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Chinese expert consensus on food and nutrition management for dysphagia (2019 version)

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Running title: Nutrition management for dysphagia in China

Chinese Expert Consensus Group of Dysphagia and Nutrition Management

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ABSTRACT

Background and Objectives: Dysphagia is a common clinical symptoms among older adults. The incidence of dysphagia is high, and it can easily cause complications such as aspiration, aspiration pneumonia, and malnutrition; affect clinical outcomes; and even become life-threatening. Nutrition for patients with dysphagia is considered the first problem to address in dysphagia intervention. Currently, China has no standard for food classification and nutrition management for patients with dysphagia. **Methods and Study Design:** The Dysphagia Rehabilitation Specialty Committee of Chinese Association of Rehabilitation Medicine and the Elderly Nutrition Committee of Chinese Nutrition Society organized and led Chinese experts in related fields to publish the “Chinese Expert Consensus on Dysphagia and Nutrition Management 2019.” The goals of the publication were twofold: (1) to establish and improve Chinese dietary standards for dysphagia, and (2) to promote the development of special food industries for dysphagia. **Results:** The consensus is separated into three parts: (1) the definition and description, (2) classifications of food for dysphagia, and (3) nutrition management for patients with dysphagia. **Conclusions:** This report systematically explains the content of nutrition management for patients with dysphagia and can serve as a reference for medical and food industry in related fields.

Key Words: dysphagia, food classification, aspiration, malnutrition, nutrition management

INTRODUCTION

Because of older adults' declining physiological functions, particularly their ability to chew and swallow, the increasing prevalence of dysphagia has gradually become a major problem affecting their health and quality of life. Clinically, dysphagia is a common symptom in daily multidisciplinary diagnosis and treatment and have a high prevalence rate. The symptoms can easily engender complications such as aspiration, aspiration pneumonia, and malnutrition; increase the risk of infection; affect clinical outcomes; and cause multiple organ failure, even leading to death in severe cases. For patients with dysphagia, swallowing-function rehabilitation and dietary and nutrition management have gradually become common topics in public and clinical research. The evaluation and treatment technology for dysphagia is being improved and innovated constantly. Following several years of efforts by scholars in related fields, the Chinese Experts Consensus on Dysphagia Evaluation and Treatment (2013 and 2017 versions),^{1,2} the Expert Consensus Statement on the Management of Dysphagia and

Nutrition after Stroke (2013 version),³ and the China Expert Consensus on Homenutrition Administration for Elderly Patients with Dysphagia (2018 version)⁴ have been published. These expert consensus enhance the effectiveness of regulating the professional behaviors of clinical and medical personnel.

Diet and nutrition for patients with dysphagia is considered the first problem to be addressed in rehabilitation. A dysphagia diet can improve dietary safety and effectiveness for people with dysphagia. Having such diet is one crucial means of promoting body recovery and is recommended by major guides both in China and abroad. Several developed countries have developed preliminary standards for swallowing disorders, such as the food classification by the Japanese Society of Dysphagia Rehabilitation (JSDR) in 2013.⁵ Japan already has a relatively mature dysphagia food industry. However, no standard for classifying foods currently exists for patients with dysphagia in China, and definitions of dysphagia food and standards of food classification vary between medical institutions. Consequently, a patient can obtain considerably different dietary guidance in different medical institutions. The Elderly Nutrition Committee of the Chinese Nutrition Society along with the Dysphagia Rehabilitation Specialty Committee of Chinese Association of Rehabilitation Medicine organized and led Chinese experts in related fields to publish the “Chinese Expert Consensus on Dysphagia and Nutrition Management 2019” after discussing and revising the previous version repeatedly for 2 years. The publication aimed to achieve the following goals: (1) to help medical institutions and scientific disciplines reach a consensus on a swallowing diet; (2) to establish and improve China’s dysphagia dietary standards; and (3) to promote the development of special food industries for people with dysphagia.

DEFINITIONS AND DESCRIPTIONS

Dysphagia

1. **Definition:** Dysphagia, deglutition disorders, and swallowing disorders refer to the inability to safely and efficiently deliver food to the stomach because of impairments in the structure and/or function of organs, including the lower jaw, lips, tongue, soft palate, throat, and esophagus. Generalized dysphagia includes swallowing and eating problems caused by behavioral abnormalities resulted from cognitive and psychological problems, namely ingestion problems and dysphagia.⁶
2. **Diseases that cause dysphagia:** Clinically, dysphagia is common and can be caused by numerous diseases, including central nervous system diseases, peripheral neuropathy, neuromuscular junction disease, muscle diseases, oropharyngeal organic disease, and

digestive and respiratory diseases. Additionally, patients following oropharyngeal chemoradiotherapy and surgery may develop dysphagia.⁷

3. Complications of dysphagia: Common complications of dysphagia include aspiration,⁸ pneumonia, malnutrition,⁹ and resultant psychological and social anxiety disorders in patients,¹⁰⁻¹¹ which increases patient mortality and poor prognosis.¹²⁻¹³
4. Incidence rate and consequences of malnutrition following dysphagia: Reports have shown that dysphagia after stroke is an independent risk factor for malnutrition. Specifically, malnutrition following stroke can increase the incidence of various infections in patients, stroke recurrence, and mortality; thus, dysphagia is a major cause of adverse outcomes after stroke.¹⁴ The incidence of malnutrition is from 17% to 20% for older adult patients living alone with dysphagia and 37% to 67% for older adult patients living in a hospital.¹⁵

