

## Original article

## Identifying cognitive dysfunction using the nurses' rapidly clinical judgment in elderly inpatients

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## ABSTRACT

**Background/Purpose:** The aim of this study was to examine the relationship between nurses' clinical judgment on cognitive function by fall risk assessment and mini-mental state examination (MMSE) scores in elderly inpatients.

**Methods:** We studied 61 consecutive hospitalized patients who received both comprehensive geriatric assessment (CGA) and fall risk assessment at the Department of Geriatric Medicine in Kyoto University Hospital from January 2006 to June 2010. During the fall risk assessment at admission, primary nurses evaluated the cognitive function by four items (with or without disorientation, impaired judgment, lack of comprehension, and memory loss), while a trained clinical assistant performed CGA including MMSE. Patients were divided into three groups according to the MMSE scores. The association between the four items of judgment by nurses and MMSE scores was then studied.

**Results:** The mean age was 80.1 years and 55.7% of the patients were female. The percentage of patients judged to have impaired judgment, lack of comprehension, and memory loss was higher in patients with lower MMSE scores (impaired judgment,  $p$  for trend = 0.001; lack of comprehension,  $p$  for trend = 0.043; memory loss,  $p$  for trend = 0.001). The percentage of patients judged to have at least one of the four abnormalities was also significantly higher in patients with lower MMSE scores ( $p$  for trend <0.001). However, no significant relationship was found between disorientation and the MMSE scores. Further, nurses could not detect impaired cognition by the four items in one-third of the patients with mild impairment determined by MMSE.

**Conclusion:** These data indicate that a comprehensive evaluation using all the four items on cognitive impairment is more effective in detecting cognitive impairment in elderly than using individual items, although one-third of cognitively impaired elderly patients may miss detection despite the use of the four items. Better approaches should be developed to identify cognitively impaired elderly patients by nurses.

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## 1. Introduction

Falls are one of the most common complications of elderly in hospitals, with rates per 1000 patient-days estimated between 1.5 and 7.0,<sup>1–3</sup> and approximately 30% of those lead to physical injury, with 2.4–6.8% being serious.<sup>4,5</sup> Falls are associated with cognitive dysfunction, and approximately 60% of the elderly with cognitive impairment fall annually; this incidence is approximately twice

higher than those without cognitive impairment.<sup>6–10</sup> The increase of elderly population and demented patients in hospital can therefore lead to an increase in falls and fracture events. Accordingly, it is important for nurses to assess cognition in elderly patients to prevent such complications.

Many fall risk screening tools are used as part of fall prevention programs in hospitals. Available screening and fall risk assessment tools used in different settings have been subjected to systematic reviews that reveal considerable differences in practicability and validity, thus raising the question of their usefulness.<sup>11,12</sup> To identify high-risk patients for falls in institutionalized settings, our hospital developed a fall risk assessment tool. For the assessment, nurses collected information on age, history of falls, visual and hearing

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disturbance, cognition, transfer, and urinary continence, which are risk factors of falls identified by previous studies. Most items were evaluated by nurses' subjective judgment. The advantage of this tool is that nurses can finish the assessment in a relatively short period of time at an early phase of hospitalization and repeat the assessment during hospitalization. However, it was not clear how accurate nurses can assess the cognitive function of elderly patients with this tool. To this end, we tried to investigate whether or not nurses can accurately judge cognitive impairment in elderly patients using this tool by comparing the data independently obtained by mini-mental state examination (MMSE)<sup>13</sup> performed by a trained clinical assistant.

The aim of this study was, therefore, to examine the relationship between the clinical judgment of nurses on cognitive function during fall risk assessment and independently MMSE scores in elderly inpatients.

## 2. Methods

### 2.1. Designs

The design of this study was a cross-sectional study.

### 2.2. Participants and data collection

In this study we collected data from medical records for 63 inpatients who received comprehensive geriatric assessment (CGA) during hospitalization at the Department of Geriatric Medicine of Kyoto University Hospital from January 2006 to June 2010. The data was collected from CGA of inpatients judged as frail by attending physicians. All inpatients received fall risk assessment as usual care.

Of 63 inpatients, one patient was excluded because CGA was performed after more than one month of clinical judgment and the other was due to missing information. The remaining 61 inpatients were analyzed for this study.

The approval for this study was obtained from Kyoto University Graduate School and Faculty of Medicine Ethics Committee (No. E1042, 2010). Patients were informed about our study at Kyoto University Hospital and the Department of Geriatric Medicine, Kyoto University website.

### 2.3. Measurements

Cognitive function was evaluated by four items in the fall risk assessment tool on admission, at least within 24 hours after admission by primary nurses, in which nurses clinically judged cognitive function of each patient. The nurses judged the presence or absence of disorientation, impaired judgment, lack of comprehension, and memory loss. The fall risk assessment tool including these items was applied to prevent falls for almost all patients in our hospital.

CGA was conducted less than 30 days of the initial hospital stay. The mean  $\pm$  standard deviation of the period from admission to evaluation was  $8.0 \pm 6.0$  days. The information was collected on socio-demographic data, living environment, health status and hospitalization data. We collected data to assess functional and cognitive status, and depressed mood by MMSE and geriatric depression scale (GDS), and so forth. MMSE was performed by a trained clinical assistant and the patients were divided into three groups according to MMSE scores. Patients with MMSE scores from 0 to 17 points were classified as moderate to severe impairment, those from 18 to 23 points as mild impairment, and those from 24 to 30 points as slight or no impairment.<sup>14</sup>

### 2.4. Statistical analysis

We described mean  $\pm$  standard deviation or median, minimum and maximum for the continuous variable and numbers and percentages for the discrete variable. Linear regression models were constructed to examine the association of nurse's judgments on cognitive function with the MMSE scores. Additionally, at least one of the four abnormalities of judgment by nurses was compared in the two groups according to the MMSE scores using Chi-square test. The cutoff of these groups was 24.

The Statistical Package for Social Sciences, version 18.0 J (SPSS Japan Inc., Tokyo, Japan) was used for statistical analysis. All probability values were two-tailed with a significant level of  $p < 0.05$ .

## 3. Results

Table 1 shows the characteristics and main measurements of the patients. The mean age was 80.1 years and 55.7% of them were female. The median of their hospitalization length was 19 days. Of the 61 patients, 56 were discharged to home (91.8%). In terms of their cognitive function, 36% of the patients were judged to have memory loss, which was the highest among the four items. Twenty-six percent of the patients were judged to have impaired judgment, 21% lack of comprehension, and 13% disorientation. Furthermore, 43% of the patients were judged to have at least one of the four abnormalities. The median of MMSE scores was 26.

Table 2 shows the percentage of cognitive impairment judged by nurses in each group of patients classified according to their MMSE scores. Twenty-five percent of patients with moderate to severe impairment, 21% with mild impairment, and 9.3% with slight or no impairment were judged to be disoriented, respectively. Although no statistically significant association was found between disorientation and MMSE scores ( $p$  for trend = 0.053), the percentage of patients judged to have disorientation in the moderate to severe impairment group tended to be higher than those with slight or no impairment. In terms of impaired judgment, 75% of the patients with moderate to severe impairment, 36% with mild impairment, and 19% with slight or no impairment were judged to have impaired judgment, respectively. As a result, the percentage of patients judged to have impaired judgment was significantly higher in patients with lower MMSE scores ( $p$  for trend = 0.001). In lack of comprehension, 50% of the patients with moderate to severe impairment, 21% with mild impairment, and 19% with slight or no impairment were judged to have lack of comprehension,

**Table 1**  
Characteristics and main measurements of the inpatients

	All n = 61
Age; years	80.1 $\pm$ 6.0
Gender, female (%)	34 (55.7)
Length of stay in the hospital, days	19 [5, 56]
Place after discharge from the hospital	
Home	56 (91.8)
Other hospitals	3 (4.9)
Other departments	2 (3.3)
Cognitive function of judgment by nurses	
Disorientation	8 (13.1)
Impaired judgment	16 (26.2)
Lack of comprehension	13 (21.3)
Memory loss	22 (36.1)
At least one of the 4 abnormalities	26 (42.6)
Mini-Mental State Examination scores	26 [13, 30]

Number(%).

Mean  $\pm$  standard deviation or median [minimum, maximum].

**Table 2**  
Relationship between nurses' clinical judgment and Mini-Mental State Examination scores

	Moderate to severe impairment n = 4	Mild impairment n = 14	Slight or no impairment n = 43	p for trend
<b>Cognitive function of judgment by nurses</b>				
Disorientation	1 (25.0)	3 (21.4)	4 (9.3)	0.053
Impaired judgment	3 (75.0)	5 (35.7)	8 (18.6)	0.001
Lack of comprehension	2 (50.0)	3 (21.4)	8 (18.6)	0.043
Memory loss	3 (75.0)	7 (50.0)	12 (27.9)	0.001
At least one of the 4 abnormalities	4 (100)	9 (64.3)	13 (30.2)	<0.001

Number (%).

All patients were divided into 3 groups according to MMSE scores.

