



RESEARCH ARTICLE

Instrumental swallowing assessment in adults in residential aged care homes: Practice patterns and opportunities

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Abstract

Objective: To describe practice patterns in the use of instrumental swallowing assessment (ISA) for older adults in residential aged care homes (RACHs).

Methods: A retrospective audit of medical records of residents living in RACHs in Melbourne, Australia to extract data on speech-language pathologist (SLP) involvement, indications for ISA and ISA practice patterns.

Results: Medical files of 323 residents across four Melbourne facilities were reviewed. 36% ($n = 115$) of residents were referred to SLP for swallowing assessment. Referral to SLP was related to length of stay ($U = 7393.00$, $p < 0.001$), dementia status ($\chi^2[1] = 7.06$, $p = 0.008$), texture modification ($\chi^2[1] = 93.34$, $p < 0.001$) and an existing dysphagia diagnosis ($\chi^2[1] = 112.89$, $p < 0.001$). There were no referrals for ISA and no instances of ISA being used. Among 115 residents who were referred to SLP for swallowing assessment, there were 33 instances where ISA might be clinically relevant according to ISA indicators.

Conclusions: Instrumental swallowing assessment is not being used for the management of swallowing in RACHs in Australia despite a clinical need for ISA and a potential role for ISA to improve swallowing care quality. Lack of timely ISA may fail to meet the complex health-care needs of older adults living with

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dysphagia in RACHs, increasing their vulnerability to complications of dysphagia and its management.

KEYWORDS

deglutition, delivery of health care, dementia, referral and consultation, residential facilities

1 | INTRODUCTION

The prevalence of dysphagia in adults living in residential aged care homes (RACHs) ranges between 40% and 68%.^{1–3} Timely, personalised dysphagia assessment and management in older adults minimises dysphagia-associated complications including choking, dehydration, malnutrition, sarcopenia, aspiration, psychosocial sequelae and death.³ Instrumental swallowing assessments (ISA), including videofluoroscopic swallowing studies and flexible endoscopic evaluation of swallowing (FEES), are commonly used in community and hospital settings to obtain more information about swallow anatomy/physiology than is possible through a clinical swallowing evaluation alone.^{4–8} Instrumental swallowing assessments may be performed when indications for ISA⁶ (e.g. suspected aspiration, sensations of globus, vague dysphagia symptoms) align with treatment goals and consumer choice. Videofluoroscopy is a dynamic radiological imaging procedure where radio-opaque food/fluids are swallowed. FEES involves trans-nasal insertion of a flexible endoscope, with a light source and camera to allow direct visualisation of the pharynx and larynx during swallowing. These assessments provide information on the safety and efficiency of the swallow, including the volume/location of any food/fluid residue, timing of the swallow and presence of material in (aspiration) or surrounding (penetration) the airway. This information can be used to design tailored dysphagia education and management programmes.

In Australia, RACHs provide accommodation and 24-h nursing care for older people requiring assistance with everyday tasks, personal and clinical care. Facilities may be government owned or privately owned with all at least part-funded by government and adhering to national quality care regulation. Residents of RACHs pay a means-tested contribution. Currently, any resident identified to require an ISA by their treating doctor and speech-language pathologist (SLP) must be referred to an outpatient (usually hospital based) ISA clinic and travel off-site to access ISA. Australian SLPs acknowledge the value of ISA for older adults but report a range of barriers to implementation, including limited RACH staff and consumer knowledge about ISA, gaps in clinical governance and the logistics of residents travelling off-site.⁹

Policy Impact

Instrumental swallowing assessment is not utilised in RACHs, despite its role in supporting person-centred swallowing care and its use in other settings. Further research is needed into innovative care models that facilitate access to ISA for adults living in RACH, to ensure equitable health care across settings.

Practice Impact

Lack of timely ISA may fail to meet the complex health-care needs of older adults with dysphagia in RACH. There is an opportunity for medical/speech-pathology staff working in RACH to consider the role of ISA in improving the quality of swallowing care, and when appropriate, make timely ISA referrals.

1.1 | Aims

This medical file audit aimed to (i) examine the use of ISA with RACH residents; (ii) explore pathways for referral to ISA and (iii) identify situations where indicators for ISA were missed.

2 | METHODS

2.1 | Study design

A retrospective audit of medical records of residents living in four RACHs located in metropolitan Melbourne, Australia was performed between March and July 2020.

