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UROLOGIC DISEASES IN AMERICA PROJECT: BENIGN PROSTATIC HYPERPLASIA

JOHN T. WEI[*,†],

Department of Urology, University of Michigan, Ann Arbor, Michigan

ELIZABETH CALHOUN,

Department of Urology, Northwestern University, Chicago, Illinois

STEVEN J. JACOBSEN

Division of Epidemiology, Mayo Clinic College of Medicine, Rochester, Minnesota

Abstract

Purpose: Benign prostatic hyperplasia (BPH), the most common benign neoplasm in American men, is a chronic condition that is associated with progressive lower urinary tract symptoms and affects almost 3 of 4 men during the seventh decade of life. Approximately 6.5 million of the 27 million white men who are 50 to 79 years old in the United States in 2000 were estimated to meet the criteria for discussing treatment.

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

Results: In 2000 approximately 4.5 million visits were made to physician offices to for a primary diagnosis of BPH and almost 8 million visits were made with a primary or secondary diagnosis of BPH. In the same year approximately 87,400 prostatectomies for BPH were performed in inpatients in nonfederal hospitals in the United States. While the number of outpatient visits for BPH increased consistently during the 1990s, there was a dramatic decrease in the use of transurethral prostatectomy, inpatient hospitalization and length of hospital stay for this condition. These trends reflect the changing face of medical management for BPH, ie increasing use of pharmacological agents and minimally invasive therapies. In 2000 the direct cost of BPH treatment was estimated to be $1.1 billion exclusive of outpatient pharmaceuticals.

Conclusions: Given the impact that BPH has on quality of life and health care cost in millions of American men, additional research into risk factors, diagnostic and therapeutic resource use, and effectiveness and cost benefit of therapies are warranted.

Keywords

prostate; prostatic hyperplasia; economics, medical; diagnosis; epidemiology

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[*]Correspondence: University of Michigan Urology Center, Room 1013, Women's Trailer, 1500 East Medical Center Dr., Ann Arbor, Michigan 48109-0330 (FAX: 734-936-9536; Jtwei@umich.edu).

Benign prostatic hyperplasia (BPH) is pathologically characterized by cellular proliferation of the epithelial and stromal elements in the prostate gland. Clinically BPH is distinguished by progressive development of lower urinary tract symptoms (LUTS). These symptoms are variable and range from nocturia, incomplete emptying, urinary hesitancy, weak stream, frequency and urgency to the development of acute urinary retention. Such symptoms can have a significant negative impact on quality of life, leading many men to seek treatment.[1] While no standard definition of BPH exists, clinically significant BPH is heralded by the onset of LUTS and, therefore, LUTS are usually presumed to be due to BPH in the absence of other relevant diagnoses.

In this review data from the Urologic Diseases in America BPH project are presented with an emphasis on health resource use trends between 1990 and 2000. The burden of illness attributable to BPH and its associated medical care are characterized from various data sources, including administrative data sets using International Classification of Diseases-9 and Current Procedural Terminology codes, large national health surveys and community based studies with methods reported elsewhere.[2, 3]

RESULTS

Prevalence and natural history.

Recent data from National Health and Nutrition Examination Survey-III suggest that BPH and LUTS are common in men 30 years or older and they increase with age, while nocturia was the most prevalent of the obstructive symptoms measured.[4] Of 60 to 69-year-old men almost 3 of 4 complained of nocturia and the proportion was almost 83% in men 70 years or older, illustrating the increasing burden of LUTS that occurs with aging. However, a few symptoms in and of themselves may not be sufficiently bothersome to patients to lead them to seek medical attention. Therefore, moderate to severe LUTS, defined as an American Urological Association Symptom Score of (AUASI) greater than 7 in population based studies, such as the Olmsted County Study (OCS) and Flint Men's Health Study (FMHS), have been used to refine the estimates of prevalence, incidence and natural history of BPH.[5, 6] In OCS the prevalence of moderate to severe LUTS was 26%, 33%, 41% and 46% in men in the fifth, sixth, seventh and eighth and older decades of life, respectively.[5, 7] In a parallel study FMHS reported moderate to severe LUTS in 39.6% of black American men, also with a strong age association.[6] Collectively all of these studies illustrate the tremendous prevalence of LUTS and document the burden of it that occurs with increasing age.

