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The same but different: FIM Summary scores may mask variability in physical functioning profiles

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Abstract

Objective—To examine how similar summary scores of physical functioning using the FIM can represent very different patient clinical profiles.

Design—Retrospective cohort study.

Setting—Inpatient rehabilitation facilities submitting claims and assessment data to the Centers for Medicare and Medicaid Services in 2012 and 2013.

Participants—Medicare fee-for-service beneficiaries discharged from inpatient rehabilitation (N=765,441).

Interventions—Not applicable.

Main Outcome Measure—We used patients' scores on items from the Functional Independence Measure (FIM) to quantify their level of independence in both self-care and mobility domains. We then identified patients as requiring “No Physical Assistance” at discharge from inpatient rehabilitation using a rule and score-based approach.

Results—Among those patients with FIM self-care and mobility summary scores suggesting no physical assistance needed, we found physical assistance was in fact needed frequently in bathroom related activities (e.g., continence, toilet and tub transfers, hygiene, clothes management) and with stairs. In other words, it was not uncommon for actual performance to be lower than what may be suggested by a summary score in those domains.

Conclusions—Further research is needed into creating clinically meaningful descriptions of summary scores from combined performances on individual items of physical functioning.

Keywords

physical function; summary scores

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We declare that no conflicts exist in connection with this paper.

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The Centers for Medicare and Medicaid Services (CMS) is moving toward implementation of universal standardized functional measures appropriate for use with a wide range of patient diagnoses.¹ Functional scores that truly reflect differences in patient performance can be used to compare outcomes across provider settings and impose market based payment penalties for failure to meet industry benchmarks.¹ This information can also be made available to consumers. Implementation of standardized functional assessments is central to the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014.² Public reporting of post-acute care (PAC) performance rankings will begin October 2018.

Functional status data used by CMS for facility level comparisons and consumer reporting are typically based on summed ordinal level scores. The Functional Independence Measure (FIMTM), for example, is currently included in the Inpatient Rehabilitation Facility – Patient Assessment Instrument (IRF-PAI) as a basic indicator of patient disability during an episode of hospital rehabilitation care.³ The summary score for each FIM domain (mobility, self-care, and cognition) is based on the scoring of the distinct functional activities that comprise the domain. Different combinations of activity scores can sum to the same summary score. Consequently, a single summary score can represent a number of different patient clinical profiles. In other words, the same summary score for two individual patients could be obtained via multiple possible permutations of performance on each domain item.

As the mandatory use of these instruments become more wide spread, a clear understanding of the information they provide will become increasingly important to rehabilitation hospital administrators, payers, and front-line clinicians. For this research, we examined FIM mobility and self-care domain summary scores for all Medicare fee-for-service enrollees discharged from inpatient rehabilitation in the two years prior to the IMPACT Act becoming law. Our primary objective was to examine how similar summary scores of physical functioning can represent very different patient clinical profiles.

Methods

Data Sources

We used all observations of the following 2012–2013 Medicare files for our analysis: Inpatient Rehabilitation Facility-Patient Assessment Instrument (IRF-PAI); Medicare Provider Analysis and Review (MedPAR); and Beneficiary Summary. Files were linked using encrypted unique beneficiary identification numbers. Inpatient rehabilitation facility assessment records were verified by matching the admission and discharge dates (+/-1 day) with finalized claims in the MedPAR files. The study was approved by the University Institutional Review Board, and we obtained CMS data after establishing a Data Use Agreement.

Cohort

The cohort was Medicare fee-for-service beneficiaries discharged from inpatient rehabilitation between January 1, 2012 and December 31, 2013 (N=765,441). Stays less than three days were excluded (N=18,551). Inpatient rehabilitation stays of three days or less are considered a “short-stay” by CMS, with their own payment category. Patients with short

stays may not be representative, typical patients and were removed from the cohort.⁴ Patients who died during inpatient rehabilitation (N=2,079), discharged against medical advice (N=1,777), or discharged from facilities with less than 20 discharges over the two year period (N=87) were also removed. We also excluded stays with missing functional data (N=17). The final cohort included 742,930 inpatient rehabilitation stays.

