

# LABOR COSTS ASSOCIATED WITH INCONTINENCE IN LONG-TERM CARE FACILITIES

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## ABSTRACT

**Objectives.** To understand the labor resource consumption in caring activities of long-term care residents with versus without urinary incontinence (UI) and the variation in consumption patterns across shifts and facility types.

**Methods.** This prospective study was conducted in three phases. Phase I of the study developed a taxonomy of the caring activities involved in the care of the incontinent patient and of the control group patient. In Phase II, the frequency of these activities was assessed. Phase III extrapolated the cost impacts of incontinence. The sample consisted of 37 long-term care facilities in the vicinity of Winston-Salem, North Carolina, along with a supplemental sample of 12 facilities in the vicinity of Chapel Hill, North Carolina. The study examined the costs of labor, supplies, and services. To our knowledge, this is the first study to apply microcosting approaches to UI.

**Results.** All things being equal, the incremental labor costs (per shift) were \$3.31 (in 2002 dollars) for patients with occasional UI and \$5.16 for patients with frequent UI. Combining patients with frequent UI (more than 70% of all UI patients) and occasional UI, the weighted average incremental costs per shift were \$4.52.

**Conclusions.** With incremental labor costs of \$4.52 per patient per shift, UI costs an additional \$13.57 to treat per day, or \$4957 annually. Our findings can be used to capture the "averted costs" in long-term care facilities from curing UI. *UROLOGY* 62: 442-446, 2003. © 2003 Elsevier Inc.

Urinary incontinence (UI) is a condition with a high prevalence in the elderly in both community and institutional settings,<sup>1</sup> affecting 15% to 35% of noninstitutionalized persons older than 60 years of age<sup>1-3</sup> and more than 50% of nursing home residents.<sup>3-6</sup> UI has been commonly cited as the leading cause of nursing home admissions.<sup>1,7</sup> Ouslander *et al.*<sup>4</sup> attributed the cost increases of nursing care to the high prevalence of incontinence in nursing homes.

UI creates significant psychological, physical, and financial burdens on the elderly and their care-

givers and consumes enormous amounts of labor and supply resources. According to Hu,<sup>8</sup> the direct costs for caring for all persons with UI is \$11.2 billion annually in the community and \$5.2 billion annually in nursing homes. He also estimated that the total cost of managing UI in the United States was \$19 billion in 1992, a 52% increase from 1987.<sup>8</sup>

Several cost estimates for labor resources attributed to UI care have been made. Hu<sup>9</sup> summarized the daily labor cost estimates ranging from \$1.20 to \$5.50 and estimated \$6 per resident per day for routine UI care without a catheter or \$2190 annually.<sup>10</sup> Examining the time consumption associated with UI care, Hu *et al.*<sup>11</sup> estimated 17 to 20 minutes per day, and Cumming *et al.*<sup>12</sup> found each incontinent patient required approximately 15 minutes of nursing time each day. Borrie *et al.*<sup>13</sup> found the average amount of time spent by nursing staff was 52.5 minutes per UI patient, with an annual cost estimate of \$9771 per patient. They also estimated that 83% of all costs were labor costs<sup>13</sup> compared with an estimate of 70% by Ouslander and Kane.<sup>5</sup>

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Submitted: January 29, 2003, accepted (with revisions): April 18, 2003

The purpose of this study was to estimate the incremental labor costs of caring for UI patients residing in long-term care (LTC) facilities. An “incremental” approach allows estimations of the *additional* resources incurred in caring for LTC residents with UI compared with those without UI. The findings from this study will not only help administrators in LTC facilities better project for their staff needs, but will also provide information regarding the disease burden of UI and, importantly, the potential benefit from improved UI management.

## MATERIAL AND METHODS

The data were collected in three phases. In Phase I, a taxonomy of the caring activities involved in the care of LTC residents was developed. Phase II recorded the intensity of these activities, and Phase III quantified each cost element. The sample frame consisted of a group of LTC facilities served by a North Carolina physician group. The eligible case and control patients had been admitted to the selected facilities with at least 3 months of residency and no planned discharge. Excluded were those with mental impairment such as dementia and Alzheimer’s disease. Residents identified with UI were classified as “occasionally incontinent” (leakage of drops a few times a month) and “frequently incontinent” (moderate and severe incontinence, defined by Sandvik *et al.*<sup>14</sup> as having daily leakage of drops and larger amounts of leakage at least once a week, respectively).

