



## ORIGINAL ARTICLE

### Clinical management of patient with benign prostatic hyperplasia in Spain<sup>☆</sup>

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#### KEYWORDS

Benign prostatic hyperplasia;  
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#### Abstract

**Objectives:** To identify clinical management of benign prostatic hyperplasia (BPH) in Spain and its associated health care resources.

**Material and methods:** A qualitative cross-sectional study was conducted through telephone interviews with general practitioners (GPs) and urologists. Information about diagnosis, pharmacologic treatment and follow-up was collected. Results were clustered according to the key variables considered as drivers of clinical practice patterns: BPH diagnosis, severity classification, treatment initiation and follow-up of patients.

**Results:** 153 GP and 154 urologists participated in the study. 7 different clinical patterns were identified in primary care (PC). Resource use during diagnosis is relatively homogeneous, reporting a range of 2.0–2.6 visits employed and PSA and urine test being the most frequently performed. Follow-up is heterogeneous; frequency of follow-up visits oscillates from 3.2 to 7.0 visits/patient/year and type of tests performed is different among patterns and within the same pattern. In Urology, 3 clinical patterns were identified. Resource use is homogeneous in the diagnosis and in the follow-up; urologists employed 2 visits in diagnosis and a range of 2.1–3.2 visits/patient/year in the follow-up. The most frequent tests both in diagnosis and follow-up are PSA and digital test.

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**PALABRAS CLAVE**

Hiperplasia benigna de próstata;  
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**Conclusions:** BPH management shows variability in PC, identifying 7 different clinical practice patterns with different resource use during the follow-up among patterns and within the same pattern. The implementation of clinical guidelines could be justified to reduce heterogeneity. © 2011 AEU. Published by Elsevier España, S.L. All rights reserved.

**Manejo asistencial del paciente con hiperplasia benigna de próstata en España****Resumen**

**Objetivos:** Conocer el manejo asistencial de la hiperplasia benigna de próstata (HBP) en España y el uso de recursos sanitarios asociado.

**Material y métodos:** Estudio descriptivo transversal mediante entrevistas telefónicas a médicos de atención primaria (MAP) y urólogos. Se recogió información acerca del diagnóstico, tratamiento y seguimiento. Los resultados se agruparon por patrones asistenciales, definidos a partir de las variables: diagnóstico, clasificación según sintomatología, inicio de tratamiento farmacológico y seguimiento.

**Resultados:** Participaron 153 MAP y 154 urólogos. Se identificaron 7 patrones asistenciales en atención primaria (AP). El uso de recursos sanitarios en el diagnóstico presenta cierta homogeneidad, empleando de 2,0 a 2,6 visitas, siendo las pruebas diagnósticas más habituales el análisis de PSA y de orina. En el seguimiento se observa heterogeneidad en el uso de recursos. Las visitas de seguimiento oscilan entre 3,2 y 7,0 visitas/paciente/año y el tipo de pruebas realizadas varía entre patrones y dentro del mismo patrón. En Urología se identificaron tres patrones asistenciales. Existe homogeneidad en el uso de recursos en el diagnóstico y en el seguimiento. La frecuencia de visitas es de 2 para el diagnóstico y entre 2,1 y 3,2 visitas/paciente/año en el seguimiento. Las pruebas más comúnmente realizadas en el diagnóstico y en el seguimiento son el análisis de PSA y el tacto rectal.

**Conclusiones:** En AP la asistencia prestada al paciente con HBP está sujeta a variabilidad, encontrándose 7 patrones asistenciales diferentes con un seguimiento heterogéneo entre patrones y dentro del mismo patrón. Esta situación podría justificar la necesidad de difusión e implantación de protocolos asistenciales.

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**Introduction**

Benign prostatic hyperplasia (BPH) is characterized by histologic growth of the prostate gland, which causes an obstruction of the urine outflow, manifesting clinically with the so-called lower urinary tract symptoms.<sup>1</sup> It is a chronic and progressive disease that, in later stages, can lead to complications such as acute urinary retention, infections, or renal failure.<sup>2</sup>

BPH is one of the most common diseases of males. In Spain, a prevalence of 11.8% in men older than 40 is estimated, and it may reach 30% in men older than 70.<sup>3</sup> It is the first cause of consultation in the Department of Urology, and the second cause of admission for surgery in men over 50.<sup>4</sup> Given the progressive aging of the population, an increasing number of men suffering from this pathology is expected in the future.<sup>5,6</sup>

Chronic diseases, such as BPH, pose a high burden to the patient, society, and health systems by consuming many of the available resources.<sup>7</sup> There is, therefore, a growing concern not only to improve the clinical quality provided to chronic patients but also to increase the efficiency of health systems, optimizing the use of health resources devoted to these diseases.<sup>8,9</sup>

Up to date, there are no studies published about the actual management of BPH in Spain, or on the health-care resources it consumes. That is why, we raised the

performance of a study to determine clinical practice provided to the patient with BPH currently in Spain and the consumption of healthcare resources associated with the management of this disease.