Descriptors

We extracted patients' age, sex, and race from Beneficiary Summary files, which include sociodemographic and Medicare enrollment information. The IRF-PAI file was used to determine patients' rehabilitation impairment category (RIC) at admission. For reporting, we categorized RICs into the following groupings: central nervous system (CNS) damage, spinal cord dysfunction, other neurologic conditions, musculoskeletal conditions, endurance conditions, and other.

Functional Status

We used patients' scores on items from the Functional Independence Measure (FIM) to quantify their level of independence on self-care and mobility domains of functional status.¹ The FIM items are rated on a 1 (Total Assistance) to 7 (Complete Independence) scale (see Online Table "a"). The self-care domain included eight items related to: eating, grooming, bathing, dressing the upper body, dressing the lower body, toileting, bladder management, and bowel management (score range 8–56). The mobility domain included five items related to: transfers to and from bed, chair, wheelchair, toilet, and bath or shower; walking/wheelchair mobility; and ability to climb stairs (score range 5–35).

Data Analysis

We first calculated a simple threshold for classifying patients requiring "No Physical Assistance" at discharge from inpatient rehabilitation. A score of 5 or higher on all items indicates the patient needs only "Supervision or Setup" to complete the activity, and does not require any physical assistance; therefore, the possible range of scores according to this rule based approach for "No Physical Assistance" is 40 to 56 points for self-care and 25 to 35 points for mobility. Online Table "b" provides an example of how the summary score range for "No Physical Assistance" was calculated for mobility (see first 2 data columns). It also shows how the same summary score can be obtained via multiple different item permutations (see possible permutations a, b, and c).

Our primary focus was on those patients with scores above 40 for self-care and above 25 for mobility. These score ranges were used to identify the "No Physical Assistance" patients in our analyses. We next calculated the proportion of patients who were classified as "No Physical Assistance" needed within each domain who did in fact require assistance on cumulative numbers of tasks.

Lastly, we graphed the cumulative percentage of patients who scored a 1, 2, 3, or 4 (i.e., "Physical Assistance" needed) across each domain item for those identified as "No Physical Assistance" needed to provide a visual representation of the activities where help was needed most. All analyses were conducted with SPSS version 24.

Results

Table 1 shows characteristics of the overall sample and stratified by physical assistance threshold scores for self-care and mobility at discharge from inpatient rehabilitation. Over half of patients were classified as needing “no physical assistance” for self-care at discharge and approximately one third were similarly classified for mobility. Table 2 shows that about one quarter of patients identified as “No Physical Assistance” still required help on at least one item. The Figure shows that lower extremity dressing (16.2%), bathing (13.8%), stair climbing (20.4%), and tub transfers (6.1%) were the items that required the most assistance.

Discussion

Among patients discharged from inpatient rehabilitation who were classified as functional or mobility-able according to the cut off from the FIM subscale items, we found that it was relatively common for some of these patients to in fact not be independent on at least one self-care activity. In other words, actual performance was lower than what was suggested by a summary score. Bathroom related activities (e.g., continence, toilet and tub transfers, hygiene, clothes management), walking, and stairs were the items where help was needed most often. We studied the FIM[®] instrument in a large nationally representative sample of older patients discharged from inpatient rehabilitation. But this concern likely applies to other ordinal or interval level measures of physical functioning, particularly at the population level.

Lack of awareness on this issue could be problematic. Many of the Domain items identified are associated with a high risk of injury and other adverse outcomes.^{5,6} The Centers for Disease Control & Prevention (CDC) found that the highest rates for fall injuries occurred in or around the tub or shower and on or near the toilet.⁷ Falls that occur in the bathroom have also been shown to be twice as likely to result in injury as falls that occur in other areas of the home.⁸ Family caregivers and paid home care providers also report that bathing and toileting are the most difficulty care they provide, with assisted bathing being associated with high rates of caregiver injuries.⁹ Even minimal assistance needed in the context of bathroom activities is no doubt emotionally consequential to the both care recipient and care giver.

