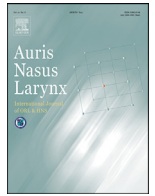
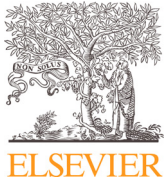




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Society of swallowing and dysphagia of Japan: Position statement on dysphagia management during the COVID-19 outbreak

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ABSTRACT

On April 14, the Society of Swallowing and Dysphagia of Japan (SSDJ) proposed its position statement on dysphagia treatment considering the ongoing spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

The main routes of transmission of SARS-CoV-2 are physical contact with infected persons and exposure to respiratory droplets. In cases of infection, the nasal cavity and nasopharynx have the highest viral load in the body. Swallowing occurs in the oral cavity and pharynx, which correspond to the sites of viral proliferation. In addition, the possibility of infection by aerosol transmission is also concerning.

Dysphagia treatment includes a broad range of clinical assessments and examinations, dysphagia rehabilitation, oral care, nursing care, and surgical treatments. Any of these can lead to the production of droplets and aerosols, as well as contact with viral particles. In terms of proper infection control measures, all healthcare professionals involved in dysphagia treatment must be fully briefed and must appropriately implement all measures. In addition, most patients with dysphagia should be considered to be at a higher risk for severe illness from COVID-19 because they are elderly and have complications including heart diseases, diabetes, respiratory diseases, and cerebrovascular diseases.

This statement establishes three regional categories according to the status of SARS-CoV-2 infection. Accordingly, the SSDJ proposes specific infection countermeasures that should be implemented considering 1) the current status of SARS-CoV-2 infection in the region, 2) the patient

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status of SARS-CoV-2 infection, and 3) whether the examinations or procedures conducted correspond to aerosol-generating procedures, depending on the status of dysphagia treatment. This statement is arranged into separate sections providing information and advice in consideration of the COVID-19 outbreak, including “terminology”, “clinical swallowing assessment and examination”, “swallowing therapy”, “oral care”, “surgical procedure for dysphagia”, “tracheotomy care”, and “nursing care”. In areas where SARS-CoV-2 infection is widespread, sufficient personal protective equipment should be used when performing aerosol generation procedures.

The current set of statements on dysphagia management in the COVID-19 outbreak is not an evidence-based clinical practice guideline, but a guide for all healthcare workers involved in the treatment of dysphagia during the COVID-19 epidemic to prevent SARS-CoV-2 infection.

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1. Introduction

On April 3, 2020, the Society of Swallowing and Dysphagia of Japan (SSDJ) issued an emergency announcement entitled “Emergency statement on dysphagia management during the novel coronavirus outbreak”. Shortly thereafter, on April 14, the SSDJ proposed a concrete statement for dysphagia treatment in consideration of the ongoing spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

The main routes of transmission of SARS-CoV-2 are physical contact with infected persons and exposure to respiratory droplets. In cases of infection, the nasal cavity and nasopharynx have the highest viral load in the body. Swallowing occurs in the oral cavity and pharynx, which correspond to the sites of viral proliferation. In addition, the possibility of infection by aerosol transmission is also concerning. Dysphagia treatment includes a broad range of clinical assessment and examinations, dysphagia rehabilitation, oral care, nursing care, and surgical treatments, and any of these can lead to the production of droplets and aerosols, as well as contact with viral particles. Recent studies have reported that nosocomial infection, originating from caregiving staff, may occur during meals. Moreover, it should be noted that persons with asymptomatic infections in Japan or other countries can form in-hospital clusters leading to the spread of infection regardless of whether they are healthcare professionals or patients [1].

Most patients with dysphagia are elderly and have complications, such as heart diseases, diabetes, respiratory diseases, and cerebrovascular diseases. They might be at a higher risk for severe illness from the novel coronavirus disease 2019 (COVID-19). With this taken into consideration, all healthcare professionals involved in dysphagia treatment must be fully briefed in terms of proper infection control measures and must appropriately implement them. The statement herein establishes three regional categories based on the status of SARS-CoV-2 infection. Accordingly, the SSDJ proposes specific infection countermeasures that should be implemented in consideration of 1) the current status of SARS-CoV-2 infection in the region, 2) the patient status of SARS-CoV-2

infection, and 3) whether the examinations or procedures conducted corresponds to aerosol-generating procedures (AGPs), depending on the status of dysphagia treatment. Strain and exhaustion of medical resources both in Japan and overseas is anticipated during the COVID-19 epidemic. The timing of dysphagia rehabilitation and indication for treatment will differ from the usual. Prioritizing the maintenance of medical infrastructure will be paramount in consultation with teams of medical experts at each facility.

This statement is arranged into separate sections providing information and advice considering the COVID-19 outbreak, including “clinical swallowing assessment and examination”, “dysphagia rehabilitation”, “oral care”, “nursing care”, “surgical procedure for dysphagia”, and “tracheotomy care”.

As SSDJ proposed these statements for the purpose of crisis management during the COVID-19 outbreak, based on case series and guidelines from other countries where the spread of COVID-19 occurred earlier, these statements are not an evidence-based clinical practice guideline. Thus, these statements would require later evaluation and revision as needed. It should also be considered that patients could receive appropriate care, but the care may be limited under these circumstances where this statement is widely accepted among healthcare professionals.