Goals for dysphagia diet management

The goals for dysphagia diet management are to promote the functional recovery of patients with dysphagia, reduce and/or shorten tube feeding, achieve oral intake earlier, enable patients to eat and enjoy delicious food, improve their nutrition, and reduce the risk of malnutrition and the incidence of various infections. Additionally, dysphagia diet management assists in shortening patients' length of hospital stay, reducing their medical costs, and returning them to their family and society earlier.

Consensus 1: Patients with dysphagia must have standardized nutrition management, which will reduce their difficulty in swallowing food, achieve oral intake earlier, and improve patients' nutrition status. Moreover, it can reduce food residues during swallowing and preventing aspiration, as well as cut and/or shorten the proportion and time of tube feeding. Nutrition management for patients with dysphagia is a shared responsibility of all clinical disciplines.

Food for dysphagia

Food for dysphagia (FD) refers to special foods made through processing, including but not limited to breaking down food or adding food additives such as thickening agents and coagulators that meet the oral intake requirements of people with dysphagia.

Characteristics and impacts of dysphagia

1. Strategies for choosing FD: (a) Reduce the difficulty of chewing solid foods and enable patients with dysphagia to swallow food with little or no chewing; (b) slow the flow of fluid food, provide patients with dysphagia with enough time to coordinate the contraction and relaxation of the muscles used to swallow, and close the breathing passage and open the passage for food in time to avoid aspiration; (c) ensure that patients have adequate food and water intake through changing the ingredients of solid food or adjusting the velocity of fluid food, thereby avoiding the risk of aspiration pneumonia and malnutrition¹⁵⁻¹⁶; and (d) reduce the incidence of various infections.
2. FD ingredients should comply with the following principles: (a) softening solid food—stir solid foods, such as mashed potatoes and fruit purees to make chewing and swallowing easier; (b) increase the viscosity of diluted food—add food additives to liquids such as water, beverages, juices, and milk to increase food viscosity, which can reduce the speed of food flow in the pharynx and esophagus; (c) avoid mixing solid and liquid food—avoid mixing and eating solid and liquid food together as well as food that can be easily separated into solids and liquids; (d) serve patients food with an even and smooth texture.¹⁷⁻¹⁸
3. Texture and characteristics of FD: (a) FD must have a certain level of cohesion. This refers to the ability of food pieces to combine with each other to form an easily swallowed food mass after being broken down). Poor cohesiveness is not conducive to forming a food mass and is easy to disperse; furthermore, such food can easily remain in the pharynx, which increases the risk of aspiration accordingly; (b) FD must have an appropriate level of viscosity; excessively high food viscosity can increase the risk of having food residues in the pharynx; (c) FD should have certain levels of solidity and elasticity and the food mass formed after chewing should be easily deformable (i.e., be able to pass the mouth and throat smoothly); and (d) solid FD should have a uniform density.¹⁹⁻²⁰

Selection principles

The selection of food characteristics for patients with dysphagia should be based on the results of clinical and instrumental assessments and can be integrated with the affected swallowing organs. That is, the right food should be selected and prepared appropriately, and foods of different textures can be adjusted by adding food additives.

Solid food is often altered into pastes or gels, and other suitable food types include mashed and soft food, and stuffing-like food. If a food additive is added to heated food and it is broken down with a blender, then it can be made into gelatinous food. In addition to strict

food shape requirements for patients with dysphagia, paying attention to the nutritional mix of food and the personal taste preferences of patients is necessary. Specifically, through food preparation and a combination of swallowing posture and bitesize food portions, patients' safe and effective eating can be ensured.²⁰⁻²¹ If a patient is coughing when drinking water, an appropriate amount of thickening agents can be added to thin liquid food to increase its cohesiveness, slow the liquid flow rate, and reduce the risk of aspiration.

Consensus 2: FD should have the following characteristics: liquid foods should have appropriate viscosity, and solid foods should not be easily dispersed but easily deformed and have an even density.

Please note that it is not recommended for people with dysphagia to eat rice paste, sesame paste, and other foods in paste form that have not been processed with a thickening agent. These types of food tend to remain in the oropharynx and cause hidden aspiration or aspiration, which in turn increases the risk of aspiration pneumonia.

For information on the evaluation and screening of dysphagia, please refer to the Chinese Experts Consensus on Dysphagia Evaluation and Treatment (2017 version). The process of the evaluation and treatment is shown in Figure 1.²

Consensus 3: The swallowing ability of people at high risk of dysphagia should be screened for and evaluated before oral intake; subsequently, whether patients should have oral intake should be considered and appropriate food characteristics determined based on evaluation results.