0-17points: moderate to severe impairment

18-23points: mild impairment

24-30points: slight or no impairment

A liner trend test was used with the discrete value in each groups according to the MMSE scores in liner regression models.

respectively. The percentage of patients judged to have lack of comprehension was significantly higher in patients with lower MMSE scores ( $p$  for trend = 0.043). In memory loss, 75% of patients with moderate to severe impairment, 50% with mild impairment, and 28% with slight or no impairment were judged to have memory loss, respectively. The percentage of patients judged to have memory loss was significantly higher in patients with lower MMSE scores ( $p$  for trend = 0.001). Finally, all patients with moderate to severe impairment, 64% with mild impairment, and 30% with slight or no impairment were judged to have at least one of the four abnormalities, respectively. The percentage of patients judged to have at least one of the four abnormalities was significantly higher in patients with lower MMSE scores ( $p$  for trend <0.001).

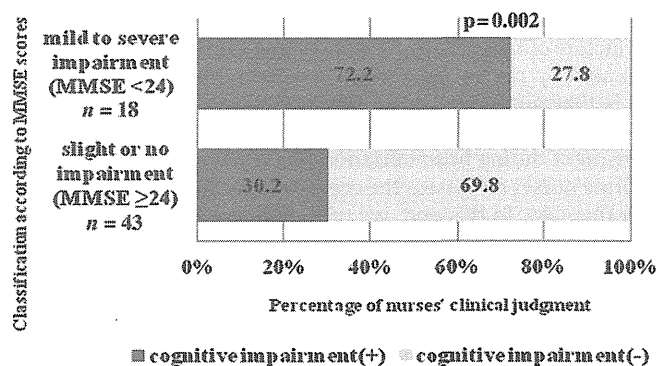
In the 14 patients with mild impairment, nine were judged to have at least one of the four abnormalities and five were not. Although those five patients were not judged to have impaired cognition using the four items by nurses at admission, four were judged to have at least one of the four abnormalities at the second time of evaluation by nurses during hospitalization. The second evaluation by nurses was performed from 1 to 2 weeks after admission. Thus, most of the patients were judged to have at least one of the four abnormalities by nurses at the second assessment (data not shown). Therefore, we assume that it takes time for nurses to assess the cognitive function of inpatients.

Fig. 1 shows how many of the patients with mild to severe impairment or slight to no impairment can be judged to have at least one abnormality by nurses. The patients with mild to severe impairment determined by MMSE were more likely to be judged to have at least one of the four abnormalities than those with slight or no impairment ( $p = 0.002$ ). However, nurses could not detect impaired cognition using the four items in one-third of the patients with mild to severe impairment determined by MMSE, while they judged to have some kind of cognitive impairment in one-third of the patients with slight to no impairment.

Fig. 2 shows the number of items judged to have abnormality in four items on cognitive function by nurses in each group of patients classified according to their MMSE scores. There was no relationship between the number of items judged to have abnormality and the level of cognitive function according to MMSE scores.

**4. Discussion**

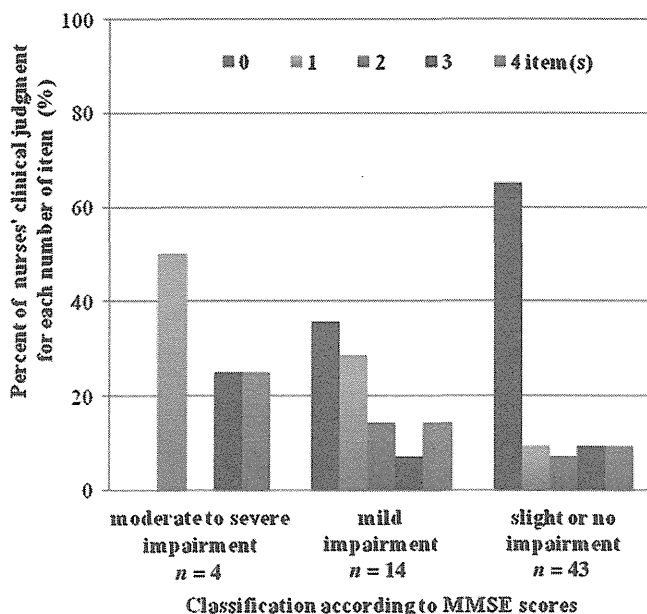
In the present study, we demonstrated that the percentage of patients judged by nurses to have cognitive impairment were



**Fig. 1.** The percentage of patients to be judged to have at least one abnormality by nurses in patients with mild to severe cognitive or slight to no impairment by MMSE. The difference was determined using Chi-square test.

higher in elderly patients with lower MMSE scores than those with higher MMSE scores. Despite using the four items to detect cognitive impairment, our study demonstrated that the assessment used by nurses was not completely successful to evaluate the cognitive function of elderly patients.

According to our data, nurses could not detect impaired cognition with the four items in one-third of the patients with mild impairment determined by MMSE. This percentage was unexpectedly high. We assume that it is difficult for nurses to accurately assess patient's cognitive function at admission; however, nurses could detect impaired cognition in patients with mild impairment at the second assessment, which was done 1 to 2 weeks after admission. Thus, it is conceivable that nurses may not have obtained sufficient information for the assessment at admission. However, most falls in hospital occur within a week.<sup>15</sup> In addition, demented patients have a markedly increased fall and fracture risk, almost two times more in comparison with nondemented elderly.<sup>16–18</sup> Furthermore, diminished motor control is related to cognitive status in older adults. Thus, changes in cognitive function may contribute to an increased fall risk. Accordingly, it is necessary



**Fig. 2.** The number of items judged to have abnormality in four items on cognitive function by nurses in each group of patients classified according to their MMSE scores.

for nurses to assess even mild cognitive impairment as well as severe impairment at an early stage of admission.<sup>19</sup> According to these results, it is conceivable to think that we should develop a better fall assessment tool to detect mild cognitive impairment and educate nurses to assess patients with cognitive impairment more accurately. However, generally speaking, screening of cognitive function by nurses should be aimed for higher sensitivity than higher specificity.

Although all patients with moderate to severe impairment were judged to have at least one of the four abnormalities, they were not completely judged to have each abnormality. It is suggested that a comprehensive evaluation using all of the four items of cognitive impairment is better to evaluate than using each item at admission. The percentage of patients judged by nurses to have memory loss was the highest among the four items. In contrast, the percentage of patients judged by nurses to have disorientation was the lowest. Nurses obtain information of patients during nursing care including active daily life assistance. It is extremely difficult to confirm whether a patient recognizes date, a day of the week, and a place during active daily life assistance. However, it is easy to assess whether or not a patient forgets recent episodes, to repeat the same questions and talks, and forgets where he or she puts something. The most likely explanation is that the judgment of disorientation is more difficult to assess than memory loss. Therefore, the judgment of disorientation might be unnecessary in this tool.

Many studies have shown the development of effective several assessment tools to identify fall risk in the elderly at high risk in institutionalized settings.<sup>11,12</sup> Many hospitals have implemented routine screening to assess fall risk for a patient, followed up with a more focused assessment of those deemed to be at high risk.<sup>11,12</sup> In addition, previous study showed that nurses' clinical judgments could predict falls of a patient as well as fall risk assessment tool.<sup>20–22</sup> However, these studies did not indicate how nurses made successful predictions. They only implicated that the intuition by nurses can predict falls. Because of this, we thought it necessary to show the validity of nurses' clinical judgment by performing MMSE in frail geriatric patients.

Several potential limitations should be considered when interpreting these results. First, the two measurements used in this study, four items of cognitive impairment in the fall risk assessment tool and MMSE, were not evaluated at the same time so information bias could occur. However, we excluded the data in which CGA was performed after more than one month of clinical judgment. Clinical judgment by nurses was also performed at admission, and all of the patients were judged by nurses before MMSE. The nurses were not informed of the patients' MMSE scores. Thus, the evaluation of MMSE did not affect nurses' clinical judgment. Second, we did not investigate the experience of nurses which might have affected the results. Third, the education level in the patients was also a confounding factor in this study. Information about the education levels of the patients was not obtained, because the literacy rate is extremely high in Japan and the education levels of Japanese patients is quite similar. Therefore, we assumed that the effect of educational levels would be minimal. Finally, the patients were limited those who admitted only to the Department of Geriatric Medicine in one university hospital and selected for CGA. It could be difficult to generalize these results.

In conclusion our data indicated that a comprehensive evaluation using all of the four items on cognitive impairment more effective in detecting cognitive impairment in elderly than using individual items. However, one-third of cognitively impaired elderly patients based on the result of MMSE were not accurately assessed by nurses despite using the four items on cognition, while

the presence of disorientation assessed by nurses was not able to predict cognitive impairment based on the results of MMSE. Therefore, disorientation in this tool should be deleted in the future. Furthermore, it is important to repeat nurses' assessment on cognition after 1 or 2 weeks of admission because cognition levels might change after the acute phase. It is important to educate nurses to assess patients with cognitive impairment more accurately.

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ORIGINAL ARTICLE: EPIDEMIOLOGY,  
CLINICAL PRACTICE AND HEALTH

# Indications and practice for tube feeding in Japanese geriatricians: Implications of multidisciplinary team approach

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**Aim:** The aim of this study was to examine how geriatricians decide the indication of tube feeding in the elderly with eating difficulty as a result of several disorders, and to determine the factors associated with their decision making and interventions for dysphagia.

**Methods:** The design was a cross-sectional study. All board-certified geriatricians in the Japan Geriatrics Society were recruited to this study in September 2010. We sent questionnaires to 1469 geriatricians. Among them, 629 agreed to participate. The survey consisted of self-administered questionnaires regarding demographic information, indications of tube feeding and interventions for dysphagia before tube feeding.