The natural history of BPH/LUTS is more accurately estimated in community based cohorts than in self-selected patients seeking medical attention. The former are more likely to represent the full spectrum of illness and less likely to be biased by socioeconomic factors, such as access to health care. OCS longitudinal data suggest an annual prostate growth rate of 1.6%, as measured by transrectal ultrasonography (TRUS),[8] and an average annual increase of 0.2 AUASI point. At a median followup of 42 months in OCS the proportion of men reporting moderate to severe LUTS increased from 33% to 49%.[9]

Urinary retention, considered to represent a final symptomatic stage of progressive BPH, occurred in OCS at an overall incidence of 6.8 episodes per 1,000 person-years of followup

and subset analyses revealed 34.7 episodes per 1,000 person-years of followup in men 70 years or older who had moderate to severe symptoms.[10] These rates are comparable to data subsequently reported in the Health Professionals Followup Study, in which men 45 to 83 years old were followed from 1992 to 1997.[11] In 82 men acute urinary retention developed during 15,851 person-years of followup. The 2 studies showed that age, more severe symptoms and larger prostate size were associated with an increase in the risk of urinary retention.

OCS data also revealed much about risk factors for BPH. Age, prostate volume and peak urinary flow rate were each significantly associated with AUASI scores but they accounted for only 13% of symptom variability. The odds of moderate to severe symptoms increased with age after the fifth decade of life from 1.9 to 2.9 to 3.4 in men in the sixth, seventh and eighth decades, respectively. Even after adjusting for age the odds of moderate to severe symptoms were 3.5 times greater in men with a prostate larger than 50 cc on TRUS than in men with a smaller prostate. In addition, peak urinary flow less than 10 ml per second was associated with a 2.4-fold risk of moderate to severe symptoms.[10] OCS data also showed that age was associated with an increased risk of acute urinary retention. After adjusting for baseline symptom severity and peak urinary flow rate the relative risk of urinary retention increased after the fifth decade of life from 0.9 to 2.1 to 4.8 in men in the sixth, seventh and eighth decades, respectively. Men with baseline AUASI greater than 7 and peak flow rates of 12 ml per second or less were 2.3 and 2.1 times more likely to have urinary retention, respectively.[10] After multivariate adjustment increasing age, moderate to severe LUTS, decreased peak flow rate and prostate size (or prostate specific antigen) were associated with an increased likelihood of receiving BPH treatment.

Outpatient visits.

Unequivocally the first point of entry for almost all patients with BPH is the outpatient setting. In this regard we observed an increase in the number of outpatient visits for BPH from 10,116/100,000 in 1994 to 14,473/100,000 in 2000 (table 1). BPH related visits to emergency rooms decreased from 330/100,000 in 1994 to 218/100,000 in 2000 (table 2). The reasons for the increase in outpatient visits could not be examined based on available administrative data. However, one can reasonably assume that these visits included clinical evaluations such as imaging, and prescriptions for medical and surgical interventions.

Clinical evaluations.

The excretory urogram (IVP) and TRUS have been the most commonly used imaging examinations for BPH.[12] Notably since the dissemination of the BPH guidelines in 1994, the use of IVP and TRUS in the Medicare population has decreased consistently (table 3).[13] By 1998 use rates for IVP and TRUS were only 986/100,000 and 3,497/100,000 cases, respectively. Computerized tomography (CT) was uncommonly used to evaluate BPH. However, other tests for assessing lower urinary tract function, including uroflowmetry and pressure flow studies, increased, while the use of cystometrograms decreased modestly based on Medicare claims data between 1991 and 1995 (table 4). These data were substantiated by the 1997 AUA Gallup Poll survey of practicing urologists in the United States who reported a decrease in the use of IVP, uroflowmetry and urodynamic studies.

