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Selection of Post-Acute Care for Stroke Patients

Kathryn M. Gulfo
Columbia University; Weill Cornell Medicine; New York Presbyterian Hospital - USA, kgulfo@gmail.com

Glen Gillen
Columbia University; New York Presbyterian Hospital - USA, gg50@cumc.columbia.edu

Lauri Bishop
Columbia University; New York Presbyterian Hospital - USA, lb2413@cumc.columbia.edu

Clare C. Bassile
Columbia University; New York Presbyterian Hospital - USA, ccb2120@cumc.columbia.edu

Randy B. Kolodny
Seton Hall University - USA, randy.kolodny@shu.edu

Joel Stein
Columbia University; Weill Cornell Medicine; New York Presbyterian Hospital - USA, js1165@columbia.edu

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Abstract

Background: Significant variation exists in post-acute care for stroke survivors. This study examines referral practices of occupational and physical therapists for patients after acute stroke.

Method: Occupational therapists (OTs) and physical therapists (PTs) were surveyed either electronically or in person at a national conference. The respondents selected the most appropriate referral for each of five case vignettes. The referral choices included Inpatient Rehabilitation Facility (IRF), Skilled Nursing Facility (SNF), Long-Term Acute Care Hospital (LTACH), home with home services, or home with outpatient services. Demographic data included practice location, setting, and duration. The respondents were also asked to rate how strongly 15 clinical factors influence their referral decisions.

Results: The 33 OTs and 41 PTs favored similar referrals. Consensus was observed in four of the five cases. No differences were observed among the respondents based on practice location, practice setting, or number of years in practice and the referrals. Prognosis for functional improvement and pre-stroke functional status were identified as the most important factors influencing referral decisions.

Conclusion: Further studies are needed to define areas of broad consensus as well as areas of disagreement, with subsequent efforts to clarify optimal treatment algorithms for patients who currently receive variable rehabilitative care.

Credentials Display and Country
Kathryn M. Gulfo, MD; Glen Gillen EdD, OTR, FAOTA; Lauri Bishop, DPT; Clare C. Bassile PT, EdD; Randy B. Kolodny PT, DPT, MA; Joel Stein, MD

Stroke survivors often require ongoing rehabilitation after discharge from the acute care hospital. Several different types of rehabilitation care are available in the United States for postacute stroke care, including inpatient rehabilitation facilities (IRFs, also referred to as acute rehabilitation), skilled nursing facilities (SNFs, also referred to as subacute rehabilitation), long-term acute care hospitals (LTACHs), home care services, and outpatient (ambulatory) rehabilitation services. In general, to qualify for IRF care, an acute stroke survivor must require daily medical supervision and be able to tolerate 3 hr of multidisciplinary therapy (usually a combination of occupational, physical, and speech-language therapies) and be able to make significant functional gains to allow for community discharge within a few weeks. Patients most appropriate for discharge to a SNF after stroke are those who do not meet the requirements above and who typically are not physically or mentally able to tolerate 3 hr of therapy; they do not require multidisciplinary therapy, they are not expected to return to a community-based living environment within a few weeks, and/or they do not require intensive medical supervision. While patients can receive rehabilitation therapies in a LTACH setting, the focus there is on long-term medical management of complex conditions requiring advanced care that cannot be provided outside of a hospital setting. Discharge home with home services after acute stroke implies that patients are medically stable for home discharge but not yet able to navigate the community environment to attend outpatient therapies. To bridge this gap, home services may include home occupational, physical, and speech-language therapies, as well as visiting nursing services, as appropriate. Patients discharged home with outpatient rehabilitation services are typically medically stable and able to navigate the community environment.

Despite significant differences in the intensity of rehabilitation therapies and the degree of medical and nursing support provided in these different settings, there are no clear clinical criteria for assigning stroke survivors to the most appropriate level of care. Various regulations govern these levels of care, dictating to a large degree where patients can receive their rehabilitation care. For example, as alluded to above, Medicare patients admitted to an IRF must be able to participate in and benefit from at least 3 hr of rehabilitation therapy per day. At the same time, they must be sufficiently medically complex that their care cannot be safely delivered in a lesser level of care (e.g., home or outpatient services).