**Results:** We analyzed the remaining 555 questionnaires after excluding incomplete ones. Over 90% of geriatricians answered that “neurological disorder” and “stroke” are indications, whereas 46.8% of them answered that “dementia” is an indication for tube feeding. Geriatricians who organize a multidisciplinary team conference tended to carry out more “interventions for dysphagia before the prescription of tube feeding” compared with the reference group (odds ratio 2.1–8.7) after multivariate adjustment.

**Conclusions:** The results show that approximately half of the geriatricians prescribe tube feeding when the patient has dementia with loss of appetite or apraxia for eating. There is no consensus among Japanese geriatricians about the indication of tube feeding for demented people. We suggest that guidelines for tube feeding in the elderly should be established. Furthermore, a multidisciplinary approach would be desirable for decision making for tube feeding. *Geriatr Gerontol Int* 2012; 12: 643–651.

**Keywords:** elderly, geriatrician, multidisciplinary team, percutaneous endoscopic gastrostomy, tube feeding.

## Introduction

Many older patients have nutritional problems caused by eating difficulties as a result of stroke, cancer,

dementia and other conditions. When the patients have a functional gastrointestinal tract and they cannot take sufficient nutrition orally, tube feeding is an option. Percutaneous endoscopic gastrostomy (PEG) is the preferential route when enteral nutrition is expected to last for a longer period of time, because it is associated with better nutritional status and a lower incidence of aspiration than nasogastric tube (NGT).<sup>1</sup> PEG was originally developed for pediatric use by Gauderer in 1980.<sup>2</sup> However, thereafter PEG has become the most

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common way to supply artificial enteral nutrition in the elderly, including dementia patients. The number of people on PEG is increasing because of the improved simplicity and safety. Approximately 5–30% of the advanced dementia patients in nursing homes are on tube feeding in Europe and the USA; whereas, in Japan, approximately 50% of those are on tube feeding.<sup>3–6</sup> Thus, the percentage of tube feeding including PEG for dementia patients is higher in Japan than that in Western countries. However, recent studies have questioned the appropriateness of tube feeding in these patients. The decision of the practice or the withholding of tube feeding in patients with dementia is a difficult challenge among geriatricians and many other health-care professionals, as they need to make a decision with clinical ethical dilemmas. Furthermore, the quality of life (QOL) in the elderly with tube feeding and its effect on long-term survival have not yet been clarified,<sup>7–13</sup> and neither has a guideline for tube feeding in the elderly, especially in dementia patients. Accordingly, tube feeding is the focus of some extremely complex legal and ethical questions. Therefore, it is important to study the current situation of tube feeding for the elderly in Japan.

When we make a decision on tube feeding, comprehensive assessment of the patient, such as nutrition, cognition and swallowing function, is important and the assessment should be based on a multidisciplinary team approach. Previous studies showed the effectiveness of inpatient geriatric evaluation and management; that is, comprehensive geriatric assessment (CGA).<sup>14</sup> A multidisciplinary approach might be required for medical and nursing care of elderly patients, especially when we need to make a complicated decision, such as that of tube feeding. However, it is unknown whether the team approach can affect the decision making for tube feeding and interventions for dysphagia.

Therefore, the aim of the present study was to examine how geriatricians decide on the indication of tube feeding in the elderly with eating difficulty as a result of various disorders, and to determine whether the team approach can affect their decision making and interventions for dysphagia.

## Methods

The design was a cross-sectional study. All board-certified geriatricians in the Japan Geriatrics Society were recruited to the present study in September 2010. We separately sent self-administered questionnaires to 1469 geriatricians by post and collected them from October to December 2010. These geriatricians were chosen because of their experience in taking care of patients who require tube feeding, and carry out CGA by organizing multidisciplinary team conferences. The present study was approved by the Ethics Committee

of Kyoto University Graduate School and Faculty of Medicine (no. E984, 2010).

The questionnaires included demographic information, such as age, sex, place of employment, and clinical experience, reference guidelines for tube feeding, aims and indications of tube feeding in geriatrics, interventions for dysphagia before tube feeding, and multidisciplinary team approach if tube feeding is indicated. It was explained in the questionnaires that the term “elderly” was defined as people over the age of 75 years and those who require nursing care, and tube feeding included NGT, PEG and enterostomy tube.

We carried out descriptive analyses for each item in the questionnaire. The  $\chi^2$ -test or *t*-test was used to compare the differences of place of employment and clinical experience. Logistic regression analyses were carried out to evaluate the differences of the frequencies and conference members according to the indication for tube feeding, and the interventions for dysphagia before tube feeding. Each item in the indication for tube feeding or interventions for swallowing disorder was adjusted for sex, working place and clinical experience of geriatricians. The frequency and number of members in a multidisciplinary conference were divided into five categories: not at all, occasional and less than five different health-care professionals, occasionally and  $\geq 5$  different health-care professionals, every time and less than five different health-care professionals, and every time and  $\geq 5$  different health-care professionals. The Statistical Package for Social Sciences version 18.0J (SPSS Japan, Tokyo, Japan) was used for statistical analysis. All probability values were two-tailed with a significant level of  $P < 0.05$ , and all confidence intervals were estimated at the 95% level.

## Results

We sent a questionnaire to 1469 board-certified geriatricians, and 51 were returned as a result of being undeliverable because of wrong address. Among the rest, 629 agreed to participate in the present study. The response rate was 44.4%. After excluding the questionnaires with missing data, we analyzed the remaining 555 questionnaires. The prevalence of doctors aged over 60 years and male doctors was 34.6% and 89.2%, respectively. We found that 43.8% of the geriatricians had a clinical experience of more than 30 years, and 63.7% were working in acute hospitals, 30.7% in a clinic and 3.9% in long-term care facilities.

Table 1 shows the percentage of geriatricians who follow the guidelines and the purpose for tube feeding according to the geriatrician’s place of employment and clinical experience. A total of 68% of geriatricians did not use any guideline for tube feeding. Among geriatricians following guidelines for tube feeding, 137 used “Guideline of Parenteral and Enteral Nutrition (EN) in

**Table 1** Use of guidelines and the aims of tube feeding according to place of employment and clinical experience

Questions	Characteristics of geriatricians					Clinical experience			Total n = 555
	Place of employment				P-value	<30 years n = 317	≥30 years n = 238	P-value	
	Hospital n = 360	Clinic n = 166	Long-term care n = 20	Other <sup>†</sup> n = 9					
Do you use any guidelines for TF in geriatrics? <sup>‡</sup>									
Guideline of Parenteral and EN in Japan*1	84 (23.3)	48 (28.9)	4 (20.0)	1 (11.1)	ND	87 (27.4)	50 (21.0)	0.082	137 (24.7)
Guideline of PEG in Japan*2	51 (14.2)	21 (12.7)	4 (20.0)	1 (11.1)	ND	41 (12.9)	36 (15.1)	0.460	77 (13.9)
Guideline of Parenteral and EN in America*3	13 (3.6)	11 (6.6)	0 (0.0)	0 (0.0)	ND	11 (3.5)	13 (5.5)	0.253	24 (4.3)
Guideline of Parenteral and EN for elderly in Europe*4	9 (2.5)	11 (6.6)	0 (0.0)	1 (1.1)	ND	9 (2.8)	12 (5.0)	0.178	21 (3.8)
Not using guideline for TF	253 (70.3)	106 (63.9)	10 (50.0)	7 (77.8)	ND	209 (65.9)	167 (70.2)	0.291	376 (67.7)
What are the aims of TF in geriatrics? <sup>§</sup>									
Improvement of survival	63 (17.5)	29 (17.5)	6 (30.0)	0 (0.0)	ND	54 (17.0)	44 (18.5)	ND	98 (17.7)
Improvement of general condition and prevention of complications	201 (55.8)	93 (56.0)	12 (60.0)	3 (33.3)	–	163 (51.4)	146 (61.3)	–	309 (55.7)
Improvement of activities of daily living	17 (4.7)	9 (5.4)	0 (0.0)	1 (11.1)	–	22 (6.9)	5 (2.1)	–	27 (4.9)
Improvement of quality of life	24 (6.7)	9 (5.4)	2 (10.0)	2 (22.2)	–	24 (7.6)	13 (5.5)	–	37 (6.7)
Satisfaction of patient	15 (4.2)	13 (7.8)	0 (0.0)	2 (22.2)	–	19 (6.0)	11 (4.6)	–	30 (5.4)
Burden of caregiver	5 (1.4)	9 (5.4)	0 (0.0)	0 (0.0)	–	6 (1.9)	8 (3.4)	–	14 (2.5)
Length of hospital stay	3 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)	–	3 (0.9)	0 (0.0)	–	3 (0.5)
Living will	27 (7.5)	3 (1.8)	0 (0.0)	1 (11.1)	–	20 (6.3)	11 (4.6)	–	31 (5.6)
Other	5 (1.4)	1 (0.6)	0 (0.0)	0 (0.0)	–	6 (1.9)	0 (0.0)	–	6 (1.1)

Number (%). P-values were tested by  $\chi^2$ -test. <sup>†</sup>Other included part-time doctors, retired doctors, researchers and so on. <sup>‡</sup>Multiple answers were allowed. <sup>§</sup>Simple answer was allowed for nine items. \*1 From Japanese Society for Parenteral and Enteral Nutrition \*2 From Japan Gastroenterological Endoscopy Society \*3 From American Society for Parenteral and Enteral Nutrition \*4 From European Society for Gastroenterological Endoscopy Society. EN, enteral nutrition; ND, not determined; PEG, percutaneous endoscopic gastrostomy; TF, tube feeding.



