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## Malnutrition: Risks & Concerns in Dysphagia Management

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## Abstract

Malnutrition, particularly undernutrition, negatively affects health outcomes. Risk of malnutrition, often identified by a Registered Dietitian as part of a patient's dietary assessment, increases greatly in the presence of dysphagia. Patient characteristics that may be linked to malnutrition include advanced age, medical diagnoses, level of diet tolerated, actual calorie and protein intake, need for feeding assistance, weight changes, and quality of life issues. Many older adults may be malnourished at the time of their hospital admission or become so during the course of their medical care. Poor physical condition from malnutrition could negatively impact on a patient's rehabilitation potential. This article highlights possible causes and effects of undernutrition and the importance of nutrition strategies to patient care through a case study illustration.

Dietary management of the patient with dysphagia is multifaceted combining the expertise of numerous professionals including a registered dietitian (RD). As part of the initial intake and dietary assessment, the dietitian is positioned to identify concerns regarding malnutrition. Malnutrition is defined as an imbalance of nutrients and can result from both under- and overnutrition (Brown, 2010; Mahan & Escott-Stump, 2008). When the body's nutrient reserves are depleted or nutrient intake is inadequate to maintain daily metabolic functions, undernutrition develops. When an excess of nutrients is ingested resulting in overweight, obesity, or nutrient toxicity, overnutrition develops. Both under- and overnutrition have negative health consequences, but for the purposes of this discussion, the focus will be on the relationship between dysphagia and undernutrition, particularly for older adults.

#### Causes & Effects of Malnutrition

Many older patients who acquire dysphagia may have been malnourished prior to hospitalization. It has been found that as many as 40-60% of hospitalized older adults are malnourished or at risk for malnourishment and 40-85% of nursing home residents have malnutrition (Mahan & Escott-Stump, 2008). Contributing factors to malnutrition in the older adult include medications, depression, decreased sense of taste and/or smell, poor oral health, chronic diseases, and other physical problems that make eating difficult. Social causative factors include living alone, inadequate income, transportation difficulties and difficulty with grocery shopping and preparation of food.

Advanced age should trigger intensive nutritional screening and monitoring for symptoms of undernutrition at the time of hospitalization. Patients with existing undernutrition are at risk for many complications and undernutrition negatively impacts the body's response to new acute events. Malnutrition is associated with increased infection rates, emphysema, pneumonia, anemia, GI tract atrophy, intestinal bacterial overgrowth, increased postoperative complications, and hepatic mass losses (Escott-Stump, 2008). Tools have been developed to evaluate nutritional status of older adults. The Mini Nutritional Assessment (MNA) is an efficient and noninvasive method used by health professionals to detect risk for malnutrition based upon answers to questions and anthropometric (body) measurements (Vellas et al., 1999). Some triggers or "red flags" that indicate malnutrition or risk for malnutrition include: weight loss during the last three months, decreased food intake in the last three months, onset of acute disease in the last three months, presence of pressure sores, inadequate fluid intake, inability to self-feed, dementia or depression, and calf circumference. While anthropometrics such as Body Mass Index (BMI) and arm circumference should not be used as sole makers in older adults, when combined with the above "red flags", they contribute to the nutritional assessment. Some assessment tools use albumin, the most abundant plasma protein, as a marker of malnutrition when albumin is less than 3.0 grams per deciliter. However, the nutritional team must carefully monitor levels during stress and illness as albumin typically declines as part of the inflammatory response and may not be valid markers of nutritional status (Mahan & Escott-Stump, 2008).

Whether or not prior malnutrition contributes to dysphagia symptoms has been debated. Veldee and Peth (1992) suggested that protein-energy malnutrition (PEM) may contribute to the development of dysphagia by diminishing swallow function. Veldee postulated that the muscles involved in swallowing have a moderate to high percentage of type II fibers present because successful swallowing requires rapid contractions and short bursts of activity. Type II muscle fibers (fast twitch) are affected by PEM more than type I fibers (slow twitch). Therefore, Veldee claimed that deglutitive muscles may be among the first to atrophy due to reduced food intake resulting in reduced integrity of the swallow. In contrast, Cooper, Gates, and Darzins (2005) did not find any clinical data to support a causal relationship between PEM and dysphagia. Cooper et al. reported the lack of causal relationship could be due to frequent coexisting neurological states in older adults which influence swallowing and make it difficult to identify PEM as an independent risk factor for dysphagia.

