

IMPACT OF URINARY INCONTINENCE ON REHABILITATION OUTCOMES IN INPATIENT REHABILITATION FACILITIES IN THE UNITED STATES

Hypothesis / aims of study

The prevalence of urinary incontinence in patients receiving inpatient medical rehabilitation in the United States remains largely unknown. This knowledge gap is a problem since a primary goal of medical rehabilitation is discharge to home and urinary incontinence (UI) has been strongly related to nursing home admission and other unfavorable outcomes [1,2]. The aims of this study were to establish a baseline description of the prevalence of urinary incontinence (UI) in inpatient medical rehabilitation settings in the United States, and to evaluate the impact of UI on patient outcomes. We hypothesized that incontinence would be associated with less recovery of mobility function, less recovery of self care skills, and increased likelihood of discharge to nursing home.

Study design, materials and methods

Study design: retrospective cohort study of Medicare beneficiaries admitted to Inpatient Rehabilitation Facilities (IRFs) in 2005. n = 403,697

- Exclusion criteria: Under 21 yrs of age, length of stay > 3 SD above mean for that Rehabilitation Impairment Categories (RIC), admitted from another IRF, admitted for evaluation only, short stay (3 days or less), expired during stay, or discharged against medical advice.
- Patients were grouped by RIC: stroke (RIC 01), brain dysfunction (RIC 02, 03), spinal cord injury (RIC 04, 05), orthopedic (RIC 07, 08, 09, 17) other (RIC 06, 10-16, 18-21).

The function modifier used in the Inpatient Rehabilitation Facility-Patient Assessment Instrument (IRF-PAI) for frequency of bladder accidents defines an "accident" as "the act of wetting linen or clothing with urine, and includes bedpan and urinal spills." This definition does not match the ICS classification of incontinence as "any leakage of urine". In particular, Level 6 is described as "Continent with a Device" but includes categories that the ICS classifies as incontinent. For this study, IRF-PAI Levels or categories are defined as follows:

- **IRF-PAI Level 7 = Continent:** "the patient controls the bladder completely and intentionally and does not have any accidents"
- **IRF-PAI Level 6 = Continent with a Device:** "No accidents; uses device such as catheter" "Device" defined quite broadly: "a urinal, bedpan, catheter, bedside commode, absorbent pad, diaper, urinary collecting device, or urinary diversion, or uses medication for control".
- **IRF-PAI Level 1 through 5 = Incontinent:** the number of accidents in the past 7 days.

Results

Table 1. Overall prevalence of UI in IRFs in the United States

	Urinary Incontinence (score 5 or less)	Continent with device (score of 6)	Continent (score of 7)
ADMISSION	96,233 (24%)	175,775 (43%)	131,689 (33%)
DISCHARGE	69,009 (17%)	129,233 (32%)	205,455 (51%)

33% of patients have no change in UI status from admission to discharge.

Table 2: Prevalence of UI by Rehabilitation Impairment Categories (RIC)

	Urinary Incontinence (score 5 or less)	Continent with device (score of 6)	Continent (score of 7)
Stroke RIC 01	25,081 (*33%)	30,247 (40%)	20,577 (27%)
Brain Injury RIC 02,03	14,210 (31%)	19,080 (41%)	12,750 (28%)
SCI RIC 04,05	6,243 (20%)	14,664 (48%)	9,802 (32%)
Ortho RIC 07-09, 17	**39,888 (19%)	94,477 (45%)	74,086 (36%)
Other RIC 06,10-16, 18-21	10,811 (25%)	17,307 (41%)	14,474 (34%)

*Stroke has the highest prevalence by diagnosis,

**Ortho has the highest prevalence overall.

Table 3. Impact of Incontinence on Mobility and Self-Care IRF-PAI Score at Discharge*

Ordinary Least Squares Regression	Stroke model RIC 01		Orthopedic model RICs 07-09, 17	
	R ² Mobility	R ² Self Care	Stroke Mobility	Stroke Self Care
	.791	.831	Orthopedic Mobility	Orthopedic Self Care
Change in IRF-PAI score related to UI			-0.81	-0.57

Table 4. Impact of Incontinence on Discharge (DC) location*

Odds ratio	Stroke RIC 01	Orthopedic RICs 07-09, 17
Pseudo R ²	.266	.31

Likelihood of DC to	Nursing Home	Other Community	Acute Hospital	Nursing Home	Other Community	Acute Hospital
UI	1.16			1.22	1.48	

- Base Comparison Category = discharge to home
- Nursing Home = discharge to nursing home or skilled nursing facility
- Other Community = discharge to assisted living, transitional living, board and care

* For Tables 3 and 4 the full model analysis included: self care at discharge, mobility at discharge, co-morbidities, age, race, gender, cognition, time from onset, length of stay, fecal incontinence status, double incontinence status, and modified incontinence status.

Interpretation of results

Urinary incontinence is highly prevalent among IRF patients. UI makes a significant contribution to patient outcomes independent of functional status at admission. UI has highest rate in stroke but absolute numbers are greatest in orthopedic patient populations. UI is related to significantly worse patient mobility and self care outcomes. UI has a greater impact on function and discharge location for orthopedic patients than stroke patients. UI increases likelihood of admission to a skilled nursing facility (SNF) for both orthopedic and stroke patients.

Concluding message

The classification definitions of the IRF-PAI and the scoring system underestimates the true prevalence of UI and emphasizes management with devices and medication instead of rehabilitation. Rehabilitation -based interventions such as pelvic floor muscle training and electrical stimulation, as well as behavioral techniques such as timed voiding, can potentially benefit many patients with UI during the inpatient admission. This is especially true for the largest group; the orthopedic patients, who would likely respond to rehabilitation-based interventions for UI. Yet assessment and rehabilitation treatment of UI is rarely given sufficient priority in inpatient rehabilitation treatment planning. Because many causes of UI are potentially treatable by the rehabilitation treatment team, these data suggest opportunities for improved patient outcomes. Though treatment strategies for incontinence may differ by diagnostic group, all patients could potentially be treated with rehabilitation-based interventions if UI was more accurately identified and classified, and if higher priority was given to UI's prevalence and significance in IRFs.

Topic/Key words: Epidemiology and Outcomes Research, Inpatient Rehabilitation, Urinary Incontinence

References

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2. Wagg, A., J. Potter, et al. (2008). "National audit of continence care for older people: management of urinary incontinence." *Age Ageing* 37(1): 39-44

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Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	This study was approved by the IRB of Northwestern University, Chicago, Illinois
Was the Declaration of Helsinki followed?	No
This study did not follow the Declaration of Helsinki in the sense that	it is a study of de-identified data from a large national database and so informed consent by the subjects was not necessary
Was informed consent obtained from the patients?	No