

Urinary Incontinence: Epidemiology, Demographics, and Costs

Author: David A. Smith, MD, CMD

Professor of Family Medicine, Texas A & M - Bangs Nursing Home, Certified Medical Director Geriatrics Consultants of Central Texas

incontinence

Keywords: Urinary incontinence, prevalence, incidence, institutionalized, community-dwelling, geriatric

Introduction

The Scope of the Problem

Urinary incontinence (UI) is a pervasive, complex, and costly problem that is highly prevalent among the elderly. Although clinical attention is increasingly focused on UI and its treatment, information concerning its prevalence and incidence in the population as a whole, and in the geriatric population in particular, remains uncertain.

Although UI is one of the most frequent causes of nursing home referral, specific diagnosis by type is rare in institutionalized settings. UI is cited three times more frequently than other diseases as the reason for admission to a nursing home.^(1,2)

Collection of epidemiologic data is even more problematic among noninstitutionalized, community-dwelling elderly persons with UI. Many individuals with UI do not report it, and many healthcare providers do not inquire about it. At this time, only 23% of primary care physicians are fully prepared to evaluate UI, and 32% are misinformed about the potential for improvement using noninvasive behavioral and pharmacotherapeutic treatments.⁽³⁾ Fewer than half of incontinent persons spontaneously mention incontinence concerns to their doctors, and only 40% of those who do discuss it with their doctors receive treatment. In addition, data sets used to calculate the incidence and prevalence of UI, such as the discharge data from the 1992 National Hospital Ambulatory Medical Care Survey (NHAMCS) or the 1993 National Hospital Discharge Survey, underestimate the total population treated for UI, because they exclude individuals treated in physicians' offices, freestanding clinics, or non-Federal short-stay hospitals. Discrepancies among studies with regard to the epidemiology of UI have also been attributed to the variety of reported symptoms, differences in methods and outcomes of data collection, and a lack of conformity regarding the definitions used.⁽³⁻⁶⁾

**This is a Continuing Education
Independent Study.
1.0 Contact Hours for RNs**

UI is not a normal consequence of aging, although the prevalence and incidence of UI increase with age.^(1,7) Because the percentage of persons in the United States who are or soon will be 65 years of age is rising, the prevalence and incidence of geriatric UI will likely increase exponentially over the next decade and beyond, as will referrals to nursing homes for care of the elderly with UI. By 2030, it is projected that the number of older Americans will have more than doubled to 70 million (one in every 5 persons in the United States), so it is likely that the prevalence of UI will at least double during the same period.⁽⁸⁾ If, as expected, UI will be more easily identified in the general population by 2030, the rates of incidence and prevalence of UI will greatly exceed current estimates.

Defining Urinary Incontinence

What is UI? Broadly speaking, UI is any involuntary loss of urine caused by physiologic or pathologic changes in the lower urinary tract, or by certain disease processes, or drug therapies. UI has been classified by type: urge incontinence (usually associated with overactive bladder, involuntary bladder contractions, or bladder hypersensitivity without a demonstrable neurologic lesion); stress incontinence caused by anatomic changes or increases in abdominal pressure; mixed incontinence (a combination of stress and urge incontinence); overflow incontinence (usually associated with outlet obstruction, neurological disease, or medication adverse effects); transient incontinence brought about by illness or medications that increase the volume of urine or interfere with normal urinary tract functioning; and functional incontinence, which is associated with physical or cognitive impairment that interferes with independent toileting.⁽⁹⁻¹¹⁾