Moreover, high use rates for measuring post-void bladder residual urine and serum prostate specific antigen in men with BPH were seen (71% and 92%, respectively).[14] In 2003 the updated AUA guidelines were disseminated and to our knowledge the impact of these guidelines has yet to be evaluated.[15]

Pharmacological management.

In contemporary practice α-blockers and 5α-reductase inhibitors are first line therapy in men with symptomatic BPH and LUTS. The AUA Gallup Poll showed that 88% of urologists recommended α-blockers in men with moderate urinary symptoms and evidence of prostate enlargement less than 40 cc.[14] These findings are supported by data from the National Ambulatory Medical Care Survey (NAMCS) (table 5), which show that terazosin was the primary pharmacological agent, prescribed in 14% to 15% of visits for BPH between 1994 and 1996. With the subsequent introduction of more selective agents terazosin was replaced by doxazosin and tamsulosin, which together in 2000 represented 23% of the prescriptions written at BPH related outpatient visits. In contrast, the proportion of BPH outpatient visits in which finasteride was prescribed remained relatively stable (6.5% and 7.3% in 1994 and 2000, respectively) (table 5).

Justification of such widespread use of these pharmacological agents can be readily found in the clinical literature.[16–19] Perhaps one of the most important studies done to date for BPH is the Medical Therapy of Prostatic Symptoms Study, a multicenter randomized, controlled trial that evaluated whether treatment with doxazosin (an α-blocker) or finasteride (a 5α-reductase inhibitor) alone or in combination was more effective than placebo for preventing the clinical progression of BPH. Clinical progression was defined as worsening in the AUASI score of 4 points or more, acute urinary retention, incontinence, renal insufficiency or recurrent urinary tract infection. This randomized clinical trial demonstrated that combination therapy was almost twice as effective as monotherapy for decreasing the risk of progression (66% for the combination, 39% for doxazosin and 34% for finasteride).[18]

Surgical management.

Historically transurethral resection of the prostate (TURP) was the second most commonly performed operation in the United States. However, with the introduction of effective alternatives to surgery urologists have increasingly used pharmacological therapy and minimally invasive procedures.[14] In turn, this led to a dramatic decrease in hospitalizations for TURP throughout the 1990s, most notably between 1992 and 1995 (tables 6 and 7).[20] In men older than 65 years Medicare data show that outpatient surgery for BPH decreased across almost all patient age, racial/ethnic and geographic strata (table 8). Specifically surgical visits by Medicare beneficiaries decreased from 491/100,000 in 1992 to 372/100,000 in 2000. In those hospitalized for BPH surgery length of stay (LOS) was shorter, consistent with trends following the widespread adoption of prospective payment and managed care systems (table 9). By 2000 mean LOS was less than 3 days in all except the most elderly patients.

In the 1990s a number of minimally invasive surgical therapies (MIST) were introduced, including laser ablation, transurethral needle ablation (TUNA), transurethral microwave

therapy (TUMT), high energy focused ultrasound and hot water thermotherapy. The 1997 AUA Gallup Poll of practicing urologists indicated that, while 95% had performed TURP in the prior year, 26% had performed laser prostatectomy, while only 3% had performed TUNA or TUMT.[14] According to data from the Healthcare Cost and Utilization Project (HCUP) of MIST procedures performed in the inpatient setting only TUNA and TUMT had increased by the end of the decade (table 6), while the use of laser prostatectomy decreased. Simultaneously BPH procedures in ambulatory surgery setting had increased substantially toward the end of the decade from 264/100,000 in 1998 to 357/100,000 in 2000 based on data from commercially insured men 65 to 74 years old (data not shown). Little is known about decision making for proceeding with surgical and minimally invasive therapies. In one of the few such studies age adjusted data from National Health and Nutrition Examination Survey-III revealed no difference in the odds of BPH surgery by racial/ethnic group, education, geographic region or urban/rural area, although never married men were 70% less likely to have undergone BPH surgery.[4]

Economic impact.

