

Special Edition
"Recent Advances in Pulmonary
Rehabilitation"

Review

Corresponding author

Satoru Ebihara, MD, PhD

Professor
Department of Rehabilitation Medicine
Toho University Graduate School of
Medicine, 6-11-1, Omori-nishi
Ota-ku, Tokyo 143-8541, Japan
Tel. +81-3-3762-4151
Fax: +81-3-3768-6125
E-mail: satoru.ebihara@med.toho-u.ac.jp

Special Edition 2

Article Ref. #: 1000PRRMOJSE2108

Article History

Received: June 28th, 2017

Accepted: July 5th, 2017

Published: July 5th, 2017

Citation

Ebihara S, Sekiya H. Recent advances in rehabilitation for aspiration pneumonia. *Pulm Res Respir Med Open J*. 2017; SE(2): S54-S56. doi: [10.17140/PRRMOJ-SE-2-108](https://doi.org/10.17140/PRRMOJ-SE-2-108)

Copyright

©2017 Ebihara S. This is an open access article distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Recent Advances in Rehabilitation for Aspiration Pneumonia

Satoru Ebihara, MD, PhD¹; Hideki Sekiya, DD, PhD²

¹Department of Rehabilitation Medicine, Toho University Graduate School of Medicine, Tokyo, Japan

²Department of Oral Surgery, Toho University Omori Medical Center, Tokyo, Japan

ABSTRACT

Respiration and swallowing are intimately related to each other. The respiration center and the swallowing center in the brain stem are located very closely and the activation of each center inhibits the other center in a very sophisticated way. Therefore, the rehabilitation for aspiration pneumonia should be the combination of pulmonary and dysphagia rehabilitations. Dysphagia rehabilitation includes food modification, oral hygiene, indirect and direct training, and positioning. Since the rehabilitation for aspiration pneumonia is covered in the wide range, the rehabilitation is a comprehensive intervention. The best strategy to achieve the comprehensive interventions is making the multidisciplinary team with various medical amenities. The decision to stop and start eating should be made by concluding under multidisciplinary discussion. The construction of the system towards dysphagia is a key of successful rehabilitation for aspiration pneumonia.

KEY WORDS: Dysphagia rehabilitation; Food modification; Team approach.

INTRODUCTION

Occurrence of aspiration pneumonia is based on dysphagia.¹ It is also important to notify that respiration and swallowing are intimately related to each other.² The respiratory and swallowing centers in brainstem are located very close and affects each other. During the respiratory distress, the firing of respiratory center is too busy to be coordinated with the firing of the swallowing center.² Therefore, the rehabilitation for aspiration pneumonia should be the combination of pulmonary and dysphagia rehabilitations. The pulmonary rehabilitation for aspiration pneumonia is basically similar to the pulmonary rehabilitation in intensive care unit (ICU) which has been discussed in another manuscript "Recent Advances in Pulmonary Rehabilitation for Patients in the Intensive Care Unit (ICU)" of this special edition.³ Since older patients are particularly vulnerable to dysphagia because they undergo multiple age-related changes which increases the risk of dysphagia. Dysphagia is a highly prevalent and is of growing concern in the population of Japan. Here, we have focused on the dysphagia rehabilitation for aspiration pneumonia.

FOOD MODIFICATION

Among the rehabilitation intervention for dysphagia, food modification has the strongest effect based on the research.⁴ Food texture and liquid consistency modification has become one of the most common forms of intervention for dysphagia, and is widely considered important for promoting safe and efficient swallowing. The widespread manipulation of texture modification as a clinical intervention has created a need to establish clear terminologies to describe the target consistencies that are recommended for patients with dysphagia. However, till date, there is no single convention with respect to the terminology used to describe levels of liquid thickening or food texture modification for clinical use, as it is impossible to remove subjectivity in

the terminologies. Therefore, the levels of liquid thickening or food texture modification should be quantified with an objective device with clarity.

ORAL HYGIENE

Oral hygiene is recognized as an essential aspect of dysphagia rehabilitation. Many dentists and dental-associated persons understand the importance of oral hygiene for disabled persons, and it has many prevalent educational programs in the community to impart the knowledge to the citizens. Several important studies have been managed by collaborations between dentists and geriatric physicians. One of them showed that the oral hygiene treatment of the disabled elderly in nursing homes reduced the incidence of aspiration pneumonia.⁵ A study regarding the effects of oral care and functional training on entirely tube-fed patients showed that professional oral care and indirect therapy by a dental hygienist once weekly was sufficient to maintain oral hygiene and reduce the incidence of pneumonia.⁶

DYSPHAGIA REHABILITATION BY THERAPIST

At clinics, during daily practical rehabilitation by therapists such as speech therapists, the rehabilitation was largely divided into the indirect therapy and the direct therapy. Indirect therapy was applied to all the patients. However, the application of direct therapy depends on the patients medical status and the severity of dysphagia.

Indirect therapy for dysphagia is widely practiced and has many treatments, including respiratory exercise or range-of-motion exercise for the neck or around the shoulder. Therapist often apply the head-raising exercise developed by Shaker and colleagues to many kinds of dysphagia,⁷ which is called as "Shaker exercise." Balloon expansion of the upper esophageal sphincter is applied for dysphagia in cases where large amounts of pharyngeal retention is present after swallowing.⁸

Direct therapy is conducted not only by speech therapists but also by nurses certified and well trained in dysphagia treatment. In direct therapy, during the early stage, food with more liquid consistency are often recommended. Recently, many food companies have developed easy-to-swallow foods, or easy-to-eat foods for patients with dysphagia, which can also be used in therapy for recovery. It should be noted that 'rice' is the staple diet of the Japanese and has some viscosity and well-prepared rice porridge is good for many patients with dysphagia.

