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Evaluating Swallowing Ability on Admission in Community-Based Integrated Care Settings: Clinical Implications from a Retrospective Study

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Abstract

The present study was designed to investigate swallowing function in patients at admission to community-based integrated care wards and to determine the value of this early evaluation. Seventy-seven elderly patients who were admitted to these wards from April 2023 to March 2024 enrolled in the study. Within the first 48 hours after admission, a multidisciplinary team used a custom-designed screening tool, along with structured meal observation sessions, to assess oral and pharyngeal function and the current method of nutritional intake. Diets for dysphagia were categorized according to the Dysphagia Diet Classification 2021 and subsequently compared with the International Dysphagia Diet Standardization Initiative framework. Assessment of oral and pharyngeal function relied on the Food Intake LEVEL Scale (FILS) combined with standardized meal rounds. When required, fiberoptic endoscopic evaluation of swallowing was also conducted. The relationship between modifications in feeding routes and final discharge destinations was tested with the chi-squared test. At the same time, shifts in FILS scores were analyzed using the Wilcoxon signed-rank test. The leading medical conditions observed were aspiration pneumonia and cerebrovascular disorders. A substantial number of patients transitioned safely from total or peripheral parenteral nutrition to oral feeding, and this transition was associated with clear improvements in their FILS scores. Overall, the results underline the practical benefits of early swallowing assessment and careful selection of feeding methods in community-based integrated care wards. Findings from this work may support the development of more effective feeding strategies and better nutritional oversight throughout the hospital stay. By applying easy-to-share multidisciplinary swallowing assessment tools, it becomes possible to encourage a secure return to oral intake without always needing extensive specialized testing.

Keywords: Deglutition, Aging, Community-based integrated care, Dysphagia, Nursing care, Quality of life

Introduction

Community-based integrated care wards constitute a healthcare model specific to Japan. Their main purpose is to assist patients in a seamless transition from the acute care phase to home or other support settings, ultimately helping individuals regain independence after leaving the hospital. These wards were introduced during the 2014 medical fee schedule revisions to address the challenges posed by Japan's rapidly aging population and to serve as an intermediate stage between intensive hospital treatment and discharge [1, 2]. They primarily accommodate older adults who have completed the acute phase of treatment but still require ongoing medical attention, rehabilitation, or additional assistance before returning home. Admission decisions are guided by medical category and assessments of daily living activities [3]. Discharge arrangements are thoughtfully managed by a

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multidisciplinary team, and past research has highlighted the value of cooperation that extends beyond doctors, nurses, and therapists to include dental professionals, dental hygienists, and dietitians [4, 5].

That said, both the daily operations of these wards and the profiles of admitted patients can differ considerably from one facility to another. People recovering from various issues—such as post-fracture surgery, disuse syndrome, stroke-related conditions, or aspiration pneumonia—may enter these wards. If suitable nutritional care and rehabilitation are not provided before discharge, the likelihood of readmission or new episodes of aspiration pneumonia after leaving the hospital grows, placing greater strain on families and home-care teams [6–8].

Effective nutritional management is essential for protecting patients' quality of life once they return home. Measures to avoid aspiration, together with the proper choice of feeding methods, play a vital role in supporting reliable oral intake, particularly among individuals affected by dysphagia [9].

Dysphagia is a swallowing disorder characterized by the inability to safely and efficiently move food or liquids from the pharynx into the stomach. This difficulty arises from dysfunction in one or more stages of swallowing, including the oral, pharyngeal, or esophageal phases. Its origins are highly varied and may stem from structural issues (for example, tumors or surgical alterations), neurological or neuromuscular conditions (such as stroke, Parkinson's disease, and various myopathies), natural age-related decline in function, medication side effects, or impairments in consciousness and cognitive processing. These factors frequently overlap and interact in complex ways.