### PHASE I

A “time and motion” (TAM) study was implemented to create a taxonomy of the different types of labor involved in patient care and to investigate the time consumption and staffing level for each labor input. Two graduate students in nursing were recruited and trained to conduct the TAM observations. The primary unit of observation was certified nursing assistants (CNAs); the CNA selected for this study had to have at least three incontinent patients for whom they were responsible. To minimize facility-related variations, two LTC facilities with all three levels of care (ie, skilled, intermediate, and domiciliary) were selected, and the TAM observations were recorded for the day, evening, and night shifts for each care level at each facility (a total of 18 shifts). At each shift, the student followed the CNA, recorded the care provided and time spent by the CNA, as well as the assistance of the CNA’s supervisor or other personnel. A total of 18 CNAs (one at each shift) were observed.

### PHASE II

Phase II estimated the intensity (frequency and time to complete) of caring activities performed by the staff members in each category of labor. Checklists developed from the TAM served as the primary data collection instrument. Information was collected on patient interventions and the nature and types of labor for 1 week. Checklists were printed in papers of bright color and placed at the bedside of the LTC residents (one per person per shift). Before distributing the checklists to the participating facilities, we conducted a training session on how to fill out the checklists and where to place them. The research assistant then visited each facility twice: once at mid-week for problem solving and to monitor the data collection progress and once at the end of the week to collect the completed checklist. The time estimated by the caregivers was then combined with the activity frequencies to obtain a mea-

sure of time consumption in caring for incontinent versus continent patients.

Five facilities and a total of 116 patients participated in Phase II. These facilities produced data for 63 UI patients (22 in skilled nursing, 20 in intermediate nursing, and 21 in rest home units) and 53 continent/control patients. Excluding the misplaced or unreadable checklists, a total of 1868 completed checklists were used in the analysis. Patient information (demographics, payers, type of incontinence [none, occasional, or frequent], and institutionalization history) was also collected.

### PHASE III

Cost data were obtained from a resource utilization/consumption survey and included facility characteristics, physical layout of facilities, facility staffing, facility experience in UI patients, perception of the association between UI and nursing home admissions, and wage rate and seniority of facility nursing staff.

This survey was mailed to nursing administrators in 39 facilities served by the participating physician groups and a supplemental sample of 12 Chapel Hill, NC facilities.

### CONSTRUCTION OF COSTS

The labor costs of caring activities were calculated by combining the wage rates with the data from Phase I and II:

$$C = \sum_{j=1}^J \sum_{k=1}^K F_{kj} * T_{kj} * W_j,$$

where  $F_{kj}$  are the frequencies of  $k$ th caring activity performed by the  $j$ th type of labor at a shift,  $T_{kj}$  is the time the  $j$ th type of labor spent on activity  $k$ , and  $W_j$  is the hourly wage rate of the  $j$ th type of labor.

The hourly wage rates in this study were collected in 1998. The labor costs were adjusted to 2002 U.S. dollars using the medical care services component of the Consumer Price Index—Urban Wage Earners and Clerical Workers.

## RESULTS

### PHASE I

Four types of health professions contribute to patient care in LTC facilities: CNAs, registered nurses, licensed practicing nurses, and therapists (occupational, respiratory, physical, and speech). Additional labor activity included physician visits and housekeeping. The list of labor activities observed in the TAM included 17 major caring activities (Table I).

### PHASE II

The patient characteristics revealed some expected patterns based on our data collection criteria. The UI group was slightly older (81.4 versus 80.0 years,  $P = 0.76$ ), had a greater proportion of patients who were women (78% versus 71%,  $P = 0.45$ ), had Medicare coverage (25% versus 19%,  $P = 0.41$ ), and resided in either skilled (35% versus 30%,  $P = 0.59$ ) or intermediate (32% versus 21%,  $P = 0.18$ ) nursing units, although none of the above relationships was statistically significant. Among residents without UI, only 1.9% reported having

**TABLE I. Average time spent by caring activities, CNAs/non-CNAs, type of facility\***

Activities	SNF (min)		ICF (min)		RH (min)		Average (min)	
	Yes	No	Yes	No	Yes	No	Yes	No
Feed patient	23.75	25	25	23.75	18	19.4	22.25	22.72
Full bed bath	21.25	22.5	22.5	20	14	19	19.25	20.5
Partial bed bath	13.75	16.25	17.5	13.75	9	12	13.42	14
Used incontinent care	10	13.75	10	10	7.4	11	9.13	11.58
Change clothes	10	10	10	10	10	11	10	10.33
Check for wetness	0.44	1.08	.5	1	0.47	0.9	0.47	1
Take to bathroom	11.25	11.25	13.75	7.75	10	4.8	11.67	7.93
Put on diaper	9.25	5.5	10	3.5	5.4	3.6	8.22	4.2
Change soiled diaper	10	6.25	10	5	7.2	5	9.07	5.42
Change all linens	10	8.75	10	8.5	6.2	8.4	8.73	8.55
Change some linens	6	5.75	5.5	6	4	4.8	5.17	5.52
Put incontinence pad on bed	2.75	1.75	3	2	1.8	1.4	2.52	1.72
Turning and positioning patient	3.5	5.75	3	5	4	3.4	3.5	4.72
Applied skin care product	0.75	2.25	0.69	2.75	1.89	1.95	1.11	2.32
Change soiled incontinence pad	4.75	2.25	4.5	2.25	1.8	3.6	3.68	2.7
Give and remove bedpan	4.25	5	3	3.25	1.6	4.4	2.95	4.22
Bladder/bowel training program	16.25	16.25	13.75	13.75	5.4	9.4	11.8	13.13

