Swallowing Disorders and Nutritional Status: The Registered Dietitians' Perspective

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Introduction

The registered dietitian (RD) and the speech-language pathologist share a common goal: to optimize their patients' health and quality of life. Through mutual understanding and collaboration, we can achieve this common goal together. The following discussion is an attempt to present the nutritionists' perspective on the treatment of the dysphagic patient in order to foster increased dialogue and enhance the health care team approach to patient care.

The Role of the RD on the Health Care Team

An RD is a specially trained food and nutrition expert who has completed 4-6 years of American Dietetic Association (ADA) approved science-based training and has successfully passed the national Registration Examination for Dietitians (ADA, 2003). This extensive training allows the RD to serve as the nutrition expert on the health care team (ADA, 1998).

The primary tool used to communicate this expertise is the nutrition assessment. The RD completes nutrition assessments on all patients determined to be at high risk using information provided by the patient, the physician, nursing staff, rehab professionals, and laboratory professionals (ADA, 2000). Patients who experience swallowing difficulty warrant special attention by the RD—even if they have no other nutrition related problems, because of the potential impact on nutritional status (Mahan & Escott-Stump, 2000). When working with these patients, the RD relies on collaboration with the speech-language pathologist to optimize nutrient intake of appropriate consistency foods and beverages and to decrease dysphagia-related complications (Brody, Touger-Decker, Monhagen, & Maillet, 2000). Nutrition assessments serve as a useful tool for the speech-language pathologist, because they provide a clear and concise report of the patient's nutritional status and a plan of action that can be coordinated with the speech-language pathology plan.

The Nutrition Assessment

The nutrition assessment is the foundation of the individual nutrition care plan and involves the gathering and evaluation of pertinent information and the identification of nutrition problems. The information used in a nutrition assessment includes medical, social, nutritional, and medication histories; physical examination; anthropometric measurements; and laboratory data. The RD gathers this information through interviews with the patient, patient's family members, or other health care professionals; patient examinations and observations; and review of medical records. The RD evaluates this information to estimate nutrient requirements, determine a patient's nutritional status, and identify specific nutrition problems (Mahan & Escott-Stump, 2000).

Estimating Requirements (The Dietary Reference Intakes)

A standard nutrition assessment includes an estimate of nutrient requirements. The historical Recommended Daily Allowances (RDA) were based on the classic definition of a nutrient as a component of food that is required for normal growth and development but cannot be made by the body. A lack of this substance in the diet causes organ system or cell dysfunction that can be reversed upon reintroduction of the nutrient (Food and Nutrition Board [FNB], 1989). A revision and elaboration of the RDA is currently underway to reflect current scientific knowledge based on the contemporary definition of a nutrient as an adequately researched, safe component of food that, in addition to the classical definition, plays a role in prevention of chronic diseases. In 1993, the FNB of the Institute of Medicine (IOM), part of the National Academy of Sciences, presented a framework for the new Dietary Reference Intakes (DRI), which are designed to replace the RDAs (IOM, 1994).

The DRI is a set of nutrition guidelines for healthy people that includes the Estimated Average Requirement (EAR), the RDA, the Adequate Intake (AI) and the Upper Limit (UL). The EAR is the level of a nutrient that meets the needs of 50% of the population. The RDA is based on this level and is set at two standard deviations above the EAR at which point the needs of 97.5% of the population would be met. When there is insufficient information available to determine the EAR or RDA, an AI is set. The RDA and the AI are appropriate for use in setting individual nutrient goals. The UL is the highest level of daily intake of a given nutrient below which there is little to no evidence of adverse effects for the majority of healthy individuals (IOM, 1994). This level is particularly important when estimating intake of nutrients from supplements, which may provide

very large doses (Mahan & Escott-Stump, 2000). See Figure 1 for a graphic representation of the DRI. For more detailed information on the DRI, the full reports can be found at: http://www.iom.edu/IOM/IOMHome.nsf/Pages/FNB+FAQ+DRI.

Energy. Energy is derived from the three macronutrients: protein, carbohydrate, and fat. The RD calculates estimates of energy, protein, fat, and carbohydrate needs based on consideration of numerous factors such as gender, age, current height and weight with adjustments for obesity, physical activity level, degree and type of trauma or injury, infection, fever, digestive and absorptive capacity, medical history, and current medical status (Mahan & Escott-Stump, 2000).