2.2 | Sample and setting

Convenience sampling was used to select RACHs. Facilities were recruited if they were (i) located in metropolitan Melbourne, Australia; (ii) accredited by the Australian Aged Care Quality Agency and (iii) able to offer access to medical records of all residents.

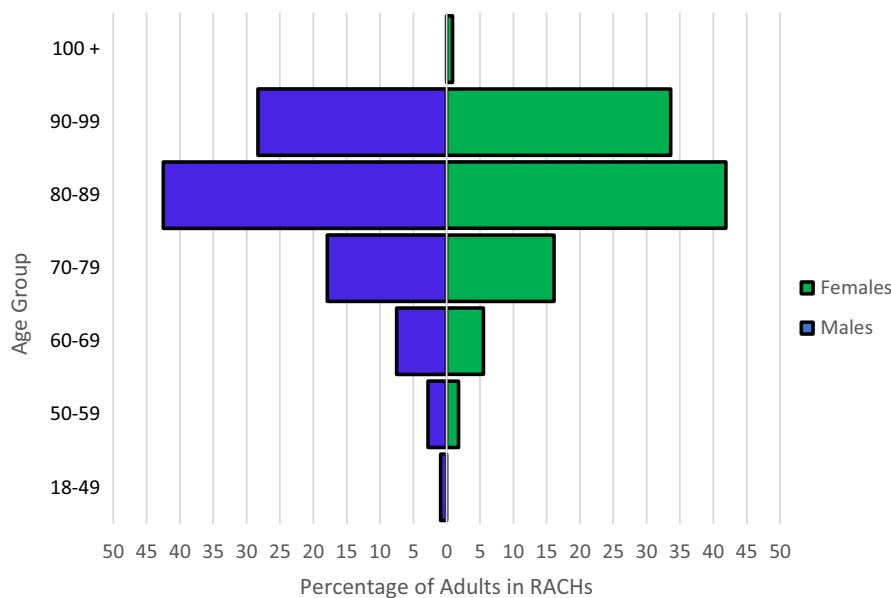


FIGURE 1 Age and gender distribution of 323 residents from four residential aged care homes

2.3 | Measures

An electronic audit tool was developed to guide data extraction (Appendix S1) in the following areas: de-identified biographical information, medical diagnoses, texture of oral intake, SLP involvement (e.g. referral, diagnoses, recommendations) and ISA (i.e. indications and practice patterns for ISA). Indicators for ISA (Appendix S2) were based on Langmore and Aviv.⁶

2.4 | Procedures

Ethical approval was granted by The University of Melbourne Human Research and Ethics Committee (#1955492, 02/05/2020). Facilities were contacted, recruited and consented if they satisfied the study inclusion criteria. Consent was not required from individual RACH residents as data were deidentified.

Medical files (paper and/or electronic) of all residents on a nominated date were audited. For each resident, the entire medical record was reviewed (by author 1) using a combination of handsearching and keyword searching (electronic records). Data were manually recorded and managed using REDCap electronic data capture tools.^{9,10} Two authors (authors 1 and 2) individually reviewed SLP, medical, allied health and nursing staff documentation to identify the presence of ISA indicators and discussed findings to reach consensus. Both reviewers were SLPs with >20 years of experience in evaluation and management of dysphagia in adults, across a range of health-care settings (including RACHs and acute hospitals), private and public health sectors.

2.5 | Statistical analyses

Quantitative data were analysed in IBM® SPSS®, Version 26.0 (2019: IBM Corp). Demographic characteristics and the presence of indicators for ISA were summarised using descriptive statistics. The chi-square (χ^2) test for goodness-of-fit compared age and gender distribution of participants against normative data from the National Aged Care Data Clearinghouse (independent repository of national aged care data) published by the Australian Institute of Health and Welfare.¹¹

Key groups of interest were defined by referral to SLP (yes/no) and use of ISA (yes/no). To determine the relationship between these two variables and categorical variables (e.g. medical diagnoses), Pearson chi-square (χ^2) analyses were calculated. Mann-Whitney *U* and the one-sample *t* tests were used to determine differences between groups on continuous measures (e.g. length of stay [LOS] data). LOS data were compared against state specific data from the National Aged Care Data Clearinghouse. Statistical significance was set at $p < 0.05$.