2. Terminology used in this statement and basic concept of classification

2.1. Regional division by infection status [2,3]

Prefectures are designated as one of the three categories and are managed depending on the status of infection [*1,2]

- 1) Regions where SARS-CoV-2 infection is not endemic (**non-endemic regions**): the prefecture where 0–9 patients are currently hospitalized due to COVID-19.
- 2) Regions in which SARS-CoV-2 infection is endemic (**endemic regions**): the prefecture where 10 or more patients are currently hospitalized due to COVID-19.
- 3) Regions experiencing an epidemic of SARS-CoV-2 infections (**epidemic regions**): Regions targeted by a declara-

tion of emergency, prefectures in which infection countermeasures or equivalent restrictions are ongoing, or where there is suspicion of infection clusters in the vicinity of a medical facility.

*1. The current number of patients hospitalized due to COVID-19 in the relevant prefecture according to the Ministry of Health, Labour and Welfare (reference materials regarding COVID-19 cases in Japan). The number of “currently hospitalized” patients listed in reports prepared by prefectures in Japan is the current number of patients hospitalized due to COVID-19 (in that prefecture). https://www.mhlw.go.jp/stf/newpage_10651.html.

*2. The website <https://www.stopcovid19.jp> displays the relevant data for reference purposes, in an easy-to-understand format, as the current number of patients hospitalized due to COVID-19 in each prefecture.

2.2. Classification by status of SARS-CoV-2 infection

- 1) Cases of diagnosed or suspected SARS-CoV-2 infection (showing clinical symptoms or having had close contact with infected persons)
- 2) Unconfirmed SARS-CoV-2 infection (showing no clinical symptoms)
- 3) SARS-CoV-2 infection negative or cases initially diagnosed as positive but were negative as per PCR test after 2 weeks

2.3. Aerosol generating procedures [4,5]

SARS-CoV-2 is transmitted primarily through droplets or physical contact with infected persons. However, it has been suggested that the virus can float in air for prolonged periods of time, increasing the risk of infection as a result of adsorption into aerosols (particles of 5 µm or smaller).

Swallowing managements reported to generate aerosols include induction of the gag and coughing reflexes; feeding exercises with a risk of aspiration; suctioning in the oral/nasal cavities, pharynx, and trachea; and endoscopic examination. Infection prevention measures against these AGPs differ depending on the local infection status in patients. For more information, please refer to the respective section.

2.4. Preventative measures against SARS-CoV-2 infection and personal protective equipment [6]

Preventive measures by route of infection

SARS-CoV-2 has been confirmed to follow two primary routes of infection: droplet infection and infection through physical contact. The possibility of aerosol-based infection has also been suggested. The basic concept of preventive measures focusing on routes of infection can be summarized through the following three points:

① Measures against droplet infection

Prevent droplets containing virus from adhering to the mucous membranes of the eyes, nose, and mouth.

- Healthcare workers should wear personal protective equipment (PPE), such as surgical masks, goggles, face/eye shields, and caps, which protect the eyes, nose, and mouth.
- Use surgical masks to prevent splashing of fluids from patients.
- Pay close attention for potential transmission via aerosols (see below for countermeasures).

② Measures against contact infection

Avoid transmitting virus present on the hands through contact with the mucous membranes of the eyes, nose, and mouth.

- Healthcare workers should wear PPE, such as gloves, aprons, gowns, and masks.
- Use surgical masks to prevent splashing of fluids from patients.
- Maintain a distance of at least 1.5 m.

③ Measures against infection by aerosols

Surgical masks may have some effect, but no definite effects have been verified.

2) Recommendations of additional precautions for AGPs

The following precautions are recommended in addition to the use of PPE when engaging in AGPs (strongly recommended for procedures possibly producing large amounts of aerosols):

- Use an N95 mask and always perform a seal check when donning the mask.
- Wear eye protection (goggles/face shield).
- Wear clean long-sleeved gowns (sterilization not necessary) and gloves.
- Wear a non-permeable apron or gown.
- Perform the AGP in a well-ventilated room.
- Observe hand hygiene before and after contact with patients and surrounding environmental surfaces, as well as after removing PPE.

2.5. Appropriate PPE selection and utilization in dysphagia management [6]

The selection of PPE should be made according to the risk of infection due to the procedure. In this proposal, PPE for dysphagia management is described as follows, according to the purpose.

- A) **sPPE (standard PPE)**: PPE based on standard precautions “Surgical mask, gloves” (Fig. 1A)
- B) **E-PPE (Eye-PPE)**: PPE in which eye protection (E) is added to sPPE Surgical mask, gloves, face shield, or goggles” (Fig. 1B)
- C) **EB-PPE (Eye/Body-PPE)**: PPE in which eye protection (E) and body protection (B) are added to sPPE Surgical mask, gloves, face shield or goggles, gown, or apron” (clean exposed skin of the upper extremities after using the apron) (Fig. 1C)
- D) **Full-PPE**: Preventive measure against aerosol infections “N95 mask, cap, double gloves, face shield ± goggles, impermeable long-sleeved gown” (Fig. 1D)



Fig. 1. (A) sPPE (standard PPE): PPE based on standard precautions. “Surgical masks, gloves” (B) E-PPE (Eye-PPE): PPE in which eye protection (E) is added to sPPE. “Surgical mask, gloves, face shields, or goggles” (C) EB-PPE (Eye/Body-PPE): PPE in which eye protection (E) and body protection (B) are added to sPPE. “Surgical masks, gloves, face shields or goggles, and gown or apron” (clean exposed skin of the upper extremities after using the apron). (D) full-PPE: Preventive measures against aerosol infections.