The term overactive bladder (OAB) has recently been defined by the International Continence Society (ICS) as a

symptom syndrome comprised of urinary urgency, frequency, and nocturia with or without UI.⁽¹²⁾ A patient with OAB loses a large volume of urine with each episode of incontinence and complains of frequent voiding (eg, >8 per 24 hours) and a feeling of urgency concerning the need to void. Nocturia has been defined by the ICS as awakening from sleep at night to void. The symptom syndrome of OAB results from involuntary contractions of the detrusor muscle that may occur spontaneously, or may be provoked by rapid filling, or postural alterations while the patient attempts to suppress contractions. OAB, with a US prevalence of at least 17 million, is the cause or contributor of 40% to 70% of all diagnosed cases of urge or mixed UI and is most commonly seen in women older than 60 years.^(1,12,13) A longitudinal cohort study of more than 2,000 women aged 65 and over in rural Iowa found that the prevalence of urge and stress incontinence was 36% and 40%, respectively, but a study of octogenarian women living either at home or in nursing homes showed the reverse: the corresponding prevalence of urge and stress incontinence was 43% and 26%, respectively. Another study of UI in Swedish women showed that stress incontinence was more common than urge incontinence in women younger than 50, but that urge incontinence predominated in women older than 50.⁽¹⁴⁾ Urge incontinence is cited as the most troubling of all the OAB symptoms for patients, and it follows that successful therapy for OAB from the perspective of patient satisfaction will be driven by the diminution or elimination of this symptom.^(15,16)

Unlike urge incontinence, stress incontinence occurs when a rise in intra-abdominal pressure overcomes urethral resistance. Stress incontinence is triggered by physical exertion, including coughing, sneezing, straining, or exercise. In women, relaxation of the pelvic floor muscles due to vaginal childbirth may cause a defect in the support of the internal sphincter, ultimately leading to stress incontinence. Multiparous women are prone to cystocele and urethrocele, which are also linked to stress incontinence. Obesity and increased body mass index, seen in both men and women, are associated with both stress and urge incontinence.^(1,10,17,18)

Other risk factors play a major role in the incidence of UI. A patient with diabetes has a 30% to 70% increased risk of developing urge or mixed UI. Diabetes-induced hyperglycemia may increase the volume of urine and the incidence of polyuria, both of which affect bladder function. The autonomic neuropathy seen in diabetics may result in bladder nerve damage that can lead to a loss of detrusor function. Chronic urinary tract infections can also lead to bladder dysfunction and decreased sphincter tone, ultimately resulting in urine leakage. Advanced age can also contribute to urge incontinence.^(1,18)

Epidemiology and Demographics of Urinary Incontinence

Prevalence

In epidemiologic parlance, prevalence refers to the total number of cases of a disease, syndrome, or medical condition in a specified population at any given point in time. Estimates of UI prevalence are as much influenced by definitions applied to UI as to the paucity of data and conflicts in methodology and validation of study outcomes. What constitutes frequency, what is the measure of abnormal volume, and how is nocturia to be defined? The answers to these questions define and shape study methodology and outcomes.

To date, outcomes of studies that have attempted to determine the prevalence of UI among noninstitutionalized elderly individuals have varied. Based on 1995 US census reports, and assuming that 5% of elderly men and women reside in institutions, one recent source has estimated the prevalence of UI among community-dwelling incontinent women aged 65 years and older to be 35% (range, 12%–50%) and that of men to be 22% (range, 5%–30%). A second study has found that 30% of noninstitutionalized persons older than 60 have UI. The prevalence of UI in institutionalized persons aged 65 years and over has been variously estimated at over 50% (with one estimate reaching 56%) for the total population and at 47% for women (range, 17%–55%) and 30% for men (range, 11%–34%). In 1995, the US noninstitutionalized population aged 65 years and older totaled approximately 31.76 million; the institutionalized population was 1.89 million. Using the 56% prevalence rate as a basis, it is clear that some 1.06 million elderly patients residing in nursing homes in 1995 had some form of UI; likewise, using 30% of the noninstitutionalized elderly as a basis, in 1995 as many as 9.36 million community-dwelling elderly persons had UI of one type or another.^(2,4,13,14,19-25)