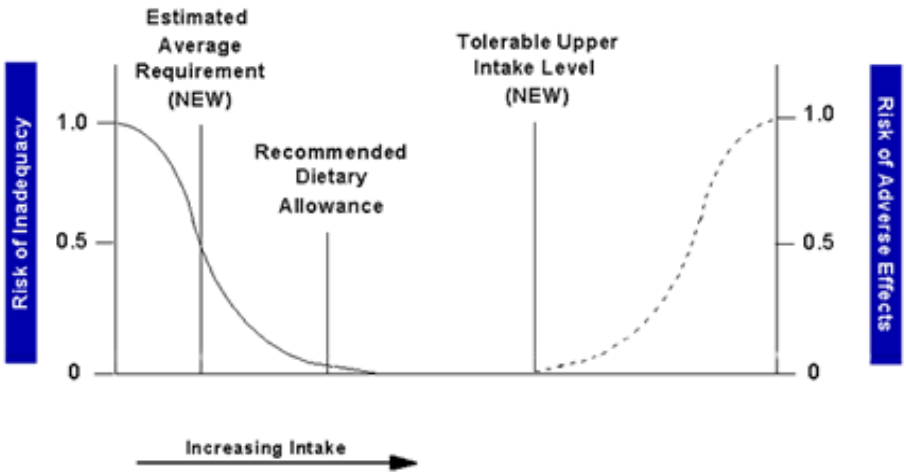
Macronutrients (Protein, Carbohydrates, and Fat). In some cases, the RD may indicate an appropriate macronutrient distribution to promote optimal health. For promotion of optimal health and disease prevention, the FNB recommends that individuals consume 45-65% of energy as carbohydrate, 20-35% as fat, and 10-35% as protein (IOM, 2002). The actual macronutrient distribution recommended by the RD depends on the patient's medical conditions. For example, a person with Type 2 diabetes would be advised to aim for a specified carbohydrate range, such as 45-55% of kilocalories (Mahan & Escott-Stump, 2000).

An estimate of protein requirements is considered of primary importance in the nutrition planning process as protein is required in sufficient amounts to promote optimal health. For a healthy, normal weight individual a level of protein at or above .8 gm/kg of bodyweight is considered adequate. This minimum protein requirement is adjusted, depending on life stage and certain medical conditions. Protein needs are higher per kilogram of body weight for infants, young children, and the elderly (IOM, 2002). Traumas such as fractures, open wounds, or infections increase protein needs. In addition, some medical conditions such as renal disease require that maximum levels for protein intake also be set (Mahan & Escott-Stump, 2000).

Fluid and Electrolyte Requirements. Dehydration and electrolyte imbalances are common threats to hospitalized patients and pose serious risks to recovery. Estimation of fluid requirements are determined based on many of the same factors discussed above, such as height and weight, age, gender, physical activity level, medical diagnoses, and medications. Providing fluid at or just above minimum needs is appropriate for most individuals because excess fluid will be excreted via the urine. However, individuals with chronic or acute renal insufficiency, congestive heart failure, or other diseases that alter fluid and electrolyte balance, must be monitored closely, and care should be taken to ensure that the patient becomes neither under nor over hydrated. In these cases, fluid needs are specified within defined boundaries, and intake is regularly monitored to avoid over or under hydration (Mahan & Escott-Stump, 2000).

Vitamin and Mineral Requirements. Estimations of vitamin and mineral needs are based primarily on review of biochemical data, medical history, and medications prescribed. Using the DRI, the RD can determine the level that would be appropriate for a healthy individual (IOM, 1998). However, many medical conditions and medications alter requirements for vitamins and minerals through changes in digestion and absorption, changes in metabolism of the nutrient, and changes in excretion. Each of these changes may serve to increase or decrease an individual's need for given nutrients (Stipanuk, 2000). The RD draws on knowledge of nutrient digestion, absorption, metabolism, and excretion; drug/nutrient interactions; and medical conditions to determine the patient's nutritional status in regards to given nutrients. When possible, the RD uses existing guidelines and peer reviewed literature to estimate an individual's requirement and to recommend certain interventions. For example, if the RD determines that an individual's iron needs are higher than what can be achieved from foods alone, as in the case of severe iron deficiency anemia, he/she may suggest a multivitamin/mineral supplement prescription from the MD (Mahan & Escott-Stump, 2000).

Figure 1. Dietary Reference Intakes (IOM, 1998)



Determination of Nutritional Status

Simply stated, nutritional status is "a measurement of the extent to which the individual's physiologic need for nutrients is being met" (Mayan & Escott-Stump, 2000, p. 353). The determination of nutritional status involves analysis of information to determine if nutrient intake is below, meets, or exceeds physiologic need. The methods and information used to determine nutritional status depend on the nutrient in question.

