ORIGINAL RESEARCH

Evaluating Siebens Domain Management Model for Inpatient Rehabilitation to Increase Functional Independence and Discharge Rate to Home in Geriatric Patients

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Abstract

Objective: To evaluate the Siebens Domain Management Model (SDMM) for geriatric inpatient rehabilitation (IR) to increase functional independence and dispositions to home.

Design: Before and after study.

Setting: IR facility.

Participants: During 2010 (preintervention), 429 patients aged ≥75 years who were on average admitted to IR 8.2 days postacute care, and during 2012 (postintervention), 524 patients aged ≥75 years who were on average admitted to IR 5.5 days postacute care. Case-mix group (CMG) comorbidity tier severity, preadmission living setting, and living support were similar in both groups.

Intervention: The SDMM involving weekly adjustments of IR care focused on potential barriers to discharge home.

Main Outcome Measures: FIM efficiency, length of stay (LOS), and disposition rates to community/home, acute care, and long-term care (LTC) to compare pre-/postintervention facility data and comparison of facility to national CMG-adjusted data from the Uniform Data System for Medical Rehabilitation for both years (2010/2012).

Results: Pre-/postintervention group admission FIM scores were similar ($t=2.96$, $P<.003$), but the preintervention group had on average 2.6 days greater LOS during IR and greater time to onset of IR (8.2 vs 5.5d) from acute care. Preintervention FIM efficiency was 2.1, whereas postintervention FIM efficiency was 2.76, a significant difference ($t=4.1$, $P<.0001$). There were significantly more discharges to the community in the postintervention group (74.4%) than the preintervention group (58.5%, $\chi^2=26.2$, $P<.0001$). There were significantly fewer patients discharged to LTC in the postintervention group ($\chi^2=30.47$, $P<.0001$). The preintervention group did not significantly differ from the 2010 national data, but the postintervention group significantly differed from the 2012 national data for both greater FIM efficiency ($t=-5.5$, $P<.0001$) and greater discharge to community ($\chi^2=34$, $P<.0001$). LOS decreased by 2.6 days in the postintervention group compared with the preintervention group, whereas LOS decreased by only 0.6 days nationally from 2010 to 2012, a significant difference with postintervention LOS lower than the national data ($t=31.1$, $P<.0001$).

Conclusions: Use of the SDMM during IR in geriatric patients is associated with increased functional independence and discharges to home/community and reduced institutionalization.

Archives of Physical Medicine and Rehabilitation 2015;96:1310-8

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The population of older persons in the United States aged ≥65 years, was 41.4 million in 2011, an 18% increase of 6.4 million since 2000. This population is projected to more than double to 92 million by 2060.[1] The population aged ≥85 years is projected to increase from 5.7 million in 2011 to 14.1 million by 2040. The growing U.S. geriatric population will put an increasing burden on

health care services and costs, including the costs related to long-term skilled nursing care. In 1991 nursing home institutional care represented one third of the U.S. health care budget, or approximately $60 billion, which was paid by Medicaid, private pay, insurance, and various other sources.[2] Since 1991, institutional care has become increasingly expensive; between 2010 and 2011 alone the related annual costs for a semiprivate or private skilled nursing facility (SNF) bed have increased by 4.4% ($74,825−$83,585 in 2010 to $78,110−$87,235 in 2011).[3]

There are multiple interacting medical, physical, functional, and social risk factors that put geriatric patients at an elevated risk for institutionalization after acute care hospitalization. Risk factors most commonly associated with discharge of geriatric patients to institutional care are incontinence[4-8] and impaired cognition and functional dependence,[5-15] particularly if the dependence involves ≥3 activities of daily living.[11] Social factors that place geriatric patients most at risk for long-term care (LTC) include lack of caregiver availability and inadequate caregiver preparation.[13-19] Approximately 29% of noninstitutionalized older persons live alone (8.1 million women, 3.2 million men), whereas almost half of older women (47%) aged ≥75 years live alone.[1] Geriatric patients who live alone are at a greater risk of institutionalization after acute care hospitalization. Further risk factors for institutionalization include being a woman, advanced age (≥85y), acute care hospitalization, and discharge from an acute care hospital to an SNF.[20] Interestingly, >75% of all SNF admissions are preceded by acute care hospitalization, and discharge to an SNF is associated with a high risk of subsequent LTC.[20] Inpatient rehabilitation (IR) for geriatric patients is increasingly important in limiting the economic and social costs to society of debility in older adults by maximizing functional recovery, by the prevention of secondary medical complications, and by promoting the discharge of geriatric patients to home/community.

