

## UROGYNECOLOGY

## Urinary incontinence in women: Direct costs of routine care

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**OBJECTIVE:** The purpose of this study was to estimate the direct costs of routine care for urinary incontinence (UI) in community-dwelling, racially diverse women.

**STUDY DESIGN:** In the Reproductive Risks for Incontinence Study at Kaiser population-based study, 528 women with UI weekly or more quantified resources that were used for UI. Routine care costs were calculated with the use of national resource costs (\$2005). Potential predictors of these outcomes were examined by multivariable linear regression.

**RESULTS:** Mean age was  $55 \pm 9$  (SD) years. Among women with weekly UI, 69% reported incontinence-related costs. Median weekly cost was \$1.83 (25%-75% interquartile range [IQR], \$0.50, \$5.23),

increasing from \$0.93 (IQR, \$0, \$3) for moderate to \$7.82 (IQR, \$5, \$37) for very severe incontinence. Costs that increased with incontinence severity ( $P < .001$ ) and body mass index ( $P < .001$ ) were 2.2-fold higher for African American versus white women ( $P < .0001$ ) and 42% higher for women with mixed versus stress incontinence ( $P < .05$ ).

**CONCLUSION:** Women pay a mean of  $> \$250$  per year out-of-pocket for UI routine care. Effective incontinence treatment may decrease costs.

**Key words:** cost, female, stress incontinence, urge incontinence, urinary incontinence

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Urinary incontinence is common in women and results in high economic costs, medical and psychological morbidity, and adverse effects on quality of life. Incontinence is associated with a 2-fold increased risk of nursing home admissions, significant limits on daily functioning, and a profound adverse ef-

fect on quality of life.<sup>1,2</sup> The most recent estimate of the annual direct costs of incontinence was  $> \$16$  billion (in 1995 US dollars),<sup>3</sup> which is greater than the annual direct costs for breast, ovarian, cervical, and uterine cancers combined.<sup>4</sup> The estimated cost for incontinence has increased by 170% over a 10-year period (in 1995 US dollars, adjusted for all urban consumers; <http://www.bls.gov/cpi/home.htm>), with previous estimates of \$6.6 billion in 1984<sup>5</sup> and \$10.3 billion in 1987.<sup>6</sup> This 70% increase in costs for incontinence is the  $> 20\%$  increase in costs for all medical care, which were adjusted for inflation, during the same time interval.

More than one-half of the cost of incontinence is attributed to routine care, including absorbent pads, protection, and laundry.<sup>3,7</sup> Routine care costs have been estimated as \$50 to \$700 per person per year, with the wide variance between estimates because of the population studied, severity of incontinence, and method of cost determination. These costs have been well-studied in the nursing home population where resource use can be assessed accurately and include labor, supplies, and laundry. However,

there are limited data on routine care costs for community-dwelling women, with most estimates calculated as a proportion of nursing home costs.<sup>5-7</sup> This method likely overestimates routine care costs in the community because, on average, incontinence is less severe, and a woman's functional ability to reach a toilet is improved in the community-dwelling population. Despite the great economic burden of incontinence, routine care costs that have been estimated among community-dwelling women are described poorly; there are few estimates in racially diverse populations, and there are limited data on predictors of incontinence-related spending.

We conducted this study to provide accurate estimates of the economic costs of routine care for urinary incontinence for community-dwelling women in a racially and ethnically diverse population-based cohort and to identify potential predictors of cost.

## MATERIALS AND METHODS

From October 1999 through February 2003, 2109 community-dwelling women were enrolled in the Reproductive Risks for Incontinence Study at Kaiser

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(RRISK), a population-based, racially diverse cohort of middle-aged and older women. The study was designed to determine the association between childbirth events, hormone use, and urinary incontinence in later life. The study population was constructed by identifying women between 40 and 69 years of age on January 1, 1999, who had been enrolled continuously in the Kaiser Permanente Medical Care Program of Northern California (KPMCP) since age 18 years and had at least one-half of their births within KPMCP. From within this group, women were sampled randomly within age and race strata with a goal of (1) obtaining approximately equal numbers of women in each of six 5-year age groupings and (2) achieving a race/ethnicity composition. Details on the sampling process that was used to construct this cohort have been described previously.<sup>8</sup>

The KPMCP is a large vertically integrated healthcare delivery system with >3 million members that serves approximately 25% of the population in the area. Although previous studies have found KPMCP members to somewhat underrepresent extremes in economic status and to be slightly more educated, members have been shown to be very similar to the population in the geographic area that is served with respect to other demographic characteristics.<sup>9</sup> The study protocol was approved by the institutional review boards of the University of California, San Francisco, and Kaiser Foundation Research Institute.