CLASSIFICATION OF FOOD FOR DYSPHAGIA

Currently, China remains unable to conduct a universal measurement of food; specifically, the country does not have a comprehensive measurement method for foods with uneven texture and few research outcomes are available for reference. We used JS DR20134 and IDDSI standards as references for our consensus and integrated them into the dietary habits of Chinese people. Subsequently, we classified foods into two categories, namely liquid food and solid food, based on their characteristics and shapes. Each food category has three levels: (1) low-viscosity, (2) mid-viscosity, and (3) high-viscosity. Commercially available food additives can be used to thicken liquid food to different viscosities. The viscosity value of each level of liquid food was clearly specified in a specific range. Furthermore, solid foods

were also divided into three levels according to their physical properties and suitable groups. Additionally, a special food was established to enhance food intake training (see Figure 2).

Classification standards of FD

Liquid food characteristics

1. Characteristics of 1st level low-viscosity foods: These can be represented by the word “suck.” Low-viscosity foods disperse in the mouth and do not require considerable force when swallowing. The food’s slight delay in falling from a tilted spoon can be perceived, but it flows easily in a linear shape from the spoon and can be sucked with a thin straw. Food of this type can be used as a low-viscosity liquid for Videofluoroscopic swallowing examination and laryngoscopic examination of patients’ swallowing function.
2. Characteristics of 2nd level mid-viscosity food: These can be represented by the word “drink.” The level of viscosity that patients with dysphagia first attempt is this type of liquid food. One can clearly feel that mid-viscosity food is viscous; the food disperses slowly in the mouth and tends to aggregate on the tongue. If the food is stirred with a spoon, only few traces remain on the spoon’s surface. The food drips off the spoon when scooped and the spoon is tilted. This is the required initial viscosity of liquids in Videofluoroscopic swallowing examination and laryngoscopic examination of patients’ swallowing function.
3. Characteristics of 3rd level high-viscosity food: These can be represented by the word “eat.” This level of food viscosity is suitable for patients with severe dysphagia. This type of food has an obvious level of viscosity, easily forms a food mass, requires certain force to be swallowed, and thus is unsuitable to be consumed with a straw. The food forms a food mass after being scooped with a tilted spoon; moreover, it does not drip immediately and is used as a high-viscosity liquid in Videofluoroscopic swallowing examination and laryngoscopic examination of patients’ swallowing function (see Table 1).

Solid food characteristics

1. 4th level pureed food characteristics: (a) homogeneous, smooth, easily gathered, and can be scooped with a spoon; (b) can easily form a food mass in the mouth, and food residues do not easily remain in the mouth and cause dysphagia; (c) does not require biting or chewing, but does require the ability to form a food mass and maintain it; (d) has a certain level of smoothness and cohesiveness such as various foods with food additives added

after being stirred by a blender; and (e) the food is suitable for patients who cannot chew but consciously push their tongue upwards and have the ability to transport food.

Food examples: pastes or gelatinous foods made by stirring various types of meat, vegetables, or congee with food additives.

2. 5th level stuffing-like food characteristics: (a) has a certain shape and is easily broken down; (b) has a certain level of cohesiveness and forms a food mass easily, does not leave considerable water in the mouth, and does not easily disperse in the pharynx; (c) can be broken down between the tongue and the upper and lower palate; (d) food with food additives added that can be reshaped by agitation or crushing; and (e) suitable for patients whose tongue and upper and lower palate can break down food and transport it over the tongue.

Food examples: 30% congee, 50% congee, soft foods, and food prepared by adding and stirring food additives.

3. 6th level soft food characteristics: (a) has a soft texture, is not easily scattered or viscous, and its softness enables it to be cut with chopsticks or a spoon; (b) does not require the chewing ability of teeth or dentures, but requires the ability to squeeze and crush between the upper and lower gums; and (c) is suitable for older adults or patients whose swallowing function is at risk of aspiration and with declined chewing function.

Food examples: soft food including congee and soft rice, as well as harder food made by adding food additives after being stirred with a blender, which is the major part of the diet (see Table 2).

Food for swallowing training

Food characteristics: (a) Gelatinous food that is homogeneous, soft, low in adhesion and dehydration, and high in cohesiveness; (b) easily flaked into pieces and becomes a suitable food mass when scooped with a spoon; (c) can be swallowed directly without chewing (i.e., completely swallowed); (d) FD residues with no protein or that contain less protein can be easily removed; (e) recommended food for swallowing evaluation and training in patients with dysphagia; additionally, the food is used for candidate food selection for Videofluoroscopic swallowing examination and laryngoscopic examination of patients' swallowing function; and it is suitable for patients with dysphagia who have started oral intake training before and after extubation; and (f) the food texture has a certain level of viscosity and maintains its shape on a spoon; however, the food will slide off completely when the spoon is tilted.

Food examples: tea gel or juice gel produced with food additives.

Consensus 4: FD is classified into six levels: three levels for liquid food (1st level low-viscosity, 2nd level mid-viscosity, and 3rd level high-viscosity) and three levels for solid food (4th level pureed food, 5th level stuffing-like food, and 6th level soft food); and food for swallowing training is incorporated into solid food. Each level of food should have clearly described food characteristics as well as patients such food is suitable for.