- Nasal/oral protection: N95 mask* or powered air purifying respirator (PAPR)
 - * Before using an N95 mask, conduct a user seal check (Fig. 2).
- Eye protection: Face shield ± goggles*
 - * Recommend using an anti-fogging agent in advance, when using goggles.
- Physical protection: impermeable long-sleeved gowns
- Head exposure protection: Wear a surgical cap. Take care to avoid exposing hair after affixing cap.

2.6. Recommendations regarding appropriate PPE based on regional classification, patient status of SARS-CoV-2 infection, and presence of AGPs [6]

In dysphagia management, most examinations and therapies will involve AGPs, and to prevent the spread of nosocomial infection, special precautions to prevent aerosol-based infection, as well as standard precautions, will be necessary. However, it should be noted that the supply of medical resources at medical facilities around the world is limited. The distribution of medical resources at each facility will be coordinated with specialized departments. In case of a shortage of suitable PPE for dysphagia treatment, prior-

ity should be given to the maintenance of the medical care infrastructure at each facility (e.g., withholding AGP-related tests and therapies). However, examinations/therapies for unconfirmed cases in endemic regions should not interfere with in-house policies at medical facilities where strict infection control measures, such as strictly limiting external contact, should be followed (Table 1).

2.7. Wearing and removing PPE

Removal of PPE may inadvertently spread the infection. **Conduct training for donning and doffing PPE beforehand.** Consideration should also be given to the separation of spaces for the donning and doffing PPE (clean areas/passage areas/semi-contaminated areas/contaminated areas) as much as possible at each facility.

The standard methods for donning and doffing of PPE are described in detail at the following websites (The Research Group of Occupational Infection Control and Prevention in Japan homepage) [7].

- Surgical masks: <https://www.safety.jrgoicp.org/ppe-3-usage-surgicalmask.html>

Table 1

Recommended management of appropriate PPE based on regional classification, infection status, and presence of aerosol generating procedures.

	<i>Confirmed and Suspected</i>		<i>Unconfirmed</i>		<i>Negative and 2-week change to negative after confirmation</i>	
	AGP	Non-AGP	AGP	Non-AGP	AGP	Non-AGP
Non-endemic region	full PPE	EB-PPE	E-PPE	sPPE	E-PPE	sPPE
Endemic regions	full PPE	EB-PPE	EB-PPE	E-PPE	E-PPE	sPPE
Epidemic regions	full PPE	EB-PPE	EB-PPE	E-PPE	E-PPE	sPPE

PPE: personal protective equipment, sPPE: standard PPE, E-PPE: Eye-PPE, EB-PPE: Eye/Body-PPE.



Fig. 2. User seal check: Test to check if the N95 mask fits every time you wear it. 1) Cover the mask with both hands and repeat inspiration and expiration to check for air leaks, 2) adjust the rubber band or nose position if leaking, 3) repeat 1) and 2) until the leak is not observed.

- N95 masks: <https://www.safety.jrigoicp.org/ppe-3-usage-n95mask.html>
- Goggles/face shields: <https://www.safety.jrigoicp.org/ppe-3-usage-goggles.html>
- Gowns/aprons: <https://www.safety.jrigoicp.org/ppe-3-usage-gown.html>
- Gloves: <https://www.safety.jrigoicp.org/ppe-3-usage-glove.html>
- Powered air purifying respirator (PAPR): <https://www.safety.jrigoicp.org/ppe-3-usage-papr.html>

3. Clinical swallowing assessment and examination for patients with dysphagia

Swallowing assessment in non-epidemic areas or for SARS-CoV-2-negative patients should be conducted with appropriate PPE. The evaluation for patients with suspected or confirmed COVID-19 is not recommended in consideration with the risk of aerosol generation. In this clinical statement, we propose a strategic plan to facilitate safe practice in dys-

phagia management for clinical care staff and patients with dysphagia.

If the condition of patients is not serious, non-urgent swallowing assessment should be postponed because clinical swallowing assessment includes many AGPs. Transmission of SARS-CoV-2 to clinical care staff needs to be prevented. When these high-risk procedures cannot be postponed in consideration of the necessity for each patient and the prevalence of COVID-19 in the relevant area, they may be permitted with a minimum number of participants and with proper PPE [5].

3.1. Medical history, mental and physical examination, and evaluation of oral motor and pharyngeal and laryngeal function

In the current pandemic context, the clinical swallowing assessment without producing aerosols is more preferable compared to AGPs. Dysphagia screening tools, such as the Eating Assessment Tool-10 [8] and the Seirei Questionnaire of Swallowing, can be utilized to detect dysphagia. Pharyngeal sensory testing or flexible endoscopic evaluation of swallowing with sensory testing are considered as AGPs, can be incredibly high risk, and require different PPE that do not produce aerosols.