This condition is most commonly observed in older adults due to multiple age-related health problems [10]. When patients cannot sustain adequate oral intake, prolonged reliance on parenteral nutrition—whether via total parenteral nutrition (TPN) or peripheral parenteral nutrition (PPN)—increases the risk of catheter-related bloodstream infections (CRBSI) and various metabolic disturbances. On the other hand, transitioning to enteral feeding methods (for instance, via nasogastric tube or gastrostomy) introduces different hazards, including aspiration pneumonia, gastroesophageal reflux, infection at the insertion site, and tube blockage. Moreover, stopping oral intake can trigger disuse atrophy of the orofacial and pharyngeal muscles, decreased saliva production, and worsening oral hygiene, all of which further elevate the likelihood of pneumonia and additional infectious complications. For these reasons, whenever enteral or parenteral nutrition is initiated, it is crucial to implement thorough supportive care that preserves swallowing capability and maintains consistent oral hygiene practices [11].

Numerous investigations have explored dysphagia in the elderly population and its consequences for everyday life. Ohta and colleagues investigated the link between dysphagia and the likelihood of returning home among older patients in a rural rehabilitation setting. Their analysis revealed that dysphagia was associated with a reduced probability of home discharge, largely because comprehensive strategies to address multiple coexisting conditions remain insufficient [10]. In a separate study, Mori *et al*. reported that severe dysphagia significantly affected the psychological well-being of caregivers and emphasized the need for innovative multidisciplinary strategies within dysphagia rehabilitation programs [12]. Additionally, a scoping review was performed to evaluate the nutritional assessment tools used for adult patients experiencing oropharyngeal or esophageal dysphagia [13].

Despite these efforts, robust evidence remains scarce on the most effective swallowing assessment techniques and multidisciplinary nutritional care protocols within community-based integrated care wards. Furthermore, there is currently no broadly accepted or easily comparable swallowing screening instrument available.

Consequently, the current study sought to determine whether a swallowing function evaluation protocol—combining screening tools and structured meal observation rounds conducted shortly after admission—could facilitate safe and suitable oral feeding, help prevent aspiration events, decrease the risk of hospital readmission, and ease the caregiving demands placed on families at home. The study also outlines a practical operational framework for successfully applying this protocol in community-based integrated care wards. By presenting this new system, the research contributes to the existing body of knowledge. It offers a foundation for future interventions that may alleviate the physical discomfort linked to aspiration pneumonia and breathing difficulties, the distress associated with artificial feeding methods, the emotional hardship resulting from the inability to eat orally, and the overall burden experienced by caregivers.

Materials and Methods

Research design

This study was a retrospective observational study conducted in line with the STrengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

Participants

Every patient admitted to the community-based integrated care ward at Yokohama Izumidai Hospital between April 2023 and March 2024 was eligible for inclusion, regardless of age, gender, past medical conditions, primary diagnosis, or the degree of care required upon admission. Individuals were excluded if they refused to take part, could not complete a swallowing assessment within 48 h of admission because of medical reasons (for example,

sudden worsening of their condition or unplanned early discharge), or faced strict limitations on modifying their nutritional route, such as those admitted exclusively for end-of-life palliative care.

Research procedure

Right after admission and no later than 48 hours, the team implemented a specially crafted screening instrument—created in-house by the multidisciplinary group—paired with careful meal observation rounds. Nutritionists, speech-language-hearing therapists, and dental hygienists worked together to check how well patients could use their mouth and throat for swallowing and to record exactly how nutrition was being delivered. Every professional on the team held official certification from the Japanese Society of Dysphagia Rehabilitation and brought more than 10 years of practical clinical work. This thorough screening device was developed and rolled out by a cross-functional team of qualified nutritionists, speech-language-hearing therapists, and dental hygienists within the first 48 hours after patients arrived at community-based integrated care wards. It breaks down into six key sections: (1) basic details about the patient and their current clinical status; (2) a scan of past medical issues that could relate to swallowing difficulties; (3) the kind of nutrition the patient relied on before coming in and where they were expected to go after leaving; (4) how well the patient could communicate plus the working condition of the mouth, including tooth alignment at the back and how freely the tongue could move; (5) a complete review of swallowing performance that noted the current feeding method (whether by mouth, through a gastrostomy, nasogastric tube, TPN, or PPN), the texture of food, how thick liquids needed to be, the best posture for eating, and any signs of trouble while swallowing; and (6) decisions on next steps such as ordering FEES, starting swallowing practice, or arranging dental work. Extra spaces for repeated checks made it easy to track progress over the entire stay. Thanks to this orderly method, the team could quickly identify gaps between the planned nutrition plan and what the patient could safely handle, which opened the door to timely support and smoother transitions away from intravenous feeding toward eating normally.

