



Published in final edited form as:

Am J Obstet Gynecol. 2010 May ; 202(5): 483.e1–483.e4. doi:10.1016/j.ajog.2010.01.015.

Costs of ambulatory care related to female pelvic floor disorders in the United States

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Abstract

OBJECTIVE—To evaluate trends in costs of ambulatory care related to female pelvic floor disorders (PFD) in the United States.

STUDY DESIGN—We used the National Ambulatory Medical Care Survey for national estimates of ambulatory visits in the United States. PFD-related visits were based on ICD-9 codes. Visits were assigned an Evaluation and Management (E/M) code and costs were estimated using national average Medicare allowances for physician services. We converted costs to 2006 dollars using the physicians' services component of the Consumer Price Index and compared the average annual costs between 1996–1997 and 2005–2006.

RESULTS—The average annual cost of ambulatory physician services related to PFDs was \$190 million in 1996–1997 and \$298 million in 2005–2006 ($P=.05$). Adjusting for deductibles and co-payments, these estimates increase to \$262 million in 1996–1997 and \$412 million in 2005–2006.

CONCLUSIONS—The cost of ambulatory care related to female PFDs is significant and is increasing.

Keywords

ambulatory care; costs; incontinence; pelvic floor disorders; prolapse

Introduction

Female pelvic floor disorders (PFDs) are common conditions and include urinary incontinence (UI), pelvic organ prolapse (POP), and fecal incontinence. It is estimated that 23.7% of U.S. community-dwelling women will have at least one of these disorders and that the prevalence increases with age.¹ The financial burden of these disorders includes both direct (routine care, medical visits, medical treatments) and indirect (loss of productivity) costs. One aspect of

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Presented at the Thirtieth Annual Scientific Meeting of the American Urogynecologic Society September 24–26, 2009, Hollywood, Florida

health care expenditures that has not been well explored includes the costs associated with ambulatory care for PFDs.

The primary objective of our study was to estimate the annual costs associated with ambulatory care visits made to physician offices for PFDs. The secondary objective was to describe changes in the economic burden of ambulatory care for PFDs between 1996–1997 and 2005–2006.

Material and Methods

Data Sources

We used data from the National Ambulatory Medical Care Survey (NAMCS). This survey is conducted by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention and includes information regarding ambulatory care, the predominant method of providing health care services in the United States. A complete description of this federally sponsored annual survey can be found at the website <http://www.cdc.gov/nchs>. This study used national de-identified data and was determined to be exempt by the Institutional Review Board of Women and Infants Hospital of Rhode Island.

The NAMCS is an annual sample of outpatient visits to office-based physicians including private practices, freestanding clinics, public health clinics, family planning clinics, and faculty practices. Approximately 1500 physicians are sampled each year. The basic sampling unit is the patient visit. Data from the NAMCS can be extrapolated to the over 1 billion ambulatory visits to physician offices that occur in the United States annually.

Each patient visit in the NAMCS includes up to three diagnoses coded using The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9), the type of visit (referral, new, or established patient), the type of physician seen (primary care versus specialist) and length of visit. PFD-related visits included ICD-9 codes for UI (ICD-9 codes 599.81, 599.82, 625.6, 788.3, 788.31, 788.33, 788.37, 788.38, 788.39), POP (ICD-9 codes 618.0–618.9), fecal incontinence (ICD-9 code 787.6), fistula (ICD-9 code 619), and chronic interstitial cystitis and urethral syndrome (ICD-9 codes 595.1, 597.80–597.81). Based on the type of visit and length of time coded for each visit, an Evaluation and Management (E/M) Current Procedural Code (CPT) was assigned. Patient gender is a separate variable in the NAMCS and we restricted our study population to only women.

We used the average national Medicare allowances for physician services based on E/M codes to estimate costs and 95% confidence intervals.^{2–5} We converted costs to 2006 dollars using the physicians' services component of the Consumer Price Index (CPI).⁶ Because Medicare does not provide full coverage for services, beneficiaries pay deductibles and coinsurance expenses under Part B. To capture these costs, we inflated the estimated costs by 38%, based on recommendations of the Centers for Medicare and Medicaid Services (CMS) Office of the Actuary.^{7–9} To examine trends, we compared average annual costs in 1996–1997 to 2005–2006.

