Contents

1 Introduction

Debra M. Suiter and Memorie M. Gosa

Summary

This book is a comprehensive, yet accessible, volume of information on dysphagia and its many manifestations across the lifespan. It is written for graduate-level students, practicing clinicians currently working with individuals with swallowing disorders, and practicing clinicians wishing to transition to working with individuals with swallowing disorders. Experts in their respective areas provide the latest, most evidence-based information available on swallowing disorders, including their assessment and treatment.

Keywords

dysphagia, deglutition, penetration, aspiration, mastication, bolus

Learning Objectives

In order to understand swallowing disorders, it is important to first understand the following terms.

- **Dysphagia** is the medical term for swallowing disorders. As Dr. Jerilyn Logemann, a pioneer in the field of dysphagia assessment and treatment, described it, dysphagia is "any difficulty in moving food from the mouth to the stomach."
- **Deglutition** is the medical term for swallowing.
- **Penetration** is the entrance of anything ingested by mouth, secretions (saliva or mucus), or refluxed or regurgitated stomach contents into the laryngeal vestibule, which is bounded superiorly by the epiglottis, laterally by the aryepiglottic folds, and inferiorly by the true vocal folds. The term *penetration* indicates that material has entered the laryngeal vestibule but has not spilled below the level of the true vocal folds.
- **Aspiration** is the entrance of anything ingested by mouth, secretions (saliva or mucus), or refluxed or regurgitated stomach contents into the laryngeal vestibule and below the level of the true vocal folds.
- **Mastication** is the medical term for chewing.
- **Bolus** is a cohesive mass of food or liquid to be swallowed.

Additional terms specific to dysphagia in various settings and across various patient populations are defined in each chapter of this book.

1.1 Introduction to Swallowing Disorders

Each chapter begins with an introduction to its topic, a summary of what will be discussed, and a list of learning objectives. At the end of each chapter, the reader is asked a number of review questions to facilitate retention of the material. We hope our readers will find this approach to be beneficial.

This is not a "how-to" manual by design. Instead of "if you see this, do this," this text was designed to prepare current and future clinicians to assess and treat patients with dysphagia by equipping them with the underlying knowledge necessary to facilitate safe oral intake whenever possible. The text begins with foundational knowledge on the anatomy and physiology of typical swallowing across the life span. These chapters are purposefully dense; they are meant to provide the reader with a complete understanding of what is known about typical swallowing across the life span. This sets the stage for clinicians to apply the knowledge when evaluating swallowing in populations with various disorders that are known to impact swallowing function. Once readers understand how structure and physiology work together to create a typical, safe swallow, they can conceptualize how disorders that impact normal structure or function will impact swallowing.

The book transitions to chapters on assessment and again provides foundational knowledge for these concepts throughout the life span. The knowledge from these chapters should guide readers as they delve into population-specific chapters later in the book and apply the concepts gleaned from the assessment chapters to populations of interest.

From assessment, the book moves on to comprehensive chapters on treatment for individuals with dysphagia. Chapters 8 to 10 provide the fundamental concepts that underlie all treatment, regardless of specific etiology. Again, readers will apply these foundational concepts as they evaluate treatment-specific options in each of the population chapters. Readers are then ready to examine population-specific information about dysphagia in conditions that affect individuals across the life span, beginning with prematurity and ending with pulmonary disease.

Finally, readers will have the opportunity to evaluate the knowledge gained in this text in the context of biomedical ethical considerations. At that point, it is our hope that clinicians (future and currently practicing) have the knowledge needed to accurately diagnose and treat dysphagia across populations and diagnoses, which is more than could be accomplished with a simple "how-to" manual. Individuals with dysphagia deserve no less than a competent clinician equipped with the knowledge necessary to help them reach their specific goals related to feeding and swallowing. All those who contributed to this text invested the necessary time and energy to create this type of resource out of a desire to provide the best care possible to patients with dysphagia. We hope it will become a valuable resource to all readers.