Japan" from the Japanese Society for Parenteral and EN. For the purpose for tube feeding, more than half of the geriatricians chose "improvement of general condition or prevention of complications." However, a few geriatricians chose "improvement of QOL," "satisfaction of patient" or "living will." The working place or clinical experience did not affect the aims of tube feeding placement.

Table 2 shows the indication for tube feeding and the interventions for dysphagia before tube feeding according to place of employment and clinical experience. Among the seven target indications for tube feeding in the elderly, over 90% of the geriatricians answered that "neurological disorders other than dementia" and "stroke" are indications for tube feeding. Over 80% of the geriatricians answered that "head injury or facial trauma" and "oropharyngeal malignancy" are also an indication. In contrast, 46.8% of the geriatricians answered that "dementia" is an indication for tube feeding, and 65.9% of the geriatricians answered that "aspiration-prone frail elderly without comorbidities" is an indication. The place of employment was not associated with the judgment for the indication. The percentage of geriatricians who answered that "head injury or facial trauma" and "neurological disorders other than dementia" were an indication for tube feeding was significantly higher in those with less than 30 years of clinical experience than in those with more than 30 years of clinical experience (head injury or facial trauma;  $P = 0.012$ , neurological disorder;  $P = 0.049$ ). However, following guideline for tube feeding did not affect the decision making of tube feeding for these disorders (data not shown). We also asked about the life expectancy of the patient after PEG placement, and 79.5% answered that at least more than 12 weeks were expected.

Next, we asked how many interventions they carried out for swallowing disorder before tube feeding. The mean number of interventions was 6.22, and geriatricians with less than 30 years of experience carried out significantly more interventions than those with more than 30 years ( $6.49 \pm 3.2$  vs  $5.86 \pm 2.8$ ,  $P = 0.015$ ). The number of interventions was not significantly different between geriatricians working in an acute hospital and those working in a clinic. Among 15 items of interventions for swallowing disorder, over 70% of geriatricians answered that "thickening agent" and "using semi-solid and liquid foods" were afforded to patients with swallowing disorder.

Figure 1 shows the percentage of geriatricians organizing a multidisciplinary conference for tube feeding. A total of 63% of geriatricians discussed with other health-care professionals every time or occasionally. They also answered that physicians including themselves (95.4%), primary nurses (84.9%), dieticians (49.7%) and speech therapists (42.0%) were the

members of the conference. The place of employment was not associated with the number of conference members (Table 3).

Table 4 shows the multiple logistic regression analysis for the frequencies and conference members according to the indication for tube feeding and interventions for dysphagia before tube feeding. More "interventions for dysphagia before introducing tube feeding" were carried out in geriatricians organizing a multidisciplinary team conference than the reference group after multivariate adjustment (odds ratio 2.1–8.7). We also found that geriatricians who always organize a conference with many types of health-care professionals (multidisciplinary) carried out more tests for the assessment of swallowing function and interventions for dysphagia before introducing tube feeding, such as oral ice massage, than the reference group. However, the indications for tube feeding were not affected by a multidisciplinary conference.

## Discussion

In the present study, we found that approximately 70 % of board-certified geriatricians did not use any guidelines for tube feeding in their practice. We also noted that the use of guidelines was not associated with the decision making for tube feeding in the elderly, because "Guideline of Parenteral and EN in Japan" or "Guideline of PEG in Japan" does not describe the indications for tube feeding in elderly patients, especially in dementia patients.<sup>15,16</sup> Furthermore, more than half of the geriatricians consider that the purpose of tube feeding is to improve the general condition or to prevent complications in the elderly with eating problems. In contrast, only a few geriatricians selected living will or patient satisfaction. Decision making of geriatricians for tube feeding did not seem to be related to their working place or clinical experiences. Although the guideline describes that "respecting the wishes of the family or living will of the patient when nutrition therapy is needed for the elderly at the terminal stage or with dementia,"<sup>15</sup> most geriatricians who decide the indication of tube feeding might not have a chance to care for patients' living will. Although there is an ideal description in the guideline, it might be difficult for doctors to obtain a patient's living will beforehand, even if they understand the importance of respecting the living will of the patient. Therefore, comprehensive approaches not only from the field of nutrition and gastroenterology, but also from the experience and know-how from the professionals involved in medicine, nursing and care for the elderly, such as geriatricians, nurses, speech therapists, caregivers and care managers, would be expected to make a new guideline for tube feeding in the elderly.

Several studies have shown that there is no survival benefit in dementia patients who receive artificial



**Table 2** Indications for tube feeding and interventions for dysphagia before introducing tube feeding according to place of employment and clinical experiences

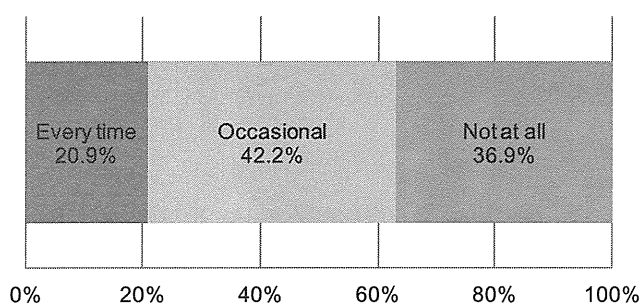
Questions	Characteristics of geriatricians Place of employment				P-value	Clinical experience			Total n = 555
	Hospital n = 360	Clinic n = 166	Long-term care n = 20	Other <sup>†</sup> n = 9		<30 years n = 317	≥30 years n = 238	P-value	
Is the following disorder an indication for TF?									
Head injury or facial trauma	313 (86.9)	144 (86.7)	8 (40.0)	7 (77.8)	ND	208 (88.3)	192 (80.7)	0.012	472 (85.0)
Oropharyngeal malignancy	286 (79.4)	143 (86.1)	13 (65.0)	7 (77.8)	ND	258 (81.4)	191 (80.3)	0.736	449 (80.9)
Neurological disorder	328 (91.1)	155 (93.4)	15 (75.0)	7 (77.8)	ND	295 (93.1)	210 (88.2)	0.049	505 (91.0)
Stroke	334 (92.8)	147 (88.6)	18 (90.0)	8 (88.9)	ND	290 (91.5)	217 (91.2)	0.899	507 (91.4)
Dementia	177 (49.2)	66 (39.8)	13 (65.0)	4 (44.4)	ND	1156 (49.2)	104 (43.7)	0.198	260 (46.8)
Aspiration-prone frail elderly without comorbidity	238 (66.1)	108 (65.1)	15 (75.0)	5 (55.6)	ND	216 (68.1)	150 (63.0)	0.208	366 (65.9)
Malnutrition in frail elderly without comorbidity	115 (31.9)	58 (34.9)	9 (45.0)	5 (55.6)	ND	115 (36.3)	72 (30.3)	0.137	187 (33.7)
How long does a patient need to survive after PEG placement? <sup>‡</sup>									
2 weeks	3 (0.8)	2 (1.2)	0 (0.0)	0 (0.0)	ND	3 (0.9)	2 (0.8)	ND	5 (0.9)
4 weeks	19 (5.3)	16 (9.6)	1 (5.0)	2 (22.2)	-	18 (5.7)	20 (8.4)	-	38 (6.8)
6 weeks	4 (1.1)	2 (1.2)	1 (5.0)	1 (11.1)	-	7 (2.2)	1 (0.4)	-	8 (1.4)
8 weeks	39 (10.8)	21 (12.7)	3 (15.0)	0 (0.0)	-	37 (11.7)	26 (10.9)	-	63 (11.4)
12 weeks	295 (81.9)	125 (75.3)	15 (75.0)	6 (66.7)	-	252 (79.5)	189 (79.4)	-	441 (79.5)
Interventions for swallowing disorder before introducing TF									
No. Interventions; mean ± standard deviation (total 15 items)	6.44 ± 3.12 <sup>*</sup>	5.83 ± 2.93	6.70 ± 2.00	3.67 ± 3.32 <sup>*</sup>	0.010 <sup>§</sup>	6.49 ± 3.20	5.86 ± 2.82	0.015	6.22 ± 3.06
No. interventions, ≥6 items <sup>¶</sup> (total 15 items)	211 (58.6)	84 (50.6)	14 (70.0)	2 (22.2)	ND	188 (59.3)	123 (51.7)	0.073	311 (56.0)
Consultation									
To otolaryngologist	131 (36.4)	60 (36.1)	3 (15.0)	4 (44.4)	ND	123 (38.8)	75 (31.5)	0.076	198 (35.7)
To speech therapist	166 (46.1)	31 (16.7)	7 (35.0)	1 (11.1)	ND	131 (41.3)	74 (31.1)	0.013	205 (36.9)
To certified nurse of dysphagia nursing	77 (21.4)	25 (15.1)	4 (20.0)	2 (22.2)	ND	67 (21.1)	41 (17.2)	0.250	108 (19.5)
Test									
Repetitive saliva swallowing test	111 (30.8)	63 (38.0)	4 (20.0)	2 (22.2)	ND	109 (34.4)	71 (29.8)	0.257	180 (32.4)
Water swallowing test	243 (67.5)	104 (62.7)	13 (65.0)	5 (55.6)	ND	210 (66.2)	155 (65.1)	0.783	365 (65.8)
Video endoscopy	55 (15.3)	26 (15.7)	1 (5.0)	0 (0.0)	ND	50 (15.8)	32 (13.4)	0.444	82 (14.8)
Video fluorography	163 (45.3)	47 (28.3)	4 (20.0)	2 (22.2)	ND	140 (44.8)	76 (31.9)	0.003	216 (61.1)
Practice and education									
Oral ice-massage	102 (28.3)	23 (13.9)	5 (25.0)	0 (0.0)	ND	86 (27.1)	44 (18.5)	0.017	130 (23.4)
Swallowing exercise	72 (20.0)	40 (24.1)	5 (25.0)	0 (0.0)	ND	70 (22.1)	47 (19.7)	0.505	117 (21.1)
Vocalization exercise	50 (13.9)	20 (12.0)	1 (5.0)	0 (0.0)	ND	44 (13.9)	27 (11.3)	0.376	71 (12.8)
Using semi-solid and liquid foods	267 (74.2)	120 (72.3)	18 (90.0)	3 (33.3)	ND	236 (74.4)	172 (72.3)	0.565	408 (73.5)
Thickening agent	308 (85.6)	131 (78.9)	20 (100.0)	3 (33.3)	ND	267 (84.2)	195 (81.9)	0.474	462 (83.2)
Positioning	235 (65.3)	106 (63.9)	17 (85.0)	4 (44.4)	ND	215 (67.8)	147 (61.8)	0.138	362 (65.2)
Appropriate approach for swallowing	161 (44.7)	80 (48.2)	12 (60.0)	2 (22.2)	ND	153 (48.3)	102 (42.9)	0.206	255 (45.9)
Ways of coping with aspiration	161 (44.7)	85 (51.2)	17 (85.0)	4 (44.4)	ND	142 (44.8)	125 (52.5)	0.071	267 (48.1)