Furthermore, the IRF Prospective Payment System, which applies to patients covered under the Medicare Fee-For-Service Program, requires that at least 60% of the patients admitted to each IRF have one of 13 qualifying medical conditions, such as stroke (Department of Health and Human Services, 2017). This encourages IRFs to preferentially select patients with these diagnoses for admission. Many private insurers have adopted policies similar to Medicare regarding therapy intensity and medical necessity. The other postacute stroke rehabilitation settings (SNFs, LTACHs, home care services, and ambulatory rehabilitation services) provide fewer rehabilitation therapies and differing levels of medical supervision. LTACHs provide the most medical supervision, while SNFs and home or outpatient services provide less medical and nursing care than IRFs.

The process of referral to postacute rehabilitative care varies from hospital to hospital. Decisions regarding the appropriate venue may be determined in part by physicians, nurses, case managers, social workers, occupational therapists (OTs), physical therapists (PTs), and speech language pathologists (SLP). One study found that occupational therapy and physical therapy recommendations were the most influential in determining discharge destination, exceeding the impact of physician recommendations (Magdon-Ismail, Sicklick, Hedeman, Bettger, & Stein, 2016). There is currently no generally accepted

standardized assessment to determine where each stroke patient should be referred (Stein et al., 2015). Data suggests that the efficacy of rehabilitation differs among the different levels of postacute care; therefore, variation in referral patterns may contribute to suboptimal rehabilitation outcomes for some stroke patients (Stein et al., 2015).

In addition to regulatory factors, a variety of clinical and social factors influence selection of postacute level of care. These include the likelihood of response to rehabilitation and the likelihood of returning home after completion of inpatient rehabilitation. Other factors include patient motivation, family support, living situation, and logistic issues. Lastly, the availability of rehabilitation resources, insurance coverage, bed availability, location of rehabilitation facilities, provider relationships, and cost also play a role in selecting the level of care (Kennedy, Brock, Lunt, & Black, 2012; Luker, Bernhardt, Grimmer, & Edwards, 2014).

There have been efforts to make the process of selecting postacute levels of care more objective. Specifically, standardized assessments have been proposed as a means of informing this decision. Instruments, such as the Motricity Index, Berg Balance Scale, gait speed, Boston Naming Test, Barthel Index, and Functional Independence Measure (FIM) scores are commonly used, but no formal criteria using these measures or standardization in practice exists (Bland et al., 2015). Based on observational studies indicating superior outcomes for patients discharged to IRF when compared with SNF, the American Heart Association and American Stroke Association stroke rehabilitation guidelines recommend that stroke survivors who qualify for and have access to IRF care should receive treatment in an IRF in preference to a SNF (Winstein et al., 2016). This guideline does not address whether certain patients who do not meet the current admission criteria for IRF would nonetheless benefit from this level of care, however, leaving the issue of optimal postacute level of care unresolved for many stroke survivors.

Method

Participants

This study focused on practicing OTs and PTs. Each group was invited to completed a survey (one for the OTs and one for the PTs). The occupational therapy respondents were invited to complete a survey either in person at the April 2015 American Occupational Therapy Association (AOTA) national conference or via e-mail distribution of a link to a web-based survey. The physical therapy respondents were invited to complete a survey either via e-mail distribution of a link to a web-based survey or via an electronic post on the American Physical Therapy Association (APTA) website for the Neurologic Interest Group discussion board.

Survey Design

The surveys were web-based using the SurveyMonkey® platform. The first page of the surveys explained the study's purpose and the survey format. The respondents were also informed that participation was entirely voluntary and that completion of the survey constituted informed consent for participation. The researcher's contact information was provided should a respondent have questions or concerns regarding the study. The respondents provided demographic information, including number of years in practice, geographic location of practice (state), and practice environment (acute care hospital, inpatient rehabilitation hospital, skilled nursing facility, long-term acute care hospital, home care, or outpatient facility). The remainder of the survey asked the respondents to select the most appropriate postacute level of care for each of five acute stroke survivors, presented in the form of case vignettes with the assumption that each patient was being treated in a stroke unit after suffering an acute stroke

and that the referral decision was made within a week after stroke. The five case vignettes (see Table 1) were the same as those used in a similar study examining postacute stroke care referral patterns of physiatrists (Cormier, Frantz, Rand, & Stein, 2016). The cases were written to represent relatively common scenarios encountered in acute care hospitals surrounding appropriate discharge plans for patients after acute stroke.