Oral intake principles for patients with dysphagia

Patients' swallowing function should be tested prior to oral intake. Specifically, swallowing function evaluation and/or examination using an instrument should be performed on patients at risk of dysphagia. This can determine whether patients can perform oral intake and reveal which functional foods for swallowing should be selected. For details on the screening and evaluation methods and processes for swallowing function, please refer to the Chinese Experts Consensus on Dysphagia Evaluation and Treatment (2017 version)² and the selection process of functional FD, which is presented in Figure 3.

NUTRITION MANAGEMENT FOR PATIENTS WITH DYSPHAGIA

Nutritional status is an independent prognostic factor for clinical outcomes and is closely related to those such as mortality, complication rate, length and cost of hospitalization, and quality of life.²²⁻²³ Dysphagia is closely related to malnutrition and affects the nutritional status of patients considerably. Furthermore, malnutrition can aggravate dysphagia through neuromuscular dysfunction. Specifically, a causal relationship exists between malnutrition and dysphagia, and the two can form a vicious cycle.²⁴ Therefore, once a patient is diagnosed with dysphagia, nutritional risk screening should be performed immediately to identify patients at risk of malnutrition, which would facilitate further nutritional status evaluation.²⁵⁻²⁶ Additionally, screening and evaluation for the risk of malnutrition should be performed multiple times during the treatment of patients with dysphagia. The nutrition management process for patients with dysphagia is shown in Figure 4.

Nutritional support therapy

Diet + nutrition education

(food modification)

Diet + oral nutrition supplement (ONS)

(failure to obtain 60% of daily nutrient requirements)

Tube feeding

(failure to obtain 60% of daily nutrient requirements with diet + ONS)

Partial intestinal nutrition + partial parenteral nutrition

(Intestinal nutrition fails to obtain 60% of daily nutrient requirements)

Complete intestinal nutrition

Nutritional risk screening

1. Nutritional risk screening tool: This tool is named Nutritional Risk Screening 2002 (NRS-2002) and was introduced by the European Society for Parenteral and Enteral Nutrition in 2002.²⁷ Numerous studies have suggested that NRS-2002 is also suitable for nutritional risk screening in hospitalized patients with dysphagia and can effectively screen for the nutritional risks of patients.²⁸⁻²⁹
2. Malnutrition Universal Screening Tool (MUST): The MUST is used for the nutritional screening of community populations, mainly for malnutrition caused by impaired function;³⁰ the predictive validity of the MUST verifies it as being suitable for screening nutritional risk in patients with stroke.
3. Mini Nutritional Assessment: This method is simple and fast and can be used for the nutritional screening of older adults older than 65 years, and is currently also widely used in nutritional screening for patients with dysphagia,³¹⁻³² and thus it is a recommended method.

Evaluation of nutritional status

The nutritional status of patients with dysphagia at risk of malnutrition should be assessed in a timely manner to provide evidence for the formulation of a reasonable nutrition support plan. Currently, using a single type or a single set of evaluation methods to perform a comprehensive diagnosis of patients' nutritional status is still impossible. Therefore, multiple evaluations should be conducted as much as possible in clinical settings, and the sensitivity and specificity of nutritional assessments should be improved by combining subjective and objective indicators.

Evaluation contents include dietary surveys, nutritional disease and medication histories, nutrition-related clinical symptoms, anthropometrics and body composition determinations (BMI, upper arm circumference, calf circumference), and laboratory indicators (hemoglobin, albumin, prealbumin, Glucose, urea nitrogen/creatinine, electrolytes, vitamins, and trace elements); see Table 3 for details.

Consensus 5: Screening and nutritional status evaluation should be performed before a dietary nutrition intervention is implemented on patients with dysphagia.

Prolonged fasting causes atrophy and thinning of the intestinal epithelium, which affects the completeness and permeability of the intestinal mucosal barrier. Consequently, damage is caused to the intestinal barrier function and bacterial translocation. Enteral nutrition can provide nutrients to the intestinal mucosa, stimulate the secretion of intestinal hormones and digestive fluid, increase intestinal mucosal blood flow, maintain gastrointestinal microbiota balance, and stimulate intestinal mucosal epithelial tissue repair and proliferation. These actions in turn maintain the function of the intestinal barrier, conforming to human physiology; furthermore, enteral nutrition is an economical, safe, and convenient method with a low incidence of complications.³³⁻³⁴ Therefore, for patients who have less severe dysphagia and show no clear sign of aspiration or considerable food residues according to safety and effectiveness testing or testing and evaluation using an instrument, oral intake is the optimal means of nutrition intake; foods that can be chewed and swallowed easily or with altered textures should be selected for these patients.³⁵⁻³⁶

If oral intake fails to satisfy nutritional needs, patients are recommended to select oral nutritional support (ONS) as an additional nutritional supplement if their bowel function is normal. ONS should reach a minimum of 400 to 600 kcal daily and the supplement is usually used between meals. The supplement duration varies individually and ONS is recommended to be used for no less than 1 month. Patients who have difficulty eating solid foods can use ONS as a meal replacement to provide their body with the required nutrients. ONS preparations can be enteral nutrients, nutrient components (single or multiple macronutrients and/or vitamins, and minerals), but their corresponding characteristics and shapes must meet the food texture requirements of dysphagia, such as an increased viscosity.