In a survey by Diokno and colleagues of 1,965 community-dwelling seniors aged 60 years and over, the self-reported prevalence of incontinence differed by gender, with 18.8% of men and 37.7% of women reporting this condition, a 2:1 ratio. The difference was highly significant ($P<0.0001$). There were also important differences by type of incontinence: 55.4% of women reported mixed urge and stress symptoms and 26.9% pure stress symptoms, whereas 35.1% of the men reported pure urge symptoms and 29.1% mixed urge and stress symptoms. In the same survey, incontinence during or immediately after pregnancy was found to correlate highly with UI later in life, although of all women who had urge incontinence symptoms, 36.4%

had never been pregnant, while only 5% reported postpartum incontinence and none reported incontinence during pregnancy.⁽¹⁷⁾

A very large European survey of the prevalence of OAB in six European countries (France, Germany, United Kingdom, Italy, Sweden, and Spain, N=16,000) found that the prevalence of all OAB symptoms increased with age and was greater in men than women, beginning at age 60 with frequency, 65 with urgency, and 75 with urge incontinence.⁽¹⁴⁾

Brown et al, in a study of the prevalence of UI among 2,763 community-dwelling postmenopausal women enrolled in the Heart and Estrogen/Progestin Replacement Study (HERS), found that 54% reported experiencing incontinence during the previous week. The mean age of the participants was 66.7 years; 89% were white and 8% black. When stratified by type of incontinence, 14.4% of participants reported urge incontinence, 12.8% stress incontinence, 12.3% mixed incontinence, 10.2% mixed incontinence (primarily stress type), and 5.9% mixed (primarily urge type). Urge incontinence in this study population was associated with advancing age, and diabetes; these variables were also discovered to be predictors of urge-mixed incontinence. The investigators speculated that the etiology of urge incontinence associated with aging is unclear but could include age-related lower urinary tract, vascular, and central nervous system changes affecting bladder control mechanisms. In multivariate analyses of this study population, white women had a threefold greater prevalence of stress incontinence than did black women. White race, higher body mass index, and waist-to-hip ratio were also predictors of stress-mixed incontinence.⁽¹⁸⁾

Incidence

Incidence is defined as the number of new cases of a disease, syndrome, or medical condition in a specified population over a specific period of time. There are few data concerning the incidence of UI in the geriatric population, but it is likely that the incidence of UI, like its prevalence, increases with age. Elving et al have reported an increase in the incidence of urge incontinence from 0.08% to 0.2% in a population cohort between 30 and 59 years of age.⁽²⁵⁾

The monthly incidence rate of UI among stroke patients is 29/1000. Patients hospitalized for stroke are routinely placed in nursing homes if they have UI at the time of discharge. Hospital-acquired incontinence affects 21% of female hip-fracture patients.^(26,27)

Both the incidence and prevalence of UI are highly associated with problems of mobility and with the incidence

of transient ischemic attacks and angina, neurologic and muscle disease, and OAB. In women, there is also a relationship between the use of estrogen and UI, and in both sexes there is a relationship between UI and fecal incontinence and constipation.^(1,7)

The Financial Burden of Urinary Incontinence

The economic costs of UI, as with any disease, have been characterized as "the total value of all resources used or lost by ill individuals, treatment providers, or other segments of society as a result of the illness."⁽⁴⁾ Costs are calculated using aggregate individual-level data pertaining to the average direct and indirect costs of treatment. The number of individuals with UI is obtained by multiplying the population estimates by the prevalence rates. The population data are combined with average cost data to determine the economic impact of the illness on society, known as the societal cost of UI.

