

Clinical Management of Swallowing Disorders

SIXTH EDITION

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Preface

Clinical Management of Swallowing Disorders, Sixth Edition, has been a core textbook for the past 19 years. The sixth edition brings to the student and clinician current information from early birth to the older adult. The sixth edition is updated with added full-color images, video examples of normal swallowing, and selected examples of patients with swallowing disorders. Additional tables were added to coincide with anatomical images. This text addresses the needs of students who will treat swallowing disorders as well as those clinicians who currently treat swallowing disorders in hospitals, rehabilitation centers, nursing homes, and private outpatient clinics. The text emphasizes team management, evidence-based practice, swallowing safety, nutrition, behavioral treatments, and management by speech-language pathologists (SLPs) for patients across the lifespan. This edition updates current thinking and treatment of swallowing disorders.

The essential aspects of dysphagia diagnosis and treatment are presented in a format that both beginners and clinicians needing a practical update on dysphagia will find useful. Because of our continuing teaching, clinical, and research involvement in swallowing disorders at major teaching institutions, we saw a need to revise and update the text that continues to be accepted well by clinicians, students, and teachers since its inception. This book addresses clinical issues at the current level of clinical understanding and evidence. The material contained in the *Clinical Management of Swallowing Disorders, Sixth Edition*, derives from a vast storehouse of recent knowledge and academic pursuits, along with our daily experiences from our multispecialty swallowing disorder clinics and research activities. Since the fifth edition was published, new evidence has demonstrated the importance of early intervention and aggressive treatment of dysphagia. Outcome data are now available to show the importance of proper assessments and treatments to deter and prevent aspiration and improve patients' quality of life. The sixth edition addresses clinical issues through clinical evidence and case studies. We distilled the complexity of the pathophysiology of dysphagia to a practical level that can be absorbed by students and clinicians. Practical treatment options for a wide variety of swallowing problems with medical, surgical, behavioral, and combined treatment models are concisely presented.

Throughout the book, certain terms are highlighted. These terms, which are fundamental to the understanding of swallowing, are briefly explained in the text, and many of the terms are further expanded in the Glossary. However, the reader may

want to pursue these in greater depth, thus the reason for highlighting them. We tried to maintain the focus on treatment of swallowing disorders and purposely avoided long discussions on the causes and complications of many neuromuscular diseases and neurological conditions that result in dysphagia. Rather, once the student studies the anatomy and physiology material presented in the third chapter, they can focus on the essentials of assessments and treatments of swallowing in their patients.

Patient vignettes are now included in every chapter to give extended examples of who the patient is and how the patient came to have the problem that is discussed.

We now work in 3 separate universities, but we continue to share a philosophy that focuses on a multispecialty treatment approach based on sound research, where available, consistent clinical methods, and review of the outcomes of treatment to enhance future clinical care. In most chapters, video examinations of case examples are provided.

Chapter 1 presents the clinical scope of dysphagia—what is the spectrum of dysphagia, the indications for assessment, intervention, the importance of treating dysphagia, and the relationship of dysphagia to associated medical conditions. A review of the extent of swallowing disorders in hospitals, nursing homes, and otherwise healthy individuals is provided. Video examples of normal swallowing are part of this chapter. There are almost no medical conditions or diseases in which swallowing disorders do not occur. While many swallowing disorders may be temporary, the need to intervene early and address them must be considered in light of the primary disease or disorder.

Chapter 2 was revised again with additional color illustrations that present an in-depth review of the basic organs of swallowing. This chapter reviews the essential anatomy and function of the swallowing mechanism. We chose to present a summary of normal swallowing anatomy along with the contributions of the cranial nerves to add to the anatomical and neuroanatomical description of swallowing in keeping with the clinical focus of this text. The contributions of the cranial nerves are presented in color illustrations and tables that the clinician can easily access for later use. In the sixth edition, the current understanding of the interaction of the

phases of swallowing is discussed. In this addition, the role of the sensory nervous system has been given more attention than in past editions.

Chapter 3 was extensively revised to focus on swallowing disorders arising from neurological disorders. Chapter 3 provides current reviews and descriptions of swallowing disorders that arise from various neurological and head and other neck disorders and diseases. Definitions of aspiration and aspiration pneumonia are given. An updated list of diseases with their associated swallowing problems along with video examples is found in this chapter. An array of tables accompanies this chapter, which provides quick access to diseases and disorders and the swallowing problems associated with these disorders. In addition, the effects of medication on swallowing are discussed. This chapter was shortened, and the SLP's role in the treatment of head and neck cancer was moved to Chapter 4.