1.2 Scope of the Problem

Human beings begin life taking all nutrition and hydration in liquid form, from either the breast or the bottle, consuming breast milk or formula. In rapid order, infants transition from

a full liquid diet to a diet of varied textures and consistencies, typically by age 2. As infants learn to eat a variety of foods, there will be periods of increased coughing and gagging that resolve as the oral–motor patterns to support mastication of increasing textures are mastered. As infants mature into childhood, adolescence, and adulthood they will most likely continue to experience transient difficulty with swallowing.

Most people can relate to coughing on a piece of dry, crumbly food, such as cornbread or tortilla chips, or experiencing the feeling of something "going down the wrong tube." During times of illness, people experience painful swallowing due to a sore throat and choose to avoid certain foods or liquids that exacerbate the pain. As people age, they may have difficulty swallowing large pills and will need to find ways to facilitate safe swallowing. In most instances, these encounters with swallowing difficulty are transient and do not have lasting negative effects on a person's health or well-being. However, for some individuals, difficulty swallowing is an ongoing issue that can have a significant impact on health and quality of life, forcing them into scenarios that seem out of their control.

Swallowing disorders can occur at any age, from birth to old age. Dysphagia can have a variety of causes, including prematurity. It can be neurogenic, resulting from a stroke, brain injury, Parkinson's disease, or amyotrophic lateral sclerosis (Lou Gehrig's disease). It can arise from structural abnormalities, such as craniofacial disorders, head and neck tumors, narrowing of the esophagus, or trauma to the head and neck, or from systemic diseases such as pulmonary disease. Chapters 11 through 22 of this book provide relevant information on dysphagia resulting from specific etiologies, including diagnostic and treatment consideration of the specific etiology, not just information specific to dysphagia in this population.

Dysphagia occurs in approximately 1 in 25 adults per year,[1] and dysphagia occurs in 9 in 1,000 children between the ages of 3 and 17 years.[2] Dysphagia is more prevalent in some developmental and disease-specific pediatric populations, such as those with congenital heart disease and syndromes with craniofacial disorders, but accurate information on incidence and prevalence is difficult to discern due to various definitions and diagnostic modalities. Dysphagia is most common in older adults.[1,3,4] In a large acute care hospital, dysphagia referral rates doubled between the years 2000 and 2007, and over 70% of those referrals were for adults 60 years of age or older, with 42% of those referrals being for adults over the age of 80 years.[4] The prevalence of dysphagia in community-dwelling adults over the age of 50 is estimated to be somewhere between 15 and 22%,[5,6] and in skilled nursing facilities the prevalence rises to over 60%.[7]

1.3 Consequences of Dysphagia

Dysphagia can have devastating consequences for an individual's health. Malnutrition and dehydration often occur in individuals with swallowing disorders. An individual who coughs frequently when attempting to eat or drink, or who has significant difficulty getting food or liquid to clear, may avoid those foods and liquids and ultimately limit the overall intake of food and liquid.

Malnutrition can lead to additional health consequences, including a weakened immune system, which increases infection risk, results in poor wound healing, and leads to muscle weakness, all of which can increase the risk of falls or other injuries. Infants and children do not have the nutritional reserves to withstand prolonged periods of dehydration and malnutrition, and these can lead to significant morbidity and mortality in pediatric populations. Therefore, dysphagia must be diagnosed accurately and treated effectively to avoid these undesirable consequences.

In addition to malnutrition and dehydration, dysphagia can also result in pulmonary complications, including aspiration pneumonia. Aspiration pneumonia is demonstrated by radiographic evidence of infiltrates in the lungs of individuals known to be at risk for dysphagia.[8,9] Aspiration pneumonia is caused when bacteria that normally reside in the oropharynx or nasopharynx enter the lungs. According to the Agency for Health Care Policy and Research (AHCPR), approximately one-third of individuals with dysphagia develop aspiration pneumonia, and 60,000 individuals die each year from complications related to aspiration pneumonia.[1,10] The 30-day mortality rate from aspiration pneumonia is 21% overall, with a higher percentage (29.7%) for health care–associated aspiration pneumonia.[11]