The primary focus of a determination of nutritional status is protein and energy status. The RD examines information on current weight and height, weight change over a defined time period, and select biochemical measures to determine level of depletion/repletion. Based on this assessment a diagnosis of kwashiorkor, nutritional marasmus, severe protein-calorie malnutrition, malnutrition of moderate degree, malnutrition of mild degree, or unspecified protein-calorie malnutrition may be suggested to the MD (American Society for Parenteral and Enteral Nutrition, 1993). The RD also examines other aspects of nutritional status, depending on the individual's current diagnosis and prior medical history.

Several biochemical measures are utilized by the RD to aid in the determination of nutritional status. Measures commonly used in the assessment of protein-energy status include albumin, transthyretin, and total lymphocyte count (TLC). Serum albumin is a common, relatively inexpensive test that is widely used in nutrition screening and assessment. Many of the diagnostic standards for protein-energy malnutrition (PEM) include albumin levels. However, albumin has a survival time of about 20 days, is sensitive to inflammation and stress and is buffered by a large extracellular pool making it difficult to interpret (Mahan & Escott-Stump, 2000). Thransthyretin, otherwise known as prealbumin, has a short half-life of approximately 2 days and has been shown to correlate with short-term changes in PEM, thus, making it a useful tool for monitoring changes in nutritional status. However, when using this test for screening purposes interpretation must be done carefully as this measure has many of the same problems as albumin (Mahan & Escott-Stump, 2000). Finally, the TLC is often used as a nonspecific clinical indicator of malnutrition. As with albumin and prealbumin, TLC is sensitive to inflammation or stress (Shopbell, Hopkins, & Shronts, 2001). In summary, these three measures of protein and energy status contain valuable information that requires careful interpretation with particular attention to medical conditions that involve inflammation or severe stress. The RD uses his/her training to carefully interpret these biochemical measures in order to accurately assess a patient's nutritional status.

The RD also uses numerous other biochemical measures for screening, classification, assessment, and monitoring of various nutrition related health issues. A complete review of all or even the most common measures used is beyond the scope of this article. The RD is trained to use biochemical measures in conjunction with the other forms of information mentioned above in order to determine a patient's current nutritional state and also to determine the diet recommendations that would optimize the patient's health. The expertise of the RD and the speech-language pathologist can best be coordinated through communication and collaboration at this point. The RD can look to the speech-language pathologist for a determination of appropriate diet consistency, and the speech-language pathologist can look to the RD for a determination of the most appropriate diet order and nutrition supplements. This collaboration draws on the strengths of the two professionals and provides the best possible care to the patient.

Assessing Nutrient Intake

When evaluating nutrient intake, the actual intake of nutrients must be assessed in order to determine if the patient's needs are being met. In a clinical setting, this is done through patient interviews (food recalls) or calorie counts. A food recall involves a series of questions about food intake with appropriate clarifying probes. A food recall can only be used if the patient is able to consistently and reliably report their food intake. If there is any question about the accuracy of the food recall or if the RD suspects that current intake is inadequate, a calorie count may be used. A calorie count involves detailed recording of all foods and beverages consumed by the patient over a 3-7 day period. These methods allow for an accurate estimation of average nutrient intake that can be used for nutrition care planning.

The RD and other nutrition staff also make meal rounds to monitor patient's preferences, acceptance, tolerance, and functional abilities, noting possible eating difficulties. If a patient has difficulty manipulating utensils and foods, coughs while eating certain consistencies, or has difficulty chewing certain textures, it will be documented and communicated to the health care team. In many institutions, the RD has authority to modify diet consistencies in a downward (more restrictive) direction (ADA, 2003). This is primarily indicated as a temporary safety measure, until a speech-language pathologist can perform an evaluation. In this way, the RD plays a valuable role in identifying patients at risk for dysphagia (Brody et al., 2000). RD and speech-language pathologist collaboration is crucial to safely

provide food and beverages of tolerable textures.

The RD also may adjust the nutrient composition of the diet within the scope of the current diet order. If it is determined that a patient is unable to meet his/her nutrient needs from the standard menu items, the RD may opt to provide commercial or in-house supplemental products of various textures and consistencies that comply with the speech-language pathologist's recommendation. Additionally, it is often possible to add nutrients to regular foods with the use of specialized supplements or food components, such as commercial protein powder or non-fat dry milk. This approach is helpful for the patient who desires to eat the foods provided, but has a difficult time consuming an adequate amount. It is important that the speech-language pathologist consult with the RD regarding the possible need for supplements as some supplements are contraindicated for certain medical conditions. As the nutrition expert, the RD can select the most appropriate product(s) to meet the patient's needs within the limits of the recommended diet consistency.