In *Chapter 4*, we present an updated overview of swallowing disorders arising from surgical interventions. The effects of surgery to the head, neck, and upper airway are likely to produce a swallowing disorder. With the increasing number of in-office and operating room surgical procedures, there is a greater need to understand those procedures and how they will affect swallowing in the short and long terms. While many of these problems are temporary, the swallowing team must acutely manage them. A new feature of this chapter includes sections describing the role of the SLP once surgery has been completed. The authors relate their daily experiences in the team management of these disorders. Long-term swallowing disorders arising from oral cancer or skull base surgical procedures require extensive management with both the otolaryngologist and the SLP working together to offer the patient the best pathway to improved swallowing. Indications for aggressive and conservative rehabilitation treatments and follow-up management are presented in this chapter.

Chapter 5 focuses on the clinical swallow evaluation (CSE), the starting point for swallowing management. We begin this chapter with an extensive review of commonly used clinician-based screening protocols and patient self-assessment tools. Along with the interview and case history, these then become the basis for subsequent testing and man-

agement. The different components of a full CSE are then described in the sequence of how they may appear in a typical evaluation session. The oral examination is presented in greater detail in the typical order of administration. A sample CSE recording form is included in Appendix 8. Students will want to use this chapter as part of their daily swallow assessments. While the CSE is rarely the only evaluation of swallowing, it is an essential first step in the management process. Moreover, our experience with the CSE has led us to identify appropriate instrumental tests to be done subsequently to identify additional tests and consultations early in the treatment process.

Chapter 6 focuses on the current instrumental evaluations of swallowing. Importance is placed on the indications for instrumental tests and criteria for test selection. We updated the procedures and recommendations for different instrumental tests based on recent evidence. Video examples of the modified barium swallow examination and flexible endoscopic examination of swallowing are included to illustrate the use of these instruments. Descriptions of additional instrumental examinations added include high-resolution manometry, tongue pressure testing, electromyography, and ultrasound. Testing for gastroesophageal reflux and upper esophageal reflux is described, and new tests for these are reviewed.

Chapter 7 presents the nonsurgical treatment approaches to swallowing. This chapter starts with a revised introduction to evidence-based practice and a multidisciplinary approach to swallowing therapy. The revisions are based on the most current information that has developed since the fifth edition was published. Techniques are divided in compensatory swallowing therapy and rehabilitative swallowing therapy. Since the majority of treatments for swallowing disorders are nonsurgical, this important chapter outlines exercises for improving oral motor strength, bolus propulsion, and swallowing safety. Extensive references to evidence for various procedures are provided. Recent developments in the use of electrical stimulation and cortical neuro-modulating methods are reviewed and discussed in light of new evidence for their use.

Chapter 8 addresses nutrition and the collaboration with nutrition specialists. The importance of working with a registered dietitian is now high-

lighted in light of the various food options and food consistencies for patients. A unique aspect of this chapter is the explanation of the properties of liquids and foods that clinicians can understand. The introduction to rheology as a characteristic of foods and liquids is presented. Although the terms may be new to the SLP, they are part of the everyday language in a swallowing clinic. The latest framework for foods and drinks developed by the International Dysphagia Diet Standardization Initiative is fully described with current evidence. Nonoral feeding methods are also presented with current evidence. Malnutrition and dehydration, 2 factors that affect recovery from dysphagia, are discussed in relation to specific populations.

Chapter 9 is revised from the previous edition. This chapter focuses on the aging population, including the physical, cognitive, and swallowing changes that occur. Both healthy aging and aging disorders are addressed. The latest evidence and clinical guidelines on how to manage nutrition for individuals with dementia are described in Chapter 9. Specifically, careful hand feeding and feeding assistance strategies are presented in detail.

Chapter 10 is the first of 3 chapters that comprise infant and pediatric feeding and swallowing disorders. In Chapter 10, dedicated focus is paid to human lactation and its interaction, nourishing a child from birth. The delicate interplay of lactation and infant feeding skills is outlined. When children are unable to directly nurse due to dysphagia, alternative feeding plans are depicted. The reciprocal relationship between milk production and infant feeding performance is illustrated with augmentative treatment plans, often involving a breast pump and bottle feeding. Interventions among premature, healthy term infants and those with medical complexity are provided.