3.2. Simple screening tests for evaluating swallowing function

Screening tests for dysphagia are intended to select the patients who are strongly suspected without videofluorography (VF) and fiberoptic endoscopic evaluation of swallowing (FEES, VE), and include repetitive saliva swallowing test (RSST), cervical auscultation of swallowing, water swallow test, modified water swallow test, and food test. Among them, RSST and cervical auscultation of swallowing can be performed for patients wearing a mask without oral intake, and thus, the risk of aerosol generation is very low. However, some screening tests, such as water swallow test and modified water swallow test, are AGPs (Table 2).

Considering some procedures such as water swallow test and modified water swallow test may induce coughing, adoption of the highest level of PPE is highly recommended when undertaking these procedures for patients with suspected or confirmed COVID-19. Concerning water swallow test, modified water swallow test (3 mL) overrides the original version of the water swallow test (30 mL).

Table 2
Recommended management of clinical swallowing assessment and examination for patients with dysphagia.

	<i>Confirmed and Suspected</i>		<i>Negative and 2-week change to negative after confirmation</i>	
	All regions		All regions	
	Permissivity	Recommended PPE	Permissivity	Recommended PPE
RSST	Deprecated	full PPE	As usual	sPPE
Modified water swallow test	Deprecated	full PPE	As usual	E-PPE
FEES	Deprecated	full PPE	As usual	E-PPE
VF	Deprecated	full PPE	As usual	E-PPE

	<i>Unconfirmed</i>					
	Non-epidemic regions		Endemic regions		Epidemic regions	
	Permissivity	Recommended PPE	Permissivity	Recommended PPE	Permissivity	Recommended PPE
RSST	Acceptance	sPPE	Acceptance	E-PPE	Acceptance	E-PPE
Modified water swallow test	Acceptance	E-PPE	Limited acceptance	E-PPE	Limited acceptance	E-PPE
FEES	Acceptance	E-PPE	Deprecated	E-PPE	Deprecated	E-PPE
VF	Acceptance	E-PPE	Limited acceptance	E-PPE	Limited acceptance	E-PPE

PPE: personal protective equipment, sPPE: standard PPE, E-PPE: Eye-PPE, EB-PPE: Eye/Body-PPE, RSST: repetitive saliva swallowing test, VF: videofluoroscopic examination of swallowing.

3.3. Fiberoptic endoscopic evaluation of swallowing (FEES)

The nasopharynx carries a higher viral load than the oropharynx. Thus, FEES has a higher risk of aerosolization from the nasal passage and nasopharynx. FEES can trigger sneezing and/or coughing, leading to aerosolization during the procedure. In light of the pandemic of COVID-19, clinicians need to consider risks related to FEES, and suspension of laryngeal sensory testing and FEES examinations should be seriously considered to minimize aerosol generation.

Possibility of virus attachment to the endoscopy

- FEES may elicit sneezing and/or coughing by the stimulation to the nasal mucosa
- FEES can trigger sneezing and/or coughing by aspiration during examination and can require suction, which may generate droplets and aerosols.
- FEES can induce coughing due to sensory testing.

3.4. Swallowing videofluorography (VF)

VF is also an AGP but is preferable to FEES in the current situation of COVID-19 as it does not involve invasive instrumentation during the procedure, and the administering clinician (otolaryngologists or SLPs) can maintain a greater distance from the patient while the examination is performed. VF may be the safer option in the current climate. In cases where accurate assessment is necessary, we advocate for adoption of VF with high-level PPE to minimize the risk to patients and clinical care staff in consideration of the infectious status of the area. To minimize aerosol generation and scattering when patients aspirate the contrast medium, patients are required to wear a surgical mask during examination.

3.5. Other swallowing evaluations

Other swallowing evaluations include tongue pressure measuring, pharyngeal manometry, and swallowing CT. Considering these are AGPs, these are not positively recommended.

4. Swallowing therapy

Healthcare professionals, who provide dysphagia therapy in close patient proximity, can be at high risk of transmitting the COVID-19 virus. Both indirect exercises (non-swallowing exercises) and direct exercises (swallowing exercises) involve direct contact with a patient's oral mucosa and secretions and exposure to droplets/aerosols that can be generated by coughing and sneezing. Furthermore, if a healthcare professional is an asymptomatic or pre-symptomatic carrier of COVID-19, the virus can be transmitted to patients from the healthcare professional through rehabilitation and may cause hospital-acquired infections.

It is strongly advised that standard and additional precautions for AGPs, including use of PPE, hand hygiene, and disinfection of environmental surfaces and equipment, be implemented during swallowing therapy. If PPE, disinfectants, and other materials are in short supply, and adequate infection prevention cannot be achieved, swallowing therapy should be suspended under the COVID-19 outbreak.

4.1. The risk of COVID-19 transmission and infection in swallowing therapy

The risk of COVID-19 transmission and infection should be minimized in swallowing therapy. Physicians who order swallowing therapy to healthcare professionals should confirm the patient's current COVID-19 status and carefully assess the

urgency of intervention. All healthcare professionals must be updated with the local infection control policies and must maintain a close relationship with the infection control office of their institution.