In addition, the respondents were asked to rate multiple potential factors that might influence their selection of postacute level of care in general, from 1 through 10 (1 indicating the lowest level of influence and 10 indicating the highest level of influence). No personal identifying information was obtained via the survey. There was no financial incentive to complete the survey. Copies of the surveys for the OTs and the PTs are available at:

http://scholarworks.wmich.edu/cgi/viewcontent.cgi?filename=0&article=1405&context=ojot&type=additional and http://scholarworks.wmich.edu/cgi/viewcontent.cgi?filename=1&article=1405&context=ojot&type=additional. The Columbia University Medical Center Institutional Review Board approved this study.

Table 1

Case Scenarios Provided in Survey for Disposition Referral Determination

Case	Scenario
1	Mr. Jones is a 64-year-old man, working full-time as an attorney, lives with his wife in a ranch-style, single-family home. He sustained a left internal capsule stroke with right hemiparesis arm > leg. He needs moderate assistance with ADLs and moderate assistance to walk a few steps. His cognition, language, and swallowing are intact. Past medical history: hypertension, type II diabetes, coronary artery disease, cardiac stents.
2	Mr. Smith is an 83-year-old man with prior stroke, lives alone, homebound before admission, with 24 x 7 home-health aide, poor short-term memory before stroke. He sustained a large left MCA infarct with global aphasia, dysphagia requiring G-tube, and right hemiplegia. He is dependent for ADLs and transfers.
3	Ms. Doe is a 42-year-old woman, accountant, married, with three school-age children. She sustained a brainstem hemorrhage from an ateriovenous malformation with severe dysphagia, requiring G-tube, tracheostomy tube (now capped), severe dysarthria, hemiplegic on the left, and hemiparetic on the right side. She is dependent for ADLs and transfers. She is alert and cognitively intact.
4	Ms. Johnson is a 70-year-old woman, lives with her husband in accessible apartment, both recently retired. She sustained a right subcortical stroke with left hemiparesis affecting arm > leg. She can walk 25 feet with minimal assistance from therapist and needs minimal assistance with dressing and bathing. She has normal cognition, speech, swallowing. Past medical history: hypertension, newly diagnosed atrial fibrillation, now well-controlled with warfarin and beta-blocker.
5	Ms. Thompson is an 86-year-old woman, widowed, lives alone in an apartment in a building with an elevator. She was active before stroke as volunteer in hospital. She has no children and limited financial resources. She sustained a left MCA stroke with right hemiplegia, moderate expressive aphasia, but with relative sparing of comprehension, dysphagia with G-tube in place. She is dependent for ADLs, maximum assistance for transfers. She has newly diagnosed atrial fibrillation, rate well-controlled, on warfarin for secondary stroke prevention.

*Note.* ADLs = Activities of daily living; MCA = Middle cerebral artery.

Procedure

Survey responses were collected from April 2015 through July 2016. Data was collected in person via paper copies of the survey from 26 individuals at the April 2015 AOTA national conference. A link to the electronic survey was sent via e-mail to physical therapy and occupational therapy clinical education coordinators. Lastly, a link to the electronic survey was posted on the APTA Neurology Interest Group discussion board. The body of the e-mail correspondence, as well as the text posted on the discussion board, explained the purpose of the study, outlined the survey format, and indicated that participation was entirely voluntary. The survey required approximately 15 min to complete. There was no option to save the survey and complete it later. Once the survey was closed, the responses were recorded electronically through the SurveyMonkey® platform.

Data Analysis

Demographic data were collapsed for analysis, including practice setting (acute hospital, inpatient rehabilitation, outpatient rehabilitation, and all settings), geographic location (Northeast, Midwest, South, and West based on the U.S. Census Bureau categories), and number of years in practice (grouped into 10 years or more or fewer than 10 years). The OTs and PTs data were analyzed separately. Statistical analysis was completed using IBM SPSS for Mac, Version 23.0. Bivariate analysis using the Chi-square test was used to assess whether or not there was a difference between referral preferences and the demographic variables of the respondents for each case. The Chi-square test was used to compare the OTs and their responses for each case. A value of $p = 0.05$ or less was considered statistically significant.