Chapter 11 is revised and expanded from the fifth edition. This revised chapter provides the most up-to-date information that SLPs and other caregivers will find essential to understand the current infant and pediatric assessment techniques. It depicts tenants of structural and functional elements that impact nutrition. For infants, there is a focus on precise respiratory timing while sucking and swallowing. Typical and atypical solid food introduction is described in the setting of dysphagia.

This is framed in the context of caregiver involvement and the child's intellectual status. The value of instrumental studies and subsequent collaborative treatment plans among multidisciplinary teams is discussed.

Chapter 12 is devoted to the treatment of feeding and swallowing difficulty spanning birth to adolescence. It guides the reader through multidisciplinary and family engagement to optimize outcomes. Specific interventions related to growth faltering, sensory disorders, and aspiration are outlined. For children who enter treatment with severe dysphagia and feeding tubes, clinicians are guided through preswallowing therapy targets. Family resources are illustrated, including virtual peer support, dysphagia exercise demonstrations, and lectures by clinical experts.

Chapter 13 presents our philosophical approach to the organization of a multidisciplinary swallowing center. Case examples of patients with dysphagia show how a multidisciplinary team works in a comprehensive swallowing center. The diagnosis and treatment may involve treating swallowing and voice disorders concurrently. The center combines clinicians with various training and interests who come together to manage swallowing and voice disorders in one center. Cases are presented to show the value of a comprehensive swallowing center. The contributions of the SLP and otolaryngologist in the diagnosis and treatment phases are described. The concept of a unified center implies efficiency, comprehensiveness, and timeliness in the clinical management process of patients who will benefit from a combined management approach.

A *Glossary* is included and expanded from the fifth edition of *Clinical Management of Swallowing Disorders* to help the beginning swallowing therapist quickly find important terms. The Glossary in the sixth edition was completely revised and

includes expanded explanations of the terms as they relate to swallowing and other diseases.

This textbook originally evolved from our clinical and research interests to improve the treatment of swallowing disorders and from our daily involvement in treating those disorders emanating from a variety of medical conditions, diseases, and disorders. We translated our teaching, research, and clinical experiences into each of the chapters that contain information that we continue to draw on daily. The *Clinical Management of Swallowing Disorders, Sixth Edition*, offers the student and the practicing clinician a textbook of the current procedures for the diagnosis and treatment of pediatric, adult, and aging disorders of feeding and swallowing.

A FINAL NOTE

Clinical Management of Swallowing, Sixth Edition, was in revision following the height of the COVID-19 pandemic. We extend our sincere thanks to those who have been working on the front lines of the pandemic and afterward for their efforts to improve swallowing and communication among patients, medical personnel, and other caregivers. Although management of COVID-19 is changing rapidly, we offer the following websites to our readers and colleagues that they may keep abreast of those changes over time. The websites that follow have produced timely updates regarding testing and treatment of swallowing and communication problems:

<https://www.asha.org/about/coronavirus-updates/>

<https://www.dysphagiaresearch.org/page/COVID-19Resources>

Video List

Chapter 1

Video 1–1. Normal flexible endoscopic evaluation of swallowing.

Video 1–2. Normal modified barium swallow examination (also known as videofluoroscopic examination of swallowing).

Video 1–3. Flexible endoscopic evaluation of swallowing of a patient with a history of dysphagia.

Video 1–4. Modified barium swallow showing a trace of the barium flowing down into the airway after the majority of the bolus is swallowed.

Chapter 2

Video 2–1. Patient with difficulty initiating the proper sequence, resulting in significant pooling of the bolus.

Video 2–2. Videofluoroscopic examination of swallowing of a patient following cerebrovascular accident.

Chapter 3

Video 3–1. Penetration obtained during transnasal flexible endoscopy.

Video 3–2. Aspiration and cough.

Video 3–3. Flexible endoscopic evaluation of swallowing with aspiration and no cough and the bolus at the level of the larynx.

Video 3–4. Videofluoroscopic examination of swallowing with silent aspiration.

Video 3–5. Cerebrovascular accident, right vocal fold paralysis, poor cough, and poor laryngeal elevation.