The discharge rate of geriatric patients to home/community from IR is limited by the rate of institutional discharges to LTC and by transfers back to acute care facilities/wards because of medical complications. The Siebens Domain Management Model (SDMM) is increasingly used as a health care management tool to improve patient outcomes in acute and chronic care by the facilitation of interdisciplinary professional communication and collaboration.[21-27] The SDMM for geriatric IR provides a standard format for weekly interdisciplinary team conferences with a focus on potential medical, physical, cognitive, emotional, and social barriers to recovery and barriers to community/home discharge. The SDMM has been found to be associated with improved functional outcomes and discharges to home/community and reduced institutionalization in patients with stroke during IR.[27] To our knowledge, there has not yet been a study to evaluate the use of the SDMM in improving functional outcomes and discharges to home/community while reducing institutionalization in IR

List of abbreviations:

ACA	Affordable Care Act
CMG	case-mix group
IR	inpatient rehabilitation
LOS	length of stay
LTC	long-term care
PPS	prospective payment system
SDMM	Siebens Domain Management Model
SNF	skilled nursing facility
UDSMR	Uniform Data System for Medical Rehabilitation

geriatric patients. Therefore, the goal of this study was to investigate the use of the SDMM during IR in improving functional outcomes and discharge disposition for geriatric patients.

Methods

Participants

This is a before and after observational study that included all IR geriatric patients admitted to a teaching hospital in 2010 and 2012. There were no exclusion criteria; all geriatric patients were included for the facility from the Uniform Data System for Medical Rehabilitation (UDSMR) Metrics Reports for the corresponding years regardless of the admitting diagnosis. Geriatric patients were defined as any patient aged ≥75 years. All 21 UDSMR diagnostic impairment groups were included for the geriatric patients. The preintervention group (2010) involved 429 geriatric patients aged ≥75 years who were on average admitted to IR 8.2 days after the onset of acute care hospitalization. The postintervention group (2012) included 524 patients aged ≥75 years who were on average admitted to IR 5.5 days postacute care. There were 17.3% more patients admitted within the neurologic impairment group as categorized by the UDSMR in the postintervention group than in the pretreatment group. (The UDSMR defines neurologic disorders as those that are coded as multiple sclerosis, parkinsonism, polyneuropathy, cerebral palsy, neuromuscular diseases, and other neurologic, which includes other diseases that are extrapyramidal, demyelinating, spinocerebellar, and/or autonomic.[28]) However, case-mix group (CMG) comorbidity tier severity appeared to be similar in both groups. Also, the preadmission living setting and home social support status appeared to be similar in the 2 groups. A comparison summary of participant demographics, admitting diagnoses, and preadmission living setting and home social support status is given in table 1. The facility data for both years were aggregate data provided by the UDSMR, and no information was available regarding specific patients. The UDSMR CMG-adjusted national aggregate data for both years were also used as comparison groups in this study. The UDSMR provided CMG-adjusted national aggregate data to the facility case mix of patients for each year.

Procedure

This study involved a comparison of preintervention and postintervention participant outcome metrics for the purpose of assessing the use of the SDMM in geriatric IR. The preintervention group included all IR geriatric patients from 2010, the year prior to adoption of the SDMM intervention for use in the facility in weekly interdisciplinary team conferences. The postintervention group included all IR geriatric patients from 2012, the full year after the adoption of the SDMM for regular use in all facility weekly interdisciplinary team conferences. This study was approved by the hospital's clinical research review committee.

Intervention

The SDMM was the intervention implemented in mid-2011 for IR geriatric case management. The intervention involved weekly adjustments of IR care focused on potential barriers to discharge home per the SDMM framework of 4 domains, including I. Medical/Surgical Issues, II. Mental Status/Emotions/