The economic burden of BPH can be stratified into 3 areas, namely 1) direct medical costs associated with treatment, 2) indirect costs associated with absenteeism, work limitations and premature mortality, and 3) intangible costs associated with pain, suffering and grief.

Direct Costs:

We estimated that the direct cost of medical services provided at hospital inpatient and outpatient settings, emergency departments and physician offices to treat BPH in the United States in 2000 was approximately $1.1 billion. This estimate does not include the costs of outpatient prescriptions and nonprescription medications or alternative medicine visits reported by a small percent of men with BPH, nor does it include indirect and intangible costs. After adjusting for inflation total medical spending for BPH has decreased with time, particularly in the Medicare population. This decrease in spending is largely attributable to a dramatic decrease in inpatient expenditures. Total hospitalization spending for BPH decreased by more than half in Medicare beneficiaries 65 years or older from $743 million in 1992 to $315 million in 1998 (in nominal dollars).

Spending on outpatient prescription drugs for BPH treatment in 1996 to 1998 was $194 million annually according to estimates from the Medical Expenditure Panel Survey. The majority of prescriptions and pharmacy spending were for terazosin, followed by doxazosin and finasteride (table 10).

To examine the incremental medical costs associated with a diagnosis of BPH we used data on 280,000 primary beneficiaries 18 to 64 years old with employer provided insurance coverage in 1999. We estimated medical expenditures in persons with and without a primary diagnosis of BPH in 1999, controlling for differences in insurance coverage (medical and drug benefits), patient demographics and health status (medical comorbidities). Based on these data we estimated that the incremental direct annual medical costs for BPH were $2,577. The average annual cost in men without a BPH claim was $3,138, while the claim in those with BPH was $5,715.

Indirect Costs:

Work lost by men with BPH was measured in 1999 (MarketScan, Chichester, United Kingdom). A tenth of the men with BPH missed work, losing an average of 7.3 hours annually. Each visit for outpatient care was associated with an average work loss of 4.7 hours. With an estimated 4.5 million visits with a primary diagnosis of BPH and almost 8 million visits with BPH as a primary or secondary diagnosis of BPH there is a significant loss to society of between 21 million and 38 million hours of lost productivity. Therefore, the inclusion of indirect costs would certainly increase the estimates of the overall economic burden of BPH.

DISCUSSION

The tremendous prevalence of BPH and its associated high cost of care affirms not only the conviction that this is an important chronic condition, but also that government and other health care payers must constantly examine patterns of care to optimize quality and cost. The prevalence and natural history of BPH have been well studied in the last decade of the millennium and our appreciation of the clinical manifestations from mild symptoms to urinary retention is fairly clear. However, the perspective taken in these studies has almost universally considered the clinical perspective to the exclusion of the broader public health picture. For example, one can readily quote OCS data that show an increasing likelihood of moderate to severe symptoms with increasing age decades but one cannot easily express what is the most cost-effective long-term care in a patient presenting with moderate to severe symptoms due to BPH. As a result, almost all patients presenting with LUTS are prescribed medical management as initial therapy almost by default. Does this represent good quality of care?