Video 3–6. Patient with midstage Parkinson disease working to achieve a swallow.

Chapter 4

Video 4–1. Videofluoroscopic study with the residue of food in the mouth after each swallow.

Video 4–2. Patient with partial glossectomy attempting to swallow with the bolus in the front of his mouth.

Chapter

1

Introduction to and Epidemiology of Swallowing Disorders

CHAPTER OUTLINE

Introduction

Swallowing

Normal Swallowing

Abnormal Swallowing

*Impact of Swallowing Disorders on Quality
of Life*

Aspiration

Dehydration

Malnutrition

Weight Loss

Types of Pneumonia

*Related Impacts of Swallowing Disorders on
Quality of Life*

General Health

Psychological Well-Being

Financial Well-Being

Voice Disorders

Need for Early Intervention

Quality of Life

Epidemiology

*Cerebrovascular Accidents and Neurological
Diseases*

Dementia

Older Adult Population

Head and Neck Oncology

Hospitalized Patients

Nursing Home Residents

Cardiac-Related Conditions

Gastroesophageal Reflux and

Laryngopharyngeal Reflux

*Conditions Leading to Swallowing Disorders**Burns**Muscle Tension Dysphagia*

Biomedical Ethics: Principles and Practices

Summary

Discussion Questions

Study Questions

References

A Look at the Chapter

In this chapter, normal and disordered swallowing are defined using figures, tables, and video examples. Terminology is reviewed as it relates to normal and abnormal swallowing. The direct and indirect impacts of a swallowing disorder on quality of life are presented, and tools for assessing quality of life are introduced. Those tools are more specifically reviewed in Chapter 5. We also introduce the importance of patient self-assessment as a tool for better understanding the patient's perspective of dysphagia. This is followed by the epidemiology of swallowing disorders. Epidemiology refers to both the prevalence and cause of a disorder. In this chapter, we focus on the prevalence. Specific causes of dysphagia are taken up in later chapters.

INTRODUCTION**Swallowing**

What other human activity other than swallowing excites all of the 5 senses: taste—sweet or sour; touch—crusty, chewy or smooth; smell—spicy or tangy; sight—berries and ice cream; and hearing—bubbling or crackling?

And, at many points in the act of swallowing, the senses act in harmony—the sight, smell, and taste of a large fresh orange or the hearing, touch, and crunch of a fresh potato chip, just to name of few.

The allure of a bakery or hot dog stand may entice you to stop and enjoy a croissant or a hot dog smothered in mustard, onions, and ketchup. Or, it may just make you salivate and swallow. All of these sensory stimulations are sent to the brain that then coordinates swallowing activity when you pass by that bakery or hot dog stand. The brain organizes a sequence of actions that lead you to go into the pastry shop, buy that croissant, and enjoy the taste of each flaky bite.

What happens when you bite into that croissant? The body's neuromotor systems go to work. For a normal swallow, the lips, teeth, tongue, pharynx, and esophagus must be coordinated for the food to pass into the stomach. Actions are going on all of the time once the food or liquid is placed near the lips. The integration of the lips opening, the jaw dropping, and the tongue finding its place require fine and rapid activity in the neuromotor control systems. The sensory system joins the motor system that results in an amazing set of actions that take place in a matter of seconds (or faster!). At the same time, the pleasure of that bite is preparing you for the next bite. Almost magic? Not quite. The normal act of swallowing develops in utero and evolves as we are exposed to new tastes, smells, consistencies, and visions of foods and liquids.

Throughout this textbook, the reader is challenged to think of swallowing as a collection of overlapping events; by exploring the details of each of these events, one can appreciate the importance of normal swallowing and understand the conditions and diseases that lead to abnormal swallowing. This textbook explores the sensory and neuromotor actions of normal and disordered swallowing and the clinical management of abnormal swallowing.

Let's begin with a general introduction to normal and abnormal swallowing.

Normal Swallowing

The anatomical structures of the swallowing mechanism can generally be divided into 3 major areas:

(1) nasopharynx, (2) oropharynx, and (3) hypopharynx.¹ The major structures of the swallowing mechanism are shown in Figure 1–1. Interactions within and between each of these divisions takes place to allow the food to move from the mouth to the esophagus and into the stomach.