For many elderly patients, meeting fluid requirements is an issue. The mechanism to sense thirst declines with age, and the elderly patient may not perceive the need for fluids before they become dehydrated (Kleiner, 1999). Assessments of nutrient needs take into account this "forgotten nutrient." One commonly used rule of thumb is that if it is liquid at room temperature, then it is a fluid (ADA, 2000). Jello and ice cream clearly fit this description; however, the fact that they are often near-solid when consumed confuses many professionals as to whether they are true fluids or not. In addition, foods that are not liquid at room temperature, such as thickened liquids, fruits, puddings, and yogurt, still contain a significant amount of water, and their consumption may be taken into consideration when assessing fluid intake (ADA, 2000). It should be noted that patients with dysphagia who are restricted to thickened liquids are at particular risk for dehydration. This is often a result of poor intake, due to functional limitations or refusal of thickened liquids (Whelan, 2001). Thickened liquids do provide approximately the same amount of ingested free fluid as regular liquids, making it possible for patients with dysphagia to meet fluid requirements through thickened liquids alone (McLaughlin, 2001). However, care must be taken to maintain hydration in the case of a patient who does not tolerate or accept thickened liquids. Factoring in the water provided by non-liquid foods can prove helpful in establishing that fluid needs are being met (Kobriger, 1999).

When Nutrition Support is Indicated

The use of nutrition support is indicated for the patient who is unable to consume adequate nutrients by mouth. Enteral nutrition support involves the delivery of a nutritional formula to a part of the gut, while parenteral nutrition indicates delivery of nutrients directly into the bloodstream. A discussion of parenteral nutrition exceeds the scope of this paper; therefore, the focus here will be on enteral nutrition.

Generally, enteral nutrition support is preferred if the gastrointestinal tract is functioning. Nutrition support is critical to maintain or improve nutritional status in the patient who is unable to safely consume adequate nutrition by mouth. In the well-nourished patient who is expected to eat a full diet in the short term (7 to 9 days), nutrition support may not be necessary. However, if risk for malnutrition is high or if malnutrition is present, it is prudent to initiate nutrition support so that nutritional status does not worsen (Charney, 2001).

Several enteral nutrition support feeding devices are available. For the dysphagic patient who needs to receive enteral feedings on a short-term basis (e.g. one to two weeks), a nasogastric, nasoduodenal, or nasojejunal tube can be quickly inserted at the bedside. It is important to remember that providing nutrition via non-oral routes cannot prevent aspiration of oral secretions. In addition, aspiration of tube feedings can occur due to reflux. This problem is typically managed with appropriate body positioning and rate of flow. However, in severe cases, nasogastric or gastrostomy tube placements may be contraindicated due to tube feeding aspiration Instead, the duodenal or jejunal routes are preferred, because the formula is delivered postpylorically (into the small bowel), thus reducing aspiration risk (Huckabee & Pelletier, 1999). When using a nasal route of delivery, the tube size of 12-French or smaller will be most comfortable as will a flexible, soft tube. For longer term tube feedings (3 or greater weeks), a gastrostomy, transgastric jejunostomy or jejunostomy should be considered. The aforementioned feeding tubes all require physician placement surgically, endoscopically, or radiologically and so are more invasive than a nasally placed feeding tube. While all enteral feedings pose at least some aspiration risk, the patient with significant reflux and/or aspiration who needs longer term nutrition support may be best served with a jejunally placed feeding tube, rather than a gastrostomy (Minard & Lysen, 2001). When enteral nutrition support is indicated, selection of a feeding tube should be determined by the treatment team and the patient/patient's family to select the method that will meet the most requirements of the patient's needs and pose the least amount of risk to the patient's health.

Many commercial enteral products exist for use in tube feedings. Product selection is usually accomplished by considering the metabolic needs of the patient, availability of the formula, cost to potential benefit, and mechanical issues (tube size, clogging of tubes; Mahan & Escott-Stump, 2000). Additionally, facilities may have a contract with one particular vendor that limits product availability. The RD is trained to determine which product best suits a patient's needs. Once delivery of the formula begins, the patient will be monitored for tolerance to the formula and the impact of feeding on nutritional status.