3 | RESULTS

3.1 | Resident demographics and clinical characteristics

Four RACHs (Facility 1 [F1], F2, F3 and F4) were recruited and the medical files of 323 residents audited (F1 $n = 87$; F2 $n = 75$; F3 $n = 27$; F4 $n = 134$ residents). Two facilities were operated by the same organisation.

The age and gender distribution of residents was consistent with the Victorian state-wide distribution¹² ($\chi^2[13] = 11.74, p = 0.55$). Average age of residents was 84.3 years ($SD = 9.5, 47-105$ years) of whom nearly two-thirds were female (Figure 1). Most residents had English as their primary language (75%, $n = 241$, Table 1).

Dementia, musculoskeletal and connective tissue diseases (e.g. osteoarthritis), and circulatory diseases (e.g. hypertension) were the three most frequently documented medical diagnoses (Table 1). While 99% ($n = 318$) of residents presented with more than two comorbidities, 58% ($n = 186$) had over 10 comorbidities. Cognitive impairment and dysphagia were documented in 69% ($n = 223$) and 29% ($n = 94$) of residents, respectively. Adults with dementia had an increased likelihood of dysphagia diagnosis ($\chi^2[1] = 8.32, p = 0.004$). The degree to which each condition required active management or care was not explored.

Average LOS ranged from 654.3 (F2) to 1278.2 (F3) days. Total cohort the average LOS was 951.9 days (Median (Mdn) = 573.0 days, standard deviation (SD) = 1123.4 days, 95% interquartile range = 828.9–1074.9) was like data for adults in Victorian RACHs (M = 909.7 days, Mdn = 580.0 days, SD = 1031.8 days)¹³ one-sample $t(322) = 0.68, p = 0.5$.

3.2 | Referral patterns for SLP swallowing care

Across the four facilities, 36% ($n = 115$) of residents were referred to SLP for swallowing assessment. Those referred for swallowing assessment had a longer LOS (Mdn = 202.7 days) than participants who were not referred (Mdn = 140.0 days; $U = 7393.00, p < 0.001$). Referral to SLP was related to dementia status ($\chi^2[1] = 7.06, p = 0.008$), texture modification ($\chi^2[1] = 93.34, p < 0.001$) and an existing dysphagia diagnosis ($\chi^2[1] = 112.89, p < 0.001$). Factors related to referral in adults with dementia were LOS ($\chi^2[13] = 8.32, p < 0.001$) and facility ($\chi^2[3] = 13.34, p = 0.004$). Similarly, among residents receiving texture modified food/drinks, those referred to SLP had a longer LOS than residents who were not referred ($U = 976.50, p < 0.001, r = 0.34$). In exploring the effect of facility on SLP referral in this group, 69% ($n = 20$) of F1 residents were not referred to SLP. This relationship was reversed in F2, F3 and F4, where more than 60% of residents receiving texture modification were referred for a swallowing assessment.

One in five residents with a dysphagia diagnosis were not referred to SLP (20%, $n = 19, N = 94$). There were three cases where SLP referral was not documented despite acute hospital handover recommendations for SLP input.

TABLE 1 Demographic and medical characteristics of 323 residents from four RACHs

	Descriptive statistic	Value
Demographic characteristics		
Age (years)	M (SD)	84.3 (9.5)
Gender % (female)	% (n)	65 (217)
Language spoken % (English)	% (n)	75 (241)
Common medical comorbidities		
Cognitive impairment	% (n)	69 (223)
Dementia	% (n)	64 (205)
Osteoarthritis	% (n)	59 (190)
Hypertension	% (n)	55 (179)
Pain syndrome	% (n)	50 (162)
Depression	% (n)	43 (140)
Incontinence	% (n)	42 (137)
Anxiety	% (n)	38 (124)
Hyperlipidaemia	% (n)	31 (99)
Recurrent falls	% (n)	29 (95)
Fractures	% (n)	26 (85)
Cancer	% (n)	25 (80)
Stroke	% (n)	25 (79)
Non-insulin-dependent diabetes	% (n)	24 (77)
Number of medical comorbidities		
1–5	% (n)	6 (19)
6–10	% (n)	36 (129)
11–15	% (n)	40 (129)
16–20	% (n)	13 (43)
21–26	% (n)	4 (14)
Dysphagia diagnosis	% (n)	29 (94)
Food and/or fluids modified	% (n)	39 (125)
Length of stay (days) in RACH	Mdn (95% IQR)	573 (828.9–1074.9)
Number of SLP contacts		
1	% (n)	60 (68)
2	% (n)	24 (27)
3	% (n)	8 (9)
4	% (n)	6 (7)
5	% (n)	0.9 (1)
7	% (n)	0.9 (1)

Abbreviations: IQR, interquartile range; M, mean; Mdn, median; RACHs, residential aged care homes; SD, standard deviation; SLP, speech-language pathologist.