The normal swallow is a rapid and overlapping sequence of neurologically controlled movements involving the muscles of the oral cavity, pharynx, larynx, esophagus, and stomach. Although most individuals take normal swallowing for granted, everyone experiences an abnormal swallow at some time in life, most likely resulting in an episode of a sudden choking sensation. However, in a normal, healthy person, this is usually resolved quickly by a cough or throat clearing.

When the muscles and nerves that govern the swallowing organs are disordered, disrupted, damaged, or destroyed, swallowing function is altered. However, neuroplasticity allows for adaptations when normal structures are destroyed. The swallowing organs and their ability to develop compensatory strategies in individuals with neurological or muscular damage to the swallowing organs can still swallow certain types of foods and liquids safely. Video 1–1 shows an example of a normal flexible endoscopic evaluation of swallowing (FEES). Video 1–2 presents an example of a normal modified barium swallow (MBS) examination. (MBS is also known as a videofluoroscopic swallow study [VFSS].) Note the fluid movement and the speed of the bolus as it travels to the esophagus.

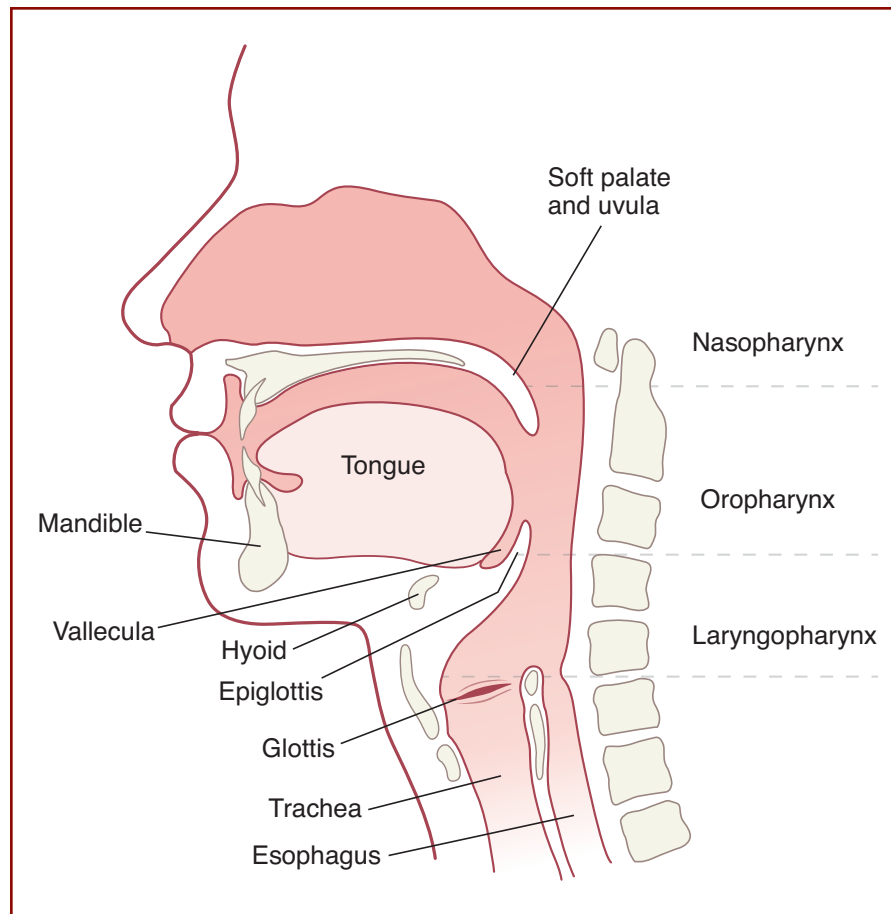


FIGURE 1–1. An overview of the nasopharynx, oropharynx, and laryngopharynx. Below shows the area of the larynx from the epiglottis anteriorly to the esophageal sphincter posteriorly.



A video description of the normal and abnormal swallowing processes can be found at <https://swallow.edu.hku/nsns/>

Abnormal Swallowing

Abnormal swallowing includes difficulty with swallowing or the total inability to swallow, referred to as dysphagia and aphagia, respectively.