Although aspiration pneumonia occurs more frequently in adults, it can occur at any point across the life span. Aspiration is also recognized as a significant source of respiratory morbidity in pediatric patients because it has potential to cause permanent damage to developing lungs.[12]

In addition to impacting an individual's health adversely, dysphagia can also significantly impact quality of life. So many special moments in a person's life are celebrated and acknowledged in the context of eating and drinking. Birthdays are celebrated with cake, weddings are toasted with champagne, holidays are celebrated around the dinner table with friends and family, families are comforted by friends bringing food after the death of a loved one. Eating and drinking are a part of everyday life. An individual who is experiencing dysphagia may not be able to participate in these activities and may be able only to watch while others take part. Inability to participate in these types of activities can lead to social isolation, anxiety, and depression. Sometimes, even taking a small amount of food or liquid by mouth can lead to coughing or the need to regurgitate food or liquid and may become too embarrassing for a person to participate in situations that involve any eating and drinking. Many individuals with dysphagia report avoiding certain activities, such as eating out in a restaurant, because they do not wish to draw embarrassing attention.

Parents of children with dysphagia have to be hypervigilant and often have to restrict their child's involvement in typical social activities, such as school events, play dates with friends, and birthday parties. In a survey of individuals with dysphagia, clinical depression was found in 7% of respondents, and 20% of respondents reported experiencing anxiety related to their dysphagia.[13] Hewetson and Singh[14] reported on the experience of mothers of children with dysphagia and found that mothers describe the experience as two intertwined journeys: one of deconstruction, where their previous expectations of motherhood are lost, and one of reconstruction, where they learn to function in the reality of having a child with dysphagia. The authors emphasize the need for health care professionals to incorporate the parent's experience into true family-focused interventions.

1.4 The Dysphagia Team

The dysphagia team comprises individuals from a number of health care specialties. These include speech-language pathology, nursing, nutrition, medicine, psychology, allied health professions (e.g., occupational therapy or physical therapy), and respiratory therapy. This list is not exhaustive, and, depending on the patient's needs, other health care professionals may serve as members of the dysphagia team. Members of the team work together to ensure that all the individual's dysphagia-related needs are met. For instance, physical therapists are often involved with individuals who have dysphagia across the life span to determine optimal positioning and develop seating systems for head and neck supports. Occupational therapists may identify utensils or plates that facilitate the individual's ability to self-feed; again this is seen across the life span. Speech-language pathologists (SLPs) work closely with dietitians to ensure that individuals with dysphagia are meeting their nutrition and hydration needs and doing so safely. Psychologists may address the negative social consequences individuals with swallowing disorders experience.

SLPs often take the lead role in caring for individuals with dysphagia. This is because SLPs receive extensive training in the anatomy and physiology of the upper aerodigestive tract, including the oral, pharyngeal, and cervical esophageal regions that are involved in swallowing. The SLP is a primary professional involved in assessment and management of individuals with dysphagia and is responsible for the following:

- Performing a clinical swallowing and feeding evaluation
- Performing an instrumental assessment of swallowing function with medical professionals as appropriate
- Identifying normal and abnormal swallowing anatomy and physiology
- Identifying signs of possible or potential disorders in upper aerodigestive tract swallowing and making referrals to appropriate medical personnel
- Making decisions about management of swallowing and feeding disorders
- Developing treatment plans
- Providing treatment for swallowing and feeding disorders, documenting progress, and determining appropriate dismissal criteria
- Providing teaching and counseling to individuals and their families
- Educating other professionals on the needs of individuals with swallowing and feeding disorders and the SLP's role in the diagnosis and management of swallowing and feeding disorders
- Serving as an integral part of a team as appropriate
- Advocating for services for individuals with swallowing and feeding disorders
- Advancing the knowledge base through research activities[15]

Because of the negative health consequences of unrecognized or improperly treated dysphagia, it is imperative that SLPs who wish to work with individuals with swallowing disorders have proper training and knowledge to do so. As with other areas of clinical practice, this is required by the American Speech-Language-Hearing Association Code of Ethics.[16]

1.5 Assessment and Treatment for Dysphagia

Proper management of individuals with dysphagia begins with accurate assessment. Assessment can include screening, clinical swallow evaluation, or instrumental assessment, such as videofluoroscopy (X-ray), endoscopy, or manometry. The purpose of each of these assessments, optimal means of completing them, and indications/contraindications for each type of examination are discussed in Chapters 4 to 10.