Consensus 6: Patients should strive to maintain oral intake or start it early; when their food intake does not meet nutritional requirements, enteral nutrition preparations or special medical foods with modified food characteristics and shapes can be selected.

In addition, patients who are unable to reach 60% of their recommended daily calorie intake through oral intake, those with disturbed consciousness or cognitive disorders, and those with dysphagia who cannot perform oral intake should be provided with feeding through continuous or intermittent oroesophageal tube.³⁷⁻³⁸ Clinically, an appropriate feeding tube should be selected according to patients' disease, length of feeding time, mental state, and gastrointestinal function.³⁹⁻⁴⁰ If patients have severe gastrointestinal dysfunction and are

unable to use gastrointestinal feeding or the use of enteral nutrition alone cannot reach 60% of their daily calorie intake in the short term, parenteral nutrition as a supplement should be considered.

Consensus 7: When oral intake is unable to reach patients' target nutritional requirement, they should select feeding through a continuous or intermittent oroesophageal tube; moreover, the addition of parenteral nutrition as a supplement should be considered when gastrointestinal nutrition cannot achieve 60% of patients' daily calorie intake.

Nutrition therapy plan

For patients with dysphagia, the purpose of diet management is to maintain their ideal nutritional status, prevent aspiration and dehydration, and delay swallowing impairment. Therefore, individualized treatment plans should be formulated according to patients' medical conditions.

1. Energy: Different energy goals are set at different stages of diseases. The total energy can be 25 to 35 kcal/kg³ for patients with stable dysphagia, and can be reduced to 80% of the standard energy level for patients with unstable dysphagia. For patients with severe malnutrition, particularly those with long-term hunger or fasting, the goal for initiating feeding should be strictly controlled. Moreover, nutrient intake should be increased gradually (both through enteral and parenteral routes) to avoid refeeding syndrome. For the recommended intakes of different types of food at different energy levels,⁴¹ see Table 4.
2. Protein: The target protein requirement must be 1.0 to 2.0 g/(kg.d),⁴² and for patients with chronic kidney disease (CKD) during the period of nonreplacement treatment in Stages 1 and 2, target protein should be 0.8 to 1.0 g/(kg.d), and in Stages 3–5 it should be 0.6 to 0.8 g/(kg.d). Therefore, supplementing high-quality protein is emphasized.
3. Carbohydrate: The Chinese Dietary Reference Intakes (2013)⁴³ recommend that healthy adults should derive 50–65% of their daily calorie intake from carbohydrates, which can be adjusted according to patients' medical condition.
4. Water: Water is a crucial part of any diet and is a necessary substance for all life. People's need for water is in direct proportion to their weight and energy consumption, with the recommend intake being 30 mL/(kg.d), which should be adjusted according to patients' medical condition.
5. Nutrition monitoring: Periodic monitoring is required during the implementation of nutritional support to evaluate patients' current dietary status, gastrointestinal symptoms,

nutrient intake, and nutritional status, thereby facilitating the timely adjustment of nutritional support plans (see Table 5).

Consensus 8: Nutrition management should be used to develop individualized nutrition plans based on the different diseases of patients.

Conclusion

Compared with nutrition management for other diseases, the characteristics of nutrition management of patients with dysphagia are distinct. Our consensus provides classification standards for dysphagia diets in China as well as a basis for domestic patients with dysphagia to select foods with reasonable characteristics and shapes. Additionally, we incorporated nutrition management elements according to the dietary habits of Chinese people. The consensus can also guide patients in effective diet nutrition management, reduce their tube feeding dependence, help them achieve oral intake earlier, and improve their prognosis. This consensus can be used by numerous related medical departments such as departments of rehabilitation medicine, nutrition, critical care medicine, neurology, neurosurgery, geriatrics, respiratory and critical care, and otolaryngology head and neck surgery. Furthermore, our consensus provides standards for FD produced by relevant businesses and industries. These standards for FD shall be updated constantly in the future with the accumulation of clinical evidence and experience

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AUTHOR DISCLOSURE

This consensus only represents the opinions of the experts who participated in its preparation and review, and has no legal effect.

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Table 1. Liquid food classification standards

Food characteristics	1 st level: low-viscosity	2 nd level: mid-viscosity	3 rd level: high-viscosity
Description of characteristics	The food disperses immediately in the mouth and does not require considerable force to swallow.	The food disperses slowly in the mouth and tends to aggregate on the tongue.	The food is clearly viscous and requires a certain force to be swallowed.
Suitable group	Patients with mild dysphagia.	Patients who begin therapeutic oral intake.	Patients with severe dysphagia.
Food texture description	The food can easily flow in a linear shape from a tilted spoon, and the most appropriate expression for eating this type of food is “to suck.”	The food drips from a spoon when scooped and tilted. The most appropriate expression for eating this type of food is “to drink.”	The food forms a mass after it is scooped with a tilted spoon and the mass does not drip immediately from the spoon. The most appropriate expression for eating this type of food is “to eat.”
Viscosity (mpa·s)	50~150	150~300	300~500
LST value*(mm)	36~43	32~36	30~32