*The global definition of **dysphagia** is simply “difficulty in swallowing.”*

When someone cannot swallow at all, the term *aphagia*, or “inability to swallow anything,” is used. The terms *dysphagia* and *aphagia* refer to swallowing saliva, liquids, foods, and medications of all consistencies. Dysphagia may also include such problems as foods or liquids “sticking” in the throat or regurgitation of swallowed liquids or foods. Swallowing difficulties may arise from mechanical problems of the swallowing mechanism, neurological disorders, gastrointestinal disorders, or loss of organs due to surgery or traumatic injury. Dysphagia and aphagia may also involve the disruption of the timing of the events needed to swallow normally. Dysphagia may also include one’s perception of difficulty swallowing.

Video 1–3 is a FEES of a patient with a history of dysphagia. Note that the food that is colored green remains in the area above the vocal folds and is not swallowed. It may ultimately be aspirated (fall below the vocal folds) if the patient does not cough it out. Video 1–4 presents an example of an MBS showing a trace of the barium flowing down into the airway after the majority of the bolus is swallowed. In a patient with a weak cough or pulmonary disease, this can lead to aspiration pneumonia.

Impact of Swallowing Disorders on Quality of Life

It is estimated that in the United States alone, 300,000 to 600,000 people with clinically significant

dysphagia are diagnosed annually.^{1,2} Nearly 70% of these patients are older than 60 years of age.² The true incidence of dysphagia may not be known, as it is often a secondary or tertiary diagnosis following a primary diagnosis. Since dysphagia is a *symptom*, it is often not listed as the principal diagnosis if the physician has only documented the underlying cause. However, according to the *International Statistical Classification of Diseases, Tenth Revision (ICD-10)*, the appropriate code for dysphagia can be listed as a secondary diagnosis following a stroke, esophagitis, and other diseases of the neurological system or gastroesophageal pathway.³ Swallowing disorders, even when subtle, eventually take a toll on the quality of life. Because eating is a natural part of social interactions, daily nutrition, and general health, the importance of normal swallowing cannot be overstated. Swallowing affects quality of life in a number of ways, regardless of the severity of the problem. Table 1–1 summarizes common effects that dysphagia has on the quality of life.

Aspiration

Aspiration is a condition in which foods, liquids, pills, or oropharyngeal secretions pass into the airway below the level of the true vocal folds. This happens occasionally to most people; but in the absence of injuries to the muscles or nerves of swallowing, most people have the ability to sense the food or liquid in the airway and cough it out. When there is an injury or damage to the swallowing mechanism and aspiration is frequent or extensive, there is a higher risk of lung infections, dehydration, and malnutrition, and the enjoyment of eating diminishes; thus, quality of life also diminishes.^{4,5}

Dehydration

Dehydration is the state when there is not enough water in the body to maintain a healthy level of fluids in the body’s tissues. Even in an otherwise healthy person, the lack of adequate water intake can lead to dehydration. Water is an essential element for all individuals as it replaces fluid losses from bowel movements, urination, and general physical exercise. A general rule of thumb is to replace body fluids with 3 quarts of water per day or, more specifically,



TABLE 1–1. Effects of Dysphagia on Quality of Life

A. Functional Limitations
1. There may be limitations on the types of food that a patient can swallow safely.
2. Patients may be limited to a specific diet of foods that they do not like.
3. Swallowing and finishing a meal may take longer.
4. Oral structures may limit the types of food able to be swallowed.
5. Some foods may cause the patient to choke.
6. Awareness due to either visual or conscious limitations may restrict eating.
7. Gastric structures or functions may limit the amounts or types of foods.
B. Activities and Participation
1. Patients on a nonoral diet may be reluctant to attend events where food is served.
2. Foods related to culture or religion may not be available to the patient.
3. The ability to hold and use a straw or utensils may limit eating/drinking.
4. The ability to eat in a group setting may limit activities.
5. The ability to prepare meals may reduce food intake.
C. Environmental Factors
1. Changes in room lighting or sound may limit eating.
2. Proper eating arrangements may be limited due to room spaces.
3. Eating in public may present unwanted attention.
4. Use of personal care providers may be needed during mealtimes.
5. The ability to prepare food may be limited.

with an amount equal to half of the body weight. For patients with neurological impairments who may be at risk for aspiration when swallowing liquids, fluid intake may require constant monitoring. Other factors, such as medications that have dehydrating side effects, as discussed in Chapter 3, and dryness due to treatment with radiation therapy, will also impact one's ability to swallow. For example, when there is not enough natural saliva in the mouth, chewing becomes more difficult, food does not easily form a bolus, and particles may break apart and require multiple swallows. Payne et al reported that patients with dysphagia are at high risk for dehydration, which represents a common cause of morbidity and rehospitalization in this group.⁶ Patients with dysphagia should be evaluated frequently for signs of dehydration, and if present, further evaluation of other nutritional deficiencies may be warranted.