**Materials and methods****Design and study area**

We designed a cross-sectional descriptive study in primary care (PC) and specialized care (Urology) to identify patterns of health care provided to patients with BPH in Spain. The study was conducted through structured telephone interviews among a sample of GPs and urologists representatively distributed throughout the Spanish territory on the basis of the existing population in the autonomous communities.<sup>10</sup> The sample size calculation was based on a universe of 2200 urologists and 48,000 GPs identified in healthcare centers, primary care centers, and public hospitals.<sup>11</sup> The sample size required to estimate dichotomous variables with an accuracy of 8%, an  $\alpha$  risk of 0.05, and with the criterion of maximum indetermination ( $p=q=0.5$ )<sup>12</sup> is of 300 participants (150 GPs and 150 urologists), according to the following formula<sup>13</sup>:  $\text{Sample size} = Nz^2pq / (i^2(N-1) + z^2pq)$ , where "N" is the size of the population, "Z" the 1.96 value (for a  $\alpha$  risk of 5%), or 2.56 (for a  $\alpha$  risk of 1%), "P" the

expected frequency of the factor under study, “ $Q$ ” is  $1 - p$ , and “ $I$ ” the accuracy or admitted error. A panel of doctors consisting of 6 GPs and 2 urologists participated in the study design, in the definition of standard care, and in the subsequent analysis of the results.

## Variables and instrumentation

For the collection of the information, a questionnaire specifically designed for this research was designed. It consists of 33 closed questions, grouped into 4 sections: (a) environment (6 questions) that collects information on whether the BPH is included in the portfolio of services of the center, the training received on BPH, the clinical burden, the existence of specific guidelines or indicators of BPH in the workplace; (b) diagnosis (3 questions) that collects information on the tests performed for the diagnosis and the level of care where it is conducted; (c) treatment and follow-up (19 questions) that collects information about the frequency of follow-up visits, the tests performed, pharmacological treatment and the clinical level where it is performed; and (d) referral of clinical level (5 questions) that collects information on the cases of interconsultation between clinical levels and the reasons.

At the beginning of the interview, a question was added to act as a filter to avoid including doctors who did not regularly see patients with BPH in their office, and, therefore, could not accurately answer the questionnaire. The interviewers received training prior to field work.

The questionnaire was conducted twice, first with a PC doctor and a urologist to verify that it was feasible to carry out the telephone interviews and interpret the questions included in the questionnaire, and a second one with 10 GPs and 10 urologists to verify the most important aspects of the questionnaire and the interview itself, including whether the questions were understood correctly by the surveyed, if the duration of the interview was adequate, if there was rejection or fatigue during the questionnaire, and the process of coding and data analysis itself. The errors or problems encountered during the pilot study were solved prior to the beginning of the field work.

## Data analysis

For the data analysis, we used the SPSS version 13.0 statistical program. We performed a descriptive analysis of the qualitative variables of the study and the mean, median, and standard deviation were calculated for quantitative variables. For the quantitative variables in which there was more variability, the weighted average per number of responses was also calculated. A contrast statistical analysis of ratios was performed to study whether there were statistical differences between sociodemographic and clinical variables of the two samples (PC and Urology).

The 4 variables considered key for the definition of a clinical pattern were: making of the diagnosis (yes/no); classification of the disease based on symptoms (yes/no); prescription of the first drug treatment (yes/no); follow-up of the patient (yes/no). The different responses were grouped according to these 4 variables. Thus, *a priori*, there could be up to 16 different clinical patterns in both PC

**Table 1** Sociodemographic and clinical characteristics of the surveyed.

Characteristics	Total PC	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	Total URO	URO 1	URO 2	URO 3	$p^a$
Men (%)	65%	78%	70%	57%	40%	69%	67%	67%	90%	91%	91%	86%	<0.0001
Years since the end of the degree (average)	24	27	26	24	24	24	25	23	24	24	26	18	>0.05
Have received training on BPH in the last 2 years (%)	50%	56%	56%	43%	47%	51%	53%	44%	77%	78%	73%	68%	<0.0001
BPH is a part of the service portfolio of the center (%)	59%	61%	52%	86%	60%	67%	52%	66%	86%	86%	91%	86%	<0.0001
Has BPH specific clinical protocol (%)	24%	28%	19%	57%	27%	23%	26%	11%	64%	63%	64%	73%	<0.0001
Has an indicator of clinical quality of BPH (%)	7%	28%	4%	0%	0%	8%	0%	0%	16%	18%	18%	9%	>0.05
Has an indicator of pharmaceutical prescription for BPH (%)	6%	11%	4%	29%	13%	5%	0%	0%	4%	5%	9%	0%	>0.05

<sup>a</sup> Comparative statistical analysis of proportions between sample of PC and sample of Urology.