Results

We collected 88 survey responses between April 2015 and July 2016. Of these, there were 74 respondents (33 OTs and 41 PTs) that were included in the final analysis. There were also 12 responses from individuals who were not OTs or PTs but who still gained access to the survey. Of these, three were physical therapy assistants, two were occupational therapy assistants, two were speech language pathologists, and five were occupational therapy students. Although their interest and participation is appreciated, their responses were not included in the data analysis presented here. See Figure 1 for a detailed illustration of included and excluded responses.
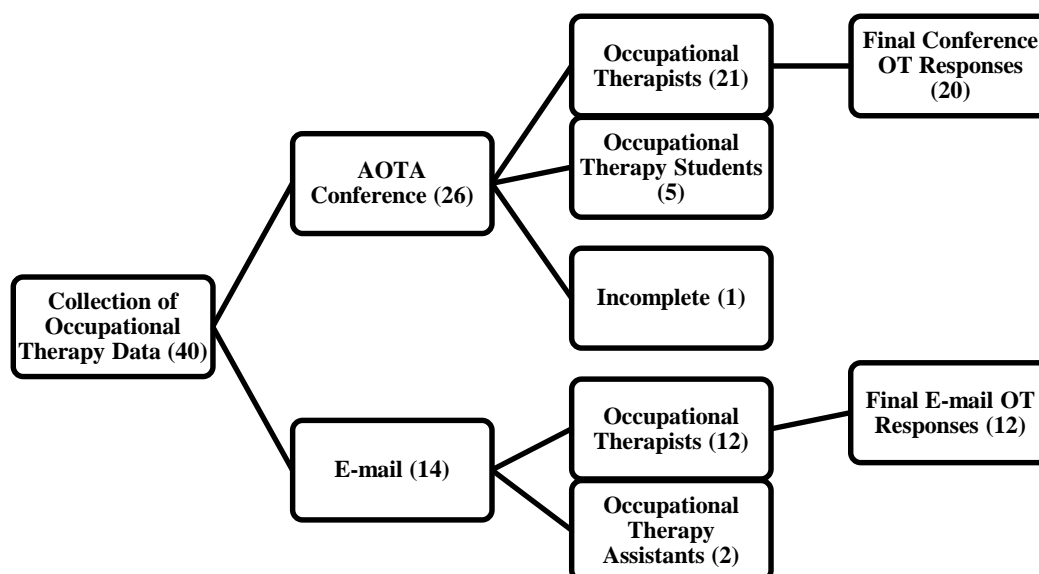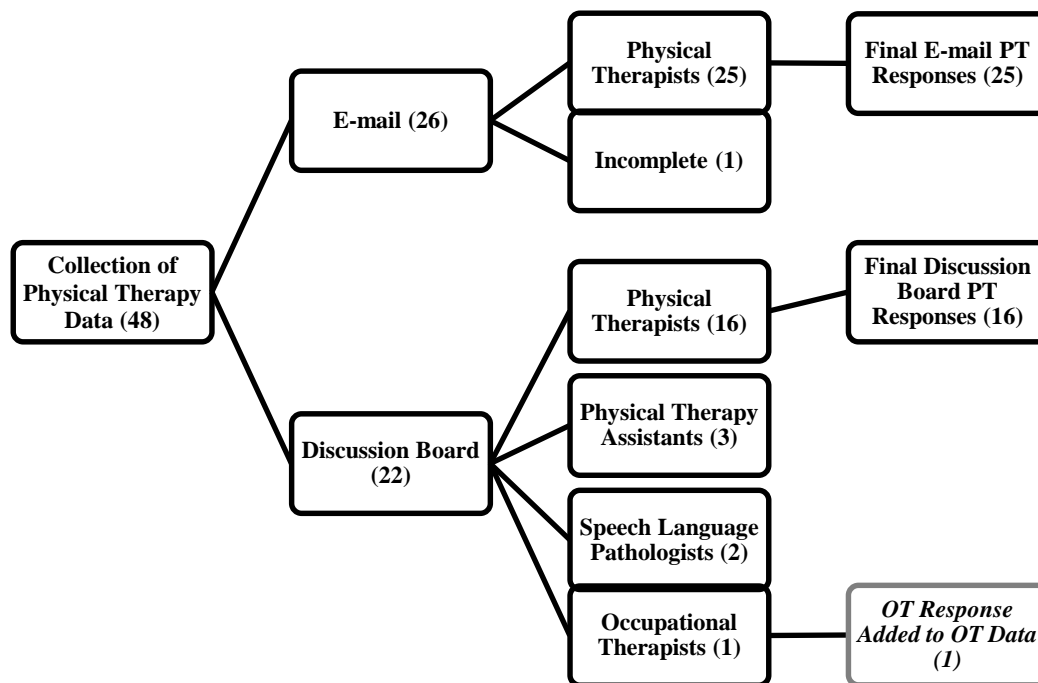
Figure 1. Breakdown of survey responses for OTs and PTs. The total number of responses for OTs included in analysis is 33, including the one OT response obtained via PT recruitment as above. The total number of responses for PTs included in analysis is 41.