Direct costs for urinary incontinence are comprised of diagnostic tests and inpatient and outpatient care (including all goods and services). Indirect costs consist of the value of lost earnings due to UI, and the time family and friends spend on behalf of the patient with UI. Intangible costs, although valid and important, are incalculable, because they have not been established or estimated in the literature. These costs include the monetary value of the pain and suffering that UI places on the patient and all others involved with the patient (primarily caregivers).⁽⁴⁾

The most recent studies of the financial impact of UI rely on 1995 census data and average costs for goods and services associated with the diagnosis and management of UI from the same year.^(2,4) In 1995, the societal costs for UI for individuals in the United States aged 65 years and older totaled \$26.3 billion, or \$3,565 per UI sufferer. Because UI is underreported, the true costs may well be considerably higher. It is instructive to note that the cost of UI per individual in 1984 was estimated to be \$2,052, so that the incremental percent increase to 1995 was 174%.⁽⁴⁾

Direct costs, which included costs from the adverse consequences of UI, accounted for \$25.6 billion (97%), with the single biggest cost being for routine care among older adults living in the community (29.4% of total costs). The adverse consequences of UI considered in the direct costs breakdown included dermatologic problems, falls, and extended hospital stays.

Among community-dwelling patients, some \$60 million was spent on behavioral therapy, \$8.5 million on pharma-

colgic treatments, and \$613.8 million on surgical treatments. The same cost categories among institutionalized patients accounted for approximately \$4 million, \$0.8 million, and \$41.2 million, respectively. In total, the direct cost for treatment in 1995 was \$728.3 million. Costs for routine incontinence care include costs for pads and reusable briefs, as well as laundry costs for clothing and bedding. These costs are incurred by both community-dwelling and institutionalized UI patients. Catheterization was included as a routine cost in institutional settings. Of the total, \$11.4 billion costs for routine continence care, \$7.1 billion was incurred by community-dwelling adults compared with \$4.3 billion for institutionalized patients. Of the \$4.3 billion, \$224 million was for catheterization care.^(2,4)

Indirect costs represented the value of home care services lost as a result of UI. UI forces the patient and/or caregiver to lose wage-earning potential. The cost of caretaking in 1995 totaled \$704 million, or \$96 per person with UI.⁽⁴⁾

The cost of illness method used in this analysis did not incorporate changing finances involved in the delivery of care, such as the use of managed care, because 1993 Medicare claims data were used to obtain the average cost of treatment; however, as the investigators indicated, "sensitivity analysis showed that even a 50% reduction in the cost of surgery, both for individuals living at home and those in institutional settings, yielded less than a 1% reduction in total costs. Thus, drastic efforts to reduce the cost of treatment may be cost beneficial to a single healthcare provider, but the overall savings to society is minimal."⁽⁴⁾

Given the incremental increases between 1984 and 1995, it is highly likely that between 1995 and 2005, and between 2005 and 2015, UI costs will quadruple or quintuple for the reasons cited above: the expected increase in the geriatric population and in that portion of the geriatric population with identified UI, in addition to the increasing direct and indirect costs of UI over these years.

Conclusions

UI is currently the focus of much clinical and basic research, and is increasingly recognized as a serious public health issue in the United States and around the world, but information is incomplete. The etiologies and pathophysiology of UI are multifactorial, and classification and treatment options are shifting as new data emerge. Although the costs and associated depredations on the quality of life caused by UI are being recognized, the true scope of the problem cannot be assessed until more clinicians and other health care professionals become better attuned to recog-

nizing and diagnosing UI. Realistic prevalence assessments and associated cost evaluations will undoubtedly generate new efforts to target, remedy, and perhaps even prevent disease-associated UI.