Malnutrition

Malnutrition is the condition that occurs when your body does not get enough nutrients due to the inability to ingest food safely, the reluctance to eat or fear of eating/drinking due to past swallowing problems, or the inability to digest or absorb ingested nutrients. Once a person is unable to ingest food safely, that person's ability to maintain health decreases. This is especially important for patients who are recovering from extensive surgeries, strokes, or other debilitating diseases and will require extensive rehabilitation.⁷ Once malnutrition develops, its treatment may be as important as any other part of the rehabilitation process. Recovery from malnutrition has been shown to help in the rehabilitation process, including in the treatment of dysphagia, leading to improvement in the patient's quality of

life.⁶ The specifics of nutrition are reviewed in Chapters 8 and 9.

Weight Loss

Weight loss can be tragic: Randy Schmidt wrote a biography of Karen Carpenter, a famous pop singer who died at the age of 33 years due to self-imposed weight loss (anorexia nervosa) followed by a heart attack. His book Little Girl Blue: The Life of Karen Carpenter, tells of the tragedy of weight loss and the causes that bring it about.

There is a great preoccupation with weight loss in our society. Extensive weight loss either induced or without reason requires attention from the dysphagia team. Significant weight loss is associated with the loss of muscle mass, which may produce weakness severe enough to change the daily activities of an individual. Moreover, weight loss may affect coordination of muscles, especially in repeated activities such as swallowing. Weight loss associated with starvation, whether intentional or not, may lead to damage of other vital organs, namely, the heart. When unplanned weight loss develops, a swallowing disorder should be suspected. Weight loss should not be so extensive that it affects quality of life, nor should it continue beyond normal weight ranges. Speech-language specialists are often called on to rule in/out the oral-pharyngeal phase of swallowing, and if normal, the patient is referred to a gastroenterologist.

The impact of weight loss on various medical conditions or postsurgical recovery has been shown to slow or delay recovery.

A survey of studies related to weight loss suggests the importance of monitoring food and liquid intake.⁷ The factors most consistently associated with weight loss were depression, poor oral intake, swallowing issues, and eating/chewing dependency. Staffing factors such as inadequate staffing and lack of professional supervision were associated with weight loss in most studies.

The factors most consistently associated with a low body mass index (BMI) include immobility, poor oral intake, chewing problems, dysphagia, female gender, and older age. The factors most consistently associated with poor nutrition included impaired function, dementia, swallowing/chewing difficulties, poor oral intake, and older age.

Temporary nonoral feeding arrangements are now more commonly used to stabilize weight during recovery from severe diseases and disorders and to speed up such recovery. Dysphagia is a risk factor that impairs an individual's experience of mealtimes. Oropharyngeal dysphagia has been shown to have had a high impact on the quality of life of those with dysphagia living independently.⁸ Focus is needed on **xerostomia**, as well as on the psychological aspects associated with nonoral feeding.^{9,10}

Types of Pneumonia

Not all types of pneumonia are the result of dysphagia or aphagia. Infections, poor health, and lack of proper posthospital care may lead to other types of pneumonia. Clinicians who treat swallowing disorders must be aware of these, as aspiration may play a part in their cause.

Aspiration Pneumonia. When pulmonary infection results from acute or chronic aspiration of fluids, foods, or oral secretions from the mouth or from fluids arising in the stomach and flowing into the airway, **aspiration pneumonia** develops. This is a potentially life-threatening condition that requires significant medical attention. Aspiration pneumonia can occur in adults or children with medical problems that disrupt a normal swallow. However, not all aspiration leads to pneumonia. Studies report that 28% to 36% of asymptomatic healthy older adults demonstrate trace aspiration on a FEES, and up to 45% of normal adults demonstrate aspiration of oropharyngeal secretions during sleep.⁴ In most healthy children and adults, trace aspiration is responded to with awareness and a strong cough to clear the food or liquid. Nonetheless, aspiration pneumonia creates significant morbidity and may account for up