Among adults with and without a documented dysphagia diagnosis, there were 32 cases where potential signs of dysphagia (e.g. choking episodes) were documented

but not addressed or were managed by a medical/nursing professional, without SLP input (e.g. thickened fluids were initiated by nursing staff after observing a resident coughing when drinking). In an additional four cases, an SLP referral was initiated, but SLP recommendations were not followed, with nursing staff documenting an alternate swallowing management plan.

A resident referred for an SLP swallowing assessment had a median of 1.00 (interquartile range = 1.001) clinical contacts with an SLP. There was a weak positive correlation between the LOS and the number of SLP swallowing-related contacts ($r_s = 0.22$, $p = 0.018$, $N = 113$).

3.3 | ISA in adults in RACHs with dysphagia

There were no residents referred for ISA. Among 115 residents who had been referred to SLP for swallowing assessment, we identified 33 instances where ISA might be clinically relevant according to ISA indicators described by Langmore and Aviv⁶ (see Table 2).

4 | DISCUSSION

In Australia, SLPs agree there is a clinical need for ISA in swallowing evaluation and management in RACHs.⁸ However, barriers relating to governance, staff/consumer knowledge and collaboration may result in ISA being underutilised.⁸

No residents were referred for ISA in this study, similar to earlier research indicating ISA is not commonly used in managing swallowing in Australian RACHs.⁸ Based on ISA indicators,⁶ we identified 33 potentially missed opportunities for ISA. Information obtained using an ISA could have facilitated more accurate diagnosis and/or tailored swallowing care than a clinical swallowing examination (CSE) alone for these residents. For example, an ISA can help to determine if coughing during meals is associated with post-nasal drip, retrograde movement of the ingested food/fluids through the cricopharyngeal sphincter, attempts to clear pharyngeal residue and/or laryngeal penetration/aspiration. An ISA may have also helped to guide dysphagia management by offering biofeedback and education to residents with swallowing concerns (e.g. residents with globus sensations). Visual information about the effect of compensatory strategies (e.g. neck flexion during swallowing or the use of thickened fluids) is useful to determine if these strategies are effective in improving swallowing safety/efficiency.

Since SLPs are responsible for identifying the need for ISA, without SLP input this need may have been missed (Figure 2). In 33 cases, potential signs and symptoms of dysphagia were not followed up with a documented SLP referral. SLP referrals are typically initiated by RACH nursing staff when an increased risk of dysphagia is identified. Front-line RACH staff need the skills and resources (e.g. time, dysphagia screening tools) to identify these risks.^{14,15} In Australia, over the past 20 years, there has been a decrease in the percentage of qualified nurses in the RACH workforce, and increase in the proportion of unregistered, and in some cases untrained personal care workers.¹⁶ Some of the staff providing daily assistance with meals may, therefore, lack the skills to identify signs of dysphagia.¹⁶

In this study, we found that referral to SLP was related to the facility in which a resident lived, suggesting possible variations in care pathways/SLP referral criteria between facilities. With no known standardised, international dysphagia screening practices or tools for residents living in RACHs, inconsistency is expected.^{16–18} There are dysphagia screening tools, but many have not been validated in the RACH setting.¹⁸

Another example of variation in practice patterns between RACH was that more than 60% of F1 residents on texture modified intake were not referred to SLP, while the reverse was true in F2, F3 and F4. Guidelines and interprofessional education to address texture modification without SLP input could improve care quality and consistency.¹⁹ The RACH with the smallest number of beds had the largest number of SLP referrals, supporting the idea that the small household model of RACH may lead to superior quality of care.^{20,21} Care staff in smaller facilities may be responsible for fewer residents, allowing them to develop a more comprehensive understanding of each resident's swallowing needs.

A weak positive association between swallowing assessment referrals and increased LOS was found. This association needs further exploration. It is possible that LOS was a co-founder in the relationship between referral to SLP and the number and nature of medical comorbidities experienced by a resident.