Demographic data for the included respondents are described in Table 2. Some of the participants did not complete all items in the survey; the data reported for each item reflect only the actual responses for that item. Chi-square analysis did not show any statistically significant relationship between practice setting, geographic location, or number of years in practice and postacute level of care preference for any of the cases. No statistically significant differences were observed between the OTs' and PTs' responses for each case.

Table 2

Demographic Characteristics of Participants

Demographic	Characteristics	Total nOT + nPT = n (%)
n		74
Discipline	OT	33 (45%)
	PT	41 (55%)
Gender	M	5 + 7 = 12 (16%)
	F	28 + 34 = 62 (84%)
Age	< 40	15 + 23 = 38 (51%)
	≥ 40	13 + 16 = 29 (39%)
	No response	5 + 2 = 7 (10%)
Ethnicity	Hispanic	1 + 0 = 1 (1%)
	Asian	1 + 5 = 6 (8%)
	Caucasian	25 + 31 = 56 (76%)
	African American	2 + 1 = 3 (4%)
	Other/No Response	4 + 4 = 8 (11%)
Geographic Region	Northeast	19 + 12 = 31 (42%)
	Midwest	5 + 9 = 14 (19%)

	South	6 + 9 = 15 (20%)
	West	2 + 11 = 13 (18%)
	No response	1 + 0 = 1 (1%)
Practice Setting	Acute Hospital	11 + 20 = 31 (42%)
	Inpatient Rehabilitation (IRF/SNF)	11 + 14 = 25 (34%)
	Outpatient	9 + 4 = 13 (18%)
	All	1 + 3 = 4 (5%)
	No response	1 + 0 = 1 (1%)
Years in Practice	Fewer than 10 years	15 + 15 = 30 (40%)
	10 years or more	16 + 26 = 42 (57%)
	No response	2 + 0 = 2 (3%)
Treats Stroke Patients	Yes	29 + 41 = 70 (95%)
	No	4 + 0 = 4 (5%)

An overall discharge recommendation consensus was observed for Cases 1, 2, 3, and 4, with a trend toward IRF discharge in three out of those four cases (Cases 1, 3, and 4), and SNF in Case 2 (see Table 3). Case 1 showed the least variability in responses for both the OTs (88%) and the PTs (98%) groups. There was significantly more variability in the discharge recommendations for Case 5. Most recommendations in both groups (OTs and PTs) for this case were either to an IRF or a SNF, and none of the respondents recommended home or outpatient discharge.

Table 3

First Choice of Discharge Disposition by Case Scenario

Recommendation	Discipline	Case 1 n (%)	Case 2 n (%)	Case 3 n (%)	Case 4 n (%)	Case 5 n (%)
IRF	OT	*29 (88%)*	6 (18%)	*24 (73%)*	*22 (67%)*	*13 (39%)*
	PT	*40 (98%)*	2 (5%)	*30 (73%)*	*36 (88%)*	*21 (51%)*
SNF	OT	1 (3%)	*21 (64%)*	4 (12%)	2 (6%)	*16 (49%)*
	PT	0 (0%)	*31 (76%)*	6 (15%)	1 (2%)	*17 (42%)*
LTACH	OT	1 (3%)	6 (18%)	5 (15%)	0 (0%)	4 (12%)
	PT	0 (0%)	3 (7%)	4 (10%)	0 (0%)	3 (7%)
Home/Outpatient	OT	2 (6%)	0 (0%)	0 (0%)	9 (27%)	0 (0%)
	PT	1 (2%)	5 (12%)	1 (2%)	4 (10%)	0 (0%)

Note. IRF = inpatient rehabilitation facility; LTACH = long-term acute care hospital; SNF = skilled nursing facility.