**Table 2** Clinical patterns of BPH management identified in primary care.

Perform diagnosis	% (N)	Classify BPH	% (N)	Start treatment	% (N)	Perform follow-up	% (N)	Follow all kinds of patients	% (N)	Clinical pattern
Yes	87% (133)	Yes	44% (67)	Yes	30% (45)	Yes	30% (45)	Yes	12% (18)	PC 1
						No	0% (0)	No	18% (27)	PC 2
				No	14% (22)	Yes	15% (22)	Yes	NA	–
						No	0% (0)	No	5% (7)	PC 3
		No	43% (66)	Yes	25% (39)	Yes	25% (39)	Yes	10% (15)	PC 4
						No	0% (0)	No	NA	–
				No	18% (27)	Yes	25% (39)	Yes	25% (39)	PC 5
						No	0% (0)	No	NA	–
				Yes	18% (27)	Yes	18% (27)	Yes	18% (27)	PC 6
						No	0% (0)	No	NA	–
No	13% (20)	Yes	3% (5)	Yes	3% (4)	Yes	3% (4)	Yes	3% (4)	–
						No	0% (0)	No	NA	–
				No	<1% (1)	Yes	<1% (1)	Yes	<1% (1)	–
						No	0% (0)	No	NA	–
		No	10% (15)	Yes	4% (5)	Yes	3% (5)	Yes	3% (5)	–
						No	0% (0)	No	NA	–
				No	7% (10)	Yes	6% (9)	Yes	6% (9)	PC 7
						No	<1% (1)	No	<1% (1)	–

Perform diagnosis: 87% (PC 1–6); classify BPH: 47% (PC 1–4); start treatment: 61% (PC 1, 2, 5); perform follow-up: 100% (PC 1–7).

and Urology. The use of healthcare resources associated with each pattern was later determined, defined by the frequency of visits, the type and frequency of testing, and drug treatment.

## Results

A total of 307 telephone interviews were carried out, 153 to GPs and 154 to urologists. Fieldwork was conducted during the months of April and May 2010, and each interview lasted approximately 20 min.

### Characteristics of the surveyed

The main sociodemographic and clinical characteristics of the doctors interviewed are listed in Table 1. 65% of the GPs and 91% of the urologists interviewed were male, with an average of 24 years of professional practice.

50% of the GPs said they had received specific training for BPH in the past two years, compared to 77% of the urologists, these differences being statistically significant ( $p < 0.0001$ ). 24% of the GPs reported following some kind of BPH-specific guide or protocol, compared with 64% of urologists; these differences were also statistically significant ( $p < 0.0001$ ). Both in PC and in Urology, the existence of indicators of clinical quality or specific drug prescription for BPH is low, with no differences between the two samples ( $p > 0.05$  in both cases) (Table 1).

According to the key variables for the definition of a clinical pattern, 87% of the GPs surveyed reported performing the diagnosis of BPH without referral of clinical level, 61% starting drug treatment after diagnosis, and 100% performing the follow-up of the patients. In Urology, 100% of the urologists surveyed reported performing the diagnosis and follow-up of the patient, the main difference between them being classifying the patients according to their symptoms or not. The differences found between PC and Urology are significant ( $p < 0.0001$ ) in the diagnosis, early treatment, and classification.

### Clinical patterns identified in primary care

The GP responses were grouped based on the key variables for the definition of clinical patterns by the panel of experts. After the grouping of the responses into patterns, only the patterns that grouped more than 5% of the responses were selected, there being 5 different patterns. Subsequently, the panel decided to conduct a second analysis of the responses, making a sub-classification depending on whether the follow-up was performed in all the patients, regardless of the intensity of the symptoms, or if some group of patients was derived to specialist care. After this second analysis, 7 different clinical patterns were found in PC (Table 2).

In 6 of the identified patterns, the patient's diagnosis was performed; in 4, the patients were classified according to their symptoms, distinguishing between mild, moderate, or severe symptoms; in 3, drug treatment was started; follow-up of the patients was performed in all the patterns, although this follow-up is different depending on whether the patients are classified according to their symptoms or not. Thus, in the patterns that do not classify (PC 5–7), the follow-up in each pattern is the same for all the patients; in the patterns that differ in symptomatology (PC 1 and 3), a specific follow-up is performed depending on whether they are mild, moderate, and severe patients; and finally, in the remaining patterns (PC 2 and 4), follow-up is performed only in mild and moderate patients, referring severe ones to Urology.