In line with earlier published work, the meal observation rounds paid special attention to how the lower jaw moved while chewing—ranging from simple up-and-down actions and weak side-to-side turns to smooth, full rotation—and whether there was solid support between the back teeth [14, 15]. During this project, foods intended for people with swallowing problems were sorted using the Dysphagia Diet Classification 2021 system (codes 0t, 0j, 1j, 2–1, 2–2, 3, 4). The Japanese Society of Dysphagia Rehabilitation first released this system in 2013 and updated it in 2021. Researchers also examined how this Japanese framework aligned with the International Dysphagia Diet Standardization Initiative, which serves as a global reference **(Table 1)** [16, 17]. If there were any hints of material left behind in the throat or quiet aspiration, experts performed fiberoptic endoscopic evaluation of swallowing (FEES) to obtain a clearer, more accurate assessment of risk [18–21].

Table 1. Correspondence of posterior occlusal support and mandibular movements with JSDR and IDDSI texture levels.

Posterior occlusal contact	Type of chewing motion	JSDR code	Anticipated IDDSI level (reference)
Absent	Simple up-and-down movement	Code 2	Level 4 (Pureed) or Level 3 (Liquidized)
Absent	Mild rotational movement	Code 3	Level 5 (Minced and Moist)
Absent	Standard rotational movement	Code 4	Level 6 (Soft and Bite-Sized)
Present	Simple up-and-down movement	Code 2	Level 4 (Pureed) or Level 5 (Caution required)
Present	Mild rotational movement	Code 3	Level 5 (Minced and Moist)
Present	Standard rotational movement	Code 4	Level 6 (Soft and Bite-Sized) or Level 7 (Easy to Chew)

Abbreviations: JSDR = Japanese Society of Dysphagia Rehabilitation; IDDSI = International Dysphagia Diet Standardization Initiative.

Details on each patient's condition were reviewed every week in meetings that brought together doctors, dentists, nurses, dental hygienists, speech-language-hearing therapists, and nutritionists, so that any needed changes could be made right away [22]. The approach started by choosing and adjusting the best way to deliver nutrition—such as smooth, pureed items (IDDSI Level 4), easier-to-chew options, or liquids made thicker—tailored to each person's ability. After that came focused exercises to keep the mouth and tongue muscles working well or even make them stronger. On top of that, the staff provided clear instructions on brushing teeth correctly and ensured thorough daily mouth cleaning. Lastly, patients who had been receiving all nutrition via TPN or PPN were gradually moved toward eating by mouth, but only once both FEES results and meal checks showed it was safe. The study kept track of three main things: (1) which routes were used to supply nutrition (eating normally, feeding through a nose tube, PPN, or TPN); (2) any movement in scores on the Food Intake LEVEL Scale (FILS) from the beginning to the end of the program; and (3) where the patient ended up after leaving (back home, in a nursing home, moved to a different hospital section like rehab or extended care, or unfortunately passing away). The FILS offers a reliable yardstick for judging both how much and how well someone can take food by mouth, with a range of 1 to 10 [23].

Statistical analysis

Researchers applied the chi-square test to examine how nutritional delivery methods changed from the start of the program to the finish and to determine whether those shifts differed across discharge outcomes depending on whether the full set of steps had been followed. On top of that, they used the Wilcoxon signed-rank test to compare FILS scores recorded before the program began with those measured afterward. To understand the strength of any differences, they calculated effect sizes—using r from the Z score of the Wilcoxon test and Cramér's V for the chi-square results. Any finding with a p-value below 0.05 is considered meaningful from a statistical point of view.

Ethical statement

The research protocol gained official clearance from the Ethics Committee of Yokohama Izumidai Hospital with approval number 20240805–1. All individuals involved, or their legally authorized representatives, were given a thorough overview of the study details before signing written consent forms.

Results and Discussion

Over the period from April 2023 to March 2024, exactly 77 patients (average age 83.9 ± 7.4 years; 38 men and 39 women) who entered the hospital's community-based integrated care ward participated in the study. Aspiration pneumonia was the leading diagnosis at 20.8%, followed by cerebrovascular disorders at 18.2% **(Table 2)**.