Limitations

A primary limitation of this analysis are constraints inherent to administrative datasets such as the lack of information about the consistency and accuracy of data entry.³

Conclusions

Further research is needed into creating clinically meaningful descriptions of summary scores from combined performances on individual items of physical functioning. This will be important for the standardized functional assessments mandated by the IMPACT Act where public reporting of PAC provider performances begins in 2018.¹⁰ Comparable information across PAC settings is clearly desired by policy makers to evaluate care based

on clinical evidence and quality metrics, but easily interpretable information is also essential for providers, caregivers, and patients to make informed care decisions.

Table 1. FIM Instrument scoring criteria.

Table 2. Example FIM summary scores for the Mobility domain.

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Abbreviations

IMPACT	Improving Medicare Post-Acute Care Transformation Act of 2014
PAC	Public reporting of post-acute care
CMS	Centers for Medicare and Medicaid Services
FIM®	Functional Independence Measure
IRF-PAI	Inpatient Rehabilitation Facility – Patient Assessment Instrument
MedPAR	Medicare Provider Analysis and Review
RIC	rehabilitation impairment category
CDC	Centers for Disease Control & Prevention

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Figure.

Percentage of patients who required assistance on specific domain items, but who are above the summary score threshold for “No Physical Assistance”.

Table 1

Sample characteristics stratified by physical assistance threshold scores for self-care and mobility at discharge from inpatient rehabilitation.

	N	Self-care		Mobility	
		No PA	PA	No PA	PA
Overall	742,930	60.5%	39.5%	33.4%	66.6%
Age, years					
<75	311,261	66.2%	33.8%	38.1%	61.9%
75–84	260,506	60.1%	39.9%	33.6%	66.4%
85+	171,163	50.6%	49.4%	24.6%	75.4%
Sex					
Female	429,039	63.1%	36.9%	33.7%	66.3%
Male	313,891	56.8%	43.2%	33.0%	67.0%
Race/ethnicity *					
Non-hispanic white	599,299	61.6%	38.4%	34.1%	65.9%
Non-hispanic black	80,206	55.5%	44.5%	29.1%	70.9%
Hispanic	43,286	54.9%	45.1%	30.5%	69.5%
Other	18,376	57.9%	42.1%	33.7%	66.3%
Impairment group					
Central nervous system damage	213,666	49.0%	51.0%	29.0%	71.0%
Spinal cord dysfunction	35,457	54.0%	46.0%	31.1%	68.9%
Neurologic conditions	85,266	58.1%	41.9%	32.9%	67.1%
Musculoskeletal conditions	259,935	69.3%	30.7%	35.7%	64.3%
Endurance conditions	57,152	70.5%	29.5%	40.4%	59.6%
Other	91,454	60.5%	39.5%	33.9%	66.1%

Abbreviations: PA, physical assistance

* Race/ethnicity missing for 1763 cases.

Table 2

Proportion of patients who were classified as “No Physical Assistance” that did require assistance on cumulative numbers of items.

	Self-care no PA needed		Mobility no PA needed	
	N	%	N	%
	449,192	100.00%	248,026	100.00%
0 items < 5	285,812	63.63%	176,624	71.21%
1 item < 5	94,578	21.06%	67,390	27.17%
2 items < 5	47,376	10.55%	3,963	1.60%
3 items < 5	18,581	4.14%	49	0.02%
4 items < 5	2,704	0.60%	0	0.0%
5 items < 5	141	0.03%	*	*
6, 7, & 8 items <5	0	0.0%	*	*

* The Mobility Domain is made up of 5 items. The Self-care Domain is made up of 8 items.