In some cases, SLPs may not have recognised indications for ISA. Others may not have documented this need due to perceived clinical contraindications (e.g. heightened agitation increasing the risk of endoscope intolerance) and/or access barriers.⁸ In Australia, residents must travel off-site to an outpatient clinical setting to access ISA. Costs associated with off-site travel, including payment for transportation, accompanying staff and the ISA itself may have been prohibitive for some residents. These challenges may be exacerbated by comorbidities.

TABLE 2 Missed potential opportunities for ISA to support swallowing care in 115 adults referred to SLP for swallowing assessment

Criteria for ISA	Number of cases			Examples
	Adults referred to SLP for swallowing assessment (N = 115)	Adults on modified diets/fluids	Adults with dysphagia	
Unanswered diagnostic questions/unclear nature of dysphagia	20	19	13	SLP documented unclear aetiology of coughing post-swallow with differential diagnoses including post-nasal drip, reflux and aspiration
Help to guide dysphagia management (e.g. biofeedback, education, trial of compensatory strategies)	13	10	12	Biofeedback: Resident reported concerns about intermittent globus sensations before and after the swallow Trial compensation: Neck flexion posture trialled on CSE and recommended to optimise swallowing safety without visualising the impact of this strategy on swallowing dynamics. Monitor change over time: Pharyngeal and laryngeal oedema and reduced pharyngeal sensation noted on VFSS during the resident's hospital admission, preceding RACH transfer

Abbreviations: CSE, clinical swallowing examination; ISA, instrumental swallowing assessment; RACHs, residential aged care homes; SLP, speech-language pathologist; VFSS, videofluoroscopic swallowing studies.