Dysphagia is often a treatable condition. As already described, SLPs work closely with other health care professionals to determine an appropriate course of treatment. Treatments may include direct, rehabilitative treatments (e.g., active exercises to strengthen the structures involved in swallowing); indirect, compensatory treatments (e.g., suggestions for optimal posture for swallowing); or diet modifications (e.g., altering the texture of the individual's food or liquid). In some cases, when treatment outcomes are not successful, or are progressing more slowly than anticipated, an alternative means of nutrition is recommended. Treatments for dysphagia are discussed at length in Chapters 11 to 13 of this book. Additionally, treatment for dysphagia related to specific etiologies is discussed in Chapters 14 to 25.

1.6 Conclusion

Dysphagia is common in both adults and children. Its consequences can be devastating and isolating. It is our hope that the remainder of this book will serve to educate and prepare current and future clinicians who wish to work with individuals with swallowing disorders.

References

[1] Bhattacharyya N. The prevalence of dysphagia among adults in the United States. *Head Neck Surg* 2014;*151*(5):765–769

[2] Bhattacharyya N. The prevalence of pediatric voice and swallowing problems in the United States. *Laryngoscope* 2015;*125*(3):746–750

[3] Baine WB, Yu W, Summe JP. Epidemiologic trends in the hospitalization of elderly Medicare patients for pneumonia, 1991-1998. *Am J Public Health* 2001;*91*(7):1121–1123

[4] Leder SB, Suiter DM. An epidemiologic study on aging and dysphagia in the acute care hospitalized population: 2000-2007. *Gerontology* 2009;*55*(6):714–718

[5] Aslam M, Vaezi MF. Dysphagia in the elderly. *Gastroenterol Hepatol (N Y)* 2013;*9*(12):784–795

[6] Barczi SR, Sullivan PA, Robbins J. How should dysphagia care of older adults differ? Establishing optimal practice patterns. *Semin Speech Lang* 2000;*21*(4):347–361

[7] Steele CM, Greenwood C, Ens I, Robertson C, Seidman-Carlson R. Mealtime difficulties in a home for the aged: not just dysphagia. *Dysphagia* 1997;*12*(1):43–50, discussion 51

[8] Marik PE, Kaplan D. Aspiration pneumonia and dysphagia in the elderly. *Chest* 2003;*124*(1):328–336

[9] Marik PE. Aspiration pneumonitis and aspiration pneumonia. *N Engl J Med* 2001;*344*(9):665–671

[10] Group EHTA; ECRI Health Technology Assessment Group. Diagnosis and treatment of swallowing disorders (dysphagia) in acute-care stroke patients. *Evid Rep Technol Assess (Summ)* 1999; (8):1–6

[11] Lanspa MJ, Jones BE, Brown SM, Dean NC. Mortality, morbidity, and disease severity of patients with aspiration pneumonia. *J Hosp Med* 2013;*8*(2):83–90
[12] Tutor JD, Gosa MM. Dysphagia and aspiration in children. *Pediatr Pulmonol* 2012;*47*(4):321–337
[13] Eslick GD, Talley NJ. Dysphagia: epidemiology, risk factors and impact on quality of life—a population-based study. *Aliment Pharmacol Ther* 2008;*27*(10):971–979
[14] Hewetson R, Singh S. The lived experience of mothers of children with chronic feeding and/or swallowing difficulties. *Dysphagia* 2009;*24*(3):322–332
[15] American Speech-Language-Hearing Association. Roles of speech-language pathologists in swallowing and feeding disorders: Technical report. 200
[16] American Speech-Language-Hearing Association. Code of ethics. 2016. www.asha.org/policy/