Table 2. Distribution of the main illnesses among patients admitted to the community-based integrated care wards.

Main illness	Number of patients
Aspiration pneumonia	16
Cerebrovascular disorder	14
COVID-19	7
Pneumonia	4
Urinary tract infection	2
Chronic renal failure	2
Influenza	3
Parkinson's disease	2
Cancer	3
Other	24

Analysis with the chi-square test revealed a clear statistical association between implementing the intervention and the pathways used to deliver nutrition ($\chi2(3)=8.40$, $P < 0.05$, Cramer's $V = 0.23$). Through coordinated swallowing checks and meal-monitoring sessions led by the various specialists, plus customized support tailored to each person's specific issues, many patients were able to successfully shift to eating by mouth after FEES testing and mouth-muscle exercises. Examination of the adjusted residual figures for nutritional route adjustments from before to after the program showed a notable drop in TPN usage alongside a rise in direct oral feeding **(Table 3)**.

Table 3. Changes in the route of nutritional supply before and after intervention.

	Post-intervention	Before-intervention
PPN	8 (10.4%, −1.6)	15 (19.5%, 1.6)
TPN	5 (6.5%, −2.0)	13 (16.9%, 2.0)
Tube feeding	15 (19.5%, 0.0)	15 (19.5%, 0.0)
Oral intake	49 (63.6%, 2.4)	34 (44.2%, −2.4)

Note: The data are presented as the number of patients (proportion) and the adjusted residual.
Abbreviations: PPN, Peripheral parenteral nutrition; TPN, Total parenteral nutrition.

Among the 77 patients who underwent initial screening, 62 (81%) experienced a change in their FILS rating. This highlighted a noticeable difference between the originally set feeding plans and the patients' actual ability to swallow safely. Once the program was completed, the median FILS level advanced from Level 4 (severely limited oral eating that still depended on extra support) to Level 7 (full three meals consumed orally with straightforward textures to manage) ($Z = 5.757$, $P < 0.05$, $r = 0.66$). At the same time, the proportion of patients who could manage without additional nutritional support increased **(Table 4)**.

Table 4. Changes in food intake LEVEL scale scores before and after intervention.

FILS score	After-intervention	Before-intervention
1	5 (6.5%)	29 (37.7%)
2	4 (5.2%)	2 (2.6%)
3	0 (0.0%)	0 (0.0%)
4	15 (19.5%)	11 (14.3%)
5	4 (5.2%)	1 (1.3%)
6	8 (10.4%)	10 (13.0%)
7	21 (27.3%)	19 (24.7%)
8	19 (24.7%)	5 (6.5%)
9	2 (2.6%)	1 (1.3%)
Median of the FILS score	7 (4–8)	4 (1–7)

Note: The FILS score is shown as the number of patients (proportion), and the median FILS score is shown as the value (interquartile range). Abbreviation: FILS = Food Intake LEVEL Scale.

Further chi-square testing demonstrated a robust statistical relationship between participation in the intervention and the final discharge situation ($\chi 2(3) = 24.04$, $P < 0.01$, Cramér's $V = 0.38$). Review of the adjusted residuals, tied to whether the intervention occurred and the various possible discharge locations, revealed that the group receiving the program experienced fewer transfers to other hospitals and more returns straight to their own homes. To provide a useful benchmark, outcomes from a separate non-intervention group were also examined. This comparison group comprised 88 patients who had stayed in the same community-based integrated care ward during the same months one year earlier (April 2022–March 2023), when the present team-based swallowing evaluation program had not yet started. Their discharge results were then compared side by side with those in the intervention group **(Table 5)**.

Table 5. Difference in discharge destinations by the presence of the intervention.

	Intervention group	Non-Intervention group
Death	26 (33.8%, −1.7)	41 (46.6%, 1.7)
Transferred to another hospital	4 (5.2%, −3.3)	21 (23.9%, 3.3)
Admitted to the facility	27 (35.1%, 1.6)	21 (23.9%, −1.6)
Home	20 (26.0%, 3.6)	5 (5.7%, −3.6)

Note: The data are presented as the number of patients (proportion) and the adjusted residual.