POSITIONING

The positioning/changing posture, is an important technique to facilitate swallowing during both direct and indirect training such as swallowing saliva exercise. The reclining posture changes the inlet of the larynx position and makes it higher than the inlet of the esophagus and this change works to keep the

pharyngeal retention in the piriform sinus and inhibit aspiration after the swallow.⁹ After this process, patients are able to proceed safely with a second or third swallow, or apply some swallowing maneuvers to improve pharyngeal clearance. The reclining posture also helps the dysphagic patients hold a bolus in the pharynx without aspiration. The neck rotation posture is applied to the patients of bulbar palsy that have obvious lateral dislocation. The patient is asked to rotate the neck towards affected side, and the neck rotation to the affected side shifts the bolus passage to the unaffected side, resulting in improving safe pharyngeal clearance. When the reclining position and the head rotation are applied simultaneously, the patient should lie with the unaffected side down and neck rotation to the affected side because of the gravity effect.

TEAM APPROACH

Since the rehabilitation for aspiration pneumonia is ranging from oral care to nutritional intervention, the rehabilitation should be the comprehensive intervention. The best strategy to achieve the comprehensive interventions is making the multidisciplinary team consisting of rehabilitation doctor, otolaryngologist, neurologist, dentist, speech therapist, dietitian, pharmacist, social worker, and nurses certified in dysphagia treatment.¹⁰ The decision to continue or discontinue eating should be made by multidisciplinary discussion. Also the patients should be periodically followed-up by the team. It is also important to set the link nurse who take care of the swallowing status of in-patients in each ward. The link nurse frequently consults dysphagia certified nurses and should have the responsibility for indirect rehabilitation in the ward. The well build construction of the system toward dysphagia is a key of successful rehabilitation for aspiration pneumonia.

ACKNOWLEDGEMENTS

This study was supported by Grants-in-Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science and Technology, Japan (Grant numbers 24300187, 24659397, 26460899, 15K11644, 15K12588, and 15K15254), Research Funding for Longevity Sciences (25-7, 28-13) from the National Center for Geriatrics and Gerontology, and Research Promotion Grant from Toho University Graduate School of Medicine (No.17-04 to S.E.).

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

1. Ebihara S, Sekiya H, Miyagi M, Ebihara T, Okazaki T. Dysphagia, dystussia, and aspiration pneumonia in elderly people. *J Thorac Dis*. 2016; 8(3): 632-639. doi: [10.21037/jtd.2016.02.60](https://doi.org/10.21037/jtd.2016.02.60)

2. Hori R, Isaka M, Oonishi K, Yabe T, Oku Y. Coordination between respiration and swallowing during non-invasive positive pressure ventilation. *Respirology*. 2016; 21(6): 1062-1067. doi: [10.1111/resp.12790](https://doi.org/10.1111/resp.12790)
3. Sato R, Ebihara S, Kohzuki M. Recent advances in pulmonary rehabilitation for patients in the intensive care unit (ICU). *Pulm Res Respir Med Open J*. 2017; SE(2): S51-S54. doi: [10.17140/PRRMOJ-SE-2-107](https://doi.org/10.17140/PRRMOJ-SE-2-107)
4. Smithard DG. Dysphagia management and stroke units. *Curr Phys Med Rehabil Rep*. 2016; 4(4): 287-294. doi: [10.1007/s40141-016-0137-2](https://doi.org/10.1007/s40141-016-0137-2)
5. Yoneyama T, Yoshida M, Ohru T, et al. Oral care reduces pneumonia in older patients in nursing homes. *J Am Geriatr Soc*. 2002; 50(3): 430-433. doi: [10.1046/j.1532-5415.2002.50106.x](https://doi.org/10.1046/j.1532-5415.2002.50106.x)
6. Ueda K, Yamada Y, Toyosato A, Nomura S, Saitho E. Effects of functional training of dysphagia to prevent pneumonia for patients on tube feeding. *Gerodontology*. 2004; 21(2): 108-111. doi: [10.1111/j.1741-2358.2004.00016.x](https://doi.org/10.1111/j.1741-2358.2004.00016.x)
7. Shaker R, Easterling C, Kern M, et al. Rehabilitation of swallowing by exercise in tubefed patients with pharyngeal dysphagia secondary to abnormal UES opening. *Gastroenterology*. 2002; 122(5): 1314-1321. doi: [10.1053/gast.2002.32999](https://doi.org/10.1053/gast.2002.32999)
8. Hojo K, Fujishima I, Ohkuma R, et al. Balloon catheter treatment methods for cricopharyngeal dysphagia. *Japanese Journal of Rehabilitation Medicine*. 1997; 1(1): 45-56.
9. Baba M, Saitoh E, Okada SLPS. Dysphagia rehabilitation in Japan. *Phys Med Rehabil Clin N Am*. 2008; 19(4): 929-938. doi: [10.1016/j.pmr.2008.07.002](https://doi.org/10.1016/j.pmr.2008.07.002)
10. Ebihara S, Ebihara T, Yamasaki M, Kohzuki M. Stimulating oral and nasal chemoreceptors for preventing aspiration pneumonia in the elderly. *Yakugaku Zasshi*. 2011; 131(12): 1677-1681. doi: [10.1248/yakushi.131.1677](https://doi.org/10.1248/yakushi.131.1677)