Table 2. Solid food classification standards

Food characteristics	4 th level: pureed food	5 th level: stuffing-like food	6 th level: soft food
Type	Homogeneous, smooth, easily gathered, and can be scooped up with a spoon.	Has a certain shape but is easily broken down.	Food with a soft texture that is not easily dispersed or viscous.
Characteristics	A food mass can be formed easily in the mouth; food residues do not remain in the mouth easily or cause aspiration.	Food that has a certain level of cohesiveness, can easily form a rounded mass, does not leave water in the mouth, and does not easily disperse in the pharyngeal cavity.	Food with a soft texture that can be cut with chopsticks or spoons.
Required chewing ability	No biting or chewing is required.	This food requires breaking down between the tongue and the upper and lower palate.	Food that can be swallowed without teeth or dentures, but requires the ability to squeeze and crush between the upper and lower gums.
Food example	Various homogeneous paste-type foods with food additives added after being stirred by a blender.	Food made by adding food additives, such as 30% congee, 50% congee, and various soft foods.	Soft food including congee and soft rice, and harder foods made by adding food additives after being stirred with a blender, which are a major part of the diet.
Suitable targets	No chewing required, but patients must have the ability to transport food and perform oral intake.	Patients whose tongue and upper and lower palate can break down food and transport it over the tongue.	Patients whose swallowing function is at risk of aspiration and with declined chewing function.
Tilted spoon testing	Such food would slide off a tilted spoon.	Such food can maintain its shape on a spoon, but it will slide off completely when the spoon is tilted or slightly shaken. The food can form a food mass on a plate or will slowly collapse.	Such food can be cut or divided into small pieces using the edge of a spoon. It can be squashed when a small piece is pressed with a spoon head, and if the spoon is removed, the food would not return to its original shape.

Table 3. Nutritional status evaluation table

Nutrition history	Anthropometrics and evaluation	Laboratory indices	Others
Diet (Food frequency questionnaire)	Recent weight changes	Hemoglobin	Muscle strength
Recent dietary changes	BMI (kg/m ²)	Albumin	Quality of life
Nutritional supplement history	Upper arm circumference (cm)	Prealbumin	
	Calf circumference (cm)	Transferrin	
	Skin fold thickness (cm)	Glucose	
	Waist-hip ratio	Blood urea nitrogen / creatinine	
	Grip strength (kg)	Electrolytes (K ⁺ , Na ⁺ , Cl ⁻)	
	Body composition evaluation	C-reactive protein (inflammatory phase)	

Table 4. Recommended intakes for different types of food at different energy levels

Energy level	1200 kcal	1400 kcal	1600 kcal	1800 kcal	2000 kcal	2200 kcal
Cereal crop (g)	175	200	225	250	300	300
Soy (g)	20	30	30	30	40	40
Vegetables (g)	300	300	350	400	450	500
Fruits (g)	200	200	200	200	300	300
Livestock and poultry meat (g)	25	25	50	50	50	50
Eggs (g)	25	25	25	25	25	50
Aquatic products (g)	35	50	50	50	75	100
Dairy products (g)	300	300	300	300	300	300
Cooking oil (g)	15	20	20	25	25	25
Salt (g)	5	5	5	5	5	5

Table 5. Monitoring and management

Category	Monitoring content	Monitoring purposes
Food intake	Food / water intake	To evaluate the adequacy of patients' intake of nutrients and water
Symptoms when having meals	Swallowing small portions of food multiple times Cough / reflux Foreign objects / obstruction	To ensure that patients' current diet is suitable for their swallowing ability
Gastrointestinal symptoms	Hunger / bloat Constipation / diarrhea	To evaluate appropriate food portions for patients' gastrointestinal tolerance
Anthropometric indicators	Weight / BMI / body composition	To evaluate patients' nutritional status
Laboratory indicators	Prealbumin / albumin Blood glucose / lipids / electrolytes C-reactive protein	To evaluate patients' nutritional status and monitoring of infections, glucose and lipid metabolism, and electrolyte abnormalities