The present investigation demonstrated a markedly high proportion (81%) of inconsistencies between prescribed diet textures and patients' actual swallowing function at admission. This finding highlights a critical gap between clinical dietary orders and the patients' physiological capability to safely ingest food. Importantly, even when oral intake had already been initiated, swallowing evaluation often revealed the need to adjust food texture or modify the feeding route to enhance safety. The discrepancy observed in this study exceeds the adjustment rates documented in earlier reports. For instance, Martino *et al*. showed that many patients with acute stroke required changes to their diet or feeding method following swallowing screening. In a similar vein, Beck *et al*. emphasized that although modified diets and thickened liquids are routinely prescribed for dysphagia, robust evidence supporting their appropriateness remains limited.

In this study, swallowing assessments were conducted using standardized screening tools in combination with structured meal observations, both performed collaboratively by a multidisciplinary team. Patient conditions were subsequently reviewed during team-based conferences. These findings suggest that, within community-based integrated care wards, oral feeding can be initiated early while maintaining safety. Although such wards play a key transitional role in bridging acute care and post-discharge living environments, clinical practices differ across institutions, and there is still a lack of uniformity in how swallowing function and dietary intake are assessed [6–8].

The implementation of meal rounds enabled the identification of more suitable feeding strategies tailored to individual patient needs. When indicated, additional evaluations such as fiberoptic endoscopic evaluation of swallowing (FEES), along with targeted rehabilitation, were introduced to improve swallowing safety. These interventions facilitated the shift from total parenteral nutrition (TPN) and peripheral parenteral nutrition (PPN) to oral intake, resulting in measurable gains in FILS scores. Establishing stable oral intake is particularly important, as it not only reduces the likelihood of aspiration pneumonia but also helps to ease the caregiving burden after discharge [24]. Furthermore, such improvements may mitigate emotional stress for family members and help reduce overall healthcare costs [11].

Several limitations should be considered when interpreting these findings. First, this was a retrospective observational study conducted at a single institution, which may limit the generalizability of the results. Future studies employing prospective, multicenter designs are needed to validate these findings across more diverse populations. Additionally, the screening tool developed for this study was not formally compared with established standardized assessment methods, leaving its reliability and validity unverified. Further research is therefore necessary to confirm its reproducibility and to evaluate long-term patient outcomes after discharge.

Nevertheless, in the context of community-based integrated care wards—where patients with heterogeneous conditions receive intensive, short-duration care—this approach may offer a practical means to comprehensively assess swallowing function and guide appropriate dietary decisions. Such improvements could potentially lead to higher rates of discharge to home settings and lower in-hospital mortality. Moreover, the approach may help reduce the workload of both family caregivers and home-care professionals. The multidisciplinary strategy adopted in this study underscores the importance of coordinated nutritional management and swallowing rehabilitation following acute care, especially in aging societies. Given that community-based integrated care wards are unique to Japan, further research across institutions, including international collaboration, would be valuable. Establishing standardized practices supported by stronger evidence could ultimately contribute to the development of globally applicable care models for swallowing management.

The findings further indicate that a shared multidisciplinary swallowing assessment approach can enable safe progression to oral feeding without relying on detailed instrumental diagnostics. This strategy was associated with improved FILS scores and may also contribute to better discharge outcomes, including increased transitions to home or care facilities, reduced mortality-related discharges, lower incidence of aspiration pneumonia and readmissions, and decreased caregiver burden. However, these potential advantages require further confirmation through additional studies.

Conclusion

In summary, this study demonstrated that swallowing assessments conducted by a multidisciplinary team—using screening tools and structured meal observations—can effectively evaluate swallowing function at admission in community-based integrated care wards. When combined with interventions determined through team-based discussions, this approach supported the transition from TPN or PPN to oral intake. The method appears to be a feasible strategy for promoting the safe, early initiation of oral feeding. It may also help reduce the risk of aspiration pneumonia and hospital readmission, improve discharge outcomes, and lessen caregiver burden; however, these findings should be interpreted with caution. Further validation through prospective, multicenter collaborative research is necessary to confirm both the effectiveness and reproducibility of this approach. Additionally, continued efforts are required to optimize its implementation and strengthen the evidence base within community-based integrated care settings. Overall, the results suggest that adopting a standardized, team-based evaluation of swallowing function at admission may provide an effective pathway for ensuring safe and appropriate nutritional management.

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