
Prostatitis

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Purpose: We quantified the burden of prostatitis in the United States by identifying trends in the use of health care resources and estimating the economic impact of the disease.

Materials and Methods: The analytical methods used to generate these results were described previously.

Results: The rate of national inpatient hospitalizations for a diagnosis of prostatitis decreased by 21% between 1994 and 2000. Hospitalization rates were 2 to 2.5 times higher for Medicare beneficiaries with a 42% decrease between 1992 and 2001. Combined physician outpatient and hospital outpatient visits revealed an age adjusted, annualized visit rate for prostatitis of 1,798/100,000 population. More than 6% of visits with a primary diagnosis of prostatitis had a concomitant diagnosis of benign prostatic hyperplasia. The most common medications associated with any visits for prostatitis were quinolones (annualized rate 319/100,000 population) and the rate remained about the same even after visits for infectious prostatitis were removed from the data. The cost of prostatitis was about \$84 million annually, exclusive of pharmaceutical spending. Of 897 privately insured men with a medical claim for prostatitis in 2002, 14% missed some work because of the condition.

Conclusions: Overall spending in the United States for the diagnosis and management of prostatitis, exclusive of pharmaceutical spending, totaled \$84 million in 2000 and it appears to be increasing with time. Given the extensive gaps in our understanding of the diagnosis of and treatment for prostatitis, many of these expenditures may represent a waste of resources.

Key Words: prostate, prostatitis, health care costs, prevalence, cost and cost analysis

Prostatitis refers to several clinical syndromes, including well-defined acute and chronic bacterial infections, poorly defined chronic pelvic pain syndrome and asymptomatic inflammation in the prostate gland found in pathology specimens. Unlike BPH and prostate cancer, which are predominantly diseases of older men, prostatitis affects men of all ages. Although literature reviews provide compelling evidence that histological prostatitis is common,^{1,2} the prevalence of clinically evident or symptomatic prostatitis is of greater importance to the patient and physician. Because of the varying definitions used, the literature contains a number of different prevalence estimates: The prevalence of medically diagnosed prostatitis is estimated to be 9%,³ the overall lifetime prevalence of prostatitis is estimated to be 14%,⁴ the prevalence of a self-reported history of prostatitis is estimated to be 4% to 16%⁵⁻⁷ and the prevalence of chronic prostatitis-like symptoms is estimated to be 10% to 12%.^{8,9} The incidence of physician diagnosed chronic prostatitis/chronic pelvic pain syndrome is estimated to be 3.3/1,000 person-years.¹⁰

The symptoms associated with prostatitis, pelvic pain and voiding symptoms are common, bothersome and bur-

densome in terms of the health related quality of life implications^{11,12} and economic impact.¹³ We explored the burden of prostatitis in the United States by quantifying and identifying trends in the use of health care resources and estimating the economic impact of the condition. Although in recent years researchers made an effort to classify patients as having a specific type of prostatitis,¹⁴ for the purposes of this study we used prostatitis as an umbrella term including acute and chronic conditions because clinical practice and International Classification of Diseases, 9th revision codes are generally limited by more traditional definitions.¹⁵

MATERIALS AND METHODS

The analytical methods used to generate these results were described previously.¹⁶ They are available at www.uda.niddk.nih.gov.

RESULTS

Trends in Health Care Resource Use

Inpatient care. According to HCUP the age adjusted rate of national inpatient hospitalizations for prostatitis in 2000 was 7.7/100,000 population and the total number of admissions was 7,390, representing a 21% decrease since 1994, when the age adjusted hospitalization rate was 9.8/100,000 and the total number of admissions was 8,666. Medicare data on 1992, 1995, 1998 and 2001 indicated that age adjusted inpatient hospitalization rates for prostatitis were 2 to 2.5 times higher in the Medicare patient population than

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in the broader population studied in HCUP. Total age adjusted admission rates for men 65 years or older decreased substantially with time from 26/100,000 in 1992 to 15/100,000 in 2001, representing a 42% decrease, compared with a 21% decrease from 1994 to 2000 in the HCUP population. According to CHCPE data on 1994, 1996, 1998, 2000 and 2002 the unadjusted rates for inpatient hospitalization for men with prostatitis who had commercial health insurance decreased with time from 8.6/100,000 in 1994 to 3.5/100,000 in 2002, representing a 59% decrease.

Outpatient care. The rates of hospital outpatient visits by patients with prostatitis listed as any diagnosis for the visit, based on NHAMCS data for 1994, 1996, 1998 and 2000, revealed that the age adjusted rate for 1994 to 2000 was 195/100,000 population for an annualized rate of 49. The estimated rate for men 55 years or older was approximately 2.5 times higher than that for men 18 to 54 years old (375/100,000 vs 135/100,000). Information on hospital outpatient visits was also available from Medicare data on 1992, 1995, 1998 and 2001 (table 1). The age adjusted visit rate for Medicare patients 65 years or older increased dramatically between 1992 and 1995 from 88/100,000 to 129/100,000. The rate decreased slightly to 125/100,000 population in 1998 and to 117/100,000 in 2001 but it still remained 25% higher than the rate in 1992.

Rates of physician office visit by patients with prostatitis listed as any diagnosis were determined from NAMCS data on the even years between 1992 and 2000. The age adjusted visit rate in 2000 was 1,867/100,000 population with a total of 1,795,643 physician office visits, representing a 25% decrease since 1992, when the age adjusted rate was 2,477/100,000 and the total number of visits was 2,176,818. The aggregate age adjusted rate for 1992 to 2000 was 8,746/100,000 population for an annualized rate of 1,749/100,000 (table 2). In general visit rates increased with age from a low of 535/100,000 by men 18 to 34 years old to a high of 3,756/100,000 by men 65 to 74 years old. The rate tapered to 3,041/100,000 for men 75 years or older, although it remained more than 5 times higher than the rate for men 18 to 34 years old.

Some older men with lower urinary tract symptoms may be incorrectly diagnosed with BPH simply because of symptoms and older age or they may have prostatitis as well as BPH. We examined the overlap of prostatitis and BPH diagnoses for 1992 to 2000 using the NAMCS database to assess the frequency of a BPH diagnosis when prostatitis was listed as the primary diagnosis for the visit. More than 6% of visits with a primary diagnosis of prostatitis had a concomitant diagnosis of BPH. However, when prostatitis was listed as any diagnosis, the overlap was 10% of visits with the 2 conditions (table 3).

Medicare data on 1992, 1995, 1998 and 2001 showed that age adjusted physician office visit rates for prostatitis for men 65 years or older decreased steadily between 1992 and 2001 from 2,981/100,000 population (a total of 350,680 visits) to 1,828/100,000 (a total of 212,080 visits), representing an almost 40% decrease (table 4).

VA data on physician office visits for adult outpatients showed that the rates of visits by VA patients with a primary diagnosis of prostatitis steadily decreased between 1998 and 2003 (table 5). The age adjusted visit rate was

604/100,000 population in 1998, decreasing to 397/100,000 in 2003, representing a 34% decrease.

According to the NAMCS database in 1992 to 2000 the most common medications associated with any visits for prostatitis were quinolones (an annualized rate of 319/100,000), followed by sulfa medications (an annualized rate of 287/100,000) and then BPH medications (an annualized rate of 91/100,000) (table 6). When visits for infectious prostatitis were removed from the data, the rates of prescribing quinolones and sulfa medications remained essentially the same (table 6). According to data from the Pharmacy Benefits Management of the Department of Veterans Affairs rates of cephalosporin, penicillin and sulfonamide use for men with prostatitis steadily decreased with time from 1999 to 2003, although the rate of fluoroquinolone use increased with time. Tetracycline use was variable but generally stable across the years. In the VA database the rate of α -blocker use for men with a primary diagnosis of prostatitis increased slightly with time from 39,491/100,000 population in 1999 to 41,675/100,000 in 2003. Use of α -blockers generally peaked in older age groups, ie men 65 years or older.

For physician office plus hospital outpatient visits combined NAMCS and NHAMCS data produced an age adjusted, annualized visit rate for prostatitis listed as any diagnosis of 1,798/100,000.

For ambulatory surgery procedures according to the National Survey of Ambulatory Surgery database visit rates were essentially stable between 1994 and 1996 with an annualized rate of 33/100,000 population for prostatitis listed as any diagnosis. Three procedures were associated with ambulatory surgery visits for prostatitis, including cystoscopy, prostatic biopsy and urethral dilation. Visits to ambulatory surgery centers by individuals with commercial insurance who had a primary diagnosis of prostatitis were tabulated for 1994, 1996, 1998, 2000 and 2002 from the CHCPE database. The rate of visits decreased steadily between 1994 and 2002 from 11/100,000 to 6.5/100,000 population, representing a decrease of 41%. Procedures associated with a primary diagnosis of prostatitis in individuals with commercial health insurance also included ablative surgery, hydrodistention and urodynamic studies, in addition to those listed. The Medicare database showed that the rate of age adjusted ambulatory surgery visits by Medicare patients 65 years or older with a primary diagnosis of prostatitis also decreased with time from 33/100,000 to 31/100,000 population. Of note, the rate of visits by patients in the Medicare database was about 5 times the rate in the CHCPE database.

Emergency room care. Between 1994 and 2002 emergency room visits by individuals with commercial insurance who had a primary diagnosis of prostatitis remained relatively stable. According to the CHCPE database the rate of emergency room visits in 2002 was 12/100,000 population. While emergency room visits were almost 3 times more common in the Medicare population than in the CHCPE population, Medicare rates decreased with time. In 2001 the age adjusted emergency room visit rate for men 65 years or older was 34/100,000 population, representing a 29% decrease from 1992, when the rate was 48/100,000. The highest rates in each year tended to be in the older age groups, peaking each year in the group 85 years or older. According to NHAMCS data on 1994 to 2000 the annualized age ad-

TABLE 1. Hospital outpatient visits by male Medicare beneficiaries with prostatitis as primary diagnosis

	1992			1995			1998			2001		
	Count	Rate (95% CI)	Age Adjusted Rate	Count	Rate (95% CI)	Age Adjusted Rate	Count	Rate (95% CI)	Age Adjusted Rate	Count	Rate (95% CI)	Age Adjusted Rate
Totals all ages	12,140	82 (75–88)		18,400	121 (113–129)		17,500	121 (113–129)		17,100	111 (103–118)	
Total younger than 65	1,860	60 (47–72)		3,320	96 (82–111)		3,780	110 (94–126)		3,660	96 (82–110)	
Total 65 or older	10,280	87 (80–95)	88	15,080	128 (119–137)	129	13,720	124 (115–134)	125	13,440	116 (107–124)	117
Age:												
65–69	3,240	80 (67–92)		4,880	127 (111–143)		4,180	124 (107–141)		3,660	103 (88–118)	
70–74	3,440	106 (90–122)		4,160	125 (108–142)		3,880	127 (109–145)		3,920	127 (110–145)	
75–79	1,920	85 (68–102)		2,880	127 (106–148)		2,520	110 (91–130)		2,820	115 (96–134)	
80–84	1,160	89 (66–111)		2,040	147 (118–175)		2,040	148 (119–177)		1,880	126 (100–151)	
85–89	220	37 (15–59)		920	144 (103–186)		840	129 (90–168)		900	124 (88–161)	
90–94	300	148 (73–223)		140	66 (17–115)		240	112 (48–175)		220	95 (39–151)	
95–97	0	0.0		60	159 (0.0–340)		20	51 (0.0–149)		20	52 (0.0–154)	
98 or Older	0	0.0		0	0.0		0	0.0		20	37 (0.0–109)	
Race/ethnicity:												
White	8,880	71 (64–77)	70	13,880	107 (99–115)	106	13,780	113 (104–121)	112	13,840	106 (98–114)	106
Black	2,260	177 (145–210)	177	2,840	205 (171–239)	196	2,280	171 (140–202)	174	2,020	138 (111–164)	138
Asian	Not available	Not available	Not available	40	55 (0.0–130)	55	180	131 (45–217)	102	0	0.0	0.0
Hispanic	Not available	Not available	Not available	800	403 (279–527)	463	460	137 (81–193)	149	600	160 (102–217)	154
North American native	Not available	Not available	Not available	20	99 (0.0–293)	99	160	572 (175–969)	572	80	240 (6.0–474)	240
Region:												
Midwest	3,080	83 (70–96)	83	3,760	98 (84–111)	95	4,060	110 (95–125)	107	4,700	124 (108–140)	123
Northeast	2,620	83 (68–97)	80	3,240	102 (86–118)	104	2,080	75 (60–89)	74	1,800	62 (49–74)	60
South	4,120	79 (68–89)	79	8,640	157 (143–172)	156	8,940	167 (151–182)	170	7,480	129 (116–142)	132
West	2,200	91 (74–108)	92	2,540	110 (90–129)	111	2,140	98 (78–114)	93	2,840	115 (96–134)	109

Unweighted counts multiplied by 20 to arrive at values, rate per 100,000 male Medicare beneficiaries in the same demographic stratum, age adjusted rate adjusted to the 2000 US Census and individuals of other races, unknown race and ethnicity, and other region included in the total (counts less than 600 should be interpreted with caution) (source: Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995, 1998 and 2001).

TABLE 2. Physician office visits for prostatitis as any diagnosis in 1992 to 2000

	Count	Rate (95% CI)	AV Annualized Age Adjusted Rate	Age Adjusted Rate
Totals	8,021,396	8,746 (7,599–9,893)	1,749	8,721
Age:				
18–34	856,903	2,673 (1,733–3,614)	535	
35–44	1,593,750	7,671 (5,110–10,233)	1,534	
45–54	1,479,699	9,606 (6,914–12,297)	1,921	
55–64	1,792,593	17,464 (12,509–22,419)	3,493	
65–74	1,517,649	18,781 (13,499–24,062)	3,756	
75 or Older	780,802	15,204 (8,468–21,940)	3,041	
Race/ethnicity:				
White	6,758,464	9,727 (8,317–11,138)	1,945	9,306
Black	653,969	6,776 (4,017–9,535)	1,355	7,736
Hispanic	534,130	5,959 (2,935–8,983)	1,192	8,542
Region:				
Midwest	1,809,245	8,399 (5,915–10,883)	1,680	8,284
Northeast	1,363,681	7,553 (5,345–9,761)	1,511	7,400
South	2,978,887	9,384 (7,448–11,320)	1,877	9,217
West	1,869,583	9,175 (6,560–11,791)	1,835	9,617
MSA:				
MSA	6,286,413	8,974 (7,673–10,275)	1,795	8,985
NonMSA	1,734,983	8,010 (5,584–10,435)	1,602	7,831

Rate per 100,000 based on 1992, 1994, 1996, 1998 and 2000 population estimates from CPS, CPS Utilities, Unicon Research Corp. for relevant demographic categories of adult male civilian noninstitutionalized population in the US, age adjusted rate adjusted to the US Census derived age distribution of the mid point of years, and individuals of other races, missing or unavailable race and ethnicity, and with missing MSA included in the total (counts may not sum to total due to rounding) (source: NAMCS, 1992, 1994, 1996, 1998 and 2000).

justed emergency room visit rate was 91/100,000 population, which was higher than the rates noted in the CHCPE and Medicare databases.

Economic Impact

The economic impact of prostatitis includes the direct medical costs of treating the condition and the indirect costs associated with lost work time. Overall spending in the United States for the diagnosis and management of prostatitis totaled \$84 million in 2000 (table 7). This estimate is exclusive of pharmaceuticals, which can have a significant role in initial management. Increases in expenditures for hospital outpatient services and physician office visits were 31% and 62%, respectively, from 1994 to 2000, while spending on ambulatory surgery and inpatient expenditures peaked in 1998. Inpatient services accounted for the greatest proportion of expenditures in 2000 but ambulatory surgery and emergency room visits combined accounted for almost half of the total expenditures.

Expenditures for Medicare enrollees 65 years or older were \$27 million in 2001 and they remained level since 1992, indicating a decrease in real spending with time (table 8). The lack of a secular trend in expenditures was a function of slight decreases in inpatient expenditures and slight in-

creases in physician office visit expenditures. Physician office visits accounted for more than half of the expenditures in 2001 in this population. Expenditures for Medicare enrollees younger than 65 years were substantially less, totaling only \$3 million in 2001. Physician office visits accounted for more than three-fourths of the expenditures in this group in 2001.

The incremental costs associated with prostatitis were estimated using risk adjusted regression models controlling for age, work status, income, urban or rural residence and health plan characteristics (table 9). For 18 to 64-year-old males with employer provided insurance average annual expenditures were \$5,464 for those treated for prostatitis compared with \$3,705 for similar men not treated for the condition. Thus, an incremental cost of \$1,759 was associated with a diagnosis of prostatitis. Pharmaceuticals made up an important part of treatment costs (26%), which is consistent with the clinical management of the condition. Surgical removal of affected portions of the prostate is rare and typically reserved for the most severe cases of prostatitis. Excess costs were found to vary substantially by age. Treatment costs for 35 to 44-year-old men with prostatitis were \$4,690 more than those for similar men of the same age without prostatitis. A diagnosis of prostatitis was associated with modest increases in medical expenditures overall, although excess costs were relatively higher among younger men, ie those 35 to 44 years old.

In addition to the direct medical costs of treatment, the economic burden of prostatitis included indirect costs associated with absenteeism and work limitations. Of 897 privately insured men with a medical claim for prostatitis in 2002, 14% missed some work related to the condition. The average annual amount of work missed by a patient with 1 or more claims for prostatitis was 4.4 hours.

DISCUSSION

Prostatitis is a relatively common condition in the male population in the United States. It affects adult men of all

TABLE 3. BPH diagnosis with prostatitis as primary or any diagnosis at visit in 1992 to 2000

	Count	Rate (95% CI)	AV Annualized Rate yr
Primary diagnosis:			
Totals	5,430,681	5,921 (4,995–6,848)	1,184
Associated DX 600.XX	342,889	374 (207–541)	75
Any diagnosis:			
Totals	8,021,396	8,746 (7,599–9,893)	1,749
Associated DX 600.XX	781,963	853 (586–1,119)	171

Rate per 100,000 based on 1992 to 2000 population estimates from CPS, CPS Utilities, Unicon Research Corp. for relevant demographic categories of adult male civilian noninstitutionalized population in the United States (source: NAMCS, 1992, 1994, 1996, 1998 and 2000).

TABLE 4. Physician office visits by male Medicare beneficiaries with prostatitis as primary diagnosis

	1992			1995			1998			2001		
	Count	Rate (95% CI)	Age Adjusted Rate	Count	Rate (95% CI)	Age Adjusted Rate	Count	Rate (95% CI)	Age Adjusted Rate	Count	Rate (95% CI)	Age Adjusted Rate
Totals all ages	387,400	2,601 (2,566–2,637)		356,840	2,345 (2,311–2,379)		281,900	1,947 (1,915–1,979)		244,520	1,588 (1,558–1,614)	
Total younger than 65	36,720	1,176 (1,122–1,229)		42,720	1,240 (1,188–1,292)		35,080	1,021 (973–1,068)		32,440	852 (811–894)	
Total 65 or older	350,680	2,979 (2,935–3,022)	2,981	314,120	2,668 (2,627–2,709)	2,667	246,820	2,235 (2,196–2,274)	2,244	212,080	1,826 (1,792–1,860)	1,828
Age:												
65–69	115,560	2,839 (2,767–2,911)		100,180	2,601 (2,530–2,672)		72,660	2,152 (2,083–2,221)		63,900	1,806 (1,744–1,868)	
70–74	106,600	3,279 (3,192–3,365)		94,880	2,845 (2,766–2,925)		71,280	2,337 (2,261–2,413)		62,780	2,039 (1,969–2,110)	
75–79	72,360	3,197 (3,094–3,299)		65,020	2,866 (2,769–2,963)		58,900	2,579 (2,487–2,671)		45,240	1,844 (1,769–1,919)	
80–84	38,440	2,934 (2,805–3,063)		36,700	2,641 (2,522–2,761)		27,780	2,016 (1,911–2,121)		27,200	1,817 (1,722–1,913)	
85–89	13,840	2,321 (2,150–2,492)		13,700	2,151 (1,992–2,310)		12,680	1,949 (1,799–2,099)		9,960	1,377 (1,257–1,497)	
90–94	3,500	1,728 (1,474–1,982)		2,980	1,410 (1,185–1,634)		3,140	1,460 (1,233–1,687)		2,480	1,070 (883–1,258)	
95–97	340	842 (443–1,240)		480	1,273 (767–1,780)		340	859 (452–1,266)		440	1,145 (669–1,622)	
98 or Older	40	105 (0.0–250)		180	406 (142–670)		40	84 (0.0–199)		80	147 (3.7–291)	
Race/ethnicity:												
White	340,620	2,712 (2,672–2,752)	2,709	316,400	2,434 (2,396–2,471)	2,431	247,680	2,025 (1,990–2,061)	2,024	210,600	1,610 (1,580–1,641)	1,607
Black	25,320	1,984 (1,876–2,093)	1,917	25,160	1,817 (1,717–1,917)	1,818	18,300	1,371 (1,283–1,459)	1,379	17,920	1,221 (1,142–1,301)	1,240
Asian	Not available	Not available	Not available	1,520	2,086 (1,622–2,549)	2,195	2,580	1,881 (1,560–2,203)	1,765	2,300	1,122 (918–1,326)	1,054
Hispanic	Not available	Not available	Not available	4,480	2,256 (1,1964–2,549)	2,287	6,780	2,020 (1,807–2,233)	1,990	6,120	1,829 (1,448–1,810)	1,544
North American native	Not available	Not available	Not available	120	596 (119–1,074)	696	180	644 (225–1,062)	644	320	961 (492–1,429)	841
Region:												
Midwest	78,660	2,121 (2,055–2,186)	2,114	68,020	1,765 (1,706–1,823)	1,770	53,540	1,448 (1,393–1,502)	1,464	45,060	1,186 (1,138–1,235)	1,190
Northeast	58,780	1,854 (1,787–1,920)	1,835	56,140	1,765 (1,700–1,830)	1,763	39,640	1,426 (1,364–1,489)	1,411	36,480	1,248 (1,191–1,305)	1,235
South	191,980	3,665 (3,593–3,737)	3,684	176,440	3,216 (3,150–3,282)	3,225	140,100	2,610 (2,550–2,671)	2,634	113,040	1,947 (1,896–1,997)	1,959
West	53,380	2,210 (2,127–2,293)	2,208	49,800	2,148 (2,064–2,231)	2,125	41,680	1,864 (1,784–1,943)	1,807	40,360	1,631 (1,560–1,701)	1,610

Unweighted counts multiplied by 20 to arrive at values, rate per 100,000 male Medicare beneficiaries in the same demographic stratum, age adjusted rate adjusted to the 2000 United State Census, and individuals of other races, unknown race and ethnicity, and other region included in the total (counts less than 600 should be interpreted with caution) (source: Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995, 1998 and 2001).

TABLE 5. Male VA users with prostatitis diagnosis in 1998 to 2003

	1998		1999		2000		2001		2002		2003	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Totals	19,604	597	19,288	101	18,792	511	19,676	482	18,403	82	18,932	398
Age adjusted totals:	22,402	604	20,481	552	18,792	511	17,842	481	15,288	412	14,725	397
Younger than 25	48	165	44	150	54	184	41	141	37	127	46	158
25-34	477	288	486	294	452	273	443	268	422	255	397	240
35-44	1,644	449	1,552	424	1,508	412	1,466	401	1,313	359	1,184	324
45-54	4,955	605	4,631	565	4,411	538	4,181	510	3,801	464	3,651	445
55-64	4,874	781	4,350	697	3,977	637	3,803	609	3,411	546	3,395	544
65-74	6,485	673	5,978	621	5,508	572	5,117	531	4,135	429	4,099	425
75-84	3,688	541	3,257	478	2,860	420	2,619	384	2,032	298	1,847	271
85 or Older	231	373	183	296	202	327	171	279	138	223	107	173
Race/ethnicity:												
White	13,391	638	13,408	589	13,052	524	13,530	485	12,325	406	12,157	394
Black	3,714	786	3,444	719	3,316	683	3,168	649	2,815	576	2,634	553
Hispanic	772	851	686	713	749	778	810	806	683	662	650	643
Other	235	552	239	549	214	460	203	416	191	382	166	339
Unknown	1,492	257	1,511	246	1,641	276	1,965	298	2,389	299	3,325	318
Insurance status:												
No insurance/self-pay	14,605	585	13,608	540	12,501	507	11,839	780	10,583	418	10,582	420
Medicare	1,603	628	2,224	569	3,257	500	4,742	780	4,796	384	5,280	354
Medicaid	22	1003	18	660	14	365	22	354	26	300	39	409
Private insurance/ health maintenance organization	3,892	626	3,336	577	3,071	540	2,902	488	2,844	438	2,862	410
Other insurance	71	634	101	587	128	545	167	619	143	469	164	458
Unknown	0	0	1	328	1	115	4	210	11	390	5	290
Region:												
Eastern	1,625	339	1,679	326	1,585	284	1,677	246	1,758	226	1,863	233
Central	2,576	446	2,645	422	2,658	411	2,731	376	2,870	320	3,492	332
Southern	9,632	787	9,646	721	9,363	648	9,857	607	9,555	529	9,709	500
Western	5,571	568	5,318	516	5,366	506	5,411	513	4,220	424	3,868	401

Rate per 100,000 veterans using the VA system (source: Inpatient and Outpatient Files, VA Information Resource Center, VA Health Services Research and Development Service Resource Center).

ages, unlike BPH and prostate cancer, which are mainly conditions of older men. Prostatitis is an umbrella term that refers to several types of prostatitis. However, coding schemes limit the ability to obtain detailed information on the individual types. BPH is commonly associated with prostatitis, which may reflect misclassification or misdiagnosis, although it is also possible for an older man to have the 2 conditions.

Prostatitis is generally treated in the outpatient setting. Overall the 3 sets of inpatient data (HCUP, Medicare and CHCPE) consistently demonstrated a decrease with time in the rates of inpatient hospitalization for men with prostatitis. The steady decrease in the age adjusted rate of hospitalization between 1994 and 2000 may reflect a change in medical practice. Physicians now have higher thresholds for hospitalizing patients for infections, especially since some oral antibiotics, such as fluoroquinolones,

can achieve blood levels comparable to those achieved with antibiotics administered intravenously. The number of outpatient physician office visits remained substantial but each outpatient database indicated a slight decrease in visits for prostatitis with time. Ambulatory surgery and emergency room visits also decreased with time.

The cost of prostatitis, exclusive of pharmaceutical spending, is about \$84 million annually and it appears to be increasing with time despite the shift from inpatient to outpatient care. Our findings indicate that large amounts of antibiotics are prescribed in association with the diagnosis of prostatitis, although most cases of prostatitis are noninfectious. Overall there are many different diagnostic and treatment procedures but the variety likely reflects the absence of a definitive diagnostic test and the absence of effective therapies for prostatitis. Given the extensive gaps in our understanding of the diagnosis and treatment

TABLE 6. Medication associated with visits for prostatitis as any diagnosis in 1992 to 2000

	Count	Rate (95% CI)	Av Annualized Rate/Yr	Rate/100,000 Visits for Prostatitis (95% CI)
Chronic or infectious prostatitis:				
Totals	8,021,396	8,746 (7,599-9,893)	1,749	100,000 (86,885-113,115)
Quinolones ordered/provided at visit	1,464,487	1,597 (1,148-2,046)	319	18,257 (13,127-23,388)
Trimethoprim/sulfamethoxazole/sulfa ordered/provided at visit	1,315,221	1,434 (925-1,943)	287	16,396 (10,578-22,215)
BPH medications ordered/provided at visit	415,493	453 (227-679)	91	5,180 (2,594-7,766)
Chronic prostatitis:				
Totals	7,384,915	8,052 (6,960-9,144)	1,610	100,000 (86,440-113,560)
Quinolones ordered/provided at visit	1,353,675	1,476 (1,034-1,918)	295	18,330 (12,837-23,823)
Trimethoprim/sulfamethoxazole/sulfa ordered/provided at visit	1,176,772	1,283 (794-1,773)	257	15,935 (9,856-22,014)

Rate per 100,000 based on 1992 to 2000 population estimates from CPS, CPS Utilities, Unicon Research Corp. for relevant demographic categories of adult male civilian noninstitutionalized population in the United States and rate per 100,000 adult male visits based on 1992 to 2000 estimated number of visits for prostatitis in NAMCS (counts may not sum to total due to rounding) (source: NAMCS, 1992, 1994, 1996, 1998 and 2000).

TABLE 7. Prostatitis expenditures by service site

	\$ Expenditures (%)
1994:	
Hospital outpt	3,199,401 (4.0)
Physician office	3,206,854 (4.0)
Ambulatory surgery	23,560,902 (29.6)
Emergency room	13,941,447 (17.5)
Inpt	35,633,726 (44.8)
Total	79,542,330
1996:	
Hospital outpt	3,484,259 (4.1)
Physician office	3,492,375 (4.1)
Ambulatory surgery	27,425,839 (32.4)
Emergency room	15,182,719 (17.9)
Inpt	35,156,792 (41.5)
Total	84,741,984
1998:	
Hospital outpt	3,225,051 (3.5)
Physician office	4,295,666 (4.7)
Ambulatory surgery	31,669,599 (34.4)
Emergency room	15,784,644 (17.2)
Inpt	37,048,008 (40.3)
Total	92,022,968
2000:	
Hospital outpt	4,203,769 (5.0)
Physician office	5,223,512 (6.2)
Ambulatory surgery	23,831,205 (28.2)
Emergency room	16,348,869 (19.4)
Inpt	34,844,645 (41.3)
Total	84,452,000

Source: NAMCS, NHAMCS, HCUP and Medical Expenditure Panel Survey, 1994, 1996, 1998 and 2000.

TABLE 9. Estimated annual expenditures of privately insured employees with and without a prostatitis medical claim in 2002

	\$ Annual Expenditures/Pt Without Prostatitis (281,633 men)			\$ Annual Expenditures/Pt With Prostatitis (3,698 men)		
	Medical	Prescription Drugs	Totals	Medical	Prescription Drugs	Totals
All	2,669	1,036	3,705	4,038	1,426	5,464
Age:						
18-34	1,288	691	1,979	2,430	1,345	3,775
35-44	2,120	875	2,995	6,299	1,386	7,685
45-54	3,061	1,214	4,275	3,631	1,442	5,073
55-64	3,208	1,131	4,339	3,706	1,458	5,164
Region:						
Midwest	2,591	1,021	3,612	3,916	1,419	5,335
Northeast	2,616	1,117	3,733	3,955	1,544	5,499
South	2,717	969	3,686	4,107	1,322	5,429
West	2,879	1,062	3,941	4,351	1,495	5,846

Primary beneficiaries 18 to 64 years old with employer provided insurance who were continuously enrolled in 2002 with estimated annual expenditures derived from multivariate models controlled for age, gender, work status (active/retired), median household income based on zip code, urban/rural residence, medical and drug plan characteristics (managed care, deductible and co-insurance/co-payments) and binary indicators for 28 chronic disease conditions (source: Ingenix, 2002).

of prostatitis, many of these expenditures may represent a waste of resources.

CONCLUSIONS

The Urologic Diseases in America Project expended a great deal of effort to obtain the best data available on prostatitis and it identified a number of knowledge gaps that must be filled. We propose certain topics for investigation to improve the understanding of prostatitis. 1) Exploration of the relationship between prostatitis and BPH may determine whether there are differences in epidemiology, pathogenesis and treatment response in

men with pelvic pain and voiding symptoms, and men with voiding symptoms but no pain. The relationship between inflammation and acute urinary retention, which was already noted in the Medical Treatment of Prostate Symptoms study database,¹⁷ must be characterized further. 2) Given the expenditures on procedures for a clinical condition without a clear etiology, further basic research is needed to identify the etiology and pathogenesis of male chronic pelvic pain. 3) A specific diagnostic code for category III prostatitis would be beneficial in several ways. Standardized coding would lead to more specific and, therefore, more useful estimates of the incidence, prevalence and resource use of this condition, and necessitate education for clinicians on the criteria for using this diagnosis. Thus, it would likely raise awareness of chronic prostatitis/chronic pelvic pain syndrome, which would in turn lead to more accurate diagnosis and coding of this condition.

TABLE 8. Medicare beneficiary expenditures for prostatitis treatment

Service Type	\$ Expenditures (% total)			
	1992	1995	1998	2001
65 or Older:				
Hospital outpt	956,040 (3.5)	1,115,920 (4.1)	974,120 (3.6)	1,303,680 (4.7)
Physician office	11,923,120 (44.0)	12,564,800 (46.7)	12,587,820 (46.7)	13,785,200 (50.2)
Ambulatory surgery	2,649,920 (9.8)	3,088,800 (11.5)	3,532,880 (13.1)	2,948,400 (10.7)
Emergency room	908,560 (3.4)	972,320 (3.6)	1,101,120 (4.1)	939,900 (3.4)
Inpt	10,670,800 (39.4)	9,158,400 (34.0)	8,732,160 (32.4)	8,500,240 (30.9)
Totals	27,108,440	26,900,240	26,928,100	27,477,420
Younger than 65:				
Hospital outpt	152,520 (9.2)	265,600 (11.8)	283,500 (11.3)	314,760 (11.0)
Physician office	1,248,480 (75.1)	1,708,800 (76.1)	1,789,080 (71.1)	2,205,920 (77.0)
Ambulatory surgery	— (0.0)	— (0.0)	— (0.0)	— (0.0)
Emergency room	261,000 (15.7)	270,720 (12.1)	444,400 (17.7)	343,540 (12.0)
Inpt	— (0.0)	— (0.0)	— (0.0)	— (0.0)
Totals	1,662,000	2,245,120	2,516,980	2,864,220

Source: Centers for Medicare and Medicaid Services, 1992, 1995, 1998 and 2001.

Abbreviations and Acronyms

BPH	=	benign prostatic hyperplasia
CHCPE	=	Center for Health Care Policy and Evaluation
CPS	=	Current Population Survey
HCUP	=	Health Care Cost and Utilization Project
MSA	=	metropolitan statistical area
NAMCS	=	National Ambulatory Medical Care Survey
NHAMCS	=	National Hospital Ambulatory Medical Care Survey
VA	=	Veterans Affairs

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