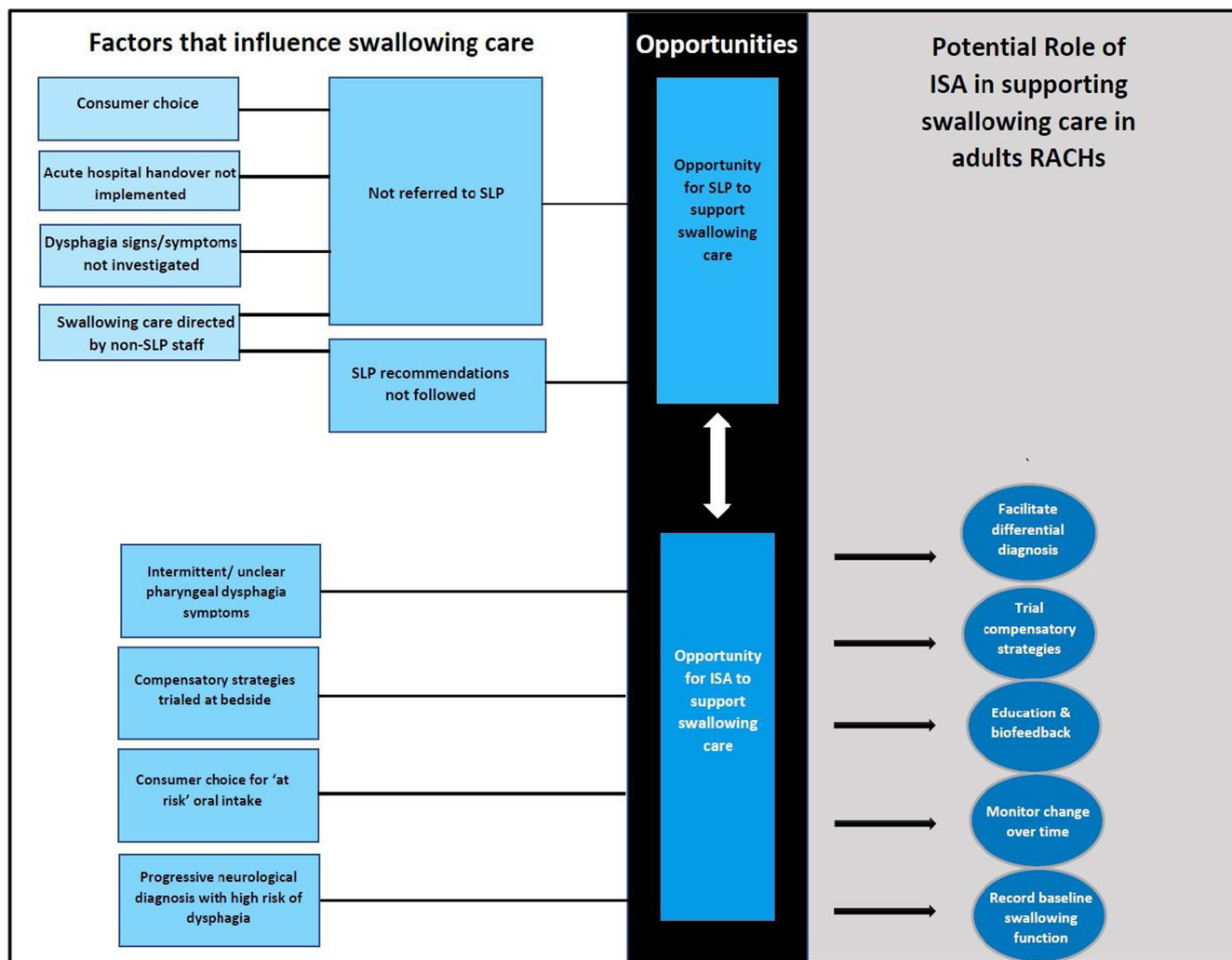


FIGURE 2 Relational view of influences, opportunities and the role of instrumental swallowing assessment (ISA) in adults in residential aged care homes (RACHs)

4.1 | Study limitations

Recruitment of RACHs and data collection occurred at the beginning of COVID-19 pandemic, in early 2020. Intermittent lockdown of RACHs may have affected SLP referral and practice patterns, with only urgent SLP referrals being initiated by facilities. SLPs may have been less likely to refer consumers for FEES because it was considered an aerosol-generating procedure, which was intermittently restricted during the pandemic. However, the pandemic represented less than 20% of the average resident's total admission period. As there was no evidence of ISA being utilised before COVID-19 was detected, it is unlikely that the pandemic significantly influenced study findings.

The global International Dysphagia Diet Standardisation Initiative (IDDSI) was introduced into Australian RACHs in May 2019 to standardise the terminology and description of texture modified food and thickened fluids.²² Following this transition, adults on

texture-modified oral intake were referred to SLP for swallowing assessment to determine which IDDSI textures correlated with existing recommendations, potentially inflating the number of SLP referrals above usual patterns. The Royal Commission into Aged Care Quality and Safety, conducted *in Australia between 2018 and 2021*, may have also stimulated increased SLP referrals as facilities prepared for quality inspections.

The accuracy and completeness of medical records examined during data collection could have influenced our findings. While medical notes have been described as a high standard for obtaining clinical information,²³ there was potential for missing data due to clerical, technical and clinical errors.

Data collection was completed by a single rater. The accuracy and reliability of extraction could have been confirmed with an additional rater, but this was not possible due to COVID-19-related restrictions in place during the data collection period.

Finally, due to convenience sampling, no rural/regional Victorian RACHs participated in the study, potentially limiting the generalisability of our results. However, RACH in more remote geographical locations generally experience greater difficulty in accessing allied health services (e.g. SLP), compared to metropolitan facilities.¹¹ Therefore, residents of these facilities are unlikely to have increased use of/referral to ISA.

4.2 | Clinical implications

Drawing from the principles of medical diagnostics,²⁴ before an ISA is utilised, there should be a need for diagnostic information beyond information that can be obtained through a CSE. This need should be identified by a health-care professional and, if appropriate, in the context of holistic patient care (Figure 3). Development of evidence-based referral guidelines for ISA, specific to adults living in the RACH setting, could help health-care professionals recognise the need for ISA. Additional FEES education and training for SLPs working in RACHs⁸ could support SLP to initiate timely and appropriate ISA referrals.

Residents who may benefit from ISA include adults who are prescribed texture modified food/fluids with the aim of increasing swallowing safety and/or efficiency. In our study, 38% of all participants received texture modified oral intake. Without visualising the pharynx and larynx using ISA, it is impossible to ascertain the impact of texture modification on critical aspects of the swallow, including the presence and severity of pharyngeal residue;

pharyngeal sensation, presence and severity of aspiration; reliability and effectiveness of the cough reflex in protecting the airway from aspiration. Hence, there is increased potential for inappropriate swallowing management, including excessive use of texture modification, and associated iatrogenic complications (e.g. malnutrition, dehydration, electrolyte imbalance, acute renal impairment, urinary tract infections, delirium and falls). These risks are amplified in frail, older adults. ISA could help to identify the functional impact of texture modification allowing more tailored recommendations.

