Implications for Utilizing a Female External Catheter (FEC) in End-of-Life Patients – Model of the Potential Impact upon Informal, Unpaid Caregiver (IUC) Burden in the Community Setting

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Background

Approximately 1.72 million Medicare beneficiaries were enrolled in hospice care in the United States in 2020 – a number that has increased steadily each year.[1] That hospice care enrollment has been found to result in savings for payers for many categories of patient.[2,3]

Conversely, discontinuing hospice care can increase healthcare spending – disenrollment in hospice by cancer patients has been found to result in higher Medicare expenditures of $124 per day.[4]

The majority of Medicare days associated with hospice care take place in the home.[1] That home-based care in the community can present a challenge for informal, unpaid caregivers (IUCs) as these patients typically present with numerous co-morbidities including urinary incontinence which may affect 84% of hospice patients.[5]

A major reason for hospice patients return to the hospital setting is IUC burden.[6] Given the prevalence of urinary incontinence in these patients, the effect of incontinence management, as a percentage of total IUC burden, is worthy of study. FECs are utilized extensively in the hospital setting to manage urinary incontinence[7,8,9] and are perceived favorably by both patients and caregivers in the community setting.[10]

Objective

This review seeks to determine the hours that IUCs provide to end-of-life patients in the community. Further, this analysis and model estimates the percentage of that time that could be saved with utilization of a novel FEC that has been found to reduce the time expended by caregivers who care for older female patients with urinary incontinence.

Methods

A systematic literature review (SLR) was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist.[11] The SLR of research published from 2007 through 2022 (PubMed and Embase databases) assessed the workload of IUCs who provided end-of-life care. The results were analyzed against research on the daily caregiver time savings afforded by the use of an FEC in female patients with urinary incontinence.[10]

Results

71 records were identified. After exclusions, 5 records were analyzed (Figure 1).[13-17] The weekly IUC burden in the last 6 to 12 months of life averaged between 22.9[13] and 65.8[17] hours. Based on a recent survey of caregivers (N=115), the middle tertile of respondents estimated that use of an FEC could save between 1 and 3 hours per day when caring for patients with urinary incontinence (Table 1).[10] Assuming an average time saving of 2 hours per day, that middle tertile of IUCs could expect the use of an FEC to reduce their weekly caregiver hours between 21% and 61% when caring for patients with urinary incontinence (Table 2).

Figure 1: PRISMA Diagram

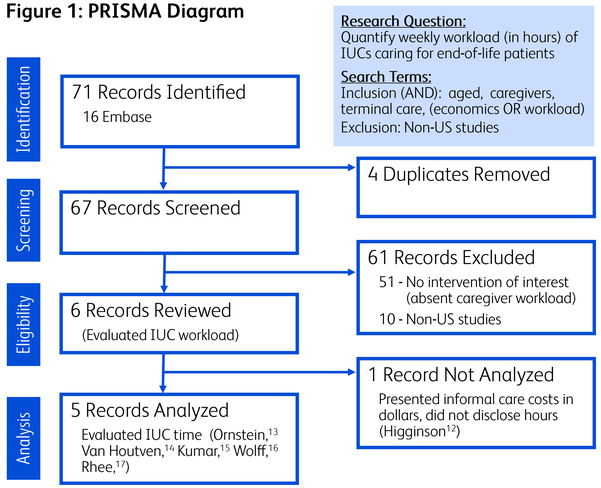

Table 1: Time Saved using an FEC

Time Saved	Number of Caregivers (%)[10]	Tertile Grouping	Projected Savings for Model
<0.5 hours	12 (10%)	1 hour or less (33%)	0.5-hour time savings/day (3.5 hours/week)
0.5-1 hours	27 (23%)		
1-2 hours	22(19%)	1 to 3 hours (32%)	**2-hour time savings/day (14 hours/week)**
2-3 hours	15 (13%)		
≥ 3 hours	39 (34%)	Greater than 3 hours (34%)	3-hour time savings/day (21 hours/week)

KEY FINDINGS

Utilization of a Female External Catheter in End-of-Life Patients

- Estimated time savings for informal caregivers (middle tertile): **14 hours per week**
- Estimated percentage of informal caregiver time saved with utilization of an FEC in appropriate female patients with urinary incontinence: **21% to 61% caregiver time savings**
- Analysis contemplated effects of combining results from dissimilar studies (i.e. healthy incontinent patients and end-of-life patients). Future prospective studies should validate these results.

Table 2: Analyzed Studies and Model

	Ornstein[13]	Van Houtven[14]	Kumar[15]	Wolff[16]	Rhee[17]
Patients:	Community-dwelling older adults who died within 12 months of completing the survey	Lung and colorectal cancer patients within 6 months of death	Community-dwelling individuals who died within 1 year	Primarily community, age 65 and older who died within 12 months	Older persons living in the community 1 year before death
Survey Subjects:	Family and unpaid caregivers	Informal, unpaid caregivers	Unpaid caregivers	Primary informal caregivers	Informal caregivers
Instrument:	NSOC Survey	Share Thoughts on Care Survey	NHATS Survey	NLTCS Informal Caregiver Survey (NICS)	HRS Survey
N:	235	144	1868	182	990
Informal, unpaid caregiver hours per week:	**22.9**	**40.5**	**41.0**	**42.9**	**65.8**
Model – Percentage of Informal, Unpaid Caregiver Time Savings Resulting From Use of an FEC in Appropriate Female Patients with Urinary Incontinence					
Lower Tertile: 3.5 hours saved per wk	15%	9%	9%	8%	5%
Middle Tertile: 14 hours saved per wk	61%	35%	34%	33%	21%
Upper Tertile: 21 hours saved per wk	92%	52%	51%	49%	32%

Limitations

The analyzed studies did not report whether the subject patients suffered from urinary incontinence – a factor that may impact caregiver hours per week. In addition, this analysis considered the time savings reported by caregivers in the community setting who assisted healthy (non-end-of-life) patients utilizing FECs. Those results were applied to the experience of caregivers assisting end-of-life patients. The caregiver time savings afforded by an FEC in end-of-life patients may actually be greater, or it may be less. Further, this review and model contemplated the implications specific to hospice patients, and the 5 analyzed studies, while examining end-of-life patients, did not specify whether the end-of-life patients were enrolled in hospice programs.

Conclusions

This model suggests that utilization of FECs, in appropriate, incontinent, hospice and end-of-life patients, may reduce the burden of caregivers who care for those patients in the community setting. Prospective studies should be considered to validate these findings in the exact populations of interest including investigation of the impact of FEC utilization upon hospice disenrollment.

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