As a consequence of physicians prescribing increasingly more oral therapies for BPH, there has been an extraordinary shift in BPH management from surgical to medical care. The net effect of this phenomenon is that BPH has transformed from a pseudo-acute condition (that is a symptomatic condition that was promptly treated with surgery) to a bona fide chronic condition requiring ongoing medication and medical care. The public health impact of this paradigm shift on the American population is wholly unclear but unlikely to be trivial. For example, note clinical studies that establish a risk decrease of 5α-reductase inhibitors on urinary retention and TURP. Do we know if men who undergo initial surgery are more or less satisfied than those who are treated medically? Does this change after 5 or 10 years of taking medication for symptoms? In fact, there are ample data to suggest that symptomatic improvement in surgical patients is much greater than in those on medical management. The picture painted by these Urologic Diseases in America data on BPH is that of a burgeoning population of aging men on medical management who increasingly need to see not only primary care physicians, but also a urologist for symptomatic BPH. If most of these men ultimately undergo minimally invasive therapy or surgical treatment, what have we achieved beyond increasing costs to society and prolonging the duration of the patient symptomatic phase?

Although critics were correct in pointing out that TURP was the most common operation in the Medicare population after surgery for cataracts, it is not clear that this practice was

wrong or represented overuse. Perhaps it is time for us to consider the possibility that some patients are better off in the long run with initial surgical treatment rather than with medical treatment. Large prospective studies that capture the process of care as it relates to long-term patient outcomes using validated measures are direly needed to identify such patients and answer fundamental questions regarding quality of care. This is particularly relevant when one considers that most elderly patients expend a significant proportion of their limited monthly income on prescriptions and there is a looming prescription drug crisis in our country.

Limitations.

Although to our knowledge this study represents the largest comprehensive description of BPH resource use to date, there are important limitations to consider. 1) These administrative data provide a reliable overview of care but lack the detailed patient level information, such as symptom severity, duration and prior therapies, necessary to adjust for confounding. 2) Only data through 2000 were available and newer therapies (eg alfuzosin, saline TURP, photovaporization, etc) were not included. The improved safety and effectiveness of therapies such as saline TURP and photovaporization over other techniques may further decrease the threshold for patients to proceed to surgical intervention. 3) This report was based on several large administrative datasets and community based cohorts (OCS and FMHS). However, due to the lack of a standard definition for BPH, statistical cross-referencing across data sets was not possible. Future standardization would greatly facilitate research of the prevention, diagnosis and treatment of BPH.

CONCLUSIONS

The substantial prevalence of BPH and its therapies attests to the tremendous impact of this condition on the health and quality of life of American men. Increasingly BPH therapy trends are moving away from the gold standard operation of TURP and toward less invasive pharmacological options and MIST in an outpatient setting. Of them the use of pharmacological approaches for BPH has had the most obvious impact. Consequently longitudinal evaluations of practice patterns in the United States should be done as newer therapies, including herbal supplements,[21] gain in popularity. Such studies will also allow a better understanding of how patients progress through the spectrum of care from watchful waiting to pharmacological management to MIST and ultimately to surgical intervention. Moreover, factors important to treatment decision making, the use of updated evidence based guidelines and how they differ between primary care and urological specialists should be examined.[15]

Future efforts should continue to address the underlying etiology of BPH. Clinical epidemiological studies that focus on the effects of sociodemographic factors, such as race/ethnicity and access to health care, on BPH prevalence and the relationship between LUTS and other conditions, such as diabetes and sexual dysfunction, have the potential to improve care. Given the dramatic trends of the last 10 years and persistent variation in the management of BPH, quality of care delivered for BPH should be evaluated. The delivery of high quality care should be the goal of all clinicians who provide care for patients with BPH.

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Table 1.

National physician office and hospital outpatient visits for BPH and LUTS (National Hospital Ambulatory Medical Care Survey-Outpatient File, 1994, 1996, 1998 and 2000, and NAMCS, 1994, 1996, 1998 and 2000)

	Count	Rate (95% CI)
1994:		
Primary reason	2,899,300	6,371 (5,495–7,248)
Any reason	4,603,426	10,116 (8,826–11,406)
1996:		
Primary reason	3,658,367	7,484 (6,294–8,675)
Any reason	6,112,287	12,505 (10,856–14,153)
1998:		
Primary reason	3,990,359	7,754 (6,281–9,226)
Any reason	6,443,185	12,520 (10,531–14,508)
2000:		
Primary reason	4,418,425	8,201 (6,765–9,637)
Any reason	7,797,781	14,473 (12,406–16,540)

Rate per 100,000 based on 1994, 1996, 1998 and 2000 population estimates from Current Population Survey, (CPS Utilities Research Corp., College Station, Texas) for relevant demographic categories of American male civilian noninstitutionalized population 40 years or older.