The extent to which each of the 15 identified factors influenced referral decision-making was examined for the OTs and PTs respondents separately. The OTs respondents ranked prognosis for functional improvement as the most influential factor (mean 8.73 [*SD* 1.66]), followed by home social supports (mean 8.64 [*SD* 1.43]) and prestroke functional status (mean 8.48 [*SD* 1.84]) (see Figure 3). Prognosis for functional improvement (mean 8.85 [*SD* 1.71]), stroke severity (mean 8.37 [*SD* 1.87]), and prestroke functional status (mean 8.34 [*SD* 1.97]) were reported as the most influential factors in determining postacute facility PT referral (see Figure 2). In both the OTs and PTs groups, the least influential factors affecting referral pattern were affiliation with the respondent's place of practice, location of the facility, patient age, and insurance.

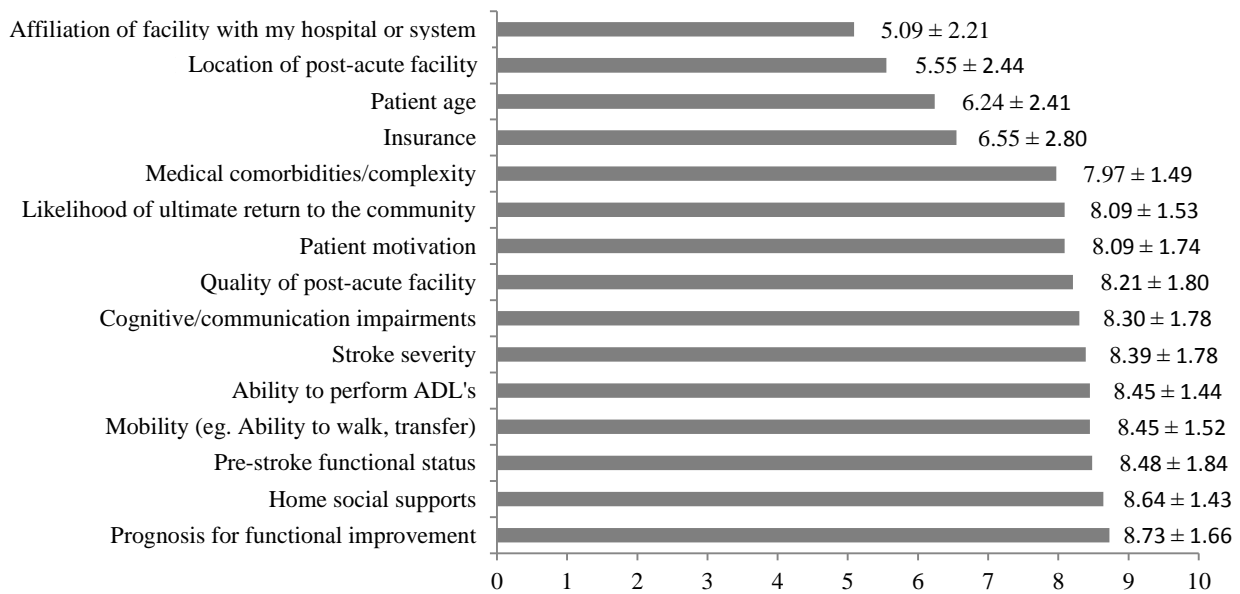## Factors Influencing OT Postacute Facility Selection

Factor	Value
Affiliation of facility with my hospital or system	5.09 ± 2.21
Location of post-acute facility	5.55 ± 2.44
Patient age	6.24 ± 2.41
Insurance	6.55 ± 2.80
Medical comorbidities/complexity	7.97 ± 1.49
Likelihood of ultimate return to the community	8.09 ± 1.53
Patient motivation	8.09 ± 1.74
Quality of post-acute facility	8.21 ± 1.80
Cognitive/communication impairments	8.30 ± 1.78
Stroke severity	8.39 ± 1.78
Ability to perform ADL's	8.45 ± 1.44
Mobility (eg. Ability to walk, transfer)	8.45 ± 1.52
Pre-stroke functional status	8.48 ± 1.84
Home social supports	8.64 ± 1.43
Prognosis for functional improvement	8.73 ± 1.66

Figure 2. Factors influencing OTs postacute facility selection.