Macro- and micronutrient needs are easily met by commercial formulas and specialized nutrient additions (e.g., protein powders). However, there is the potential to overlook the need for additional water. Although the majority of the tube feeding product is made up of water, it is still important for the RD to calculate the amount of water beyond that provided by the formula and IV fluids needed to maintain fluid balance. Any additional water can easily be delivered through routine water flushes, which not only help the patient to meet fluid needs but also serve to maintain the integrity of the feeding tube (Minard & Lysen, 2001).

Transitional feeding involves the simultaneous weaning from nutrition support and resumption of oral intake. As oral intake is resumed, the RD monitors nutrient intake in order to calculate appropriate reductions in enteral feeding. The goal is to end enteral feeding when a patient is able to meet at least 65-75% of their nutrient needs consistently (2 to 3 days) through oral feedings (Charney, 2001). One issue that arises when oral feedings are allowed is the possibility that as a result of the tube feeding the patient may not feel hungry enough to try to eat. Holding the tube feeding for approximately one hour before each meal can help to combat this situation. Alternatively, feedings may be changed to infuse at night only. The total volume of enteral feeding may be decreased as well; however, practitioners should take care to avoid decreasing the amount of nutrition provided so greatly that nutritional status is compromised. Discontinuing the tube feeding altogether should be avoided until consistent, adequate oral intake has been established. If the feeding is discontinued too soon and the feeding device removed, unwarranted risk may be posed to the patient's health. The specific diet order for transitional feeding is individualized and based on many factors, including the patient's medical diagnoses, swallowing ability, preferences, and diet tolerance (Charney, 2001; Mahan & Escott-Stump, 2000). The speech-language pathologist's ability to advise on appropriate consistencies during weaning is critical so that the RD may further tailor the food and beverage items provided to help ensure that nutritional needs can be met orally.

Conclusions

The RD uses the information, tools, and methods discussed above to develop nutrition care plans that are designed to optimize patients' nutritional status. When designing nutrition care plans for patients who suffer from swallowing disorders, the RD relies on the unique expertise of the speech-language pathologist. Therefore, in trying to optimize the health of patients suffering from swallowing disorders, it is imperative that the RD and the speech-language pathologist communicate effectively. This review is an attempt to enhance the quality of that communication by presenting the RD perspective on nutrition assessment and working with the patient with dysphagia.

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Continuing Education Questions

1. The Dietary Reference Intakes are a set of nutrition guidelines for healthy people. The two measures used in the nutritional assessment of individuals are

a. RDA and AI.
b. EAR and RDA.
c. UL and EAR.
d. EAR and AI.

2. Energy is derived from which of the following nutrients?

a. Vitamins, proteins, and fats
b. Minerals, proteins, and fats
c. Carbohydrates, proteins, and fats
d. Vitamins, carbohydrates, and fats

3. The biochemical measures, albumin, prealbumin, and total lymphocyte count are used in the assessment of

a. blood glucose control.
b. cardiovascular disease risk.
c. protein-energy status.
d. hydration status.

4. It is appropriate to discontinue enteral nutrition support (e.g. tube feedings) once a patient can safely consume _____ % of nutrient needs.

a. 20
b. 40
c. 60
d. 100

5. Thickened liquids are not considered appropriate sources of fluid to maintain hydration in the patient with dysphagia.

a. true
b. false

Therese O'Neil-Pirozzi, Column Editor

Student Abstracts

The purposes of this Student Abstracts column are:

1. To provide a mechanism for Division 13 affiliates to be updated on recent quality field-related research, and
2. To provide graduate students with an opportunity to identify a recent swallow-related research article of interest, review it, and abstract if for the division affiliates.

To date, students attending Arizona State University, Eastern Washington University, Edinboro University of Pennsylvania, Florida International University, Florida State University, George Washington University, Illinois State University, Louisiana State University Health Sciences Center (New Orleans), Louisiana State University Health Sciences Center (Shreveport), Louisiana Tech University, Northeastern University, Northern Arizona University, Southeastern Louisiana University, Southern Illinois University, Teachers College- Columbia University, University of Central Arkansas, University of Kansas, University of Memphis, University of New Hampshire, and University of Wisconsin- Madison have published abstracts in this column. **Please invite all of the graduate students who you teach and/or supervise** to consider taking advantage of this opportunity. The abstract guidelines are as follows:

1. Select a quality swallowing related experimental/prospective research article that has been published within the past 12 months;
2. Select an article from any journal other than *Journal of Speech, Language, and Hearing Research* and *American Journal of Speech-Language Pathology: A Journal of Clini-*