Table 2.

National emergency room visits by adult males with BPH and/or LUTS listed as primary diagnosis (National Hospital Ambulatory Medical Care Survey-ER File, 1994, 1996, 1998 and 2000)

	Count	Rate (95% CI)
1994	150,377	330 (201–460)
1996	117,716	241 (130–352)
1998	155,923	303 (194–412)
2000	117,413	218 (117–319)

Rate per 100,000 based on 1994, 1996, 1998 and 2000 Current Population Survey population estimates for relevant demographic categories of American male civilian noninstitutionalized population 40 years or older.

Table 3.

Imaging for BPH and/or LUTS evaluation in male Medicare population (Centers for Medicare and Medicaid Services, 5% file, 1992, 1995 and 1998)

	1992		1995		1998	
	Count	**Rate**	**Count**	**Rate**	**Count**	**Rate**
Totals	217,760	14,977	133,580	8,107	76,380	5,101
IVP:	56,280	3,871	25,400	1,542	14,760	986
Ambulatory surgery center	6,600	454	3,460	210	1,560	104
Inpt	8,120	558	2,760	168	2,080	139
Hospital outpt	920	63	520	32	260	17
Physician office	40,640	2,795	18,660	1,132	10,860	725
TRUS:	150,960	10,382	99,560	6,042	52,360	3,497
Ambulatory surgery center	5,760	396	4,940	300	4,060	271
Inpt	3,880	267	1,660	101	1,440	96
Hospital outpt	900	62	620	38	440	29
Physician office	140,420	9,657	92,340	5,604	46,420	3,100
Abdomen/pelvis CT with contrast medium:	5,700	392	5,200	316	5,220	349
Ambulatory surgery center	320	22	160	9.7	140	9.3
Inpt	2,660	183	2,460	149	3,040	203
Hospital outpt	80	5.5	100	6.1	60	4.0
Physician office	2,640	182	2,480	151	1,980	132
Abdomen/pelvis CT without contrast medium:	2,420	166	1,680	102	2,460	164
Ambulatory surgery center	140	9.6	60	3.6	100	6.7
Inpt	1,160	80	920	56	1,440	96
Hospital outpt	20	1.4	0		20	1.3
Physician office	1,100	76	700	42	900	60
Abdomen/pelvis CT with + without contrast medium:	1,900	131	1,520	92	1,460	97
Ambulatory surgery center	180	12	140	8.5	80	5.3
Inpt	560	39	660	40	620	41
Hospital outpt	20	1.4	60	3.6	0	
Physician office	1,140	78	660	40	760	51
Inpt abdomen CT, contrast material use unspecified	500	35	220	13	120	8.0

Unweighted counts multiplied by 20 to arrive at values and rate per 100,000 men with BPH (counts less than 600 should be interpreted with caution).

Table 4.

Diagnostic studies for LUTS in elderly male Medicare beneficiaries (J Urol, **160:** 816, 1998)

	No. 1991	No. 1992	No. 1993	No. 1994	No. 1995
Uroflowmetry:					
Complex	6,717	7,575	8,528	8,687	8,607
Simple	1,059	936	802	608	535
Cystometrogram:					
Complex	2,146	2,081	1,905	1,978	1,917
Simple	622	535	463	450	414
Pressure flow study:					
Bladder	274	324	354	492	514
Intra-abdominal	183	226	238	329	343

For 5% sample, 1991 to 1995.

Table 5.