References

1. Brown JS. Epidemiology and changing demographics of overactive bladder: a focus on postmenopausal woman. *Geriatrics*. 2002;57:6-12.
2. Wilson L, Brown JS, Shin GP, Luc K-O, Subak LL. Annual direct cost of urinary incontinence. *Obstet Gynecol*. 2001;98:398-406.
3. CDC: Knowledge, attitudes and practices of physicians regarding urinary incontinence in persons aged greater than or equal to 65 years—Massachusetts and Oklahoma, 1993. Available at: <http://www.cdc.gov/mmwrhtml/00039261.htm>. Accessed February 2, 2003.
4. Wagner TH, Hu T-W. Economic costs of urinary incontinence in 1995. *Urology*. 1998;51:355-361.
5. Payne C, Stewart W, Herzog R, et al. Variation in prevalence of overactive bladder symptoms in a community sample: Early results from the NOBLE program. Available at: <http://www.continet.org/publications/2000/POSTERS/DETRUSOR%20INSTABILITY>. Accessed February 2, 2003.
6. Davila GW, Neimark M. The overactive bladder: Prevalence and effects on quality of life. *Clin Obstet Gynecol*. 2002;45:173-181.
7. DuBeau CE. The continuum of urinary incontinence in an aging population. *Urol Times*. 2002;30 (Suppl 2):12-17.
8. CDC: Healthy aging for older adults. Available at: <http://www.cdc.gov/washington/overview/aging.htm>. Accessed February 17, 2003.
9. Miller SW. Management and treatment of overactive bladder in the elderly. *J Am Soc Consult Pharm*. 1999;14(Suppl 4):S1-S11.
10. Diokno AC, Atassi O. Urinary incontinence. *Comprehen Ther*. 1996;22:592-597.
11. Payne CK. Epidemiology, pathophysiology, and evaluation of urinary incontinence and overactive bladder. *Urology*. 1998;51(Suppl 2A):3-10.
12. Abrams P, Cardozo L, Fall M, et al. The standardisation of terminology of lower urinary tract function. *Neurourol Urodyn*. 2002;21:167-178.
13. Diokno A, Lee P, Zorn BH. Factors associated with clinical assessment of overactive bladder and selection of treatment. *Clin Ther*. 2001;23:1542-1551.
14. Milsom I, Stewart W, Thüroff J. The prevalence of overactive bladder. *Am J Managed Care*. 2000;6 (Suppl):S565-S573.
15. Jackson S. The patient with an overactive bladder—symptoms and quality-of-life issues. *Urology*. 1997;50(6A Suppl):18-22; discussion 23-24.
16. Kowalczyk JJ. Office evaluation of the patient with overactive urinary bladder. *J Am Osteopath Assoc*. 2000;100(3 Suppl):S1-S4.
17. Diokno AC, Brock BM, Herzog AR, Bromberg J. Medical correlates of urinary incontinence in the elderly. *Urology*. 1990;36:129-138.
18. Brown JS, Grady D, Ouslander JG, et al. Prevalence of urinary incontinence and associated risk factors in postmenopausal women. *Obstet Gynecol*. 1999;94:66-70.
19. Burnett AL. The impact of urinary incontinence. *Managed Care Consult*. 2002;2:6-12.
20. Burgio KL, Locher JL, Goode PS, et al. Behavioral vs drug treatment for urge urinary incontinence in older women. *JAMA*. 1998;280:1995-2000.
21. Klausner AP, Vapnek JM. Urinary incontinence in the geriatric population. *Mt Sinai J Med*. 2003;1:54-61.
22. Reznicek SB. Management of incontinence in the elderly. *J Gend Specif Med*. 2002;5:43-48.
23. Ouslander JG, Schnelle JF. Incontinence in the nursing home. *Ann Intern Med*. 1995;122:438-449.
24. Fultz NH, Herzog AR. Epidemiology of urinary symptoms in the geriatric population. *Urol Clin North Am*. 1996;23:1-10.
25. Elving LB, Foldspang A, Lam GW, Mommssen S. Descriptive epidemiology of urinary incontinence in 3,100 women age 30-59. *Scand J Urol Nephrol*. 1989;125(Suppl):37-43.
26. van Kuijk AA, van der Linde H, van Limbeek J. Urinary incontinence in stroke patients after admission to a postacute inpatient rehabilitation program. *Arch Phys Med Rehabil*. 2001;82:1407-1411.
27. Palmer MH, Baumgarten M, Langenberg P, Carson JL. Risk factors for hospital-acquired incontinence in elderly female hip fracture patients. *J Gerontol A Biol Sci Med Sci*. 2002;57:M672-677.