There are numerous exercises in swallowing therapy. The risk of COVID-19 transmission and infection involved in an exercise would be different depending on the ways the exercise is performed. For example, in a tongue strengthening exercise, a clinician may put his/her fingers into a patient's oral cavity to place a load on muscles. The clinician can avoid direct contact with the patient's oral mucosa/secretions and train the patient regarding the methods of self-tongue strengthening. Likewise, in respiratory rehabilitation, the risk of infection would be different if a patient forcefully exhales into the air or into a disposable sealed bottle through a tube. Therefore, it was not possible to define the risk of infection involved in all dysphagia exercises in this guidance. Instead, we listed several typical swallowing exercises and presented their potential risk of infection so that healthcare professionals can perform a COVID-19 risk assessment for their patients.

1) Indirect exercises (non-swallowing exercises)

① Exercises involve low risk of infection

Exercises involve no direct contact to the oral or pharyngeal mucosa and secretions of patients and low probability of aerosol generation.

- A set of exercises that typically includes stretching the neck, tongue, and lip movement
- Neck, lip, tongue, cheek, and jaw exercises without contacting the patient's oral cavity
- The tongue-holding maneuver
- Head-lifting exercises (Shaker exercise)
- Electrical stimulation and other therapies

Although these exercises are considered to involve low risk of infection, healthcare professionals should use appropriate PPE and maintain a permissible distance from the patient throughout rehabilitation.

② Exercises that require direct contact to the oral or pharyngeal mucosa and secretions or exposure to respiratory droplets

Exercises in which a clinician places his/her fingers to the patient's oral cavity and contacts the mucosa (massaging, stretching, or strengthening of the lip, tongue, cheek, gum, and jaw)

③ Aerosol generating procedures [5]

- Exercises that may induce the cough reflex: thermal-tactile stimulation, the K-method, tube-swallowing exercises, balloon exercises, and ice-chip swallows.
- Exercises that require forced expiration or voice: coughing, forced expiration or huffing, and voice exercises.

2) Direct exercises (swallowing exercises)

Direct exercises (swallowing exercises), such as posture adjustment and compensatory swallowing maneuvers, involve a high risk of exposure to the droplets and aerosols produced by patients. During direct exercises, healthcare profes-

sionals should select an adequate level of dysphagia diet, patient's posture, and swallowing maneuvers so that the patient does not cough or clear the throat and avoid generating the droplets or aerosol during dysphagia rehabilitation.

3) Strategies to reduce infection risk

To reduce the risk of infection during swallowing training, the following measures are recommended.

- Educate patients with cough etiquette and hand hygiene
- Always ventilate the therapy rooms
- Disinfect the environmental surfaces and therapy equipment after each use
- Maintain a sufficient distance between healthcare professionals and a patient
- Avoid facing the patient, and provide the therapy from the patient's back or side
- Consider using a mirror or a tablet to give instructions and feedback to patients
- Provide a self-training program to the patient
- When showing a patient how to perform an exercise, do not take off the mask, but show a model using pictures or movies
- Minimize the length of one session or frequency of rehabilitation
- If an AGP is inevitable, perform it at the end of the session

4.2. Infection prevention

Table 3 shows the PPE standard categorized by the regional and patient's infection statuses. PPE usage should be followed according to the guidance of each institution. Maintaining medical services should be prioritized over dysphagia rehabilitation during the COVID-19 outbreak. In epidemic areas, a newly admitted patient and a patient who had stayed at the hospital longer than two weeks without presenting any clinical symptoms would have different levels of risk of having a COVID-19 infection. In addition, in an area where clusters have been occurring, the likelihood of a newly admitted patient to be COVID-19 positive would increase.

Healthcare professionals should learn techniques to take off the PPE without contacting the contaminated surfaces of PPE after therapy to protect themselves from infection.

4.3. Swallowing therapy for patients with COVID-19

Swallowing therapy for patients with active COVID-19 should only be carried out when essential with special precautions.

5. Oral care

Especially for dysphagic patients, oral hygiene is necessary because aspiration of oropharyngeal flora into the lung may cause aspiration pneumonia. However, we must be thoroughly cautious to avoid spreading the virus through oral care during the COVID-19 outbreak.

Oral care can involve a visible spray that contains saliva and microorganisms. From the study of spattering during oral

Table 3
Recommended management of swallowing therapy.

	<i>Confirmed and suspected</i>		<i>Negative and 2-week change to negative after confirmation</i>			
	All regions		All regions		All regions	
	Rehabilitation	PPE	Rehabilitation	PPE	Rehabilitation	PPE
Indirect exercises (low risk)	Limited	Full-PPE	Perform as usual		s-PPE	
Indirect exercises (contact/droplets)	Not recommended	Full-PPE	Perform as usual		s-PPE	
Indirect exercises (AGP)	Not recommended	Full-PPE	Perform as usual		s-PPE	
Direct exercises	Limited	Full-PPE	Perform as usual		s-PPE	
	<i>Unconfirmed</i>					
	Non-epidemic regions		Endemic regions		Epidemic regions	
	Rehabilitation	PPE	Rehabilitation	PPE	Rehabilitation	PPE
Indirect exercises (low risk)	Acceptable	S-PPE	Acceptable	E-PPE	Acceptable	E-PPE
Indirect exercises (contact/droplets)	Acceptable	E-PPE	Limited	E-PPE	Limited	E-PPE
Indirect exercises (AGP)	Acceptable	E-PPE	Not recommended	EB-PPE	Not recommended	EB-PPE
Direct exercises	Acceptable	E-PPE	Not recommended	EB-PPE	Not recommended	EB-PPE

PPE: personal protective equipment, sPPE: standard PPE, E-PPE: Eye-PPE, EB-PPE: Eye/Body-PPE, AGP: aerosol generating procedure.