National count of prescriptions written at physician offices during visits for BPH and/or LUTS (NAMCS, 1992, 1994, 1996, 1998 and 2000)

	Terazosin	Doxasozin	Tamsulosin	Finasteride
1994:				
No. prescriptions	688,717	*	*	289,070
% BPH visits for which prescription was given	15	*	*	6.5
1996:				
No. prescriptions	830,314	*	*	*
% BPH visits for which prescription was given	14	*	*	*
2000:				
No. prescriptions	*	819,043	870,889	552,483
% BPH visits for which prescription was given	*	11	12	7.3

For 1992 and 1998 data on number of prescriptions and percent of visits for which prescription was given do not meet standard for reliability or precision.

*Value does not meet standard for reliability or precision.

Table 6.

Inpatient surgical procedures to treat BPH symptoms (HCUP Nationwide Inpatient Sample, 1994, 1996, 1998 and 2000)

Surgical Procedure	No. 1994	No. 1996	No. 1998	No. 2000
Open prostatectomy	5,648	4,617	4,341	4,354
TURP	136,377	103,644	88,907	87,407
Balloon dilation	279	161	148	161
Laser prostatectomy	0	10,616	3,019	2,045
TUNA	0	0	0	35
TUMT	0	0	0	14

Table 7.

Inpatient stays by male Medicare beneficiaries with BPH and/or LUTS listed as primary diagnosis (Centers for Medicare and Medicaid Services, MedPAR and 5% Carrier Files, 1992, 1995 and 1998)

	1992			1995			1998		
	Count	Rate (95% CI)		Count	Rate (95% CI)		Count	Rate (95% CI)	
Age:									
Totals	154,320	1,048	(1,043–1,053)	82,060	539	(535–543)	59,760	413	(409–416)
Younger than 65	5,420	175	(171–180)	3,240	94	(91–97)	2,600	76	(73–79)
65 or Older	148,900	1,280	(1,273–1,286)	78,820	669	(665–674)	57,160	518	(513–522)
65–74	78,240	1,081	(1,073–1,089)	37,600	523	(518–528)	25,380	395	(390–400)
75–84	57,800	1,637	(1,623–1,650)	33,580	918	(908–928)	25,340	692	(684–701)
85–94	12,560	1,589	(1,562–1,617)	7,420	875	(855–894)	6,320	730	(712–748)
95 or Older	300	386	(343–430)	220	268	(233–304)	120	137	(113–161)
Race/ethnicity:									
White	135,820	1,095	(1,089–1,101)	72,260	556	(552–560)	52,600	430	(426–434)
Black	10,380	815	(799–830)	6,820	493	(481–504)	4,180	313	(304–323)
Asian	Not available	Not available		180	247	(211–283)	560	408	(375–442)
Hispanic	Not available	Not available		1,080	544	(512–576)	1,240	369	(349–390)
North American native	Not available	Not available		60	298	(224–373)	120	429	(354–504)
Region:									
Midwest	39,400	1,062	(1,052–1,073)	21,440	556	(549–564)	16,920	458	(451–464)
Northeast	35,780	1,128	(1,117–1,140)	17,540	551	(543–560)	10,960	394	(387–402)
South	55,840	1,066	(1,057–1,075)	28,020	511	(505–517)	21,600	402	(397–408)
West	20,740	923	(911–936)	13,080	564	(554–574)	9,180	410	(402–419)

Unweighted counts were multiplied by 20 to arrive at values and rate per 100,000 Medicare beneficiaries in same demographic stratum with persons of other races, unknown race and ethnicity, and other region included in totals (counts less than 600 should be interpreted with caution).

Table 8.