Key: CNA = certified nursing assistant; SNF = skilled nursing facility; ICF = intermediate care facility; RH = rest home.  
\* Yes = CNAs; No = non-CNAs.

bowel incontinence problems; however, approximately 89% of UI residents also had bowel incontinence.

Data collected from our checklists showed that CNAs provided most of the routine care for patients in LTC facilities. It also showed that in 16 of 17 checklist items, the UI patients required more frequent care. The exception was the activity of giving and removing bedpans, which was twice as likely to be performed for a control patient. In some cases (eg, changing of linens), the differences between the UI and control patients were small. In other cases, the magnitude of the differences between the two groups was larger (eg, UI patients were more than four times as likely to be fed or to have a partial bed bath, were more than four times as likely to require incontinent care, and five times as likely to require skin care products).

Table I summarizes the average time for each activity on the checklist, by nursing and facility types. For UI patients, the three most time-consuming activities were feeding (22 minutes), bathing (19 minutes), and providing them with bowel and bladder training (11.8 minutes). The average time per activity was combined with the frequency of each activity to estimate the average nursing time per shift. In general, the Phase II results showed staff in LTC facilities spent an average of 191 minutes daily caring for UI patients compared with 60 minutes for patients without UI.

### PHASE III

Fifteen facilities returned the questionnaire (31% response rate). More than 86% of the re-

sponding facilities accepted rest home patients, 33% offered intermediate care, and 40% offered skilled nursing care.

For validation, we compared the wage information collected from the administrator's survey with that estimated from the 1997 March Current Population Survey. For each type of nursing staff, the average wage was compared with the national average, with cost-of-living adjustment for North Carolinian workers. Our comparison suggested that the wage information collected from our survey was reliable.

### LABOR COSTS

The results of our study show that the incremental labor costs associated with incontinent care in LTC facilities were \$4.52 per patient per shift, or \$13.57 per patient per day, or \$4957 annually.

In general, regardless of the incontinence status, the labor costs of routine care activities were greater for women and those who were 80 years old or older (Table II).

Compared with the continent LTC residents, those with occasional incontinence consumed \$3.31 (\$8.75 - \$5.44) more labor resources per shift. In addition, labor costs increased by a factor of nearly two when comparing continent patients with those with frequent UI (\$5.44 versus \$10.6).

The largest difference (\$7.12 = \$9.76 - \$2.64) in labor costs by facility type was observed in the intermediate-nursing units; the smallest difference (\$2.73 = \$9.46 - \$6.73) was observed in the rest home units. For residents classified as occasionally incontinent, those residing in intermediate units

**TABLE II. Labor costs per shift**

	Urinary Continent	Urinary Incontinent	Occasionally Incontinent	Frequently Incontinent
Labor costs per shift (\$)	5.44 (10.3)	9.96 (8.33)	8.75 (6.81)	10.6 (8.97)
Labor costs by age group (\$)				
<80 yr	4.76 (7.07)	9.10 (7.08)	8.72 (6.75)	9.39 (7.32)
≥80 yr	5.84 (11.94)	10.68 (9.21)	8.76 (6.93)	11.36 (9.80)
Labor costs by gender (\$)				
Male	3.75 (5.16)	9.67 (7.38)	7.98 (7.66)	10.79 (6.99)
Female	6.09 (11.72)	10.02 (8.55)	8.96 (6.54)	10.54 (9.33)
Labor costs by facility type (\$)				
Skilled nursing units	4.69 (5.66)	10.64 (8.13)	6.48 (6.62)	12.52 (8.06)
Intermediate units	2.64 (4.51)	9.76 (5.90)	10.03 (5.0)	9.52 (6.58)
Rest homes	6.73 (13.02)	9.46 (10.05)	9.54 (8.4)	9.43 (10.62)
Labor costs by shift (\$)				
Day shift	7.29 (13.13)	13.47 (9.60)	10.96 (7.63)	14.70 (10.21)
Evening shift	4.59 (9.65)	7.70 (7.16)	7.99 (6.27)	7.54 (7.67)
Night shift	4.27 (7.03)	8.27 (6.46)	7.18 (5.86)	8.81 (6.68)

Numbers in the parentheses are standard deviations.

had the greatest labor costs (\$10.03); the greatest labor costs were found in skilled nursing units (\$12.52) for frequently incontinent residents. Significant differences in labor costs between occasionally (\$6.48) and frequently (\$12.52) incontinent patients were found in the nursing home units ( $P = 0.0000$ ); however, such differences appeared to be insignificant in the intermediate ( $P = 0.46$ ) and rest home ( $P = 0.91$ ) units.

The labor costs were greatest in the day shifts (approximately 1.5 to 2 times greater than the evening or night shift). Compared with the continent residents, the labor costs were \$6.18 (\$13.47 – \$7.29), \$3.11, and \$4.00 greater per resident during the day, evening, and night shift, respectively. Among the UI residents, the labor costs for those with frequent incontinence were \$3.74 greater than those for occasional incontinence during the day shift. The differences between different levels of incontinence decreased in the evening (–\$0.45) and night (\$1.63) shifts. Additionally, although the labor costs in the skilled nursing units were much greater than that in the intermediate or rest home units during the day shift, the same patterns did not occur during the evening and night shifts. Interestingly, labor costs were actually lowest in the skilled nursing units during the night shifts.

Multivariate analyses were conducted to control for effects of demographic confounders such as age and sex. Overall, the age-sex-adjusted incremental costs were lower than the unadjusted costs, but not by much. The adjusted incremental costs of UI were \$4.47 per patient per shift, which was \$0.05 less than the unadjusted costs. Comparisons by type of UI showed that the age-sex-adjusted incremental costs were \$5.20 and \$3.15 per patient per

shift for those with frequent and occasional incontinence, respectively.

#### COMMENT

Compared with LTC residents without UI, we found that the labor costs for those with UI were \$13.57 greater per patient-day or \$13.42 after adjusting for demographic characteristics. However, we also found that wide variations existed across shifts and facilities. Most of the variation can be attributed to differences in treatment patterns and labor mix.

Only limited numbers of caring activities were actually provided by licensed practicing nurses and registered nurses; most of them occurred during the night shift, when staff shortages were more likely. Therapists provided some of the caring activities during the day shift in skilled or intermediate nursing facilities, and additional instances of daily care in rest homes were provided by the “other” labor category (eg, housekeeper). A review of the 17 caring activities summarized in our checklists suggested that potential cost savings may be achieved by delegating activities that do not have to be performed by trained nursing staff to the “other” personnel.

Labor costs were greatly reduced in the evening and night shifts, for both UI and non-UI residents, but UI residents still consumed more labor resources. The lower labor costs in the evening and night shifts can be attributed to decreased resident activity, differences in care patterns as a result of staffing capacity, behavior or rehabilitation-related caring activities that occur only during the day shifts, and caring activities that are performed by

therapists or "other" health professionals are more likely during the day shift.

Our cost estimates appeared to be greater than those in many other studies. Using 2002 dollars, the labor costs per patient per day estimated in previous studies ranged from \$1.26 (converted from \$0.76 in 1988)<sup>15</sup> to \$20.63.<sup>13</sup> The discrepancies with other studies can be explained by the different labor activities included in the cost estimation. Although our study examined the list of activities that may or may not be exclusive to incontinent care, most other studies started by identifying UI-related caring activities, but did not consider activities common to both UI and non-UI patients that may occur more frequently in the UI patient. The greater estimate can also be attributed to the high proportion (approximately 89%) of incontinent patients in our study who also reported having bowel incontinence; only a small proportion (less than 2%) of the continent patients was found to have bowel incontinence. Future studies need to examine whether a high prevalence of bowel incontinence is common among UI patients in LTC facilities and explore the additional cost impact of bowel incontinence.

We found the classification of incontinence challenging. Given each facility's own coding strategies, it was impossible to classify UI according to whether it is "urge," "stress," "mixed," or "overflow." Methods to better diagnose UI conditions must be developed.

This study was limited by the large amount of missing data, suggesting future studies need better quality control over the participating facilities and commitment by facility staff. Some of the higher costs associated with incontinence may be attributed to patients' mobility status, rather than the incontinence problem exclusively. A generalization of the study findings to the national level is limited by the small number of facilities in our study; similar studies should be replicated in larger, more representative facility samples. Finally, this study was not a cost-effectiveness analysis. Our estimates of incremental costs should not

be directly applied to cost-effectiveness analyses comparing alternative UI treatments. Incremental costs in such a study should be obtained from studies comparing interventions among UI patients, not between continent and incontinent patients.

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