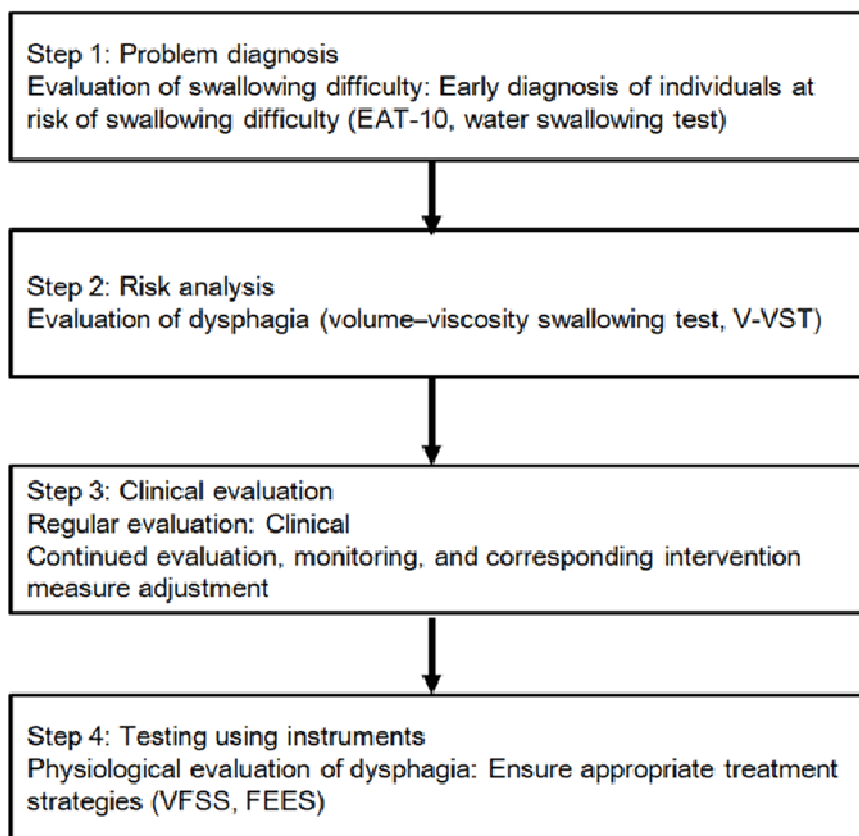


Figure 1. Screening and evaluation process for dysphagia.

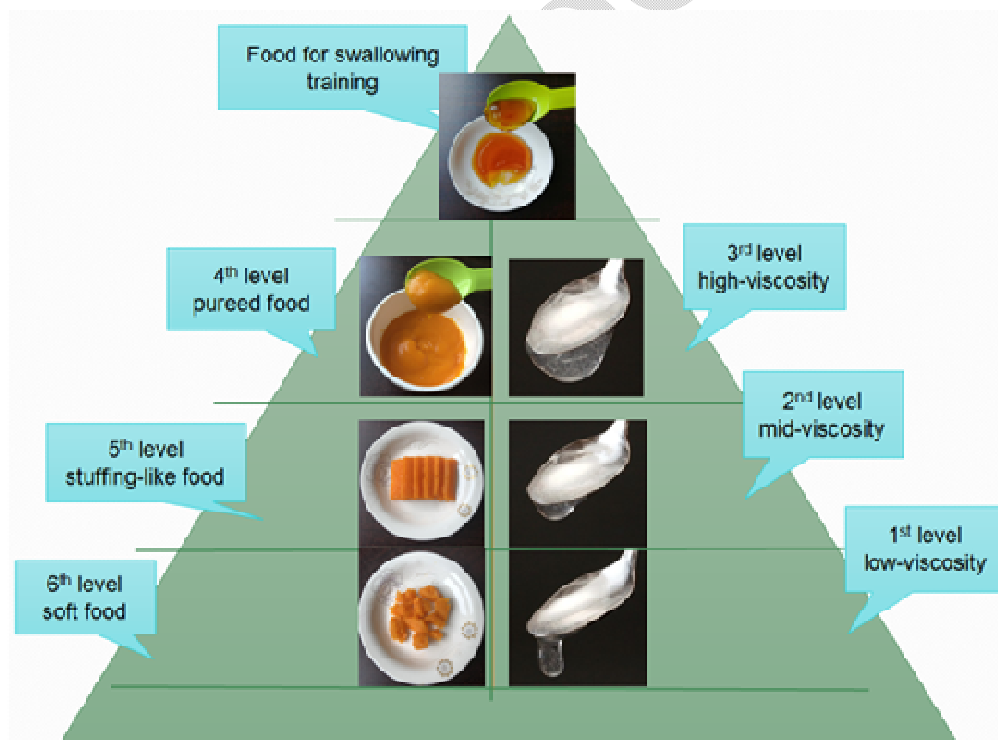


Figure 2. Food classification pyramid.