Visits to ambulatory surgery centers by male Medicare beneficiaries for BPH and/or LUTS listed as primary diagnosis (Centers for Medicare and Medicaid Services, 5% Carrier and Outpatient Files, 1992, 1995 and 1998)

	1992		1995		1998	
	Count	Rate (95% CI)	Count	Rate (95% CI)	Count	Rate (95% CI)
Age:						
Totals	72,260	491 (487–494)	62,520	411 (408–14)	53,900	372 (369–375)
Younger than 65	3,340	108 (104–112)	3,720	108 (105–111)	3,480	101 (98–105)
65 or Older	68,920	592 (588–597)	58,800	499 (495–503)	50,420	457 (453–461)
65–74	41,080	568 (562–573)	33,380	464 (460–469)	26,660	415 (410–420)
75–84	23,940	678 (669–686)	21,680	593 (585–601)	19,540	534 (526–541)
85–94	3,780	478 (463–493)	3,580	422 (408–436)	4,120	476 (461–490)
95 or Older	120	155 (128–182)	160	195 (165–226)	100	114 (92–137)
Race/ethnicity:						
White	62,580	505 (501–509)	54,820	422 (418–425)	47,220	386 (383–390)
Black	5,700	447 (436–459)	5,620	406 (395–416)	4,220	316 (307–326)
Asian	Not available	Not available	280	384 (339–429)	400	292 (263–320)
Hispanic	Not available	Not available	480	242 (220–263)	1,020	304 (285–323)
North American native	Not available	Not available	Not available	Not available	Not available	Not available
Region:						
Midwest	24,840	670 (661–678)	19,480	505 (498–512)	17,420	471 (464–478)
Northeast	18,640	588 (579–596)	12,900	406 (399–413)	11,480	413 (406–421)
South	24,660	471 (465–477)	24,960	455 (449–461)	20,040	373 (368–379)
West	4,100	182 (177–188)	5,040	217 (211–223)	4,880	218 (212–224)

Unweighted counts were multiplied by 20 to arrive at values and rate per 100,000 Medicare beneficiaries in the same demographic stratum with persons of other races, unknown race and ethnicity, and other region included in totals (counts less than 600 should be interpreted with caution).

Table 9.

Trends in inpatient LOS in adult males hospitalized with BPH and/or LUTS listed as primary diagnosis (HCUP Nationwide Inpatient Sample, 1994, 1996, 1998 and 2000)

	Mean LOS (days)			
	1994	**1996**	**1998**	**2000**
All	3.8	3.1	3.1	2.8
Age:				
40–44	3.3	2.2	2.8	3.3
45–54	3.1	2.6	2.6	2.1
55–64	3.2	2.6	2.8	2.4
65–74	3.5	2.9	2.9	2.7
75–84	4.2	3.4	3.3	3.0
85 or Older	5.3	4.4	4.3	4.0
Race/ethnicity:				
White	3.7	3.1	3.1	2.8
Black	4.5	3.5	3.6	3.6
Asian/Pacific Islander	2.9	2.9	3.1	3.1
Hispanic	3.9	3.4	3.7	2.9
Other	4.5	2.9	3.2	3.1
Region:				
Midwest	3.8	3.3	3.2	2.9
Northeast	4.8	3.7	3.7	3.2
South	3.6	3.0	2.9	2.8
West	2.7	2.4	2.7	2.4
Metropolitan statistical area:				
Rural	3.7	3.1	3.0	2.8
Urban	3.8	3.1	3.1	2.8

Table 10.

Annual spending and select outpatient prescription drugs for BPH in 1996 to 1998 (Medical Expenditure Panel Survey, 1996 to 1998)

Drug Name	No. Prescription Claims	Mean Price ($)	Mean Total Expenditures ($)
Terazosin	1,923,054	67.39	129,594,632
Doxazosin	605,744	49.26	29,838,949
Finasteride	518,038	66.77	34,589,375
Total			194,022,956

Estimates include prescription drug claims with corresponding diagnosis of BPH and exclude drugs for which number of claims could not be reliably estimated due to data limitations since including expenditures for excluded prescription drugs for which number of claims could not be reliably estimated would increase total drug spending by approximately 2% to $198.6 million.