There is much more evidence to suggest that dysphagia may contribute to PEM (Foley, Finestone, Woodbury, Teasell, & Greene-Finestone, 2006; Hudson, Daubert, & Mills, 2000; Rosenvinge & Starke, 2005; White, O'Rourke, Ong, Cordato, & Chan, 2008). A potential consequence of dysphagia is decreased nutrient intake which can result in weight loss, dehydration, and/or PEM (Germain, Dufresne, & Gray-Donald, 2006; Hudson et al., 2000; Wieseke, Bantz, Siktberg, & Dillard, 2008; Wright, Cotter, Hickson, & Frost, 2005). Protein-energy malnutrition can lead to life-threatening conditions such as pneumonia, infections related to decreased immune function, respiratory and cardiac insufficiency, decubitus ulcer formation and altered gastrointestinal function.

## Case Illustration

The following case study is based on a composite of patients with dysphagia in a hospital setting and is used to illustrate the many factors that predispose a patient with dysphagia to malnutrition. There is also discussion of strategies that can lessen the likelihood of malnutrition and the associated consequences.

Mr. Webster is an 85 year old male admitted to the hospital after suffering a stroke. Prior to his stroke, Mr. Webster consumed a regular diet but had exhibited decreased food intake and gradual loss of weight over the past six months. The speech-language pathologist recommended diet modifications (nectar thick liquids and pureed diet) on the 2<sup>nd</sup> day of his hospital admission following assessment of his swallowing function. Mr. Webster was placed in swingbed status, which allowed for an extended length of stay for rehabilitative services. Although he progressed, Mr. Webster continued on some level of dietary modification and he required assistance while eating. Mr. Webster's admitting weight was 215#. On day 7, the patient's weight was 211#. On day 14, Mr. Webster's weight was 206#. By the 3<sup>rd</sup> week of the hospital admission, his weight appeared to stabilize at 202#.

Mr. Webster's weight loss in the hospital was a concern. In the first three weeks, he had an unintentional 5% weight loss. Based upon body weight, malnutrition is defined as 10% unintentional weight loss in six months, 7.5% in 3 months, or 5% in one month (Mahan & Escott-Stump, 2008); therefore, Mr. Webster was assessed as malnourished. A

second method of defining malnutrition is based upon the patient's current weight as a percentage of usual body weight (UBW). Patients with a weight less than 74% UBW have severe malnutrition, those with 75-84% UBW have moderate malnutrition, and patients with 85-90% UBW have mild malnutrition (Mahan & Escott-Stump, 2008). Based upon the patient's self-reported UBW of 225# over the past few years, Mr. Webster was 90% his UBW at the end of three weeks. This level of weight loss significantly impacted his level of energy and ability to participate in therapy sessions, which included speech-language services, occupational, and physical therapy (Finestone, Greene-Finestone, Wilson, & Teasell, 1996). The associated fatigue also decreased oral intake which amplified the level of undernutrition.

A number of risk factors contributed to Mr. Webster's previous and current nutritional status and risk for malnutrition. One consideration is Mr. Webster's age. Sensory loss is common in the aging process and when combined with dysphagia, may result in limited food intake and food enjoyment which can lead to unintentional weight loss, compromised immune function, and malnutrition (American Dietetic Association, 2005).

Also consider Mr. Webster's medical diagnosis of stroke. The rate of malnutrition in patients who have strokes vary with a reported incidence of 16% of patients presenting with malnutrition upon admission, to 26.4% with malnutrition after one week, and 35% after the second week of admission (Davalos et al., 1996). Even early aggressive enteral nutrition did not prevent malnutrition developing during the first week of admission for patients with impaired swallowing. Researchers reported that malnutrition was associated



with increased stress reaction during the first week, a higher frequency of infections and decubitus ulcers, greater mortality, worse outcome, and lengthened hospital stay.

Finestone, Greene-Finestone, Wilson, and Teasell (1995) reported that 49% of patients admitted to a stroke rehabilitation unit were malnourished upon admission. They reported the highest probability of malnutrition for patients who had a history of diabetes or stroke or who were on tube feeding during acute services indicating patients with severe dysphagia. A Food Trial Collaboration study followed patients who had strokes over a six month period of time. Of the undernourished patients, 37% died by six months compared to 20% of patients with normal nutritional status. The undernourished patients were more likely to develop pneumonia, other infections, gastrointestinal bleeding, and pressure ulcers (FOOD Trial Collaboration, 2003). Dysphagia after an acute stroke is common with a reported incidence of 53 to 57% (Crary, Carnaby-Mann, Miller, Nader, & Silliman, 2006; Reunions, Rodrigue, & White, 2004). The odds of a patient who has a stroke becoming malnourished are much higher among adults with dysphagia than patients with intact swallowing (Foley, Salter, Robertson, Teasell, & Gail Woodbury, 2009).