Table 4
Recommended management of oral care.

	<i>Confirmed and Suspected</i>		<i>Unconfirmed</i>		<i>Negative and 2-week change to negative after confirmation</i>		
	All regions	Non-epidemic regions	Endemic regions	Epidemic regions	Non-epidemic regions	Endemic regions	Epidemic regions
Oral Care	E-PPE	E-PPE	EB-PPE	EB-PPE	full PPE	full PPE	full PPE

PPE: personal protective equipment, E-PPE: Eye-PPE, EB-PPE: Eye/Body-PPE.

care using an adenosine triphosphate (ATP) monitoring system [9], large amounts of ATP, which denotes the presence of organic material and living cells, were detected on the surface of the care giver's wrist, face shield, and apron. The study also confirmed any oral care including using toothbrush, sponge brush, suction, and wipe with gauze cause spattering and showed higher amount of splash and spatter when a toothbrush, sponge brush, and suction or bed elevation was used during the care or when the procedure took more than 5 min. Although there are currently no data available to assess the risk of SARS-CoV-2 transmission during dental practice [10], a cough may be induced when cleaning solution or saliva penetrate into the pharynx, consequently spreading airborne infectious agents.

When care givers provide oral care, they must be aware that it is an AGP and ensure appropriate preventive measures [11,12] according to the degree of regional spread. If the patients can care for themselves, it would be better to encourage selfcare considering their circumstance.

5.1. Precautions and proper PPE for oral care depending on region and infection status (Table 4)

In endemic and epidemic regions, provide oral care only after you have assessed the patients and considered both the risk to the patient of deferring care and the risk of disease transmission associated with providing care. If possible, pro-

vide shorter time care and care for the highest need. If PPE and supplies are limited, consider deferring.

5.2. General consideration in oral care

① As the patients may choke on water during rinsing, it is recommended to wipe oral mucosa with wet tissue for oral use, wet gauze, or swab after mechanical cleaning. Among water rinsing, wiping with wet tissue for oral use, and wiping with sponge brush, wiping with wet tissue is the most effective method to decrease bacteria on the tongue, palate, or gingivobuccal fold [13].

② Denture cleaning of patients with suspected or confirmed COVID-19.

To avoid the spread of the microorganisms from the denture, disinfect the denture before washing with water. After cleaning, rinse the denture with enough water to eliminate the chemical agents. It would be recommended to sink the denture for 30 min into 0.05–0.5% of sodium hypochlorite aqueous solution or ethanol for disinfection or wiping the denture with gauze saturating with it [14]). The spray on the denture may cause airborne infectious agents [15]). For dentures with metal clasps or metal bases, rust-preventive additive sodium hypochlorite aqueous solution should be used [16].

3) Consideration for reducing the aerosol generation during oral care

① Tooth brushing with water-based mouth moisturizer

As a substitute for tooth paste, teeth should be brushed with water-based mouth moisturizer, which can contribute to preventing the spread of dental plaque by retaining it in the mouth [17,18].

② Extraoral vacuum system

If the environment allows, use of extraoral vacuum system would help capture aerosols that escape outside the mouth and minimize droplets [19].

③ Mouth rinse before procedures

Chlorhexidine, which is commonly used as mouth rinse in dental practice, may not be effective in killing SARS-CoV-2 [20]. The virus is vulnerable to oxidation. Mouth rinsing with 0.2% povidone or 1% hydrogen peroxide is recommended to reduce the oral microbes, including potential COVID-19 carriers [20].

6. Surgery for swallowing disorders

Surgeries for Swallowing Disorders are divided into three groups according to the purpose. 1) “Surgeries for improving swallowing function”, 2) “aspiration prevention surgeries”, which can prevent complete aspiration by separating the floodway from the airway, and 3) “tracheostomy” for securing the airway and the suction route of respiratory secretions.

“Surgeries for improving swallowing function” include pharyngoplasty, cricopharyngeal myotomy, laryngeal suspension, laryngoplasty (injection medialization), and infrahyoid myotomy. Each procedure can be combined with other procedures depending on the swallowing function of patients with dysphagia. However, these surgeries should be postponed during the COVID-19 pandemic because they require postoperative rehabilitation for a comparatively long time. We have to consider the possible risks of spreading SARS-CoV2 infection.

“Aspiration prevention surgery” can be postponed by performing a preceding tracheostomy. However, it can be allowed in some cases according to the regional situations of the coronavirus infection. Even in regions where COVID-19 is spreading, considering the background of the intractable diseases, recurrence of aspiration pneumonia, and carriers of multidrug-resistant bacteria, in some cases, the surgery can be performed, only if the comprehensive merits are estimated to be high.