Factors Influencing PT Postacute Facility Selection

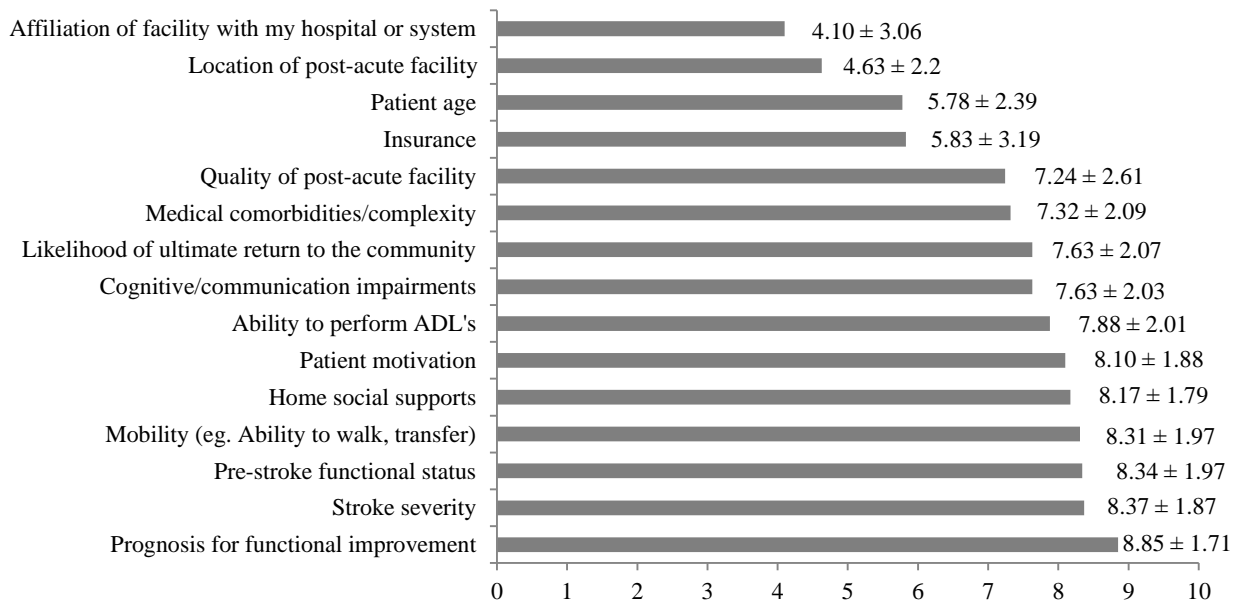| Factor	Value
Affiliation of facility with my hospital or system	4.10 ± 3.06
Location of post-acute facility	4.63 ± 2.2
Patient age	5.78 ± 2.39
Insurance	5.83 ± 3.19
Quality of post-acute facility	7.24 ± 2.61
Medical comorbidities/complexity	7.32 ± 2.09
Likelihood of ultimate return to the community	7.63 ± 2.07
Cognitive/communication impairments	7.63 ± 2.03
Ability to perform ADL's	7.88 ± 2.01
Patient motivation	8.10 ± 1.88
Home social supports	8.17 ± 1.79
Mobility (eg. Ability to walk, transfer)	8.31 ± 1.97
Pre-stroke functional status	8.34 ± 1.97
Stroke severity	8.37 ± 1.87
Prognosis for functional improvement	8.85 ± 1.71

Figure 3. Factors influencing PTs postacute facility selection.

Discussion

We found similar patterns of postacute care recommendations for both OTs and PTs. A substantial consensus was found in four of the five vignettes for rehabilitation level of care, but there was not unanimity regarding optimal discharge destination in any of the vignettes. In the remaining vignette, discharge recommendations were almost evenly divided between two options—IRF and SNF.

Selection of discharge destination did not vary based on practitioner practice setting, geographic location, or number of years in practice.

Prior studies have found that the level of disability (e.g., the Barthel Index) reliably distinguishes between stroke survivors who can return home and those who are referred for residential postacute care (i.e., IRF, SNF, or LTACH) (Stein et al., 2015). In that same study, however, the Barthel Index and other baseline characteristics measured (i.e., NIH stroke scale, cognitive status, caregiver availability) did not reliably distinguish between patients discharged to IRF versus SNF (Stein et al., 2015). Other studies have found significant overlap in the characteristics of the stroke survivors discharged to these two levels of postacute stroke rehabilitation care (Bogasky, Gage, Morley, Spain, & Ingber, 2009). Thus, the case vignettes used in this study were designed to aid in distinguishing between recommendations to IRF versus SNF.