National estimates of costs and standard errors were obtained using STATA survey sampling commands and survey weights provided in the NAMCS and Taylor series linearized variance estimation. Total costs are presented in millions of dollars. Estimates based on fewer than 30 records or with relative standard errors greater than 30% were considered unreliable and were not reported, per NCHS standards. All analyses were performed using SAS 9.0 (SAS Institute, Cary, NC) and STATA SE 9.0 (StataCorp., College Station, TX). $P < 0.05$ was considered statistically significant.

Results

Between 2005–2006, there was an average annual number of 4.01 million ambulatory visits related to PFDs. The breakdown of E/M codes for these visits is given in Table 1. The majority of visits were level 3 or 4 established patient visits with generalists (E/M codes 99213 and 99214).

The average annual cost in 2005–2006 associated with ambulatory PFD visits was \$298 million (95% CI \$203–394). Adjusting for deductibles and copayments based on CMS Office of the Actuary recommendations, this direct cost of ambulatory care increases to total \$412 million (95% CI \$280–543), including \$68.7 million for visits with UI as the primary diagnosis and \$96.9 million for visits with POP as the primary diagnosis. Due to small numbers, we are unable to report estimated ambulatory costs associated with fecal incontinence or painful bladder syndrome separately.

Older age groups had higher costs for ambulatory care compared to younger age groups. In 2005–2006, women over 75 years of age had an average annual cost of \$124.5 million (95% CI 70.0–179.4) compared to women 21–44 years with a cost of \$42.1 million (95% CI 21.4–62.5). Costs were also higher for white, non-Hispanic women compared to other races. Additional variables associated with cost are presented in Table 2.

Evaluating trends, the average annual cost associated with ambulatory PFD visits increased from \$262 million (95% CI \$204–321) in 1996–1997 to \$412 million (95% CI \$280–543) in 2005–2006 ($P=.05$). The average cost per visit increased from \$65 in 1996–1997 to \$74 in 2005–2006 ($P=.06$). There were no differences between these two time periods in costs based on race/ethnicity, primary diagnosis, geographic region, or provider type ($P>.05$ for all). However, the cost for women 65 years of age and older increased from \$131.0 million in 1996–1997 to \$210.7 million in 2005–2006 ($P<.05$).

Comment

The economic costs associated with female PFDs are substantial. In our study, we estimate that the direct annual costs associated with ambulatory care for PFDs totals \$412 million.

Although there is a growing body of literature on the economic burden associated with PFDs, most studies have focused only on urinary incontinence. Thom et al estimated that inpatient costs for incontinence were \$110.9 million in 1999, and medical expenditures for UI for both male and female Medicare beneficiaries over age 65 totaled \$234 million in 1998.¹⁰ Wilson et al estimated the annual direct cost of UI to be \$12.4 billion in 1995 for women, including routine care (70%), nursing home admissions (14%), treatments (9%), complications (6%), and diagnosis and evaluation (1%).¹¹ The estimated cost of diagnosis and evaluation in their study was \$137 million, based on an assumed consultation including a history and physical examination, post-void residual measurement, and urinalysis. Anger et al estimated the cost of outpatient care for UI in female Medicare beneficiaries 65 years and older to be \$75.9 million in 1998.¹² These studies focused only on UI and did not include other PFDs.

Data regarding the economic impact of POP and fecal incontinence is extremely limited. Subak et al estimated the costs of surgery for POP to be \$1012 million based on average Medicare reimbursement.¹³ Inpatient costs associated with surgical treatment of female fecal incontinence were estimated to be \$24.5 million in 2003.¹⁴ These studies only provide estimates of inpatient surgical costs and there is very limited data regarding ambulatory costs for either POP or fecal incontinence.

This study adds to the growing body of literature on the economic impact of female PFDs. We found that ambulatory costs have significantly increased in recent years. This increase may be a result of an increase in the prevalence of PFDs due to the changing population demographics, a general shift of care to the outpatient setting,¹² and possibly increased awareness of these disorders. We also found that the majority of visits for PFDs were established patient visits. This likely reflects the chronicity of these conditions, since the majority of women will not undergo surgical treatment and will require prolonged care for these disorders. Finally, increasing age was associated with increased costs and between the 1996–1997 and 2005–2006 time periods, the cost increased substantially in women 65 years and older. It is likely that ambulatory costs for PFDs will continue to rise with the aging population and growing prevalence of these chronic conditions.

We used Medicare reimbursement to estimate medical care costs, which is an accepted estimate of resource consumption.^{7, 11, 13} In our study, women 65 years and older represented 50% of the average annual visits. Women under 65 years likely do not have Medicare and most likely would have a higher reimbursement depending on their insurance coverage. Therefore, our estimates are likely conservative, and may underestimate the true cost of ambulatory care for PFDs. However, private payer insurance reimbursements are not publicly available, and using Medicare reimbursement has advantages, including practicality and geographical generalizability. Although we are not able to obtain private payer reimbursements information, if we use national average non-Medicare physician charge fee ranges,⁵ we estimate that \$135–172 million was charged for visits with private payer insurance in 2006. This does not account for deductibles and co-payments. Future research should focus on obtaining more accurate estimates of private payer costs for PFD ambulatory care.

There are other limitations to our study. The NAMCS does not include hospital based practices. As with any database study, the NAMCS is limited by the reliance on ICD-9 codes to identify disease conditions. In addition, using E/M codes can also underestimate costs, since modifiers and office procedures are not necessarily included. Our estimates also do not include indirect costs associated with ambulatory care of PFDs and we were unable to provide cost estimates specifically for fecal incontinence or painful bladder syndrome due to small numbers of these disorders. Despite these limitations, this study provides important information about the economic burden as well as potential implications of PFD treatments. The 2nd International Consultation on Incontinence identified priority areas for research for incontinence in 2001, and recommended increased research on direct and indirect costs, as well as cost implications of incontinence progression and remission for enhancing future cost-effectiveness analyses.¹⁵ Our study provides additional cost estimates for female PFDs that are currently lacking. As a reference, in 2005 there were 5 million office visits for non-valvular atrial fibrillation in the U.S. This was associated with a total of \$1.1 billion for all physician office care in 2005 (including visit costs, tests, procedures, and medication costs).¹⁶

In conclusion, the direct costs associated with ambulatory care for PFDs are substantial and have almost doubled between the 1996–1997 and 2005–2006 time periods. Given the large number of women affected by PFDs, the increasing prevalence, and the chronicity of these disorders, it is anticipated that these expenditures will continue to increase in the future.

Acknowledgments

Funding support: Dr. Sung is supported by grant K23HD060665-01; National Institute of Child Health and Human Development.

References

1. Nygaard I, Barber MD, Burgio KL, et al. Prevalence of symptomatic pelvic floor disorders in US women. *Jama* 2008;300:1311–1316. [PubMed: 18799443]
2. 1996 Physicians fee and coding guide. Healthcare Consultants of America. Augusta, GA: HealthCare Consultants of America; 1996.
3. 1997 Physicians fee and coding guide. Healthcare Consultants of America. Augusta, GA: HealthCare Consultants of America; 1997.
4. 2005 Physicians fee and coding guide. Healthcare Consultants of America. Augusta, GA: HealthCare Consultants of America; 2005.
5. 2006 Physicians fee and coding guide. Healthcare Consultants of America. Augusta, GA: HealthCare Consultants of America; 2006.
6. Bureau of Labor Statistics. Consumer Price Index. [Accessed June 2009]. www.bls.gov/cpi/
7. Saigal, CS.; Geshwind, SA.; Litwin, MS. US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Washington, DC: US Government Printing Office; 2007. Urologic Diseases in America. Chapter 21: Methods. <http://kidney.niddk.nih.gov/statistics/uda/Methods-Chapter21.pdf>
8. Litwin MS, Saigal CS, Yano EM, et al. Urologic diseases in America Project: analytical methods and principal findings. *J Urol* 2005;173:933–937. [PubMed: 15711342]
9. Brown ML, Riley GF, Schussler N, Etzioni R. Estimating health care costs related to cancer treatment from SEER-Medicare data. *Med Care* 2002;40:IV-104–IV-117.
10. Thom DH, Nygaard IE, Calhoun EA. Urologic diseases in America project: urinary incontinence in women-national trends in hospitalizations, office visits, treatment and economic impact. *J Urol* 2005;173:1295–1301. [PubMed: 15758785]
11. Wilson L, Brown JS, Shin GP, Luc KO, Subak LL. Annual direct cost of urinary incontinence. *Obstet Gynecol* 2001;98:398–406. [PubMed: 11530119]
12. Anger JT, Saigal CS, Madison R, Joyce G, Litwin MS. Increasing costs of urinary incontinence among female Medicare beneficiaries. *J Urol* 2006;176:247–251. discussion 251. [PubMed: 16753411]
13. Subak LL, Waetjen LE, Van Den Eeden S, Thom DH, Vittinghoff E, Brown JS. Cost of pelvic organ prolapse surgery in the United States. *Obstet Gynecol* 2001;98:646–651. [PubMed: 11576582]
14. Sung VW, Rogers ML, Myers DL, Akbari HM, Clark MA. National trends and costs of surgical treatment for female fecal incontinence. *Am J Obstet Gynecol* 2007;197:652 e1–652 e5. [PubMed: 18060967]
15. Abrams, PCL.; Khoury, S.; Wein, A. Incontinence. 2nd International Consultation on Incontinence; July 1–3, 2001; Paris. London: Plymbridge Distribution Ltd.; 2002.
16. Coyne KS, Paramore C, Grandy S, et al. Assessing the direct costs of treating nonvalvular atrial fibrillation in the United States. *Value in Health* 2006;9:348–356. [PubMed: 16961553]

Table 1

Average annual number of ambulatory visits, by visit code*

Evaluation/Management Code	Annual number of visits (N,%)
New patient	
Total	412,229 (10)
99201	40,772 (1)
99202	155,805 (4)
99203	95,972 (2)
99204	66,930 (2)
99205	52,752 (1)
Established patient	
Total	3,056,807 (76)
99211	84,030 (2)
99212	370,368 (9)
99213	1,175,280 (29)
99214	872,868 (22)
99215	554,261 (14)
Consultation	
Total	541,743 (14)
99241	202,182 (5)
99242	282,992 (7)
99243	26,113 (0.7)
99244	24,473 (0.6)
99245	5,984 (0.1)

* Annual average number of visits using data from 2005–2006

Table 2

Variables associated with higher ambulatory costs for female pelvic floor disorders

Characteristic	Average cost per visit, in dollars (95% CI)	p-value [†]	Total costs in millions of dollars (95% CI) [*]	p-value [†]
Age (years)				
<44	\$68 (54–82)	0.09	42.1 (21.4–62.5)	0.03
45–54	\$88 (76–101)		75.8 (39.2–112.2)	
55–64	\$71 (63–79)		83.4 (52.0–114.7)	
65–74	\$70 (58–83)		86.2 (41.5–130.7)	
75+	\$75 (63–87)		124.5 (70.0–179.4)	
Race/ethnicity				
White, non-Hispanic	\$75 (69–81)	0.8	311.9 (226.3–397.4)	<0.0001
Other	\$73 (\$54–92)		99.6 (30.1–169.7)	
Geographic region				
Northeast	\$68 (61–76)	0.05	50.6 (21.0–81.0)	0.02
Midwest	\$74 (63–86)		110.5 (50.2–171.1)	
South	\$79 (66–92)		171.1 (64.5–277.4)	
West	\$69 (58–80)		79.5 (40.7–118.4)	
Provider				
Ob-Gyn	\$76 (66–85)	0.3	139.4 (89.2–189.1)	0.02
Urologist	\$67 (59–75)		82.4 (53.5–111.4)	
Other	\$77 (65–89)		190.4 (78.9–302.2)	

[†]Wald test^{*} Average annual cost in dollars using data from 2005–2006, adjusted for deductibles and co-payments