vs. thinner items)

Logemann, J. A., Gensler, G., Robbins, J., Lindblad, A. S., Brandt, D., Hind, J. A., Kosek, S., Dikeman, K., Kazandjian, M., Gramigna, G. D., Lundy, D., McGarvey-Toler, S. & Miller Gardner, P. (208).

A Randomized Study of Three Interventions for Aspiration of Thin Liquids in Patients with Dementia or Parkinson's Disease (aka Protocol 201).
Protocol 201
- Part 1: Studied immediate (compensatory) effect of chin-tuck, nectar-thick liquid and honey-thick liquid on aspiration in videofluoroscopy.

- Part 2: Studied incidence of pneumonia over 3 months in patients randomized to either chin-tuck, nectar-thick liquid or honey-thick liquids.

Protocol 201, Part 1:
- 711 participants with usable data, 70% male
- 59% aged 80 or older
- Diagnoses:
  - Dementia (49%), Parkinson's disease (32%), both (19%)
- Participants declined option of enteral feeding before study
- Eligibility criterion in VFSS:
  - aspiration on at least 1 thin liquid swallow (three 3-ml sips, 3 cup sips)
- Interventions tested in random order:
  - Chin tuck with thin liquid
  - Nectar-thick liquid
  - Honey-thick liquid

Aspiration resolved by ALL 3 interventions: 25% overall
(32% PD, 20% Dementia, 26% both)

Aspiration continued with ALL 3 interventions: 49% overall
(39% PD, 55% Dementia, 50% both)

Protocol 201, Part 2:
- 177 participants who did not aspirate with ANY of the 3 Part I interventions, PLUS
- 348 participants who aspirated regardless of the 3 Part I interventions
- Randomized to:
  - Chin Tuck (with thin liquids) – N = 259
  - Thickened Liquid – N = 256
- Nectar: N= 123
- Honey: N=126
- Measured occurrence of pneumonia over 3 months, defined as evidence of pneumonia on chest x-ray, OR 3 or more of:
- Sustained febrile illness >100°F
- Presence rales or rhonchi
- Positive Sputum grams stain
- Positive Sputum culture
- The 3-month incidence of pneumonia did not differ significantly between patients randomized to chin down posture and those randomized to thickened liquids (nectar, honey)

- Within the group randomized to thickened liquids, the probability of developing pneumonia was significantly higher in those receiving the honey-thick liquids.
- How frequently are liquid modifications recommended?
- Half of SLPs prescribe thickened liquids for ¼ to ¾ of patients with impaired swallowing