

# Intervention by Speech Therapists to Promote Oral Intake of Patients with Acute Stroke: A Retrospective Cohort Study

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**Objective:** Early rehabilitation for acute stroke patients is widely recommended. We tested the hypothesis that daily intervention by speech therapists promotes safe oral intake of patients with acute stroke. **Methods:** We analyzed hospitalized patients who experienced cerebral infarction and cerebral hemorrhage and who underwent rehabilitation between October 2010 and September 2014 at our hospital. In total, 936 patients were analyzed, and 452 patients underwent daily speech therapy. We examined the association of training frequency and eating status. **Results:** Multiple linear regression analysis indicated that daily speech therapy was correlated significantly and positively with a reduction in the number of days of hospitalization until oral intake commenced (coefficient,  $-0.998$ ; 95% confidence interval,  $-1.793$  to  $-0.202$ ;  $P < .05$ ), and was not correlated with the cessation of oral intake due to aspiration pneumonia after resuming oral intake. **Conclusion:** Our retrospective cohort study demonstrated that daily intervention by speech therapists in patients with acute stroke shortens the number of days until oral intake without increasing the incidence of aspiration pneumonia. **Key Words:** Acute stroke—dysphagia—speech therapist—daily.

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Stroke often alters a patient's dietary intake because of dysphagia or impaired consciousness. The high incidence of dysphagia and pneumonia, a poor prognosis, as well as a higher risk of death are consistently observed in stroke patients<sup>1-3</sup>; therefore, swallowing function should be assessed in acute stroke patients at the start of oral intake. Early swallow screening and dysphagia management, including active therapeutic approaches

and dietary modification, reduce the risk of aspiration pneumonia and assure quality care with optimal outcomes.<sup>4-9</sup> Abnormal volitional cough, abnormal gag reflex, dysphonia, closure insufficiency of mouth, higher National Institutes of Health Stroke Scale (NIHSS) scores, and cranial nerve palsy are warning factors of dysphagia.<sup>10</sup>

Although swallowing screening tests, including the repetitive saliva swallowing test (RSST) and water-swallowing test, are simple and beneficial, the sensitivity and specificity of detecting aspiration in these screening tests have limitations. Therefore, a comprehensive evaluation of some screening items has been recommended.<sup>11-13</sup>

For the diagnosis of aspiration and dysphasia, videofluoroscopic swallow examination (VF)<sup>14</sup> and videoendoscopic examination of swallowing (VE)<sup>15</sup> are used as standard tests. Abnormal findings in these tests are related to the incidence of aspiration pneumonia. Based on the results of these tests, instructing patients and families how to modify diets and use compensatory swallowing techniques is effective in preventing medical

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complications, such as aspiration pneumonia, dehydration, and malnutrition.<sup>16,17</sup>

Our hospital opened a stroke center in October 2007 and is an acute care hospital with a 19-bed stroke ward, including a 6-bed stroke care unit (SCU). We have been providing speech therapy every day for stroke patients since October 2012. We hypothesized that daily speech therapy for acute stroke patients correlates with a reduction in the number of days until resuming oral intake without increasing the incidence of aspiration pneumonia. To test this hypothesis, we performed a retrospective cohort study to clarify the impact of daily speech language therapy for inpatients on eating status after acute stroke.

## Subjects and Methods

### Study Design

We conducted a before-and-after retrospective cohort study of patients who were admitted to our institution between October 2010 and September 2014. A daily intervention program that included speech therapists (STs) who counseled patients on swallowing was introduced in October 2012. Thus, we defined the frequency of therapy from October 2010 to September 2012 as every “weekday” and the frequency of therapy from October 2012 to September 2014 as “everyday.”

### Study Population

Cerebral infarctions or cerebral hemorrhages were based on symptoms, neurologic signs, and the results of a brain computed tomography or magnetic resonance imaging scan. We excluded patients who used tube feeding before hospitalization. The data selection criteria are shown in Figure 1. Because the functional recovery of patients has been reported to differ between subarachnoid hemorrhage and other subtypes of stroke,<sup>18</sup> we also excluded patients with a diagnosis of subarachnoid hemorrhage from this study.

### Procedures

Patients who were hospitalized between October 2010 and September 2012 were provided speech therapy at least 20 minutes per weekday. Patients who were hospitalized between October 2012 and September 2014 were provided speech therapy at least 20 minutes every day.

All patients initiated speech therapy within 48 hours of stroke onset.

### Commencement of Oral Intake and Behavioral Intervention

The timing of initiating oral intake, the patient’s posture, and the food texture were eventually left to the attending physician’s discretion and in reference to the opinion of STs. Patients were considered eligible to commence trials of oral intake when they regained consciousness (spontaneous eye opening), were afebrile (temperature <38°C), and were able to maintain a supported sitting position.<sup>7</sup> The patients were then screened for dysphagia with bedside swallowing screening tests, such as the RSST and the 3-mL water-swallowing test. These evaluations were also provided for all patients by STs. VF and VE were performed only in selected patients with a long fasting period, a poor food test score, or suspicion of aspiration.

Before the initiation of oral intake, training for sitting, proper relaxation, and the placement of the neck in the chin-tuck position was performed daily by physical therapists (PTs), occupational therapists (OTs), or ward nurses. To initiate oral intake, a diet of the appropriate texture was chosen, and the patient was fed following postural adjustment while oxygen saturation levels were monitored. Ward nurses performed an intervention during oral intake 3 times per day. The patient’s posture or food texture was adjusted according to the patient’s response. Specialized training from STs was also provided for patients with severe dysphagia.

Nutritional intake was monitored weekly by members of a nutritional support team to ensure adequate nutrition during the hospital stay.

### Oral Care

Oral care with brushing and rinsing was primarily conducted by ward nurses and was performed at least 3 times per day, regardless of the level of consciousness and intubation status. After oral intake was initiated, oral care was provided before and after meals.

### Physical Therapy and Occupational Therapy

The patients who were hospitalized between October 2010 and September 2012 received more than 80 minutes of therapy on weekdays (physical therapy and occupational therapy each for 40 minutes or more) and 40 minutes

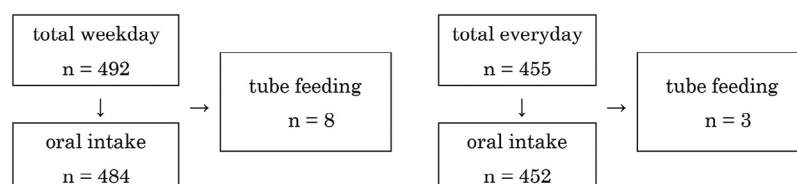


Figure 1. Data selection criteria.

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