Instrumental swallowing assessment is also beneficial in providing education. Video recordings of swallowing dynamics can be used to demonstrate specific dysphagia risks, management strategies, and facilitate shared decision-making between older adults and health-care providers. Since education can improve compliance with behavioural lifestyle changes,²⁵ residents who receive tailored swallowing education may feel more empowered to accept diet/fluid modification while RACH staff involved in meal assistance may be more motivated to implement SLP recommendations.^{26,27}

Dementia was the second most frequently documented medical diagnosis in our study, often in the context of multiple comorbidities. Of residents with dementia, 35 ($n = 71$, $N = 205$) had a diagnosis of dysphagia. While these findings align with clinically diagnosed oropharyngeal dysphagia (OD) rates (32%–45%),²⁸ prevalence rates of 84%–93% have been reported in the literature based on ISA.^{28,29} Judicious use of ISA may offer a sensitive approach to timely dysphagia identification than CSE alone.

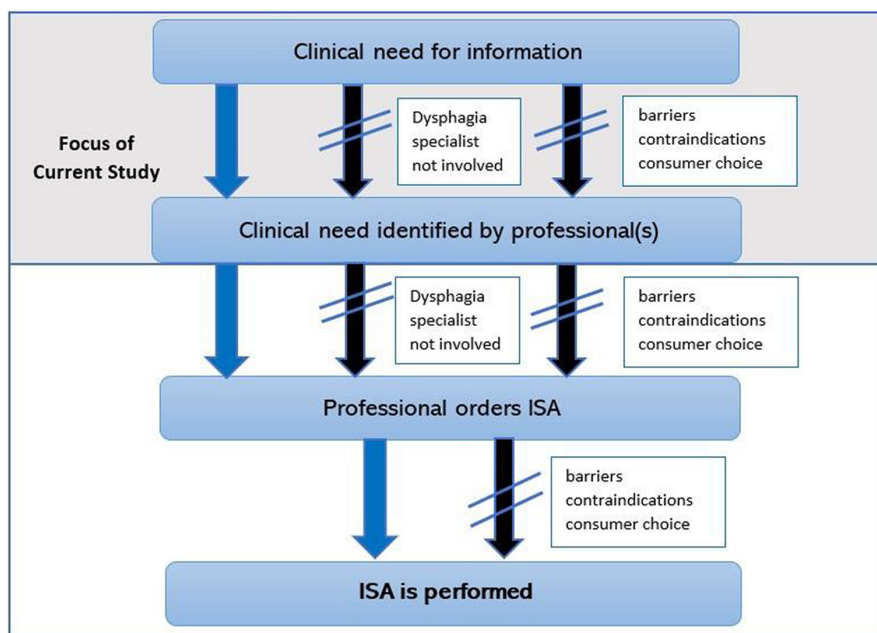


FIGURE 3 Conceptual model of stages that lead to instrumental swallowing assessment (ISA) in adults in residential aged care homes (RACHs)

Since dysphagia may occur at all stages of dementia, OD identified through ISA could also be used as a marker for disease severity and to monitor change over time.²⁸

5 | CONCLUSIONS

As the global population of older adults living in RACHs grows, there is an urgency to ensure that adults in this setting can access person-centred swallowing care, including the option to participate in ISA, an approach that offers more specific diagnostic information than CSE alone.

In this study, we examined the use of ISA in adults in RACHs by auditing clinic records of 323 residents. There were no referrals for ISA and no instances of ISA being used in this setting. We identified 33 potentially missed opportunities where ISA could have facilitated more accurate diagnosis and/or tailored swallowing care. This unmet need for ISA contradicts the principles of person-centred health care, potentially increasing the incidence of dysphagia-related complications. Moving forward, further research is needed to explore innovative care models that facilitate the use of ISA in adults in RACHs to (i) investigate its potential benefits/limitations and (ii) trial processes for appropriate consumer identification, timely referral and implementation of ISA in this setting. This research will support more informed, evidence-based choices about swallowing care.

Building upon our previous work in this area, in this medical file audit, we aimed to (i) examine the use of ISA with RACH residents; (ii) explore pathways for referral to ISA; and (iii) identify situations where indicators for ISA were missed.

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CONFLICTS OF INTEREST

No conflicts of interest declared.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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