“Tracheostomy” is a surgical procedure which opens a direct airway into the trachea from the neck. A tracheostomy tube is placed to maintain the airway and suck thick mucus and secretions from the trachea and lower airway. Tracheostomy should not be positively performed on patients suspected and confirmed for COVID-19. Tracheostomy for patients confirmed as being COVID negative is not restricted if needed. Regarding the strategy for tracheostomy, please see the Guide for tracheostomy from the Oto-Rhino-Laryngology Society of Japan [21]. Table 5 shows how to manage surgeries for patients with swallowing disorders during the COVID-19 outbreak.

7. Tracheostomy care

At the stage of COVID-19 outbreak, points to note regarding tracheostomy care including suctioning of tracheostomy tube are as follows [21–24].

Given that tracheostomy is a high-risk procedure that can generate aerosols, to protect the staff members that are involved in tracheostomy care, it is essential that staff wear appropriate PPE prior to any intervention. There is no other choice of wearing available PPE as an alternative countermeasure for viral infection, when the stock of appropriate PPE is insufficient.

It is recommended that clinicians consider that any critically ill patient recovering from COVID-19 pneumonitis is considered high risk of infection to staff during tracheostomy insertion. Be careful not to generate aerosols during tracheostomy care as follows.

- Tracheostomy procedures such as dressing, cuff care, tube care, and heat moisture exchanger change are considered high risk for staff as aerosols can be generated.
- When suctioning to remove respiratory secretions, pay attention not to cause coughing.
- Closed suction systems should be used.
- A simple face mask may be applied over the face of patients if the cuff is deflated to minimize droplet spread from the patient.
- Use of double lumen tracheostomy tube is recommended for patients with COVID-19, and to reduce the frequency of changing tracheostomy tube, only inner tube change may be permitted.
- After withdrawing mechanical ventilation, a heat moisture exchanger should be put on a tracheostomy tube. Be sure to prevent the heat moisture exchanger from being detached from the tube.
- Tracheostomy tube change can be delayed until the patient is confirmed as COVID-19 negative or COVID-19 symptoms improve. However, an individual assessment must be made for each patient.
- Avoid use of fenestrated tubes for patients with suspected and confirmed COVID-19 to reduce the aerosol risks to staff. Cuffed non-fenestrated tubes should be used until the patient is confirmed as COVID-19 negative.
- Not changing the tracheostomy tube and dressings can be allowed, unless obvious signs of infection or problems.

In view of the change in the domestic and oversea situations, tracheostomy tubes can be in a short supply. You should check the stock status of tracheostomy tubes in the medical facilities and in the country. Subsequent planned tube changes can be postponed unless signs of infection or problems such as bleeding or severe granulation are observed.

8. Nursing care

Nurses provide various forms of care to patients with dysphagia, such as oral care, and indirect/direct swallowing exercises as dysphagia therapy, meal support, and oral or tracheal suctioning. Patients with dysphagia often have multiple

Table 5
Recommended management of surgeries for patients with swallowing disorders.

	<i>Confirmed and Suspected</i>		<i>Unconfirmed</i>		<i>Negative and 2-week change to negative after confirmation</i>		
	All regions	Non-epidemic regions	Endemic regions	Epidemic regions	Non-epidemic regions	Endemic regions	Epidemic regions
Surgeries improving swallowing	Adjournment	Procedure selection	Adjournment	Adjournment	Procedure selection	Adjournment	Adjournment
Aspiration prevention surgeries	Adjournment	Limited acceptance	Only if unavoidable*	Only if unavoidable*	As usual	Limited acceptance	Limited acceptance
Tracheostomy	Only if unavoidable*	Only if unavoidable*	Only if unavoidable*	Only if unavoidable*	As usual	As usual	As usual

* suggested priority for COVID-19 testing.

Table 6
Recommended management of meal support and suctioning.

	<i>Confirmed and Suspected</i>		<i>Negative and 2-week change to negative after confirmation</i>			
	All regions		All regions			
	Permissivity	Recommended PPE	Permissivity		Recommended PPE	
Meal support	Perform with caution	full PPE	As usual		E-PPE	
Oral/tracheal suctioning	Perform with caution	full PPE	As usual		E-PPE	

	<i>Unconfirmed</i>					
	Non-endemic regions		Endemic regions		Epidemic regions	
	Permissivity	Recommended PPE	Permissivity	Recommended PPE	Permissivity	Recommended PPE
Meal support	As usual	E-PPE	Perform with caution	EB-PPE	Perform with caution	EB-PPE
Oral/tracheal suctioning	As usual	E-PPE	Perform with caution	EB-PPE	Perform with caution	EB-PPE

PPE: personal protective equipment, sPPE: standard PPE, E-PPE: Eye-PPE, EB-PPE: Eye/Body-PPE.

underlying conditions, which are more likely to become severe in conjunction with infection by SARS-CoV-2. With the ongoing spread of SARS-CoV-2 infection, there is a possibility that infections will be transmitted between healthcare workers, asymptomatic carriers, and patients. Thus, appropriate infection control measures will be necessary when caring for patients with dysphagia.