Mr. Webster's need for assistance while eating is of additional importance. Westergren, Karlsson, Andersonn, Ohlsson and Hallberg (2001) found that 80% of patients in stroke rehabilitation had difficulties eating including 52.5% who were unable to eat without assistance; 32% of these patients were undernourished. Fatigue, motor impairment, altered visual perception, depression, and cognitive deficits may be additional contributing factors (Foley, Martin, Salter, & Teasell, 2009).

During the course of his hospitalization, Mr. Webster received a modified diet. Studies have indicated that patients on texture modified diets may only meet 45% of their energy requirements (Wright et al., 2005). Wright and colleagues compared texture modified to regular diets. None of the patients consuming texture modified diets met their energy needs compared to almost half the patients on a regular diet. Additionally, 93% of patients on the texture modified diet failed to meet their protein requirement compared to 40% of patients on a regular diet. The authors felt that contributing factors to decreased intake included eating difficulty, less food choices, fewer palatable foods, poor food presentation, the lack of a dysphagia snack menu, and the fact that texture modified diets are typically lower in energy and protein due to the dilution of foods to achieve a target consistency.

A more aggressive nutritional approach of providing enteral nutrition may be necessary for patients unable to consume adequate calories and protein orally for an extended period of time. Foley et al. (2006) reported that patients receiving enteral nutrition had significantly higher energy and protein intakes compared to patients receiving a dysphagia diet. Likewise, Finestone et al. (1995) reported that none of the patients who received enteral nutrition during their entire first month at a cardiac rehab unit continued to be undernourished. However, quality of life must be addressed when determining whether or not a patient should receive enteral nutrition which is considered an invasive procedure. Clinicians must consider how quickly the patient is advancing with therapies and the potential for improved oral intake.

## Nutrition Strategies

The RD can implement strategies to increase the energy and protein content of textured modified foods. The addition of extra margarine, oils or other fats to foods, particularly pureed foods, should be considered. The addition of proteins such as non-fat dry milk to foods may also increase the protein content though care must be taken to ensure the foods remain palatable. Additionally, sweeteners can be added to appropriate foods.

Supplements should also be considered with meals and as snack options. A novel diet using reformed pureed or minced foods for patients which also offered patient menu selections resulted in increased energy (44%) and protein intakes (54%) of patients with dysphagia. The patients on the novel diet also had increased weight compared to the control group which lost weight (Germain et al., 2006).

Another consideration for the patient with dysphagia is feeding assistance. Wright et al. (2008) reported that individualized feeding assistance resulted in higher energy and protein intakes from both meals and supplements. The intervention group (who received assistance) consumed approximately 80% of their energy requirements which was almost twice that of the control group (42%). The nutritional supplements, typically high calorie and protein beverages, provided the intervention group with approximately one-third of their total energy and protein intake.

With regard to Mr. Webster, efforts were made to increase his total energy and protein intake through the addition of fats and non-fat dried milk to the appropriate pureed foods.

Mr. Webster was also offered and encouraged to consume a high calorie/high protein nutritional supplement twice a day. Initially, Mr. Webster was consuming only 40% of his modified diet. He was consuming less than half his estimated energy and protein needs thus placing him at risk for complications of undernutrition. His wife was enlisted to help improve his intake. She began assisting him with all meals and his intake improved to 100% on a regular basis. At the end week three, Mr. Webster was maintaining his weight and no further weight loss occurred between week three and week four.

An important concept to remember is that food brings comfort and pleasure at all stages of life, even when experiencing illness. As noted by Winkler (2010, p. 170-71), “the act of eating is both physiological and symbolic. Through food we express prosperity, good health, strength, and love. Through food we obtain psychological comfort and hope. Through food we evoke emotions both from taste, texture, and social meanings.” Ekberg, Hamdy, Woisard, Wuttge-Hannig, and Ortega (2002) reported that 84% of patients with dysphagia felt eating should be an enjoyable experience yet only 45% found it so. Health professionals involved in the care of patients with dysphagia should talk to patients about the social and emotional aspects of eating in addition to the calorie and nutrient content of food. Health professionals should understand how food plays a role in a patient’s quality of life and provide the safest diet that maximizes that potential. For the patient with dysphagia, coordination of care between the RD and the SLP, along with other health disciplines, is extremely important. Timely multi-disciplinary intervention can prevent or improve the complications of dysphagia and undernutrition.

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