Number (%), P-values were tested by  $\chi^2$ -test and Student's *t*-test, <sup>†</sup>Other included part-time doctors, retired doctors, researchers and so on. <sup>\*</sup>Single answer was allowed for five items, and the other questions were allowed to select more than one. <sup>§</sup>P-values were tested by ANOVA, <sup>\*</sup>*P* < 0.05 by Bonferroni. <sup>¶</sup>Number of intervention items were divided into two groups, which used median value (≥6 vs <6). ND, not determined; PEG, percutaneous endoscopic gastrostomy; TF, tube feeding.

feeding by PEG.<sup>7,8,10,12</sup> In addition, “Guideline of parenteral and EN for elderly in Europe” does not recommend enteral nutrition to persons with severe dementia as a result of more risks than benefits for persons with severe dementia, and occasionally in early and moderate dementia to ensure energy and nutrient supply and to prevent undernutrition.<sup>17,18</sup> In the present study, we found that approximately 45% of the geriatricians considered that dementia patients with loss of appetite or apraxia for eating should be on tube feeding and that 65% of the geriatricians considered that aspiration-prone frail elderly without comorbidities should also be on tube feeding, which is a relatively high percentage. In a previous study, approximately 60% of

physicians in the USA answered that aspiration pneumonia was the indication for PEG placement, and was the most common medical indication.<sup>19</sup> The present findings are consistent with other results; therefore the medical situation in Japan might be quite similar to that in the USA. Indeed, PEG placement to the elderly with repeating aspiration pneumonia or not eating voluntarily with cerebrovascular disease or dementia is indicated in “Guideline of PEG in Japan.”<sup>16</sup> In the present study, the questions did not specify the stage of disorders or the level of conditions; therefore our results should be interpreted with caution. However, it is certain that there is no consensus among Japanese geriatricians about tube feeding for the elderly with advanced dementia and there is an urgent need to develop guidelines to decide the risk/benefit ratio in the individual patient to optimize the timing and route of nutritional support. Thus, the indication for tube feeding in the elderly should be widely discussed in the future and hence a guideline should be established to describe the indication of tube feeding in more detail.

“Guideline of parenteral and EN for elderly in Europe” indicates PEG placement if EN is anticipated for longer than 4 weeks.<sup>17,18</sup> In contrast, the present study showed that approximately 80% of the geriatricians consider that survival more than 12 weeks should be expected for PEG placement. PEG is better than NGT for swallowing rehabilitation, and PEG placement



**Figure 1** Do you organize a multidisciplinary conference before introducing tube feeding?

**Table 3** Conference members for decision making of tube feeding according to place of employment

	Place of employment of geriatricians				<i>P</i> -value	Total <i>n</i> = 350
	Hospital <i>n</i> = 249	Clinic <i>n</i> = 80	Long-term care <i>n</i> = 17	Other <sup>†</sup> <i>n</i> = 3		
No. conference members; mean ± standard deviation (total 12 occupations)	4.4 ± 2.0	4.2 ± 1.8	4.3 ± 1.5	4.8 ± 4.2	0.864	4.31 ± 1.9
Conference members						
Attending physician	238 (95.2)	75 (92.6)	17 (100)	3 (100)	–	334 (95.4)
Primary nurse	224 (89.6)	54 (66.7)	15 (88)	3 (100)	–	297 (94.9)
Otolaryngologist	27 (10.8)	10 (12.3)	0 (0)	0 (0.0)	–	37 (10.6)
Certified nurse of dysphagia nursing	42 (16.8)	18 (22.2)	3 (18)	0 (0.0)	–	63 (18.0)
Physical therapist	55 (22.0)	12 (14.8)	4 (24)	1 (33.3)	–	72 (20.6)
Occupational therapist	37 (14.8)	8 (9.9)	4 (24)	1 (33.3)	–	50 (14.3)
Speech therapist	118 (47.2)	23 (28.4)	5 (29)	1 (33.3)	–	147 (42.0)
Dietician	126 (50.4)	37 (45.7)	9 (53)	2 (66.7)	–	174 (49.7)
Pharmacist	37 (14.8)	12 (14.8)	1 (5.9)	1 (33.3)	–	51 (14.6)
Discharge planning coordinator <sup>‡</sup>	26 (10.4)	14 (17.3)	2 (12)	1 (33.3)	–	43 (12.3)
Medical social worker	89 (35.6)	24 (29.6)	4 (24)	2 (66.7)	–	119 (34.0)
Care manager	46 (18.4)	39 (48.1)	5 (29)	1 (33.3)	–	91 (26.0)

Number (%), *P*-values were tested by ANOVA, \**P* < 0.05 by Bonferroni. Of the 555 geriatricians, 350 (63.1%) carried out a conference at least once. Respectively, hospital: 249 (69.2%), clinic: 80 (48.2%), long-term care: 17 (85.0%), other: 3 (33.3%). Multiple answers were allowed. <sup>†</sup>Other included part-time doctors, retired doctors, researchers and so on. <sup>‡</sup>They are a registered nurse and work for discharge planning and coordination in the hospital.

**Table 4** Multivariate-adjusted odds ratios and 95% confidence intervals for frequency and the conference members according to the indication for tube feeding and interventions for dysphagia before using tube feeding

		Conference		Every time	
		Non	Occasional	Participating occupation	Participating occupation
		Few	Multidisciplinary	Few	Multidisciplinary
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Is the following disorder an indication for TF?					
Head injury or facial trauma	Ref	1.02 (0.55–1.89)	1.15 (0.52–2.57)	0.80 (0.36–1.78)	1.52 (0.62–3.77)
Oropharyngeal malignancy	Ref	0.96 (0.56–1.66)	0.78 (0.41–1.52)	1.05 (0.48–2.31)	1.02 (0.48–2.16)
Neurological disorder	Ref	0.72 (0.34–1.52)	0.56 (0.23–1.34)	1.69 (0.46–6.16)	1.17 (0.39–3.53)
Stroke	Ref	1.41 (0.68–2.90)	1.84 (0.66–5.13)	2.35 (0.68–8.15)	4.03 (0.90–18.05)
Dementia	Ref	0.83 (0.54–1.28)	0.82 (0.48–1.42)	1.86 (1.00–3.44)	1.01 (0.56–1.83)
Aspiration-prone frail elderly without comorbidity	Ref	0.99 (0.63–1.55)	1.23 (0.69–2.19)	1.31 (0.68–2.52)	0.80 (0.44–1.46)
Malnutrition in frail elderly without comorbidity	Ref	0.77 (0.49–1.22)	0.98 (0.56–1.74)	1.30 (0.70–2.42)	1.18 (0.64–2.18)
How long does a patient need to survive after PEG placement? $\geq 12$ weeks <sup>†</sup>	Ref	0.85 (0.50–1.43)	0.89 (0.46–1.74)	0.80 (0.39–1.63)	1.44 (0.64–3.21)
Intervention for swallowing disorder before using TF					
No. intervention items, $\geq 6$ items <sup>‡</sup>	Ref	2.07 (1.33–3.20)	3.24 (1.81–5.78)	2.60 (1.39–4.85)	8.71 (3.99–19.00)
Consultation					
To otolaryngologist	Ref	1.13 (0.72–1.77)	1.36 (0.78–2.38)	0.94 (0.49–1.80)	1.48 (0.80–2.72)
To speech therapist	Ref	1.51 (0.93–2.46)	4.57 (2.52–8.29)	2.47 (1.28–4.76)	3.82 (2.01–7.27)
To certified nurse of dysphagia nursing	Ref	1.18 (0.65–2.14)	2.16 (1.11–4.23)	1.65 (0.76–3.61)	4.75 (2.43–9.32)
Test					
Repetitive saliva swallowing test	Ref	1.62 (0.98–2.66)	3.89 (2.16–6.99)	3.91 (2.05–7.44)	4.48 (2.37–8.46)
Water swallowing test	Ref	2.08 (1.32–3.28)	1.63 (0.93–2.87)	1.82 (0.96–3.44)	2.95 (1.49–5.88)
Video endoscopy	Ref	1.53 (0.83–2.82)	1.30 (0.59–2.86)	0.97 (0.37–2.53)	2.89 (1.37–6.09)
Video fluorography	Ref	1.62 (1.03–2.56)	2.08 (1.19–3.66)	3.07 (1.64–5.76)	2.28 (1.23–4.22)
Practice and education					
Oral ice-massage	Ref	1.19 (0.67–2.10)	2.19 (1.16–4.14)	2.34 (1.14–4.79)	3.59 (1.82–7.06)
Swallowing exercise	Ref	1.81 (0.97–3.39)	3.47 (1.74–6.91)	4.86 (2.34–10.09)	6.63 (3.27–13.45)
Vocalization exercise	Ref	1.55 (0.71–3.41)	2.96 (1.28–6.83)	2.70 (1.04–7.00)	6.84 (3.02–15.50)
Using semi-solid and liquid foods	Ref	1.83 (1.13–2.96)	2.12 (1.11–4.06)	1.71 (0.86–3.38)	5.96 (2.24–15.84)
Thickening agent	Ref	1.26 (0.73–2.21)	1.93 (0.85–4.39)	1.18 (0.54–2.59)	4.68 (1.36–16.12)
Positioning	Ref	1.46 (0.94–2.26)	2.36 (1.29–4.31)	1.75 (0.93–3.30)	7.22 (2.94–17.71)
Appropriate approach for swallowing	Ref	2.48 (1.59–3.88)	2.82 (1.62–4.92)	2.13 (1.15–3.95)	5.60 (2.94–10.65)
Ways to coping when the aspiration	Ref	1.48 (0.95–2.29)	2.86 (1.63–5.01)	1.24 (0.67–2.29)	5.31 (2.69–10.48)

Dependent variables: the indication for tube feeding and interventions for dysphagia before introducing tube feeding. Independent variables: frequency and the conference members (ref, non conference; 1, occasional and less than five different health-care professionals; 2, occasional and  $\geq 5$  different health care professionals; 3, every time and less than five different health-care professionals; 4, every time and  $\geq 5$  different health-care professional. Adjusted for sex, place of employment and clinical experience. <sup>†</sup>The period expected to survive after PEG was divided into two groups. (1:  $\geq 12$  weeks, 0:  $< 12$  weeks). <sup>‡</sup>Number of intervention items were divided into two groups, which was used median value into 15 items. (1:  $\geq 6$  items, 0:  $< 6$  items). CI, confidence interval; OR, odds ratio; TF, Tube Feeding.

in patients with stroke and oropharyngeal malignancy was associated with better prognosis; therefore PEG placement is recommended for these disorders by the European guideline.<sup>20</sup> We did not investigate how long PEG is placed in each condition. Thus, knowledge of geriatricians for tube feeding or PEG placement was not sufficiently explored in the present study; however, a period of PEG placement should be considered in each condition.

In Japan, requests for PEG to facilitate care are prevalent, because the staff in nursing homes tend to prefer PEG to time-consuming oral feeding. A multicenter study in the USA showed that feeding tube insertion is independently associated with both clinical characteristics of residents and fiscal, organizational and demographic features of nursing homes.<sup>4</sup> Therefore, these situations might have affected the decision making of geriatricians for tube feeding. Unfortunately, we did not include the question whether or not the request from nursing homes might have affected the decision making for tube feeding in dementia patients. Therefore, we should ask this question next time.

Regarding interventions for swallowing disorder, the mean number of interventions for swallowing disorder before introducing tube feeding was six items, which are not so many. Among the 15 items of interventions before introducing tube feeding, over 70% of the geriatricians answered that “Thickening agent” and “Using semi-solid and liquid foods” were afforded to patients with swallowing disorder. In contrast, consultation with other specialists was not frequently carried out, and care to improve swallowing dysfunction, such as “oral ice-massage,” “swallowing exercise” and “vocalization exercise” was not usually carried out either. Therefore, from these data, we think that more interventions would be necessary to care for patients with dysphagia by consulting specialists and multidisciplinary approach.

It is interesting to note the relationship between multidisciplinary conference and knowledge and practice for tube feeding for the elderly. In the present study, we showed that those who have a multidisciplinary team conference for a patient indicated for tube feeding tended to carry out more “interventions for dysphagia before tube feeding” compared with the reference group after multivariate adjustment. Furthermore, the data showed that geriatricians who organize a conference with different health-care professionals carried out more interventions for dysphagia before tube feeding, irrespective of the frequencies of conference. The present study also showed that although there were no differences in the number of conference members and interventions between the geriatricians working in an acute hospital and those in a clinic before introducing tube feeding, the percentage of geriatricians who organized a multidisciplinary conference before introducing tube feeding was higher in the hospital than in the

clinic. Therefore, the characteristics of facilities, not doctors themselves, might have affected this outcome. A previous study reported that multidisciplinary CGA is effective for the care of frail older persons admitted to the hospital, because evaluation and management by a multidisciplinary team during hospitalization documented a lower rate of institutionalization after 1 year.<sup>14</sup> Furthermore, decision making for treatment strategy should be discussed in a multidisciplinary team. The multidisciplinary conference would provide a better answer for each elderly patient who requires tube feeding, because they tend to have a complicated background.

Several potential limitations should be considered when interpreting these results. First, a cross-sectional study does not prove any causal relationship. Second, the practice rate of tube feeding in geriatricians was not clearly determined, because the present study was carried out by self-administered questionnaires. Third, the subjects were limited to geriatricians certified by the Japan Geriatrics Society, and also the response rate was not so high. Therefore, selection bias might have occurred. Finally, we did not investigate the number of beds in their place of employment; therefore these results were not completely adjusted by hospital size.

In conclusion, the present data showed that more than half of the board-certified geriatricians consider that the purpose of tube feeding is to improve the general condition or to prevent complications in the elderly with eating problems. Furthermore, regardless of their clinical experience, approximately 40% of the Japanese geriatricians consider that demented elderly with loss of appetite or apraxia for eating should be on tube feeding. At this moment, there is no consensus among Japanese geriatricians about tube feeding for advanced demented people, and hence the guideline should be established for tube feeding in the elderly. Furthermore, a multidisciplinary team approach is expected to find a better answer for each elderly patient with eating difficulty.

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## COMMISSION REPORT

# Toward the realization of a better aged society: Messages from gerontology and geriatrics

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**1. Background:** Recent medical advancements, and improvements in hygiene and food supply have led to Japan having the longest life expectancy in the world. Over the past 50 years, the percentage of the elderly population has increased fourfold from 5.7% in 1960 to 23.1% in 2010. This change has occurred at the fastest rate in the world. Compared with France, where the percentage of the elderly population has increased just twofold in the past 100 years, Japanese society is aging at an unprecedented rate. In addition, the percentage of the very elderly (aged 75 years and over), comprising more frail people, exceeded 10% of the nation's population in 2008. In such a situation, many elderly Japanese wish to spend their later years healthy, and wish to achieve great accomplishments in their lives. To achieve that, rather than considering an aging population as a negative social phenomenon, we should create a society where elderly people can enjoy a healthy, prosperous life through social participation and contribution.

Factors that hamper the elderly from leading a healthy life include various psychological and social problems occurring in older age, as well as a high incidence of diseases. Therefore, gerontology, which focuses on health promotion of the elderly by encompassing the study of social welfare, psychology, environment and social systems; and geriatrics, which focuses on health care of elderly people and carried out research, education and practices to promote health in the elderly, are becoming more important. Furthermore, along with a need for multidisciplinary care to support geriatric medicine, the development of a comprehensive education system for aged-care professionals is awaited. Thus, we should now recognize the importance of gerontology and geriatrics, and a reform of medical-care services should be made in order to cope with the coming aged society.

Population aging is a global phenomenon. The actions being taken by Japan, the world's most aged society, have been closely watched by the rest of the world. Japan's aged society has been posing not only medical, nursing and welfare problems, but also complex problems closely associated with economy, industry and culture. Therefore, to solve these

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Proposal from The Subcommittee for Aging, The Science Council of Japan

problems, a macroscopic integration and cooperation among industries, education institutions, administration and community through an interdisciplinary approach including medical science, nursing science, nursing care, study of social welfare, social science, engineering, psychology, economics, religion and ethics should be made. Regarding the promotion of gerontology, the “Committee for Establishing a Scientific Community for Sustainable Aged Society” of the Science Council of Japan also prepared a proposal and this was announced on 20 April 2011.

## 2. Current situation and problems

### (1) Promotion of social participation and contribution of elderly people

In Japan, the overall labor force rate is expected to decrease in the near future as a result of the low birth rate and high life expectancy. In contrast, many elderly people, particularly the young-old, have sufficient physical strength to fulfil their job duties and make a social contribution. For these people, a social structure where elderly people can work should be developed through re-educating the elderly and providing various job types. Promotion of social participation and contribution of the elderly is expected to cause a substantial increase in the labor force. Furthermore, it is also expected to contribute to not only the upturn of national economic activity through an increase in total consumption, but also a decrease in the number of elderly people who are likely to be in need of care. Therefore, in order for elderly people to be engaged in various social activities, strategies for developing a social structure for re-education, various employment statuses and employment opportunities should be prepared. However, as the total number of jobs is fixed, consideration should also be given to young workers.

### (2) Fostering medical specialists for aging

Older people often suffer from many diseases, together with geriatric syndromes with multiple etiologies. Signs and symptoms vary according to each individual, and are often atypical; therefore, the patients visit different hospitals and receive many screening tests and prescriptions at the same time. To solve this problem, an effective screening system carried out by a primary-care doctor, and privacy-preserving medical data sharing among hospitals and clinics are needed. In a geriatric clinical setting, health-care professionals should be aware of the physical traits of older people who often develop not only dementia, but also geriatric syndromes, such as depression, falls and urinary incontinence, so that a holistic approach with consideration of nursing care is required. However, the existing Japanese medical education system is not prepared for medical professionals enabled to respond to the aforementioned requirements. Thus, the fostering of medical professionals who can provide comprehensive care – especially for the oldest-old – such as geriatric specialists and medical professionals who understand the principles of elderly care, is urgently needed.

### (3) Diagnosis of elderly-specific diseases and reform of medical-care services

In Japan, the diagnostic system for elderly-specific diseases, including dementia, and reform of medical care services are markedly delayed. The current status concerning diagnosis, care and nursing should be investigated to collect academic data. In order to accumulate evidence for providing safe elderly care and nursing, the promotion of clinical research and a marked expansion of geriatric medical centers with high-level medical services are eagerly awaited.

### (4) Promotion of home-based care and multidisciplinary care

To reduce the length of stay in acute hospitals, to reduce the physical burden of health-care professionals working at acute hospitals and to meet the demand of older people who prefer to remain in their own homes, further promotion of home-based care is needed. In addition, “multidisciplinary care” is increasingly needed to meet various demands in the medical care and welfare of the elderly. It is considered important to share countermeasures against the problems of disease prevention, medicine, care and welfare among health-care professionals in medicine, care and welfare, and cooperate by making the best use of health-care professionals’ specialties.

## 3. Contents of the proposal

The subcommittee for aging, thus, provided the following proposal:

- 1 Development and promotion of systems that enable elderly people to participate socially and make a contribution using an interdisciplinary approach among the various areas,



including nursing science, nursing care, study of social welfare, social science, psychology, economics, religion and ethics, as well as medical sciences;

- 2 Promotion of gerontology, reform and enhancement of geriatrics in undergraduate, postgraduate and lifelong education;
- 3 Building geriatric medical centers in each area, and accumulating large-scale evidence of geriatric diseases and geriatrics; and
- 4 Structural development and promotion of home-based care and multidisciplinary care.

Through implementation of the above measures, Japan is expected to function as a successful example for the rest of the world. *Geriatr Gerontol Int* 2012; 12: 16–22.

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**Keywords:** education, elderly, geriatrics, gerontology, multidisciplinary approach.

## 1. Preface

Over the past 50 years, the percentage of elderly people in the population of Japan has increased fourfold from 5.7% in 1960 to 23.1% in 2010. Japanese society is aging at an unprecedented rate. According to the National Institute of Population and Social Security Research, the percentage the elderly population is estimated to continue increasing, reaching 26.0% in 2015 and further increasing rapidly. After 2020, the percentage of elderly people in the population is expected to stabilize; however, as a result of a decrease in the total population, the percentage will further increase to 40.5%, peaking in 2055. Japan will face a super-aged society, in which 40% of the population will be over 65 years-of-age. Unless appropriate countermeasures are taken, such as a rapid improvement in clinical skills and knowledge among physicians involved in geriatrics, marked advances in the prevention of lifestyle-related diseases, prevention of geriatric syndromes including dementia, and marked expansion of home-based care or local-care, we cannot avoid a situation where many frail elderly people have to live with no support. However, many issues remain; that is, a marked reduction of long-term care facilities, a reduction in length of hospital stay in acute hospitals and a delay in expanding home-based care system, and whether thanatology reflects a social change. We should also consider social issues, such as ageism, caregiver burnout, dignified death and the appropriateness of placing gastrostomy tubes in elderly patients with dementia. To provide dignified care, particularly for older people, appropriate care should be carried out in not only the terminal phase, but also during the last few years before death.

However, despite the challenge, little is known about gerontology and geriatrics in Japan, and they are not fully used in clinical settings or education. To solve this problem, a macroscopic integration and cooperation are needed, using an interdisciplinary approach involving medical science, nursing science, nursing care, study of social welfare, social science, engineering, jurisprudence, economics, psychology and ethics. Furthermore, along with the reform and enhancement of geriatrics in

undergraduate and postgraduate education, fostering specialists who can practice geriatrics is needed. Also, for non-geriatricians or general practitioners who currently and prospectively provide care in clinical settings, an educational system should be prepared to deepen their understanding of geriatric medicine.

## 2. Current situation and measures

### (1) *Social contribution of the elderly and the medical economy*

As a result of the low birth rate, the percentage of the total labor force (aged 20–64 years) is expected to decrease in Japan. Elderly people are usually divided into two groups based on age: 65–84 years (young-old) and 75 years and older (old-old). Although many elderly people, particularly the young-old, have sufficient physical strength to fulfil their job duties and a make social contribution though productive activity, they are not fully utilized. The promotion of social participation and the contribution of the elderly is expected to contribute to creating purpose in their lives, as well as an increase of a substantive productive population, financial stability and self-sustainability for the elderly, and an upturn of national economic activity through an increase of total consumption. Therefore, for elderly people to be engaged in various social activities, strategies for developing a social structure for re-education, volunteer activity, various employment statuses and employment opportunities should be prepared using an interdisciplinary approach involving study of social welfare, social science and economics. However, as the total number of jobs is fixed, consideration should also be given to young workers.

Life expectancy in Japan is the highest in the world. Japan also has the highest healthy life expectancy. In 2008, USA health expenditures accounted for 16% of the nation's gross domestic product (GDP), twice the Japanese rate. Compared with other countries, Japanese health expenditures as a percentage of GDP accounted for two-thirds of that of France and Germany, suggesting that we have the most cost-effective health-care

systems. In addition, the annual cost of health care has been approximately 670 000 yen per elderly person for the past 10 years. However, the aging of the population is expected to impact on future spending growth. Sasaki compared life-long medical costs between the longevity and non-longevity groups, and found that longevity decreases medical costs and has positive economic impacts.<sup>1</sup> Thus, it is important to enhance preventive medicine to achieve longevity, make continuous efforts for cost-effective medicine and improve satisfaction with the health-care systems. Discussion of geriatric medicine should be made after disclosing the aforementioned facts to the public.

Problems in geriatric medicine are closely linked to social structures, including care, welfare and dwelling surrounding the health-care system. To reveal and solve problems regarding the elderly and an aged society, the promotion of gerontology using an interdisciplinary approach is increasingly needed.

Regarding employment opportunities for older workers and future directions of medicine, care and welfare, discussion should be made among specialists from various health-care specialties. The Japan Geriatrics Society and the Japan Gerontological Society, as a core organization, should expand their activities to achieve a “society where elderly people can enjoy their lives” with the cooperation of the National Center for Geriatrics and Gerontology, Tokyo Metropolitan Geriatric Hospital and Institute of Gerontology, the Institute of Gerontology the University of Tokyo, and J. F. Oberlin University.

## ***(2) The current state of geriatric medicine and its direction***

Geriatric disorders have several features.

First, diseases occur as a result of a decline in organ systems associated with aging. Therefore, even if a disease is not so severe, a patient might have been developing an unexpectedly marked decline in organ systems. In addition, homeostatic function with aging, biophylaxis capacity and nutritional absorption capacity often decrease, and symptoms become chronic and refractory.

In terms of clinical symptomatology, older people often complicate many diseases together with a geriatric syndrome with multiple etiologies. Signs and symptoms vary according to each individual, and are often atypical. Response to drugs is different in elderly compared with non-elderly people.

Older people are more likely to develop multiple diseases, and visit different hospitals and receive many screening tests and prescriptions at the same time;<sup>2</sup> thus, total expenditures on the elderly become inevitably high, which has been said to cause financial collapse of the Japanese health insurance system. However, regarding this issue, we should focus on the medical

cost required for a single disease between elderly and non-elderly people, and we should be aware that restricting the increasing financial burden on patients to receive screenings or prescriptions for each disease would be ageism for elderly people and uncontroversial. However, unnecessary duplication of the screening given at each hospital should be avoided. To achieve this, an effective screening system carried out by primary-care physicians, and privacy-preserving medical data sharing of test results and medication among hospitals and clinics are needed. Regarding medications, the Japan Geriatrics Society has prepared the “Guidelines for medical treatment and its safety in the elderly” as an outcome of the sponsored research in Japan Foundation on Aging and Health.<sup>3</sup> The guideline explained standard medical treatments mainly for the elderly by giving examples of low priority, such as making an easy prescription or non-evidence-based prescription to prevent deterioration of chronic disease. In either retrospective fee-for-service or a prospective payment system (fixed amount), physicians should provide the same level of prescription to each patient. To carry out effective screening for the elderly or evidence-based medical treatment, a constructive research system should be developed separately from health-care reform in terms of medical economy. The Japanese government has decided to abolish the existing medical insurance system for those aged 75 years and older; however, the following principles stated in the existing medical insurance system should be included in the next system for the elderly: (i) elderly disease prevention; (ii) comprehensive geriatric assessment; and (iii) incentives to promote discharge planning.

Older people often develop functional disorders associated with chronic disease or aging. Functional disorders not only jeopardize the independence of people and pose social disadvantage, but also lead to secondary disease. This often makes elderly people fully dependent, resulting in lower quality of life. Therefore, in the treatment of geriatric disorders, priority should be given to functional outcomes, as well as life expectancy and the prognosis of organ systems. In addition, because a psychological change associated with an environmental change often leads to a deterioration of symptoms in elderly people, treatment policy and discharge planning should be prepared with a holistic consideration of the patient using the comprehensive geriatric assessment (CGA). In geriatric medicine, it is important not only to protect organ systems, but also to maintain physical function to prevent assisted living.

To maintain independent living, a person needs to have sustained function, including daily life functions, cognitive function, emotion and sociality (family, friends, job). CGA is used to determine the aforementioned functional status both comprehensively and systematically. The results of CGA give us a clue of what kind of

support can help maintain independent living or assisted living with minimum care for elderly people. However, CGA is not a popular tool. Therefore, we should examine ways of increasing the awareness of CGA to promote its use for the improvement of geriatric medicine.

End-of-life care for elderly patients is an extremely important issue in geriatric medicine; however, very few elderly people in Japan have made advance directives to show their wishes about their health care during the end-of-life period. In geriatrics, there are so many issues to discuss, including confirmation of patient's wishes, the need of a health-care representative, and the relationship between the patient and their physician. Therefore, we should investigate the awareness of end-of-life care for elderly patients among health-care professionals, including physicians and nurses, people involved in care, patients, and their families, to discuss future direction of care. Regarding end-of-life care in elderly people, "Attitudes toward end-of-life care in elderly patients",<sup>4</sup> which was announced in 2000 by the ethics committee of the Japan Geriatrics Society and is currently under revision, and a proposal prepared by the end-of-life care research group,<sup>5</sup> should be referred.

### **(3) Fostering health-care professionals involved in geriatric medicine**

Despite the growth of the elderly population, physicians with special geriatric training are not expected to increase under the present system of medical education. In order to solve the problem of care for the growing elderly population, the educational system should be restructured to provide an understanding of geriatric medicine for non-geriatricians, general practitioners and physicians working at care facilities that provide care for elderly patients. This might be an effective and practical approach for fostering physicians taking care of the elderly. To provide sufficient geriatric knowledge to general practitioners and non-geriatricians, the education program should include basic geriatrics contents to retain quality of geriatric care, which would be required even for non-geriatricians. The Japan Geriatrics Society has published *Clinical Handbook for Active Aging and Geriatric Care* for physicians, which aims to provide basic knowledge of elderly-specific symptoms, assessment, treatment and care. It is expected that using this handbook for students, residents, practitioners and non-geriatricians might contribute to the expansion of geriatric medicine. In the USA, in order to deal with a shortage of geriatric specialists, medical students are required to receive a minimum geriatrics education.<sup>6</sup>

### **(4) Promotion of geriatric disease clinical research**

In Japan, a system for making diagnosis and providing treatment and care for patients with elderly diseases,

including dementia, has not been fully developed. In elderly care, it is important to make an accurate diagnosis and collect clinical evidence to reflect diagnosis and evidence in clinical settings. To accumulate evidence of geriatric medicine and nursing, the promotion of clinical research and a marked expansion of geriatric medical centers with high-level medical services are eagerly awaited.

Currently, there are just two geriatric medical centers in Tokyo and Nagoya. Therefore, the number of centers should be increased and should be placed in each district (Hokkaido, Tohoku, Hokuriku, Kanto, Koshinetsu, Tokai, Kinki, Chugoku, Shikoku and Kyushu). The National Center for Geriatrics and Gerontology, as a core facility, is required to examine the efficacy of geriatrics-related activities and consistency with countermeasures, supervise multicenter studies and clinical research projects, and strive to enhance geriatric medicine through the standardization of geriatric medicine and care, and preparation of medical guidelines. In this process, each center, as a platform of geriatric medicine, should accumulate clinical data, and is also required to function as a facility to educate non-geriatricians.

The Japan Geriatrics Society has been carrying out clinical research on the treatment of hyperlipemia involving the elderly aged 75 years and over. An establishment of a support system for such clinical research and an accumulation of evidence on the efficacy of nutrition and exercise are also considered important.

### **(5) Promotion of home-based care and multidisciplinary care**

Based on the demand of older people who prefer to remain at home, and a government policy that aims to shorten the length of hospital stay and the number of beds to decrease the growing burden of health-care expenditure, the promotion of home-based care has been provided. However, the medical structure of home-based care has not been fully devised, requiring further development of a medical and nursing structure where older people can receive continuing treatment and care, including rehabilitation, within the local community, while not being too dependent on the hospital stay, or not being forced to choose home-based care. Enhancement of home-based care might contribute to reducing the burden on physicians and nurses at acute hospitals, and might also compensate for other care services, such as emergency care and obstetrics.

One of the concerns of home-based care among physicians, patients and their families is the difficulty with hospital admissions in the event of sudden illness or deterioration. To solve this problem, the National Center for Geriatrics and Gerontology has established a "Home-based care unit". Preregistration from both a general practitioner and the patient is necessary for

admission to this unit, with the intention to continue home-based care. The patient can be admitted any time by referral of a general practitioner. The outcome of this program is eagerly awaited.

In home-based care settings, a group of professionals from diverse disciplines mutually cooperate to provide care for a patient. For such a multidisciplinary approach, it is important to choose appropriate professionals according to the condition and disease stage of the elderly patient. However, this multidisciplinary approach involves some problems. One is the legislative “gap” between health-care providers registered under the Medical and Dental Practitioners Acts and the Act on Public Health Nurses, Midwives and Nurses, and nursing care providers registered under the Long-Term Care Insurance. The other is the discrepancy in the principle between health-care and nursing-care providers. To solve these problems, it is essential to examine them along with the legislative issues, and promote home-based care, particularly at universities offering courses in geriatrics and local community hospitals where there are accumulating results of a multidisciplinary approach to caring for elderly patients, to further promote the cooperation between medical-care and social-welfare services.

### 3. Proposals

We make the following proposals as countermeasures against various issues in geriatrics:

- (1) Development and promotion of a system that enables elderly people to participate socially and make a contribution using an interdisciplinary approach among the various areas, including nursing science, nursing care, study of social welfare, social science, engineering, psychology, economics, religion and ethics, as well as medical sciences.

Promotion of social participation and contribution of the elderly, while considering the total number of jobs and young workers, is expected to contribute to creating purpose in their lives, and reduce the growing number of older people who become frail or in need of care. It is also expected to bring about an increase in a substantial productive population, financial stability and self-sustainability for the elderly, and an upturn of the national economic activity through an increase of total consumption.

- (2) Promotion of gerontology, reform, and enhancement of gerontology and geriatrics in undergraduate, postgraduate and lifelong education.

To solve problems associated with elderly people or an aged society, gerontological and geriatric research and education should be enhanced. By fostering medical professionals who understand the physical and mental traits of older adults, and those who can provide a

holistic approach with consideration to organic integration with nursing care, provision of reliable care and nursing services is expected.

- (3) Build geriatric medical centers in each area, and accumulate large-scale evidence of geriatric diseases and geriatrics.

For system reform of diagnosis, treatment and nursing care, evidence should be accumulated through large-scale clinical studies.

- (4) Structural development and promotion of home-based care and multidisciplinary medicine and care.

Promotion of home-based care and multidisciplinary medicine and care, particularly at universities offering courses in gerontology and local community hospitals where there are accumulating results of a multidisciplinary approach to care for elderly patients, can be expected to help reduce the burden of physicians and nurses, and meet the demand of older people.

Through implementation of the aforementioned measures, Japan is expected to function as a successful model for the rest of the world.

### 4. Summary

The phenomenon of an aging population is often considered within a negative spectrum; however, elderly people in need of care only account for 13% of the total elderly population, and this is not being expected to further increase. We should rather focus on the fact of an increasing number of “healthy elderly individuals with rich experience and knowledge”, which would not become a negative factor in the future. The restructuring of these healthy elderly resources for social development is believed to bring a permanent bright future, and it is expected that medical-care and social-welfare services will make a significant contribution within this framework. The realization of healthy longevity in society is possible; however, we should be aware that it is only possible by the integration of geriatric medicine and social welfare.

To cope with the problems that come with a rapidly aging society as the world-leading model, the development of elderly-friendly medical devices and nursing-care equipment to avoid a labor shortage is considered essential. Taking the lead in the development of medical equipment for elderly people enables us to provide other countries with aging populations with a model for success, and is also expected to contribute to the creation of new employment and an increase in export as one of the main industrial products in Japan.

The task given to the country with the longest healthy life expectancy is to try to achieve the highest level of elderly satisfaction. As a result of a community change, “roles” and “presence with respect” of the elderly have become weakened, and a medical- and nursing-care “burden” for the younger population has been casting

a dark shadow over the society. As the baby boomer generation ages into elderly status, new roles, including a future health-care workforce and volunteer activities, and community satisfaction should be rebuilt. Gerontology and geriatrics ought to take the lead in showing a practical approach to the industry and the administration to create new images of the elderly.

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### Disclosure statement

The authors declare no conflict of interest.

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