As oral care and swallowing therapy have been explained in a separate section, this section will mention the handling of meal support and suctioning. It is important that appropriate preventive measures be taken while providing nursing care depending on the local infection situation and the patient's infection status. The proper PPE for each procedure should be determined based on regional classification, presence of SARS-CoV-2 infection, and the existence of AGPs (Table 6). If use of the appropriate PPE is not possible, the best alternative, in accordance with the circumstances of individual facilities (e.g., discontinuing care, changing the content of care, and shortening intervention time), should be considered.

8.1. Selection of dietary methods and meal support during the COVID-19 outbreak

To make diet and nutritional selections for patients with suspected dysphagia, it is necessary to consider the risk of aspiration, regardless of the presence of SARS-CoV-2 infection.

In particular, as patients with COVID-19 are prone to developing respiratory disorders, it is important to select

meals considering a patient's swallowing ability and not to increase the risk of aspiration pneumonia. Patients requiring meal support should be attended to while using the appropriate PPE. Note that meal support to such patients can produce aerosols when the patient coughs or expectorates sputum accumulated in the pharynx.

- ① **Environment:** Avoid taking meals in groups as much as possible regardless of infection status. If difficult, take measures, such as spacing patients (spatial separation), staggering meal time (temporal separation), and avoiding face-to-face contact. When providing meal support to unidentified people in epidemic or endemic regions, windows should be opened, and the space should be sufficiently ventilated.
- ② **Assistance:** Minimize droplets and aerosols originating from patients. Discuss the proper way of taking food (posture, food texture, and swallowing technique) with doctors, speech therapists, or certified swallowing nurses. Provide assistance while avoiding moving in front of the patient; minimize conversation during meals. Pay particular attention to patients at high risk of aspiration in endemic/epidemic regions.
- ③ **Dietary selection:** Cases with pneumonia unrelated to COVID-19 in endemic/epidemic regions must be differentiated from cases of SARS-CoV-2 infection; however, these cases could be forced to be dealt with in a similar manner as cases derived from SARS-CoV-2 infection. From the viewpoints of maintaining health system ca-

capacity, preventing the spread of nosocomial infections, and avoiding pneumonia in patients themselves, patients with dysphagia require careful diet selection compared to normal circumstances.

- ④ **Time:** Meal times should be kept to within a maximum of 30 min depending on the patient's level of fatigue.
- ⑤ **Explanation to patients:** Considering the possibility of a patient being an asymptomatic carrier of SARS-CoV-2, all patients and their families should be advised of the necessity of observing the general requests to avoid close contact, narrow spaces, and crowded areas, as well as taking measures to control the spread of sputum droplets caused by coughing. If a patient who is positive or suspected for SARS-CoV-2 is anticipated to exhibit coughing or aspiration following taking food orally, such patients should be advised to take due care to prevent the exacerbation of pneumonia and spread of infection when they restart eating.

8.2. Oral/tracheal suctioning

Suctioning must be considered as an AGP, although it conventionally requires protection only against droplet infection.

- During suctioning, anticipate splashes due to coughing and gag reflex and do not stand in front of the patient.
- Outdoor-air ventilation (entrance door should be closed) is highly recommended in endemic or epidemic regions.
- Do not look into the oral cavity or tracheostomy site carelessly.
- Use a closed suction system while patients are supported by mechanical ventilation.
- Regarding suctioning at tracheostomy sites, refer to the previous chapter "Tracheostomy care".

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Declaration of Competing Interest

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Appendix: Message from the President of SSDJ

The New Coronavirus Infectious Diseases Control Committee of SSDJ issued an urgent alert "it is recommended to refrain from swallowing training and endoscopic swallowing function tests that involve contact with the "non-emergency" upper respiratory mucosa" on HP on April 2, 2020. On the premise of this alert, this position statement, which consists of all seven chapters, was released on April 21, starting with

the introduction, terminology, and clinical swallowing assessment on April 14. While the swift action has received great praise from various sides, some medical institutions and even those of care facilities other than medical institutions have criticized it as unrealistic. In the background, there is a lack of medical resources, such as PPE and rubbing alcohol, but healthcare professionals must recognize that they may need to diverge from conventional protective measures. Moreover, management of dysphagia produces droplets and aerosols in many situations. We must recognize that procedures should always be performed using the same PPE and knowledge. These standards should apply not only for SARS-Cov-2, but other dysphagia cases suspected to be complicated because of infection from multidrug-resistant bacteria or unknown pathogens. Therefore, as a responsible medical association in this field, it is inevitable that our society repeatedly uses the terms for standard precautions and abbreviations of equipment, such as PPE and full PPE, which are globally used, in creating this statement. Although these terms may make it difficult to read this statement, please be sure to read the first section "Terminology used in this statement and basic concept of classification" before reading each medical treatment category because they have been briefly explained. This committee consists of medical doctors, dentists, speech therapists, and registered nurses who are experts in the medical treatment of dysphagia with a deep knowledge of infectious diseases and public health selected from the members of this society. Needless to say, this statement is not a standard manual for dysphagia management but a guide for all healthcare workers involved in treatment of dysphagia during the COVID-19 epidemic. We would appreciate it if you could operate it flexibly according to the supply of medical resources at each medical institution.

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SSDJ President 2020–2021.

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