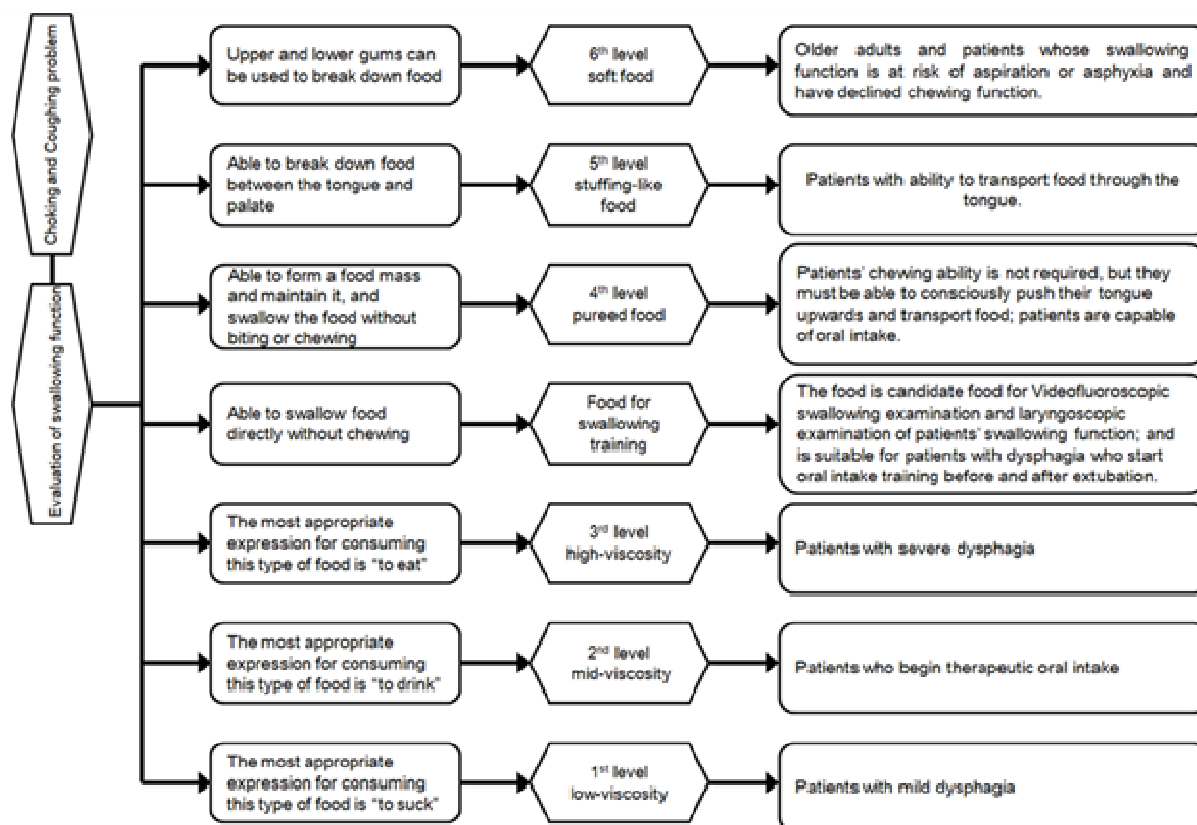


Figure 3. Swallowing function and selection of different levels of food.

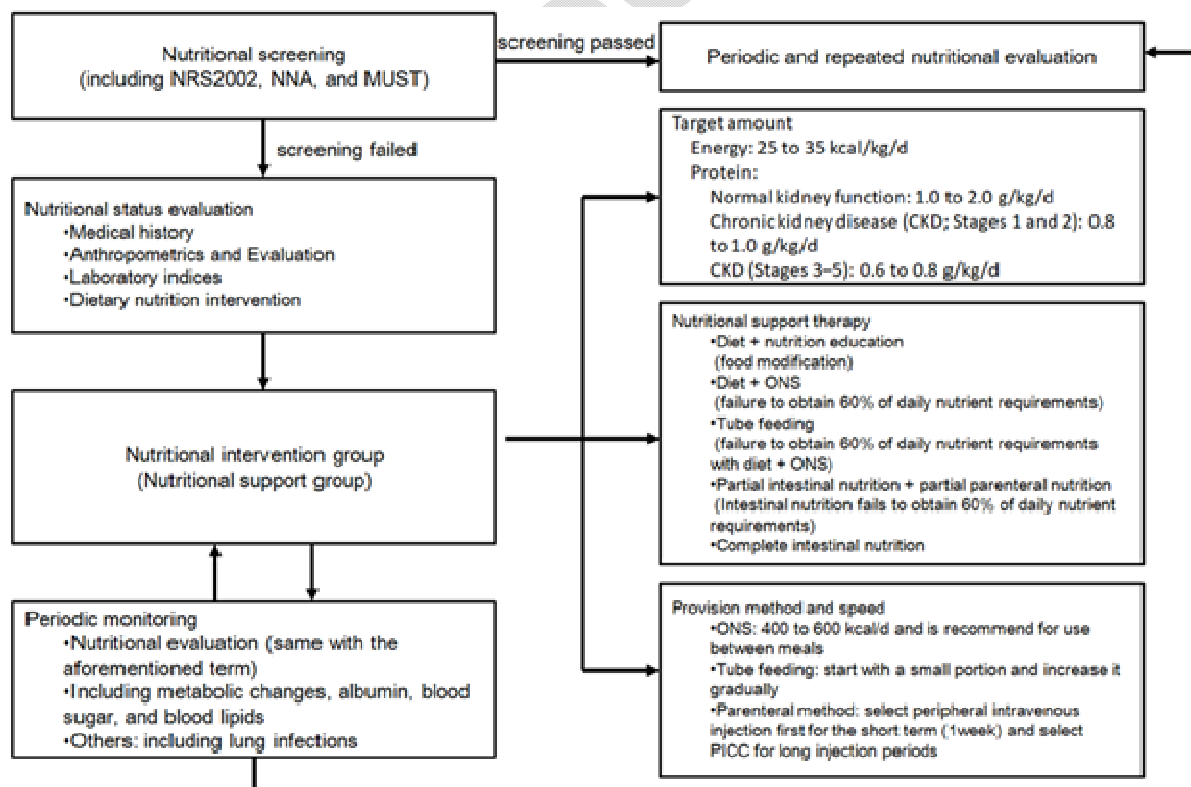


Figure 4. Nutrition management process for patients with dysphagia.