There are several important limitations of this study. The sample size is small and likely not reflective of all OTs and PTs, since the respondents were largely working in either acute care hospitals or inpatient rehabilitation settings. Many of them were involved in clinical education, perhaps as clinical supervisors or instructors, and thus academically oriented. Conversely, this was likely a relatively expert sample, and thus may be more representative of the perspective of leaders in the field who have significant experience working with this population on an ongoing basis. Further, the responses reported here reflect a convenience sample of participants who voluntarily responded to the survey via a variety of recruiting strategies, introducing further bias. In addition, 95% of the survey respondents reported that they had experience working with stroke patients, despite that this was not a criterion to participate in the study. It is not clear how much (if any) experience the remaining 5% of the respondents have had treating stroke patients, and there were insufficient numbers of these respondents to compare their responses with therapists more involved in stroke care. Lastly, although the case vignettes were designed to highlight different clinical aspects that would likely be important in making a referral recommendation, specific characteristics of each case were not analyzed. A much larger sample size and a greater number of vignettes would be needed to perform a factor analysis that would identify the underlying factors being considered by practitioners.

This study builds on a prior study (Cormier et al., 2016) that used these same vignettes to conduct a survey of physiatrists' referral practices for the postacute stroke population. The surveys used in the physician study and in the current study were nearly identical, except that the collected demographic information was adjusted to reflect the target population. Clinicians (physicians, therapists, etc.) have unique expertise in determining the ideal postacute setting but may bring different perspectives to the referral process. Of interest is that despite differing training backgrounds, we found similar referral patterns among OTs and PTs as compared to physiatrists. Further, the clinical vignette itself predicted the referral decision to postacute stroke level of rehabilitation, irrespective of the respondent's clinical discipline.

Our findings indicate that clinician factors (i.e., practice setting, geographic location, and number of years in practice) do not significantly predict referral preferences. Future research should ideally focus on the patient characteristics that most influence referral preference. Also, specific patient factors that predict success in different rehabilitation settings need to be defined. This study identified prognosis for improvement and prestroke functional status as among the most important factors influencing postacute care selection for both OTs and PTs. The OTs felt that home social supports were also important, while the PTs felt that stroke severity was more important than social factors. This

discrepancy may speak to the differences in clinical focus between OTs and PTs. OTs are typically strongly interested in how a patient interacts with his or her environment and activities, whereas PTs are commonly strongly focused on mobility and physical function. We hypothesize that these differences in training and focus contribute to these divergent responses between OTs and PTs.

Once these patient-specific factors are more clearly defined, it may be possible to create evidence-based guidelines for referral practices to ensure that acute stroke survivors receive the most clinically efficacious rehabilitation care. Further studies of referral recommendations are needed to define areas of broad consensus as well as areas of disagreement, with subsequent efforts to clarify optimal treatment algorithms for patients who currently receive variable rehabilitative care.

Conclusion

Referral preferences for post-acute care from OTs and PTs did not vary with any identified practitioner variables, including practice setting, geographic location, and years in practice. The clinical features of each case vignette determined both OTs and PTs referral recommendations. Future studies should seek to identify patient characteristics that most influence referral decisions, which can eventually guide referral decisions to ensure optimal postacute stroke rehabilitation outcomes.

Kathryn M. Gulfo, MD, Department of Rehabilitation and Regenerative Medicine, Columbia University College of Physicians and Surgeons; Department of Rehabilitation Medicine, Weill Cornell Medicine; New York Presbyterian Hospital
Glen Gillen EdD, OTR, FAOTA, Department of Rehabilitation and Regenerative Medicine, Columbia University College of Physicians and Surgeons; New York Presbyterian
Lauri Bishop, DPT, Department of Rehabilitation and Regenerative Medicine, Columbia University College of Physicians and Surgeons; New York Presbyterian Hospital
Clare C. Bassile PT, EdD, Department of Rehabilitation and Regenerative Medicine, Columbia University College of Physicians and Surgeons; New York Presbyterian Hospital
Randy B. Kolodny PT, DPT, MA, School of Health and Medical Sciences, Seton Hall University
Joel Stein, MD, Department of Rehabilitation and Regenerative Medicine, Columbia University College of Physicians and Surgeons; Department of Rehabilitation Medicine, Weill Cornell Medicine; New York Presbyterian Hospital

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