CE Questions

Urinary Incontinence: Epidemiology, Demographics, and Costs

ce test

- Epidemiologic data collection about urinary incontinence is hampered because:**
 - Physicians do not ask patients about it
 - Patients avoid talking about it
 - Epidemiologic databases exclude some information sources
 - All of the above
- By the year 2030, the number of Americans with urinary incontinence will:**
 - Decrease
 - Double
 - Triple
 - Stay the same
- Which of the following is not associated with urge urinary incontinence:**
 - Diabetes
 - Overactive bladder
 - Involuntary bladder contractions
 - Urethral stenosis
- Which organization recently defined the symptom syndrome of overactive bladder (OAB):**
 - ICS
 - AGS
 - AUGS
 - AUA
- Prevalence is:**
 - A group of people with a particular disease, syndrome or medical condition
 - The total number of cases of a disease, syndrome, or medical condition in a specified population at any given point in time
 - The total number of cases in a specified population
 - The total number of cases at a specified timepoint
- In a survey of community-dwelling seniors age 60 and over (Diokno, et al), the self-reported prevalence of urinary incontinence was:**
 - Higher among men than women
 - Equal for men and women
 - Twice as high among women than men
 - The same until men and women reach age 60
- Incidence is:**
 - The number of people with a disease, syndrome, or medical condition
 - The number of medical conditions that occur weekly in a designated area
 - The number of cases of a disease, syndrome, or medical condition
 - The number of new cases of a disease, syndrome, or medical condition in a specified population over a specific period of time
- Direct costs for urinary incontinence refer to:**
 - Diagnostic tests and outpatient care
 - All diagnostic tests, and inpatient and outpatient care (including all goods and services)
 - Pads, laundry service, and medications
 - Loss of wages derived from employment
- In 1995, the societal cost for UI in persons aged 65 years and older was**
 - \$10.4 billion (\$2280/per individual)
 - \$263 million (\$356/per individual)
 - \$66 billion (\$9,800/per individual)
 - \$26.3 billion (\$3565/per individual)
- Between 2005 and 2015 UI costs will:**
 - Stay the same
 - Double
 - Triple
 - Quadruple or quintuple

This section must be completed to receive your accrediting certificate, which will be mailed to you 30 days after receipt of the test.

This program has been approved for 1.0 contact hours of continuing education by the American Academy of Nurse Practitioners. A fee is required to process the test and certificate. Please send a check in the amount of \$10.00, made payable to DesignWrite along with the Answer Sheet and Evaluation Form to: DesignWrite, 152 Wall Street, Princeton, NJ 08540.

Please Print

Name: _____

Address: _____

City: _____

State: _____

Zip: _____

License Number: _____

Nurse; Nurse Practitioner

Signature _____

Please circle the correct response:

- | | | | | |
|-----|---|---|---|---|
| 1. | a | b | c | d |
| 2. | a | b | c | d |
| 3. | a | b | c | d |
| 4. | a | b | c | d |
| 5. | a | b | c | d |
| 6. | a | b | c | d |
| 7. | a | b | c | d |
| 8. | a | b | c | d |
| 9. | a | b | c | d |
| 10. | a | b | c | d |

Evaluation (Please circle the number of your response)

Strongly Agree

Strongly Disagree

Overall, the instructional materials were clear

5 4 3 2 1

The difficulty level of the materials was appropriate

5 4 3 2 1

The materials were relevant to my work

5 4 3 2 1

The materials addressed important practice issues

5 4 3 2 1

The materials provided new insight relevant to my work

5 4 3 2 1

This article will be useful as a future reference

5 4 3 2 1

Are there other topics you would like to see future articles on: