

CHAPTER 1

Prostatitis

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INTRODUCTION

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. Although in recent years researchers have made an effort to classify patients as having a specific type of prostatitis, for the purposes of this chapter we use *prostatitis* as an umbrella term, including both acute and chronic, because clinical practice and ICD-9 codes are generally limited by more traditional definitions (Table 1).

The symptoms associated with prostatitis are common, bothersome, and burdensome in terms of both their health-related quality-of-life implications (1, 2) and their economic impact (3).

DEFINITION AND DIAGNOSIS

The traditional definition of prostatitis included acute prostatitis, chronic bacterial prostatitis, chronic nonbacterial prostatitis, and prostatodynia (4). In 1995, following an NIH-sponsored workshop on prostatitis, a revised classification (5) included the term *chronic pelvic pain syndrome* to reflect the uncertainty about whether the discomfort in chronic nonbacterial prostatitis and prostatodynia in fact originates in the prostate gland (Table 2).

In the current classification system, Categories I and II refer to acute and chronic bacterial prostatitis, respectively. Together, these conditions account

for approximately 5% to 10% of all cases. They are clearly associated with bacterial infection and a urine culture that grows uropathogens. Acute prostatitis is characterized by the sudden onset of fever and dysuria, whereas chronic bacterial prostatitis typically involves relapsing episodes of urinary tract infections, usually with the same organism seen on urine cultures. Patients with chronic bacterial prostatitis are usually asymptomatic between infections.

Category III, known as chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS), comprises the vast majority (> 90%) of cases and is further divided, depending on the presence (Type IIIA) or absence (Type IIIB) of white blood cells in semen, post-prostate-massage urine specimens (VB3), or expressed prostatic secretions (EPS). Because there appears to be no correlation between the presence of leukocytes and symptoms, classification into Types IIIA and IIIB is controversial (6).

Category IV refers to asymptomatic inflammatory prostatitis that is diagnosed incidentally during a workup for infertility, an elevated prostate specific antigen (PSA) test, or other disorders.

Diagnosis of Category I prostatitis is primarily based on clinical findings and a positive urine culture. Prostate massage is not recommended because of fear of bacteremia. For the toxemic patient, other measures may include blood cultures and an evaluation, usually by ultrasound, of the patient's ability to empty his bladder. Imaging studies include computed tomography (CT) scans to look for a prostatic abscess in patients who do not respond to initial antibiotic therapy.

Table 1. Codes used in the diagnosis of prostatitis

Males 18 years or older with one or more of the following:

ICD-9 diagnosis codes

601.0	Acute prostatitis
601.1	Chronic prostatitis
601.2	Abscess of prostate
601.3	Prostatocystitis
601.4	Prostatitis in diseases classified elsewhere
601.8	Other specified inflammatory diseases of prostate
601.9	Prostatitis, unspecified

Categories II and III prostatitis were traditionally diagnosed using the four-glass test. This segmented, quantitative technique involves culturing initial-stream urine (so-called, voided bladder 1, VB1), mid-stream urine (VB2), expressed prostatic secretions after massage (EPS), and post-massage urine (VB3) (7). The simplified two-glass test involves culture and microscopic examination of urine obtained before and after prostatic massage; it is easier for all concerned and has operating characteristics similar to those of the four-glass test (8). While Category II prostatitis is characterized by the presence of uropathogenic bacteria, Category III prostatitis is defined by their absence in the setting of genitourinary pain. The symptom that often distinguishes CP/CPPS from other voiding dysfunction is the presence of pain.

Because there is no gold standard diagnostic test for CP/CPPS, and because its etiology and much of its pathogenesis are unknown, CP/CPPS is a diagnosis of exclusion. The main goal of the evaluation of patients with CP/CPPS is to find a treatable cause of the symptoms. Unfortunately, in the vast majority of men, no such cause is identified. A thorough discussion and detailed description of the recommended and optional tests for the evaluation of CP/CPPS has recently been published (9), and the assessment of symptoms has been greatly facilitated by the development of the National Institutes of Health Chronic Prostatitis Symptom Index (NIH-CPSI) (10), a self-administered, validated symptom index that measures pain and urinary symptoms and their impact on daily life (Table 3).

Category IV prostatitis is usually diagnosed incidentally by prostate biopsy or by finding leukocytes in semen samples collected for infertility evaluations.

RISK FACTORS

Categories I and II prostatitis are caused by bacteria, including *E.coli*, *Klebsiella*, *Enterobacter*, and *Pseudomonas*. Therefore, risk factors for these conditions are those that contribute to urinary tract infection, such as difficulty emptying the bladder. Prostatic abscess may also be facilitated by immunosuppressed states. Risk factors for CP/CPPS may include prior infection despite the lack of identifiable ongoing infection. In a comparison study, men with CP/CPPS were significantly more likely to report a history of nonspecific urethritis than men in a large group of asymptomatic controls. The men with CP/CPPS were also significantly more likely to report a history of cardiovascular disease such as hypertension; neurologic disease including vertebral or disc disease; sinusitis; and anxiety or depression (11). However, it is unclear whether these conditions are risk factors for CP/CPPS or may share some as-yet-undetermined common underlying physiologic abnormality. An article by Pontari et al. presents a detailed discussion of the possible mechanisms underlying CP/CPPS (12).

Table 2. NIDDK classification^a of prostatitis

Category	Definition
I. Acute Bacterial Prostatitis	Acute infection of the prostate
II. Chronic Bacterial Prostatitis	Recurrent infection of the prostate
III. Chronic Abacterial Prostatitis/Chronic Pelvic Pain Syndrome (CPPS)	No demonstrable infection
IIIA. Inflammatory CPPS	White cells in semen, expressed prostatic secretions or post-prostatic massage urine
IIIB. Non-Inflammatory CPPS	No white cells in semen, expressed prostatic secretions or post-prostatic massage urine
IV. Asymptomatic Inflammatory Prostatitis	No symptoms; detected either by prostate biopsy, or the presence of white cells in semen samples during evaluation for other disorders

Source: Reprinted from Journal of Urology, 162, Litwin MS, McNaughton-Collins M, Fowler FJ, Nickel, JC, Calhoun EA, Pontari MA, Alexander RB, Farrar JT, O'Leary MP, and the Chronic Prostatitis Collaborative Research Network, The National Institutes of Health Chronic Prostatitis Symptom Index: Development and validation of a new outcome measure, 369–375, Copyright 1999, with permission from American Urological Association.

Table 3. NIH-Chronic Prostatitis Symptom Index (NIH-CPSI)

<p><u>Pain or Discomfort</u></p> <p>1. In the last week, have you experienced any pain or discomfort in the following areas?</p>		Yes	No	<p>6. How often have you had to urinate again less than two hours after you finished urinating, over the last week?</p> <p><input type="checkbox"/>₀ Not at all <input type="checkbox"/>₁ Less than 1 time in 5 <input type="checkbox"/>₂ Less than half the time <input type="checkbox"/>₃ About half the time <input type="checkbox"/>₄ More than half the time <input type="checkbox"/>₅ Almost always</p> <p><u>Impact of Symptoms</u></p> <p>7. How much have your symptoms kept you from doing the kinds of things you would usually do, over the last week?</p> <p><input type="checkbox"/>₀ None <input type="checkbox"/>₁ Only a little <input type="checkbox"/>₂ Some <input type="checkbox"/>₃ A lot</p> <p>8. How much did you think about your symptoms, over the last week?</p> <p><input type="checkbox"/>₀ None <input type="checkbox"/>₁ Only a little <input type="checkbox"/>₂ Some <input type="checkbox"/>₃ A lot</p> <p><u>Quality of Life</u></p> <p>9. If you were to spend the rest of your life with your symptoms just the way they have been during the last week, how would you feel about that?</p> <p><input type="checkbox"/>₀ Delighted <input type="checkbox"/>₁ Pleased <input type="checkbox"/>₂ Mostly satisfied <input type="checkbox"/>₃ Mixed (about equally satisfied and dissatisfied) <input type="checkbox"/>₄ Mostly dissatisfied <input type="checkbox"/>₅ Unhappy <input type="checkbox"/>₆ Terrible</p> <hr/> <p><u>Scoring the NIH-Chronic Prostatitis Symptom Index Domains</u></p> <p><i>Pain:</i> Total of items 1a, 1b, 1c, 1d, 2a, 2b, 3, and 4 = _____</p> <p><i>Urinary Symptoms:</i> Total of items 5 and 6 = _____</p> <p><i>Quality of Life Impact:</i> Total of items 7, 8, and 9 = _____</p>
a.	Area between rectum and testicles (perineum)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	
b.	Testicles	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	
c.	Tip of the penis (not related to urination)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	
d.	Below your waist, in your pubic or bladder area	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	
<p>2. In the last week, have you experienced:</p>		Yes	No	
a.	Pain or burning during urination?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	
b.	Pain or discomfort during or after sexual climax (ejaculation)?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	
<p>3. How often have you had pain or discomfort in any of these areas over the last week?</p> <p><input type="checkbox"/>₀ Never <input type="checkbox"/>₁ Rarely <input type="checkbox"/>₂ Sometimes <input type="checkbox"/>₃ Often <input type="checkbox"/>₄ Usually <input type="checkbox"/>₅ Always</p>				
<p>4. Which number best describes your AVERAGE pain or discomfort on the days that you had it, over the last week?</p> <p><input type="checkbox"/>₀ <input type="checkbox"/>₁ <input type="checkbox"/>₂ <input type="checkbox"/>₃ <input type="checkbox"/>₄ <input type="checkbox"/>₅ <input type="checkbox"/>₆ <input type="checkbox"/>₇ <input type="checkbox"/>₈ <input type="checkbox"/>₉ <input type="checkbox"/>₁₀</p> <p>NO PAIN PAIN AS BAD AS YOU CAN IMAGINE</p>				
<p><u>Urination</u></p> <p>5. How often have you had a sensation of not emptying your bladder completely after you finished urinating, over the last week?</p> <p><input type="checkbox"/>₀ Not at all <input type="checkbox"/>₁ Less than 1 time in 5 <input type="checkbox"/>₂ Less than half the time <input type="checkbox"/>₃ About half the time <input type="checkbox"/>₄ More than half the time <input type="checkbox"/>₅ Almost always</p>				

Source: Reprinted from Journal of Urology, 162, Litwin MS, McNaughton-Collins M, Fowler FJ, Nickel, JC, Calhoun EA, Pontari MA, Alexander RB, Farrar JT, O’Leary MP, and the Chronic Prostatitis Collaborative Research Network, The National Institutes of Health Chronic Prostatitis Symptom Index: Development and validation of a new outcome measure, 369–375, Copyright 1999, with permission from American Urological Association.

TREATMENT

Treatment of Category I (acute bacterial) prostatitis begins with antibiotic therapy to eradicate the infection. Patients are sometimes hospitalized, and supportive measures such as intravenous hydration and analgesics may be needed. For patients unable to empty their bladders, suprapubic drainage is preferred over an indwelling urethral catheter. Following initial therapy, a two- to four-week course of an oral antibiotic with good prostate penetration is recommended (13).

Treatment of Category II (chronic bacterial) prostatitis also involves antibiotics to eliminate the organism producing the infection. Patients with frequent recurrences may be placed on antibiotic prophylaxis for three to six months and their clinical course reassessed. Treatment of bladder outlet obstruction, which may impair bladder emptying, is also important.

Since the cause of Category III prostatitis (CP/CPPS) is unknown, affected men receive various empirical therapies. The common practice of using antibiotics for chronic nonbacterial prostatitis is not supported by the existing evidence (14, 15). The effectiveness of alpha-blocker therapy, another common empirical treatment, also remains uncertain. A 2004 trial of six weeks of tamsulosin did not show symptom improvement (14); however, previous trials did show a benefit (16, 17). Further research is needed to test longer durations of alpha-blocker therapy, as well as alpha-blocker therapy in men naïve to previous treatments. In small trials, quercetin (18), finasteride (19), pentosan polysulfate sodium (20), and pelvic floor electromagnetic therapy (21) have appeared to show possible benefit, and further evaluation is merited. Other empiric treatments for CP/CPPS range from medications to treat neuropathic pain, anticholinergic medications, phytotherapies, physical therapy, and, in rare cases, surgery to treat bladder neck obstruction (22, 23). For Category IV prostatitis, no treatment is recommended.

PREVALENCE AND INCIDENCE

Unlike benign prostatic hyperplasia (BPH) and prostate cancer, which are predominantly diseases of older men, prostatitis affects men of all ages. The

histologic prevalence of prostatitis was found to range from 6% to 44% in a study by Roberts et al. (24) and from 35% to 98% in a study by Bennett et al. (25). The discrepancy is due in part to the fact that Roberts et al. used only autopsy studies, whereas Bennett et al. used both autopsy and surgical specimens. Although these reviews provide compelling evidence that histologic prostatitis is common, 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% (26); the overall lifetime prevalence of prostatitis, 14% (27); the prevalence of a self-reported history of prostatitis, from 4% to 16% (28, 29, 30); and the prevalence of chronic prostatitis-like symptoms, from 10% to 12% (31, 32). The incidence of physician-diagnosed CP/CPPS is estimated to be 3.3 per 1,000 person-years (33).

TRENDS IN HEALTHCARE RESOURCE UTILIZATION

Inpatient Care

Hospital admission for prostatitis is usually necessary only for men who are septic from a bout of acute bacterial prostatitis. Occasionally, older men with chronic bacterial prostatitis may also require hospitalization for the management of urosepsis. In rare instances, men with CP/CPPS are admitted for pain control.

According to the Healthcare Cost and Utilization Project (HCUP), the age-adjusted rate of inpatient hospitalizations for prostatitis in 2000 was 7.7 per 100,000, and the total number of admissions was 7,390—a 21% decrease since 1994, when the age-adjusted hospitalization rate was 9.8 per 100,000 and the total number of admissions was 8,666 (Table 4). The steady decline 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. Patients with painful urinary symptoms who have high fever, hypotension, tachycardia, and leukocytosis will likely

Table 4. Inpatient stays for prostatitis listed as primary diagnosis, count, rate^a (95% CI), age-adjusted rate^b

	1994			1996			1998			2000		
	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate
Total ^c	8,666	9.8 (9.0-11)	9.8	7,851	8.5 (7.9-9.2)	8.5	8,146	8.6 (8.0-9.3)	8.6	7,390	7.7 (7.2-8.2)	7.7
Age												
18-24	*	*		*	*		*	*		*	*	
25-34	534	2.7 (2.1-3.2)		525	2.6 (2.1-3.2)		499	2.6 (2.0-3.1)		389	2.1 (1.7-2.6)	
35-44	886	4.5 (3.7-5.2)		954	4.5 (3.7-5.3)		707	3.2 (2.6-3.8)		609	2.8 (2.2-3.3)	
45-54	1,282	9.1 (7.8-11)		1,351	8.7 (7.4-10)		1,299	7.8 (6.7-8.9)		1,218	6.8 (5.9-7.8)	
55-64	1,794	19 (16-21)		1,311	13 (11-15)		1,619	15 (13-17)		1,529	14 (12-15)	
65-74	2,374	30 (26-34)		1,901	23 (20-26)		2,029	25 (22-29)		1,918	24 (21-26)	
75-84	1,399	37 (31-42)		1,330	32 (26-37)		1,524	34 (29-38)		1,324	27 (24-31)	
85+	269	30 (19-41)		320	37 (26-48)		387	39 (29-49)		314	31 (23-38)	
Race/ethnicity												
White	5,542	8.2 (7.4-9.0)	7.6	4,804	6.9 (6.2-7.6)	6.4	5,110	7.3 (6.5-8.0)	6.7	4,271	6.0 (5.5-6.5)	5.5
Black	689	7.5 (5.8-9.2)	9.0	598	6.2 (4.7-7.7)	7.5	492	4.9 (3.7-6.2)	5.8	520	5.1 (3.9-6.3)	6.1
Hispanic	232	2.8 (2.0-3.7)	4.5	444	4.9 (3.6-6.2)	7.5	537	5.3 (4.0-6.7)	8.4	560	5.4 (4.2-6.7)	8.1
Region												
Midwest	2,148	10 (8.6-12)	10	1,715	8.0 (6.7-9.2)	7.9	1,692	7.8 (6.5-9.0)	7.7	1,517	6.8 (5.8-7.7)	6.9
Northeast	1,908	11 (8.9-12)	10	1,778	9.8 (8.2-12)	9.5	1,533	8.5 (7.0-10)	8.2	1,385	7.6 (6.4-8.9)	7.3
South	3,489	12 (10-13)	12	3,334	10 (9.1-12)	10	3,794	11 (10-13)	11	3,448	10 (9.0-11)	9.9
West	1,121	5.7 (4.7-6.7)	6.0	1,024	5.0 (4.1-5.9)	5.4	1,127	5.3 (4.4-6.2)	5.6	1,040	4.8 (4.0-5.6)	5.1
MSA												
Rural	2,357	11 (8.8-12)	9.4	2,195	11 (8.7-13)	9.8	2,457	12 (9.6-14)	11	1,953	9.2 (7.9-10)	8.5
Urban	6,277	9.5 (8.7-10)	9.9	5,604	7.9 (7.2-8.5)	8.1	5,648	7.7 (7.0-8.4)	8.0	5,423	7.2 (6.7-7.8)	7.5

*Figure does not meet standard for reliability or precision.

MSA, metropolitan statistical area.

^aRate per 100,000 is based on 1994, 1996, 1998, 2000 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAge-adjusted to the US Census-derived age distribution of the year under analysis.

^cPersons of other races, missing or unavailable race and ethnicity, and missing MSA are included in the totals.

NOTE: Counts may not sum to totals due to rounding.

SOURCE: Healthcare Cost and Utilization Project, 1994, 1996, 1998, 2000.

Table 5. Inpatient stays by male Medicare beneficiaries with prostatitis listed as primary diagnosis, count^a, rate^b (95% CI), age-adjusted rate^c

	1992			1995			1998			2001		
	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate
Total ^d	3,460	23 (20–27)	26	2,400	16 (13–19)	19	2,340	16 (13–19)	18	2,040	13 (11–16)	15
Total < 65	500	16 (9.7–22)		280	8.1 (3.9–12)		420	12 (7.0–18)		320	8.4 (4.3–12)	
Total 65+	2,960	28 (21–29)		2,120	18 (15–21)		1,920	17 (14–21)		1,720	15 (12–18)	
Age												
65–69	920	23 (16–29)		520	13 (8.3–19)		560	17 (10–23)		280	7.9 (3.8–12)	
70–74	780	24 (16–32)		600	18 (12–24)		420	14 (7.9–20)		340	11 (5.8–16)	
75–79	460	20 (12–29)		420	19 (11–26)		520	23 (14–32)		500	20 (12–28)	
80–84	420	32 (18–46)		260	19 (8.6–29)		220	16 (6.5–25)		320	21 (11–32)	
85–89	260	44 (20–67)		280	44 (21–67)		160	25 (7.5–42)		160	22 (6.8–38)	
90–94	100	49 (5.9–93)		40	19 (0–45)		40	19 (0–44)		120	52 (10–93)	
95–97	20	50 (0–146)		0	0		0	0		0	0	
98+	0	0		0	0		0	0		0	0	
Race/ethnicity												
White	2,980	24 (20–28)	23	2,180	17 (14–20)	17	2,080	17 (14–20)	17	1,720	13 (10–16)	13
Black	340	27 (14–39)	27	140	10 (2.6–18)	8.7	200	15 (5.7–24)	12	220	15 (6.1–24)	15
Asian	...	...	...	0	0	0	0	0	0	0	0	0
Hispanic	...	...	...	20	10 (0–30)	10	40	12 (0–28)	12	80	21 (0.5–42)	21
N. American	...	...	...	0	0	0	0	0	0	0	0	0
Native	...	...	...	0	0	0	0	0	0	0	0	0
Region												
Midwest	720	19 (13–26)	20	380	9.9 (5.4–14)	12	520	14 (8.7–20)	14	500	13 (8.0–18)	14
Northeast	580	18 (12–25)	20	560	18 (11–24)	16	180	6.5 (2.2–10)	6.5	380	13 (7.2–19)	11
South	1,700	32 (26–39)	31	1,260	23 (17–29)	22	1,420	26 (20–33)	27	840	14 (10–19)	14
West	420	17 (9.9–25)	17	160	6.9 (2.1–12)	6.0	180	8.0 (2.8–13)	7.2	240	9.7 (4.2–15)	8.1

...data not available.

^aUnweighted counts multiplied by 20 to arrive at values in the table.^bRate per 100,000 male Medicare beneficiaries in the same demographic stratum.^cAge-adjusted to the US Census-derived age distribution of the year under analysis.^dPersons of other races, unknown race and ethnicity, and other region are included in the totals.

NOTE: Counts less than 600 should be interpreted with caution.

SOURCE: Centers for Medicare and Medicaid Services, MedPAR Files, 1992, 1995, 1998, 2001.

Table 6. Inpatient visits for males with prostatitis having commercial health insurance, count, rate^a

	1994		1996		1998		2000		2002	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
<i>As Primary Diagnosis</i>										
Total	31	8.6	31	5.6	37	4.2	35	3.5	31	3.5
<i>As Any Diagnosis</i>										
Total	82	23	137	25	191	22	178	18	162	18

^aRate per 100,000 based on member months of enrollment in calendar years for males in the same demographic stratum.

SOURCE: Center for Health Care Policy and Evaluation, 1994, 1996, 1998, 2000, 2002.

continue to be admitted, but patients with mild to moderate symptoms may be more likely to be treated as outpatients.

HCUP data show that hospitalization rates for prostatitis increased with age in 1994, 1996, 1998, and 2000 (Table 4). The higher rate for the older age groups likely represents the lower threshold for their admission, probably due, in part, to a greater number of comorbid illnesses in older men. Hospitalization rates stratified by race/ethnicity showed that Hispanic men had the highest age-adjusted rates in 2000. Throughout the periods of observation, age-adjusted admission rates declined for Caucasian and African American men and increased for Hispanic men. Little regional variation was observed, with the exception of the West, where age-adjusted hospitalization rates were consistently lower than in the other geographic areas (Northeast, Midwest, and South). Age-adjusted

admission rates were generally similar in urban and rural areas.

Medicare data for 1992, 1995, 1998, and 2001 (Table 5) indicate that age-adjusted inpatient hospitalization rates for prostatitis were 2 to 2.5 times higher in the Medicare patient population than in the broader population studied in HCUP. Total age-adjusted admission rates for men 65 years of age and older decreased substantially over time, from 26 per 100,000 in 1992 to 15 per 100,000 in 2001, a 42% reduction, compared with a 21% decrease from 1994 to 2000 in the HCUP population. The geographic distribution in the Medicare data was similar to that in the HCUP data, with the highest age-adjusted rates of hospitalization in the South and the lowest in the West. In 1995, when Medicare racial categories were modified, the age-adjusted admission rates were highest for Caucasian men. As in the HCUP database,

Table 7. Hospital outpatient visits for prostatitis listed as any diagnosis, 1994–2000 (merged), count, rate^a (95% CI), annualized rate^b, age-adjusted rate^c

	1994–2000			
	Count	4-Year Rate	Annualized Rate	4-Year Age-Adjusted Rate
Total ^d	181,693	196 (126–266)	49	195
Age				
18–54	92,916	135 (62–207)	34	
55+	88,777	375 (201–550)	94	

*Figure does not meet standard for reliability or precision.

MSA, metropolitan statistical area.

^aRate per 100,000 is based on 1994, 1996, 1998, 2000 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAverage annualized rate per year.

^cAge-adjusted to the US Census-derived age distribution of the midpoint of years.

^dPersons of other races, missing or unavailable race and ethnicity, and missing MSA are included in the total.

NOTE: Counts may not sum to total due to rounding.

SOURCE: National Hospital Ambulatory Medical Care Survey, 1994, 1996, 1998, 2000.

Table 8. Hospital outpatient visits by male Medicare beneficiaries with prostatitis listed as primary diagnosis, count^a, rate^b (95% CI), age-adjusted rate^c

	1992			1995			1998			2001		
	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate
Total ^d	12,140	82 (75-88)	...	18,400	121 (113-129)	...	17,500	121 (113-129)	...	17,100	111 (103-118)	...
Total < 65	1,860	60 (47-72)	88	3,320	96 (82-111)	129	3,780	110 (94-126)	125	3,660	96 (82-110)	117
Total 65+	10,280	87 (80-95)	...	15,080	239 (119-137)	...	13,720	124 (115-134)	...	13,440	116 (107-124)	...
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	...	60	159 (0-340)	...	20	51 (0-149)	...	20	52 (0-154)	...
98+	0	0	...	0	0	...	0	0	...	20	37 (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	...	...	...	40	55 (0-130)	55	180	131 (45-217)	102	0	0	0
Hispanic	...	...	...	800	403 (279-527)	463	460	137 (81-193)	149	600	160 (102-217)	154
N. American	...	...	...	20	99 (0-293)	99	160	572 (175-969)	572	80	240 (6.0-474)	240
Native	...	...	...	...	...	...	...	...	...	...	...	...
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	96 (78-114)	93	2,840	115 (96-134)	109

...data not available.

^aUnweighted counts multiplied by 20 to arrive at values in the table.^bRate per 100,000 male Medicare beneficiaries in the same demographic stratum.^cAge-adjusted to the US Census-derived age distribution of the year under analysis.^dPersons of other races, unknown race and ethnicity, and other region are included in the totals.

NOTE: Counts less than 600 should be interpreted with caution.

SOURCE: Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995, 1998, 2001.

Table 9. Physician office visits for prostatitis listed as any diagnosis, count, rate^a (95% CI), age-adjusted rate^b

	1992			1994			1996		
	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate
Total	2,176,818	2,477 (1,820–3,135)	2,477	1,406,750	1,594 (1,206–1,981)	1,594	1,602,700	1,743 (1,212–2,274)	1,743
	1998			2000					
	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate			
Total	1,039,485	1,102 (680–1,525)	1,102	1,795,643	1,867 (1,339–2,396)	1,867			

^aRate per 100,000 is based on 1992, 1994, 1996, 1998, 2000 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAge-adjusted to the US Census-derived age distribution of the year under analysis.

SOURCE: National Ambulatory Medical Care Survey, 1992, 1994, 1996, 1998, 2000.

Table 10. Physician office visits for prostatitis listed as any diagnosis, 1992–2000 (merged), count, rate^a (95% CI), age-adjusted rate^b, annualized rate^c

	1992–2000			
	Count	5-Year Rate	Annualized Rate	5-Year Age-Adjusted Rate
Total ^d	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+	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
Non-MSA	1,734,983	8,010 (5,584–10,435)	1,602	7,831

MSA, metropolitan statistical area.

^aRate per 100,000 is based on 1992, 1994, 1996, 1998, 2000 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAge-adjusted to the US Census-derived age distribution of the midpoint of years.

^cAverage annualized age-adjusted rate.

^dPersons of other races, missing or unavailable race and ethnicity, and missing MSA are included in the total.

NOTE: Counts may not sum to total due to rounding.

SOURCE: National Ambulatory Medical Care Survey, 1992, 1994, 1996, 1998, 2000.

those rates declined over time for Caucasian men and increased for Hispanic men. In contrast to the HCUP data, the Medicare data showed that age-adjusted hospitalization rates for African American men increased over time.

According to data from the Center for Health Care Policy and Evaluation (CHCPE) for 1994, 1996, 1998, 2000, and 2002, the unadjusted rates for inpatient hospitalization for men with prostatitis who have commercial health insurance decreased over time, from 8.6 per 100,000 in 1994 to 3.5 per 100,000 in 2002, a 59% reduction (Table 6).

Overall, the three sets of data (HCUP, Medicare, and CHCPE) consistently demonstrated a decline over time in rates of inpatient hospitalization for men with prostatitis.

Outpatient Care

An individual may be seen in the outpatient setting for diagnosis, treatment, or follow-up of prostatitis. We focus on visits for which prostatitis was the primary diagnosis, except where noted.

Hospital Outpatient Visits

The rates of hospital outpatient visits by patients with prostatitis listed as any diagnosis for the visit, based on National Hospital Ambulatory Medical Care Survey (NHAMCS) data for 1994, 1996, 1998, and 2000, are presented in aggregate in Table 7. The age-adjusted rate for 1994–2000 was 195 per 100,000, for an annualized rate of 49. The estimated rate for men aged 55 and over was approximately 2.5 times higher than that for men aged 18–54 (375 per 100,000 vs 135 per 100,000). The finding that prostatitis is a relatively

Table 11. Frequency of benign prostatic hyperplasia diagnosis (ICD-9 600.XX) when prostatitis is listed as primary or any diagnosis, 1992–2000 (merged), count, rate^a (95% CI), annualized rate^b

	1992–2000		
	Count	5-Year Rate	Annualized Rate
<i>Primary Diagnosis of Prostatitis</i>			
Total	5,430,681	5,921 (4,995–6,848)	1,184
with associated Dx 600.XX	342,889	374 (207–541)	75
<i>Any Diagnosis of Prostatitis</i>			
Total	8,021,396	8,746 (7,599–9,893)	1,749
with associated Dx 600.XX	781,963	853 (586–1,119)	171

^aRate per 100,000 is based on 1992–2000 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAverage annualized rate per year.

SOURCE: National Ambulatory Medical Care Survey, 1992, 1994, 1996, 1998, 2000.

common urologic condition in older men is clinically important because all too often, physicians focus only on BPH and prostate cancer in these patients.

Information on hospital outpatient visits is also available from Medicare data for 1992, 1995, 1998, and 2001 (Table 8). The age-adjusted visit rate in Medicare patients 65 and older increased dramatically between 1992 and 1995, from 88 per 100,000 to 129 per 100,000; the rate declined slightly, to 125 per 100,000 in 1998 and to 117 per 100,000 in 2001, but still remained higher than the rate in 1992. The age group with the highest visit rate varied by year; the highest visit rates were for men aged 90–94 in 1992, men 95–97 in 1995, men 80–84 in 1998, and men 70–74 in 2001. Age-adjusted visit rates were highest in the West in 1992 and highest in the South in 1995, 1998, and 2001. Age-adjusted visit rates were highest for Hispanics in 1995. In 1998 and 2001, North American Natives appeared to have substantially higher rates, but this difference is so dramatic it must be interpreted with extreme caution, given the very low counts for this group.

Physician Office Visits

Rates of physician office visit by patients with prostatitis listed as any diagnosis were determined from National Ambulatory Medical Care Survey (NAMCS) data for the even years between 1992 and 2000 (Table 9). The age-adjusted visit rate in 2000 was 1,867 per 100,000, with a total of 1,795,643 physician office visits—a 25% decrease since 1992, when the age-

adjusted rate was 2,477 per 100,000 population, and the total number of visits was 2,176,818. The aggregate age-adjusted rate for 1992–2000 was 8,746 per 100,000, for an annualized rate of 1,749 per 100,000 (Table 10). In general, the annualized rates increased with age, from a low of 535 per 100,000 by men aged 18–34 to a high of 3,756 per 100,000 by men 65–74. The rate tapered off to 3,041 per 100,000 for men 75 and older, although it remained over five times higher than the rate for men 18–34. Age-adjusted, annualized visit rates were highest for Caucasians; the next-highest rates were for African Americans and then Hispanics. Rates were highest in the South and lowest in the Northeast, and they were generally similar in urban and rural areas.

Some older men with lower urinary tract symptoms may be incorrectly diagnosed with BPH simply because of their symptoms and older age, yet the findings from various datasets have demonstrated that prostatitis is a common condition in older men as well as younger men. It is also possible for men to have both prostatitis and BPH. We examined the overlap of prostatitis and BPH diagnoses for 1992–2000, 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 both conditions (Table 11). These findings are consistent with those of the Health Professionals Follow-Up Study database (29), which showed that

Table 13. Physician outpatient visits for males with prostatitis having commercial health insurance, count, rate^a

	1994		1996		1998		2000		2002	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
<i>As Primary Diagnosis</i>										
Total	1,615	450	2,197	397	3,411	386	3,584	357	2,605	296
Age										
18–24	53	112	57	82	112	100	125	97	89	83
25–34	225	258	334	246	537	260	507	230	367	198
35–44	481	473	593	378	969	388	1,002	363	672	285
45–54	514	685	662	558	992	509	1,069	460	766	370
55–64	270	711	431	733	672	667	698	572	572	483
65–74	63	754	103	853	110	634	154	699	117	532
75–84	8	*	16	*	18	*	27	*	21	*
85+	1	*	1	*	1	*	2	*	1	*
Region										
Midwest	1,028	474	1,307	419	1,630	382	1,656	337	1,316	283
Northeast	153	296	162	289	223	307	169	285	110	292
Southeast	353	530	635	407	1,436	413	1,619	395	1,136	320
West	81	342	93	315	122	340	140	312	43	185
<i>As Any Diagnosis</i>										
Total	2,160	602	3,141	567	4,846	549	5,330	530	3,968	451
Age										
18–24	60	127	77	111	137	123	148	115	107	100
25–34	275	316	411	303	680	330	666	302	502	271
35–44	583	573	789	503	1,280	513	1,375	498	944	400
45–54	703	936	945	796	1,459	749	1,605	691	1,162	561
55–64	415	1,092	688	1,170	1,060	1,051	1,200	983	971	819
65–74	102	1,221	199	1,648	189	1,090	282	1,279	245	1,115
75–84	20	*	28	*	39	1,445	52	1,551	33	936
85+	2	*	4	*	2	*	2	*	4	*
Region										
Midwest	1,360	628	1,841	590	2,312	542	2,471	503	2,006	432
Northeast	199	385	213	380	297	409	249	420	178	473
Southeast	487	732	963	617	2,069	595	2,398	586	1,715	484
West	114	481	124	420	168	468	212	472	69	296

*Figure does not meet standard for reliability or precision.

^aRate per 100,000 based on member months of enrollment in calendar years for males in the same demographic stratum.

SOURCE: Center for Health Care Policy and Evaluation, 1994, 1996, 1998, 2000, 2002.

more than 50% of men with prostatitis reported BPH, and more than one-third of those with BPH reported prostatitis. The distinction between the two conditions may be blurred because each is a clinical diagnosis with no gold standard or specific diagnostic test.

Medicare data for 1992, 1995, 1998, and 2001 show that the age-adjusted physician office visit rates for prostatitis for men aged 65 and over decreased steadily between 1992 and 2001, from a rate of 2,981 per 100,000 population (a total of 350,680 visits) to 1,828 per 100,000 population (a total of 212,080 visits)—an almost 40% reduction (Table 12). Rates were highest

for men aged 70–74 in 1992 and 2001 and highest for men aged 75–79 in 1995 and 1998. Age-adjusted physician office visit rates across all the years were highest in the South and lowest in the Northeast, and they were highest for Caucasian men.

Center for Health Care Policy and Evaluation (CHCPE) data for 1994, 1996, 1998, 2000, and 2002 show that unadjusted physician outpatient visit rates for men with prostatitis who have commercial health insurance steadily decreased over time, from 450 per 100,000 in 1994 to 296 per 100,000 in 2002, a 34% reduction (Table 13). Within each year studied,

Table 14. Secondary diagnoses associated with number of visits for a primary diagnosis of prostatitis in individuals having commercial health insurance, regardless of site of service, count, percent

Age	BPH		Depression		STD		Substance Abuse		Urinary Tract Infection		Erectile Dysfunction		Incontinence		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
18-24	3	0.6%	3	0.6%	...	...	...	...	9	1.9%	5	1.1%	...	...	20	4.3%
25-34	39	1.9%	32	1.6%	2	0.1%	13	0.6%	84	4.1%	19	2.4%	6	0.3%	195	9.5%
35-44	101	2.7%	52	1.4%	4	0.1%	16	0.4%	143	3.9%	57	1.5%	8	0.2%	381	10.3%
45-54	203	5.2%	62	1.6%	3	0.1%	14	0.4%	145	3.7%	91	2.3%	9	0.2%	527	13.4%
55-64	214	8.3%	23	0.9%	1	0%	10	0.4%	97	3.8%	58	2.2%	10	0.4%	413	16.0%
65-74	65	12.1%	5	0.9%	1	0.2%	1	0.2%	14	2.6%	10	1.9%	7	1.3%	103	19.2%
75-84	15	15.8%	1	1.1%	...	...	...	...	4	4.2%	2	2.1%	1	1.1%	23	24.2%
85+	1	16.7%	...	...	...	...	...	...	...	...	...	...	...	...	1	16.7%
Total	641	4.8%	178	1.3%	11	0.1%	54	0.4%	496	3.7%	242	1.8%	41	0.3%	1663	12.4%

... data not available.

BPH, benign prostatic hyperplasia; STD, sexually transmitted disease.

SOURCE: Center for Health Care Policy and Evaluation, 1994, 1996, 1998, 2000, 2002.

Table 15. Medication use associated with visits for prostatitis listed as any diagnosis, 1992-2000 (merged), count, rate^a (95% CI), annualized rate^b, rate per 100,000 visits^c (95% CI)

	Count	1992-2000		5-Year Rate	Annualized Rate	5-Year Rate Per 100,000 Visits for Prostatitis
		Count	Rate			
Chronic or infectious prostatitis						
Total	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)
TMP-SMX/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						
Total	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)
TMP-SMX/Sulfa ordered/provided at visit	1,176,772	1,283	(794-1,773)	257	15,935	(9,856-22,014)

BPH, benign prostatic hyperplasia.

^aRate per 100,000 is based on 1992-2000 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAverage annualized rate per year.

^cRate per 100,000 adult male visits is based to 1992-2000 estimated number of visits for prostatitis in NAMCS.

NOTE: Counts may not sum to totals due to rounding.

SOURCE: National Ambulatory Medical Care Survey, 1992, 1994, 1996, 1998, 2000.

Table 16. Male VA users with diagnosis of prostatitis in 1998–2003, count, age-adjusted rate^a

	1998		1999		2000		2001		2002		2003	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Total	19,604	597	19,288	101	18,792	511	19,676	482	18,403	82	18,932	398
Age-adjusted Total	22,402	604	20,481	552	18,792	511	17,842	481	15,288	412	14,725	397
Age												
< 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+	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/HMO	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

^aRate per 100,000 veterans using the VA system, age-adjusted to 2000.
SOURCE: Inpatient and Outpatient Files, VA Information Resource Center (VIRc), Veterans Affairs Health Services Research and Development Service Resource Center.

the visit rates increased with age. These findings are similar to those from the NAMCS and Medicare databases.

We also examined the frequency of various secondary diagnoses, which we expected to be associated with the primary diagnosis of prostatitis, based on the experience of the NIH Chronic Prostatitis Collaborative Research Network (11). We assessed seven conditions and found that the most common secondary diagnosis associated with the primary diagnosis of prostatitis in these individuals was BPH. This finding is not surprising given the substantial overlap of the diagnoses for prostatitis and BPH found in the NAMCS database. Across all age groups, the next most common secondary diagnosis was urinary infection, followed by erectile dysfunction, depression, substance abuse, incontinence, and sexually transmitted disease (STD) (Table 14).

According to the NAMCS database, in 1992–2000, the most common medications associated with any visits for prostatitis were quinolones (an annualized rate of 319 per 100,000), followed by sulfa medications (an annualized rate of 287 per 100,000), then BPH medications (an annualized rate of 91 per 100,000) (Table 15). When visits for “infectious prostatitis” were removed from the data, the rate of prescribing quinolones and sulfa medications remained essentially the same (Table 15). These findings reveal that large amounts of antibiotics are prescribed in association with the diagnosis of prostatitis, even though the vast majority of prostatitis is noninfectious. Given the overlap of BPH and prostatitis diagnoses, it is not possible to determine whether BPH medications were being prescribed for the prostatitis or for the BPH that may have been a concomitant condition.

A few general comments are in order before we discuss the Veterans Affairs (VA) data. Despite the clear differences indicated in rates by age and race, the data have not been age- or race-standardized (see Methods chapter in this compendium), except where indicated. Although we use the term rate, the VA data present the number of cases seen for the specified condition per 100,000 unique VA patients; 95% confidence intervals are not available for the VA rates reported here.

The rates for visits by VA patients with a primary diagnosis of prostatitis steadily decreased between 1998 and 2003 (Table 16). The age-adjusted visit rate

was 604 per 100,000 population in 1998, declining to 397 per 100,000 in 2003—a 34% reduction. The visit rate peaked at ages 55–64 in each of the years. The visit rate was highest for men with race/ethnicity listed as Hispanic or African American as compared with Caucasian in most years analyzed. Visit rates were significantly higher in the Southern region in all years studied.

According to data from the Pharmacy Benefits Management of the Department of Veterans Affairs, the rates of alpha-blocker use for men with a primary diagnosis of prostatitis increased slightly over time, from 39,491 per 100,000 in 1999 to 41,675 per 100,000 in 2003 (Table 17). Use of alpha-blockers generally peaked in older age groups, i.e., men 65 and older. There was no clear racial/ethnic pattern in use. They were routinely prescribed in the East at about one-third lower the rates in the Central, Southern, and Western regions. Rates of use of cephalosporins, penicillins, and sulfonamides for men with prostatitis steadily declined over time from 1999 to 2003 (Table 18); however, the rate of use of fluoroquinolones increased over time. The use of tetracyclines was variable but generally stable across the years.

Ambulatory Surgery Procedures

Visits to an 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 (Table 19). The rate of visits decreased steadily between 1994 and 2002, from 11 per 100,000 to 6.5 per 100,000, a decrease of 41%.

Procedures associated with a primary diagnosis of prostatitis in individuals having commercial health insurance included ablative surgery, cystoscopy, hydrodistention, urethral procedures, urine studies, and urodynamic studies (Table 20).

The Medicare database shows that the rate of age-adjusted ambulatory surgery visits by Medicare patients 65 and older with a primary diagnosis of prostatitis remained stable over time, at 31 to 33 per 100,000 (Table 21). Of note, the rate of visits by patients in the Medicare database was about five times the rate in the CHCPE database. The peak age for visits in the Medicare database was generally either 70–74 or 75–79 across the period of study. The age-adjusted visit rate was dramatically lower in the West than in the

Table 17. Use of alpha blockers in men with prostatitis listed as primary diagnosis, count, rate^a (95% CI)

	1999			2000			2001		
	Count	Rate	Rate	Count	Rate	Rate	Count	Rate	Rate
Total	7,617	39,491 (38,604–40,378)		7,693	40,549 (39,643–41,455)		8,223	41,792 (40,889–42,695)	
Age									
< 25	5	10,204 (1,260–19,148)		4	7,407 (148–14,667)		6	15,385 (3,074–27,695)	
25–34	69	13,093 (10,004–16,182)		53	11,726 (8,569–14,833)		51	12,349 (8,960–15,738)	
35–44	308	18,678 (16,592–20,764)		330	21,883 (19,522–24,244)		285	20,757 (18,348–23,167)	
45–54	1,386	30,800 (29,178–32,422)		1,367	30,991 (29,348–32,634)		1,418	32,538 (30,844–34,231)	
55–64	1,733	42,737 (40,725–44,750)		1,705	42,872 (40,837–44,907)		1,822	42,293 (40,351–44,235)	
65–74	2,741	48,938 (47,106–50,770)		2,732	49,601 (47,741–51,461)		2,888	50,270 (48,436–52,103)	
75–84	1,300	47,221 (44,654–49,788)		1,404	49,091 (46,523–51,659)		1,658	51,459 (48,982–53,936)	
85+	75	48,701 (37,679–59,723)		98	48,515 (38,909–58,120)		95	43,578 (34,815–52,341)	
Race/ethnicity									
White	5,527	41,395 (40,303–42,486)		5,491	42,385 (41,264–43,506)		5,893	44,040 (42,916–45,164)	
Black	1,375	40,181 (38,057–42,305)		1,395	42,337 (40,115–44,559)		1,377	43,784 (41,471–46,096)	
Hispanic	269	37,887 (33,360–42,415)		296	38,144 (33,799–42,490)		321	37,720 (33,594–41,847)	
Other	96	41,739 (33,390–50,089)		79	38,916 (30,335–47,498)		83	42,784 (33,579–51,988)	
Unknown	350	22,236 (19,907–24,566)		432	24,785 (22,448–27,122)		549	26,081 (23,899–28,262)	
Insurance Status									
No insurance/self-pay	5,091	37,412 (36,384–38,440)		4,795	38,357 (37,271–39,443)		4,603	38,880 (37,757–40,003)	
Medicare	1,049	47,167 (44,313–50,022)		1,600	49,125 (46,718–51,532)		2,345	49,452 (47,450–51,453)	
Medicaid	7	38,889 (10,080–67,698)		7	50,000 (12,959–87,041)		10	45,455 (17,282–73,628)	
Private Insurance/HMO	1,421	42,596 (40,381–44,811)		1,242	40,443 (38,194–42,692)		1,208	41,626 (39,279–43,974)	
Other Insurance	48	47,525 (34,080–60,970)		49	38,281 (27,563–49,000)		57	34,132 (25,271–42,993)	
Unknown	1	100,000 (96,000–296,000)		...	...		...	...
Region									
Eastern	452	26,921 (24,439–29,403)		368	23,218 (20,845–25,590)		401	23,912 (21,571–26,252)	
Central	1,096	41,437 (38,983–43,890)		1,140	42,889 (40,400–45,379)		1,205	44,123 (41,632–46,614)	
Southern	3,983	41,292 (40,009–42,574)		4,032	43,063 (41,734–44,392)		4,450	45,146 (43,819–46,472)	
Western	2,086	39,225 (37,542–40,909)		2,153	40,123 (38,428–41,818)		2,167	40,048 (38,362–41,734)	

Continued on next page

Table 17 (continued). Use of alpha blockers in men with prostatitis listed as primary diagnosis, count, rate^a (95% CI)

	2002		2003	
	Count	Rate	Count	Rate
Total	7,670	41,678 (40,745–42,611)	7,890	41,675 (40,756–42,595)
Age				
< 25	2	5,714 (-2,205–13,634)	4	9,091 (182–18,000)
25–34	48	12,766 (9,154–16,377)	44	12,644 (8,908–16,380)
35–44	223	19,060 (16,558–21,561)	189	18,602 (15,950–21,254)
45–54	1,319	32,147 (30,412–33,882)	1,272	33,386 (31,551–35,221)
55–64	1,906	42,187 (40,293–44,081)	2,230	41,038 (39,335–42,741)
65–74	2,510	49,911 (47,958–51,863)	2,517	49,189 (47,267–51,111)
75–84	1,543	52,358 (49,746–54,971)	1,512	51,411 (48,820–54,002)
85+	119	52,889 (43,386–62,392)	122	54,955 (45,203–64,707)
Race/ethnicity				
White	5,309	44,007 (42,823–45,191)	5,065	44,074 (42,860–45,288)
Black	1,250	44,996 (42,502–47,491)	1,185	45,895 (43,282–48,508)
Hispanic	284	39,065 (34,521–43,608)	288	42,291 (37,406–47,175)
Other	77	43,503 (33,786–53,220)	71	46,104 (35,380–56,828)
Unknown	750	28,227 (26,207–30,248)	1,281	31,842 (30,098–33,586)
Insurance Status				
No insurance/self-pay	3,983	37,636 (36,467–38,805)	4,064	38,405 (37,224–39,586)
Medicare	2,442	50,917 (48,898–52,937)	2,633	49,867 (47,963–51,772)
Medicaid	12	46,154 (20,040–72,268)	17	43,590 (22,868–64,311)
Private Insurance/HMO	1,177	41,385 (39,021–43,750)	1,105	38,609 (36,333–40,886)
Other Insurance	52	36,364 (26,480–46,247)	70	42,683 (32,684–52,682)
Unknown	4	36,364 (727–72,000)	1	20,000 (0–59,200)
Region				
Eastern	429	24,403 (22,094–26,712)	491	26,355 (24,024–28,687)
Central	1,214	42,300 (39,920–44,679)	1,461	41,838 (39,693–43,984)
Southern	4,281	44,804 (43,462–46,146)	4,263	43,908 (42,590–45,226)
Western	1,746	41,374 (39,434–43,315)	1,675	43,304 (41,230–45,378)

^aRate per 100,000 veterans using the VA system, age-adjusted to 2000.

SOURCE: Pharmacy Benefits Management Version 3.0 (PBM), Department of Veterans Affairs.

Table 18. Use of antimicrobials in men with prostatitis, count, rate^a (95% CI)

	1999			2000			2001		
	Count	Rate		Count	Rate		Count	Rate	
Cephalosporins	1,629	8,446 (8,036–8,856)		1,542	8,128 (7,722–8,533)		1,442	7,329 (6,950–7,707)	
Penicillins	2,733	14,169 (13,638–14,701)		2,678	14,116 (13,581–14,650)		2,618	13,306 (12,796–13,815)	
Fluoroquinolones	9,310	48,268 (47,288–49,249)		9,884	52,098 (51,071–53,125)		10,870	55,245 (54,206–56,284)	
Sulfonamides	6,978	36,178 (35,329–37,027)		6,267	33,033 (32,215–33,851)		5,743	29,188 (28,433–29,943)	
Tetracyclines	2,003	10,385 (9,930–10,839)		1,997	10,526 (10,064–10,988)		1,914	9,728 (9,292–10,163)	

	2002			2003		
	Count	Rate		Count	Rate	
Cephalosporins	1,213	6,591 (6,220–6,962)		1,293	6,830 (6,457–7,202)	
Penicillins	2,110	11,466 (10,976–11,955)		2,165	11,436 (10,954–11,917)	
Fluoroquinolones	10,342	56,197 (55,114–57,280)		10,736	56,708 (55,636–57,781)	
Sulfonamides	4,928	26,778 (26,031–27,526)		4,507	23,806 (23,111–24,501)	
Tetracyclines	2,012	10,933 (10,455–11,411)		1,919	10,136 (9,683–10,590)	

^aRate per 100,000 veterans using the VA system, age-adjusted to 2000.

SOURCE: Pharmacy Benefits Management Version 3.0 (PBM), Department of Veterans Affairs.

Table 19. Ambulatory surgery visits for males with prostatitis having commercial health insurance, count, rate^a

	1994		1996		1998		2000		2002	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
<i>As Primary Diagnosis</i>										
Total	38	11	51	9	74	8	64	6	1	7
<i>As Any Diagnosis</i>										
Total	54	15	84	15	132	15	129	13	111	13

*Figure does not meet standard for reliability or precision.

^aRate per 100,000 based on member months of enrollment in calendar years for individuals in the same demographic stratum.

SOURCE: Center for Health Care Policy and Evaluation, 1994, 1996, 1998, 2000, 2002.

Table 20. Procedures associated with primary diagnosis of prostatitis in males having commercial health insurance, count, rate^a

	1994		1996		1998		2000		2002	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Total	28	685	35	650	40	467	37	412	29	457
Procedure										
Ablative procedure	2	49	2	37	8	93	10	111	2	32
Cytoscopy	17	416	20	371	19	221	19	212	23	363
Hydrodistension	...	...	...	...	...	...	1	11	...	...
Urethral procedure	6	147	8	149	10	117	4	45	1	16
Urine studies	...	...	3	56	...	...	...	...	1	16
Urodynamic studies	3	73	2	37	3	35	3	33	2	32

... data not available.

^aRate per 100,000 based on member months of enrollment in calendar years for individuals in the same demographic stratum.

SOURCE: Center for Health Care Policy and Evaluation, 1994, 1996, 1998, 2000, 2002.

Table 21. Ambulatory surgery visits by male Medicare beneficiaries with prostatitis listed as primary diagnosis, count^a, rate^b (95% CI), age-adjusted rate^c

	1992			1995			1998			2001		
	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate
Total ^d	4,460	30 (26–34)		4,040	27 (23–30)		3,900	27 (23–31)		4,120	27 (23–30)	
Total < 65	540	17 (11–24)		440	13 (7.4–18)		460	13 (7.9–19)		480	13 (7.6–18)	
Total 65+	3,920	33 (29–38)	33	3,600	31 (26–35)	31	3,440	31 (26–36)	31	3,640	31 (27–36)	31
Age												
65–69	1,300	32 (24–40)		980	25 (18–33)		800	24 (16–31)		1,120	32 (23–40)	
70–74	1,220	38 (28–47)		1,080	32 (24–41)		1,240	41 (31–51)		1,160	38 (28–47)	
75–79	860	38 (27–49)		960	42 (30–54)		960	42 (30–54)		900	37 (26–47)	
80–84	320	24 (12–36)		440	32 (18–45)		340	25 (13–36)		340	23 (12–34)	
85–89	180	30 (10–50)		100	16 (1.9–30)		60	9.2 (0–20)		80	11 (0.3–22)	
90+	40	20 (0–47)		40	19 (0–50)		40	19 (0–44)		40	17 (0–41)	
Race/ethnicity												
White	4,020	32 (28–36)	32	3,520	27 (23–31)	27	3,520	29 (25–33)	29	3,400	26 (22–30)	26
Black	320	25 (13–37)	24	360	26 (14–38)	27	300	22 (11–34)	21	560	38 (24–52)	41
Asian	...	...	...	20	27 (0–81)	27	0	0	0	0	0	0
Hispanic	...	...	...	60	30 (0–64)	30	20	6.0 (0–18)	6.0	80	21 (0.5–42)	21
N. American Native	...	...	...	0	0	0	0	0	0	0	0	0
Region												
Midwest	1,400	38 (29–47)	37	1,280	33 (25–41)	33	1,300	35 (27–44)	35	1,200	32 (24–40)	32
Northeast	960	30 (22–39)	30	1,080	34 (25–43)	35	800	29 (20–38)	30	780	27 (18–35)	25
South	1,780	34 (27–41)	35	1,440	26 (20–32)	26	1,460	27 (21–33)	26	1,760	30 (24–37)	31
West	320	13 (6.7–20)	12	240	10 (4.5–16)	10	340	15 (8.0–22)	16	380	15 (8.4–22)	15

...data not available.

^aUnweighted counts multiplied by 20 to arrive at values in the table.^bRate per 100,000 male Medicare beneficiaries in the same demographic stratum.^cAge-adjusted to the US Census-derived age distribution of the year under analysis.^dPersons of other races, unknown race and ethnicity, and other region are included in the totals.

NOTE: Counts less than 600 should be interpreted with caution.

SOURCE: Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995, 1998, 2001.

Table 22. Male Medicare beneficiaries with prostatitis receiving ablative surgery, percent^a (95% CI), antibiotic injection, percent^b (95% CI), cystoscopy, percent^c (95% CI), urethral procedure, percent^d (95% CI), and urodynamic studies, percent^e

	1992	1995	1998	2001
	Percent (CI)	Percent (CI)	Percent (CI)	Percent (CI)
Ablative surgery	0.28 (0.27–0.28)	0.31 (0.31–0.32)	0.48 (0.48–0.48)	0.49 (0.49–0.49)
Antibiotic injection	2.1 (2.1–2.1)	1.8 (1.8–1.8)	1.7 (1.7–1.7)	1.6 (1.6–1.6)
Cystoscopy	1.6 (1.6–1.6)	1.4 (1.4–1.5)	1.4 (1.4–1.4)	1.2 (1.2–1.2)
Urethral procedures	0.15 (0.15–0.15)	0.17 (0.16–0.17)	0.08 (0.08–0.08)	0.11 (0.11–0.12)
Urodynamics	1.0 (1.0–1.0)	0.76 (0.75–0.76)	0.74 (0.74–0.74)	0.76 (0.75–0.76)

^aPercent of male Medicare beneficiaries 65 years and older with prostatitis who had ablative surgery.

^bPercent of male Medicare beneficiaries 65 years and older with prostatitis who had antibiotic injection.

^cPercent of male Medicare beneficiaries with prostatitis who had cystoscopy.

^dPercent of male Medicare beneficiaries 65 years and older with prostatitis who had urethral procedure.

^ePercent of male Medicare beneficiaries with prostatitis who had urodynamic studies.

SOURCE: Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995, 1998, 2001.

other regions, and this finding was consistent within each of the years studied. There were no apparent trends by race/ethnicity between 1995 and 2001. The percentage of male Medicare beneficiaries 65 years and older with prostatitis who had ablative surgery remained small at 0.28% in 1992 and 0.49% in 2001 (Table 22). The counts were not high enough to allow observations based on race/ethnicity or region. While prostatic abscess has been reported as a complication of prostatitis, there were no documented visits for prostatitis associated with surgical abscess drainage in 1992–2001 in the 5% Medicare sample studied. The percentage of male Medicare beneficiaries 65 years and older with prostatitis who had antibiotic injections declined from 2.1% in 1992 to 1.6% in 2001 (Table 22), possibly reflecting the decline in hospitalizations, as noted above. The percentage of male Medicare beneficiaries 65 and older with prostatitis who had bacterial culture and urinalysis remained steady (15% to 17%) from 1992 to 2001, which is not surprising, since the diagnostic approach to prostatitis has not changed over the years. The percentage of male Medicare beneficiaries 65 and older with prostatitis who had cystoscopy also remained steady (1.6% in 1992 to 1.2% in 2001) (Table 22). The percentage of those with prostatitis who had STD cultures was very low over the years, from 0.03% in 1992 to 0% in 2001 (Table 23). Part of the explanation for this low rate may be that STD testing is typically performed

in younger, unmarried individuals. The percentage of those receiving urethral procedures also remained low over time, from 0.15% in 1992 to 0.11% in 2001 (Table 22). Finally, the percentage of those receiving urodynamic studies also remained low over time, from 1.0% in 1992 to 0.76% in 2001 (Table 22).

According to the National Survey of Ambulatory Surgery database, visit rates were essentially stable between 1994 and 1996, with an annualized rate of 33 per 100,000 for prostatitis listed as any diagnosis (Table 24). Visit rates were highest in the 55–74 age group (216 per 100,000), followed closely by the 75 and over group (201 per 100,000); men aged 35–54 and 18–34 had much lower rates (91 per 100,000 and 24 per 100,000, respectively). Three procedures were associated with ambulatory surgery visits for prostatitis—cystoscopy, prostatic biopsy, and urethral dilation. The annualized visit rate was highest for cystoscopy, followed by prostatic biopsy, then urethral dilation (Table 25).

All the outpatient databases indicated a slight decrease in visits for prostatitis over time. This trend may reflect an actual decline or simply a change in how physicians coded visits for prostatitis. The variety of diagnostic studies associated with prostatitis probably reflects the absence of a gold standard diagnostic test, and the variety of therapeutic procedures probably reflects the absence of an effective therapy for most cases of prostatitis.

Table 23. Male Medicare beneficiaries with prostatitis receiving STD culture, percent^a (95% CI), age-adjusted percent^b

	1992		1995		1998		2001	
	Percent (CI)	Age-Adjusted Percent	Percent (CI)	Age-Adjusted Percent	Percent (CI)	Age-Adjusted Percent	Percent (CI)	Age-Adjusted Percent
Total	0.03 (0.03–0.03)		0.02 (0.02–0.02)		0.01 (0.01–0.01)		0	
Age								
65–69	0.05 (0.05–0.06)		0		0		0	
70–74	0		0		0		0	
75–79	0		0		0		0	
80–84	0.08 (0.07–0.08)		0		0.09 (0.08–0.11)		0	
85–89	0		0.41 (0.36–0.46)		0		0	
90–94	0		0		0		0	
95+	0		0		0		0	
Race/ethnicity								
White	0.01 (0.01–0.01)	0.01	0.02 (0.02–0.02)	0.02	0	0	0	0
Black	0.27 (0.25–0.30)	0.28	0	0	0.18 (0.15–0.22)	0.17	0	0
Other	0	0	0	0	0	0	0	0
Asian	...	...	0	0	0	0	0	0
Hispanic	...	...	0	0	0	0	0	0
N. American Native	...	...	0	0	0	0	0	0
Region								
Midwest	0	0	0	0	0	0	0	0
Northeast	0.05 (0.05–0.06)	0.05	0.11 (0.11–0.12)	0.12	0.08 (0.07–0.08)	0.08	0	0
South	0.04 (0.04–0.04)	0.04	0	0	0	0	0	0
West	0	0	0	0	0	0	0	0

...data not available.

STD, sexually transmitted disease.

^aPercent of male Medicare beneficiaries 65 years and older with prostatitis who had STD culture.^bAge-adjusted to the US Census-derived age distribution of the year under analysis.

SOURCE: Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995, 1998, 2001.

Table 24. Ambulatory surgery visits for prostatitis listed as any diagnosis, 1994–1996 (merged), count, rate^a (95% CI), annualized rate^b, age-adjusted rate^c

	1994–1996			
	Count	3-Year Rate	Annualized Rate	3- Year Age-Adjusted Rate
Total	88,261	98 (84–111)	33	97
Age				
18–34	7,647	24 (14–34)	8.0	
35–54	32,225	91 (69–113)	30	
55–74	38,523	216 (169–263)	72	
75+	9,866	201 (127–275)	67	
Region				
Midwest	29,754	140 (112–168)	47	140
Northeast	23,218	129 (84–173)	43	127
South	30,288	97 (75–120)	32	96
West	*	*	*	*

*Figure does not meet standard for reliability or precision.

MSA, metropolitan statistical area.

^aRate per 100,000 is based on 1994, 1995, 1996 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAverage annualized rate per year.

^cGrouped years age-adjusted to the US Census-derived age distribution of the midpoint of years. Individual years age-adjusted to the US Census-derived age distribution of the year under analysis.

NOTE: Counts may not sum to total due to rounding.

SOURCE: National Survey of Ambulatory Surgery, 1994, 1995, 1996.

Table 25. Procedure use during ambulatory surgery visits for prostatitis listed as any diagnosis, 1994–1996 (merged), count, rate^a (95% CI), annualized rate^b, rate per 100,000 visit^c (95% CI)

	Count	3- Year Rate	Annualized Rate	3-Year Rate Per 100,000 visits for Prostatitis
Total	88,261	98 (84–111)	33	100,000 (85,800–114,200)
With associated cystoscopy (ICD-9 57.32)	58,932	65 (54–76)	22	66,770 (55,259–78,281)
With associated prostatic biopsy (ICD-9 60.11)	22,845	25 (19–32)	8.3	25,883 (19,404–32,363)
With associated urethral dilation (ICD-9 58.6)	13,387	15 (10–20)	5.0	15,168 (10,161–20,174)

^aRate per 100,000 is based on 1994–1996 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bRate per 100,000 men is based on average annualized rate per year.

^cRate per 100,000 is based on estimated number of visits for prostatitis in NSAS 1994–1996.

NOTE: Counts may not sum to total due to rounding.

SOURCE: National Survey of Ambulatory Surgery, 1994, 1995, 1996

Table 26. Emergency room visits for males with prostatitis having commercial health insurance, count, rate^a

	1994		1996		1998		2000		2002	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
<i>As Primary Diagnosis</i>										
Total	41	11	52	9	106	12	132	13	104	12
<i>As Any Diagnosis</i>										
Total	63	18	72	13	165	19	218	22	165	19

^aRate per 100,000 based on member months of enrollment in calendar years for males in the same demographic stratum.

SOURCE: Center for Health Care Policy and Evaluation, 1994, 1996, 1998, 2000, 2002.

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 (Table 26), the rate of emergency room visits in 2002 was 12 per 100,000 population. While emergency room visits were nearly three times more common in the Medicare population than in the CHCPE population, the Medicare rates decreased over time (Table 27). In 2001, the age-adjusted emergency room visit rate for men 65 and older was 34 per 100,000, a 29% decline from 1992, when the rate was 48 per 100,000. The highest rates within each year tended to be in the older age groups, peaking each year in the 85+ group. The higher rate among older men likely reflects the lower threshold for referring older men with prostatitis to the emergency room for evaluation. The highest rates were in the South across all the years studied. The highest rates of emergency room visits were for African Americans in each of the years of study except 1995, when the rate was highest for North American Natives; however, the low counts make this estimate unreliable. According to NHAMCS data for 1994–2000 (Table 28), the annualized age-adjusted emergency room visit rate was 91 per 100,000, which is much higher than the rates noted in the CHCPE and Medicare databases. Because the years were aggregated to create an adequate sample size, we do not know if the rates declined with time in the NHAMCS data as they did in the other two 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. Each inpatient or outpatient encounter may involve a variety of cost sources, including physician professional fees; radiographic studies; room and board; and laboratory, pharmacy, and operating room costs. We use the terms *costs* and *expenditures* to refer to total payments made by patients (co-insurance, co-payments, deductibles, and uncovered expenses) and by all third-party payors (primary and secondary coverage, when available).

Overall spending in the United States for diagnosis and management of prostatitis totaled \$84 million in 2000 (Table 29). This estimate is exclusive of pharmaceuticals, which can play 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 among Medicare enrollees 65 and over were \$27 million in 2001 and have remained level since 1992, indicating a decrease in real spending over time (Table 30). The lack of a secular trend in expenditures was a function of slight decreases in inpatient expenditures and slight increases in physician office visit expenditures. Physician office visits accounted for more than half of the expenditures in 2001 in this population. Expenditures among Medicare enrollees under 65 were substantially less, totaling only \$3 million in 2001. Physician office visits accounted for more than three-quarters of the expenditures in this group in 2001.

The incremental costs associated with prostatitis were estimated using risk-adjusted regression models

Table 27. Emergency room visits by male Medicare beneficiaries with prostatitis listed as primary diagnosis, count^a, rate^b (95% CI), age-adjusted rate^c

	1992			1995			1998			2001		
	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate	Count	Rate	Age-Adjusted Rate
Total ^d	7,340	49 (44-54)	...	6,600	43 (39-48)	...	7,160	49 (44-55)	...	5,680	37 (33-41)	...
Total < 65	1,800	58 (46-70)	48	1,880	55 (44-66)	40	2,200	64 (52-76)	47	1,780	47 (37-56)	34
Total 65+	5,540	47 (42-53)	...	4,720	40 (35-45)	...	4,960	45 (39-51)	...	3,900	34 (29-38)	...
Age												
65-69	1,620	40 (31-48)	...	1,500	39 (30-48)	...	1,140	34 (25-43)	...	1,160	33 (24-41)	...
70-74	1,500	46 (36-57)	...	1,320	40 (30-49)	...	1,340	44 (33-54)	...	1,040	34 (25-43)	...
75-79	1,320	58 (44-72)	...	900	40 (28-51)	...	860	38 (26-49)	...	860	35 (25-46)	...
80-84	680	52 (34-69)	...	620	45 (29-60)	...	520	38 (23-52)	...	460	31 (18-43)	...
85-89	380	64 (35-92)	...	300	47 (23-71)	...	940	144 (103-186)	...	240	33 (14-52)	...
90-94	0	0	...	40	19 (0-45)	...	160	74 (23-126)	...	120	52 (10-93)	...
95-97	20	50 (0-146)	...	40	106 (0-252)	...	0	0	...	0	0	...
98+	20	53 (0-155)	...	0	0	...	0	0	...	20	37 (0-109)	...
Race/ethnicity												
White	5,820	46 (41-52)	46	5,260	40 (36-45)	40	5,220	43 (38-48)	45	4,400	34 (29-38)	33
Black	1,120	86 (65-111)	86	1,020	74 (53-94)	74	1,560	117 (91-143)	90	900	61 (43-79)	63
Asian	...	...	...	0	0	0	20	15 (0-43)	15	20	9.8 (0-29)	9.8
Hispanic	...	...	...	120	60 (12-109)	60	140	42 (11-73)	36	200	53 (20-86)	48
N. American	...	...	...	20	99 (0-293)	99	0	0	0	0	0	0
Native	...	...	...	0	0	0	0	0	0	0	0	0
Region												
Midwest	1,500	40 (31-50)	39	1,620	42 (33-51)	39	2,060	56 (45-66)	48	1,180	31 (23-39)	31
Northeast	1,200	38 (28-47)	37	640	20 (13-27)	19	680	24 (16-33)	24	680	23 (15-31)	24
South	3,760	72 (62-82)	70	3,620	66 (56-76)	68	3,840	72 (61-82)	78	2,860	49 (41-57)	50
West	800	33 (23-43)	36	660	28 (19-38)	28	520	23 (14-32)	22	860	35 (24-45)	34

...data not available.

^aUnweighted counts multiplied by 20 to arrive at values in the table.

^bRate per 100,000 male Medicare beneficiaries in the same demographic stratum.

^cAge-adjusted to the US Census-derived age distribution of the year under analysis.

^dPersons of other races, unknown race and ethnicity, and other region are included in the totals.

NOTE: Counts less than 600 should be interpreted with caution.

SOURCE: Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995, 1998, 2001.

Table 28. Emergency room visits for prostatitis listed as any diagnosis, 1994–2000 (merged), count, rate^a (95% CI), annualized rate^b, age-adjusted rate^c

	1994–2000		
	Count	Annualized Rate	4–Year Age-Adjusted Rate
Total	336,915	91	361

^aRate per 100,000 is based on 1994, 1996, 1998, 2000 population estimates from Current Population Survey (CPS), CPS Utilities, Unicon Research Corporation, for relevant demographic categories of US adult male civilian non-institutionalized population.

^bAverage annualized rate per year.

^cAge-adjusted to the US Census-derived age distribution of the midpoint of years.

NOTE: Counts may not sum to total due to rounding.

SOURCE: National Hospital Ambulatory Medical Care Survey, 1994, 1996, 1998, 2000.

that control for age, work status, income, urban or rural residence, and health plan characteristics (Table 31). Among 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 make 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 is 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, i.e., those 35 to 44 years of age.

In addition to the direct medical costs of treatment, the economic burden of prostatitis includes

indirect costs associated with absenteeism and work limitations. Among 334 privately insured men with a medical claim for prostatitis in 2002, 14% missed some work related to the condition (Table 32). This proportion did not vary by age or region of the country, except in the Northeast, where only 3% of men treated for prostatitis missed work. The average annual amount of work missed by a patient with one or more claims for prostatitis was 4.4 hours. This low number is likely a result of most patients being treated with drugs rather than procedures. These estimates of work loss are modestly smaller than those of prior studies—the NIH Chronic Prostatitis Cohort Study reported that 26% of men experienced work loss over a three-month period, with an average, estimated value of \$551 (3).

CONCLUSIONS

Prostatitis is a relatively common condition in the US male population. It affects adult men of all ages, unlike BPH and prostate cancer, which are mainly

Table 29. Expenditures for prostatitis, by site of service (% of total)

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

SOURCE: National Ambulatory and Medical Care Survey; National Hospital and Ambulatory Medical Care Survey; Healthcare Cost and Utilization Project; Medical Expenditure Panel Survey, 1994, 1996, 1998, 2000.

Table 30. Expenditures for Medicare beneficiaries for treatment of prostatitis (% of total)

Service Type	Age 65 and over							
	1992		1995		1998		2001	
Hospital Outpatient	\$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%
Inpatient	\$10,670,800	39.4%	\$9,158,400	34.0%	\$8,732,160	32.4%	\$8,500,240	30.9%
TOTAL	\$27,108,440		\$26,900,240		\$26,928,100		\$27,477,420	

Service Type	Under 65							
	1992		1995		1998		2001	
Hospital Outpatient	\$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%
Inpatient	---	0.0%	---	0.0%	---	0.0%	---	0.0%
TOTAL	\$1,662,000		\$2,245,120		\$2,516,980		\$2,864,220	

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

Table 31. Estimated annual expenditures of privately insured employees with and without a medical claim for prostatitis in 2002^a

	Annual Expenditures (per person)					
	Males without Prostatitis (N=281,633)			Males with Prostatitis (N=3,698)		
	Medical	Rx Drugs	Total	Medical	Rx Drugs	Total
Total	\$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

Rx, Prescription.

^aThe sample consists of primary beneficiaries ages 18 to 64 having employer-provided insurance who were continuously enrolled in 2002. Estimated annual expenditures were derived from multivariate models that control 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, co-insurance/co-payments) and binary indicators for 28 chronic disease conditions.

SOURCE: Ingenix, 2002.

Table 32. Average annual work loss of males treated for prostatitis, 1999 (95%CI)

	Number of Workers ^a	% Missing Work	Average Work Absence (hrs)		
			Inpatient ^b	Outpatient ^b	Total
Total	334	14%	0.4 (0–0.9)	4.0 (2.4–5.7)	4.4 (2.7–6.2)
Age					
18–29	7	14%	0	0.3 (0–0.9)	0.3 (0–0.9)
30–39	71	20%	0	4.7 (0.1–9.2)	4.7 (0.1–9.2)
40–49	104	13%	0.5 (0–1.4)	3.7 (1.1–6.3)	4.1 (1.1–7.1)
50–64	152	12%	0.6 (0–1.4)	4.1 (1.7–6.5)	4.7 (2.2–7.3)
Region					
Northeast	34	3%	0	0.9 (0–2.9)	0.9 (0–2.9)
Midwest	65	15%	0.5 (0–1.5)	2.7 (0–6.2)	3.2 (0–6.8)
South	174	16%	0.6 (0–1.4)	5.2 (2.5–7.8)	5.8 (2.9–8.7)
West	30	17%	0	5.5 (0–11.6)	5.5 (0–11.6)
Unknown	31	10%	0	2.1 (0–4.9)	2.1 (0–4.9)

^aIndividuals with an inpatient or outpatient claim for prostatitis and for whom absence data were collected. Work loss based on reported absences contiguous to the admission or discharge dates of each hospitalization or the date of the outpatient visit.

^bInpatient and outpatient include absences that start or stop the day before or after a visit.

Source: Marketscan Health and Productivity Management, 1999.

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. Other conditions are commonly associated with prostatitis, especially BPH, and this may reflect misclassification or misdiagnosis, although it is also possible for an older man to have both conditions. Prostatitis is generally treated in the outpatient setting; inpatient hospitalizations have declined over time. There are various diagnostic and treatment procedures, but the variety likely reflects the absence of a definitive diagnostic test and the absence of effective therapies for prostatitis. The cost of prostatitis, exclusive of pharmaceutical spending, is about \$84 million annually and appears to be increasing over time, despite the shift from inpatient to outpatient care. Given the extensive gaps in our understanding of the diagnosis and treatment of prostatitis, many of these expenditures may represent a waste of resources.

RECOMMENDATIONS

The Urologic Diseases in America project expended a great deal of effort to obtain the best data available on prostatitis and identified a number of knowledge gaps that need to be filled. We propose the following topics for investigation to improve the understanding of prostatitis:

- Explore the relationship between prostatitis and BPH.
- Explore 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, already noted in the Medical Treatment of Prostate Symptoms (MTOPS) study (34), needs to be characterized further.
- Given the expenditures on procedures for a clinical condition without a clear etiology, further basic research to identify the etiology and pathogenesis of male chronic pelvic pain is needed.
- 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 utilization of this condition and would necessitate education for clinicians on the criteria for using this diagnosis. This would likely raise awareness of CPP/CPPS, which would in turn lead to more-accurate diagnosis and coding of this condition.

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