Urinary incontinence was assessed by the question, "During the past 12 months, on average, how often have you leaked urine, even a small amount?" Frequency was reported as daily, weekly, monthly, less than monthly, or never. Women who reported weekly or greater frequency of urinary incontinence completed a self-report questionnaire on resources that were used for incontinence and were included in this study.

Factors that potentially were associated with incontinence costs were assessed by self-reported questionnaires and in-person interviews on demographic characteristics and medical history. For the assessment of the severity

and type of incontinence, women with at least weekly incontinence were asked to recall the number of incontinence episodes in the past 7 days that occurred "with an activity like coughing, lifting, sneezing, or exercise" (stress incontinence) and the number of episodes accompanied by "a physical sense of urgency" (urge incontinence). Incontinence that was not associated with either an activity or sense of urgency was characterized as "other incontinence." Incontinence episode frequency was classified as weekly (<7 incontinent episodes per week) or daily ( $\geq 7$  incontinent episodes per week). Amount of urine typically lost with each incontinent episode (volume of loss) was reported as a few drops, 1 or 2 tablespoons, approximately one-quarter cup, or one-half cup or more.<sup>10</sup> Incontinence severity was determined with the Sandvik Severity Index, which is a combined measure of frequency and volume of loss.<sup>10</sup>

Diagnosis of type of incontinence was determined by a number of incontinent episodes reported in the past 7 days. Women were classified as having "urge incontinence" if greater than 50% of episodes were identified as urge incontinence and "stress incontinence" if greater than 50% of episodes were identified as stress incontinence. Women with only other or predominately other incontinence ( $n = 75$ ) were excluded from the analyses. Women with more than 1 type of incontinence, with no type contributing >50% of total incontinent episodes, were classified as having "mixed incontinence."

*Pelvic organ prolapse* was defined as self-response of ever having "dropped or prolapsed female pelvic organs." *Incontinence treatment* was defined as "ever having surgery for leakage of urine" or "ever receiving treatment for urine leakage." Current treatment refers to the current use of treatments for incontinence.

Resource use for incontinence routine care was assessed by asking participants to record the average number of each type of supply they used each week. Supplies included panty liners or minipads, maxipads, incontinence pads, and diapers. Laundry was assessed by the question, "On average, how many extra loads

of wash do you do each week because of incontinence?"; dry cleaning was assessed by the question, "On average, how much money do you spend on dry cleaning each week because of incontinence?" If additional resources were used for incontinence (odor control products, reusable briefs, bed pads, skin care products), women estimated the average cost per week. Participants were also asked, "Including all expenses for supplies and laundry, how much money do you think you spend each week, on average, because of your incontinence?" (hereafter, called the "participants' estimate of weekly cost"). They were instructed not to include expenditures on medical visits or medications.

National unit costs were estimated as the average cost per unit for each type of supply that was determined by a survey of 14 stores in 6 states (California [ $n = 8$ ], Florida [ $n = 1$ ], Colorado [ $n = 1$ ], Massachusetts [ $n = 1$ ], New Jersey [ $n = 1$ ], Washington [ $n = 1$ ]), and 1 national internet source in 2005. Costs were similar between California and the other states. Store types included drug chain ( $n = 5$ ), food chain ( $n = 6$ ), discount variety store ( $n = 1$ ), medical supply store ( $n = 1$ ), and internet drug store ( $n = 1$ ). The cost of a load of laundry was estimated by the cost of 1 washer and dryer load at self-service laundries (average cost, \$3.00 [estimated by a survey in 4 US cities]). We used 80% of this cost (\$2.40 per load) to adjust for self-service laundry rent and profit. Because routine care costs are paid out-of-pocket by women in the United States, the analysis is from the patient's perspective.

Total routine care cost included estimated cost per week for pads, diapers, and laundry, which was calculated by multiplying the units of the resources that were used by the average cost per unit and reported costs for dry cleaning and other costs (hereafter called the "calculated cost"). Costs were adjusted to 2005 US dollars (\$2005) with US data for all urban consumers (<http://www.bls.gov/cpi/home.htm>); results are presented in \$2005. Because the distribution of the cost data were skewed, we calculated the median and 25% and 75% interquartile range (IQR) and the mean

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