The most prevalent pattern (PC 5) comprises 25% of GPs. In this, the patient is diagnosed and treated in PC, but the GPs prescribe not to take into account the severity of the symptoms at the time of initiating drug treatment or follow-up of the patient. The next two most prevalent patterns (PC 2 and 6) group 18% of the GPs each. In the PC 2 pattern, the patient is diagnosed, classified according to their symptoms, treated, and followed in PC; with the exception of the patients with severe symptoms, who are referred to Urology. In the PC 6 pattern, the patients are diagnosed and followed in PC without distinguishing according to severity, but they are derived to Urology for the initial prescription of pharmacological treatment.

**Table 3** Use of healthcare resources associated with the diagnosis of BPH in primary care.

Tests	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6
Necessary visits for diagnosis	2.1 [1–4]	2.1 [1–4]	2.6 [2–5]	2.0 [1–3]	2.2 [1–4]	2.0 [1–3]
PSA	100%	100%	86%	100%	97%	100%
IPSS	100%	89%	86%	80%	74%	78%
Rectal examination	89%	44%	71%	60%	67%	67%
Urinalysis	100%	96%	100%	93%	82%	93%
Creatinine	100%	89%	86%	100%	82%	74%
Glycemia	100%	74%	43%	87%	72%	78%
Dipstick	72%	74%	71%	60%	72%	78%
Abdominal ultrasound	72%	44%	43%	60%	54%	22%
Transrectal ultrasound	17%	7%	29%	13%	10%	4%
Uroflowmetry	0%	7%	0%	0%	5%	0%
Urodynamic study	11%	7%	0%	0%	3%	0%
Cystoscopy	0%	7%	0%	0%	3%	0%

Pattern PC 7 does not make diagnosis. IPSS: International Prostate Symptom Score; PSA: prostate specific antigen.



Once the responses were grouped into clinical patterns, an analysis of healthcare resource consumption associated with each pattern was carried out, from the questions answered in the questionnaire sections on diagnosis, treatment, and follow-up. Table 3 shows the medical resources used during the diagnosis in the patterns that perform it. The average number of visits used ranges between 2.0 and 2.6. There is some homogeneity in carrying out some diagnostic tests among the patterns, such as the analysis of prostate specific antigen (PSA) or urinalysis. However, for other tests, there is great variability, as in the case of rectal examination, whose percentage of completion ranges between 44 and 89%, or abdominal ultrasound, which ranges between 22 and 72% (Table 3).

In relation to the follow-up, we can distinguish between the patterns that perform a differential follow-up according to symptomatology (PC 1–4) and those that do not (PC 5–7) (Table 4). In the latter, the weighted average of follow-up visits ranges between 2.8 and 5.2 visits/patient/year, while in the first, the follow-up frequency varies depending on the patient's symptoms. The weighted average number of visits ranges between 4.7 and 7.2 visits/patient/year. The type of tests performed during the follow-up varies among patterns and within the same pattern. Thus, for example, the International Prostate Symptom Score (IPSS) is performed in between 48 and 89% of cases, and rectal examination in between 15 and 61%. The most prescribed starting pharmacological treatment in patterns starting treatment (PC 1.2 and 5) are the antagonists of alpha-adrenergic receptors ( $\alpha$  blockers), regardless of the severity of the patient's symptoms.

### Assistential patterns identified in Urology

Urologists' responses were grouped in the same way, from the variables that define a clinical pattern and selecting only the patterns that grouped more than 5% of the responses. In this case, we found greater homogeneity, fewer clinical patterns (URO 1–3), and 78% of the responses were grouped into a single pattern (URO 1) where the diagnosis, treatment, and follow-up are done in the field of Urology, classifying patients according to their symptoms (Table 5).

We studied the use of healthcare resources associated with the diagnosis and follow-up of the patient in each pattern. In relation to the diagnosis, both the number of visits and the type of diagnostic tests used are similar among the three patterns. The average number of visits used is two, the most widely used diagnostic tests being PSA (100%) and rectal examination (96–100%).

The follow-up differs among patterns: URO 1 and 2 perform a differential follow-up as patients present mild, moderate, or severe symptoms, while URO 3 follows all the patients equally. However, both the frequency of the visits and the tests performed are similar in all three. The weighted average number of visits during the follow-up ranges between 1.8 and 3.2 visits/patient/year. The most commonly performed tests in the follow-up are also PSA and rectal examination (Table 6).

The URO 2 pattern prescribes referring the patient to PC once it is diagnosed. In contrast, the URO 1 and 3 patterns start pharmacological treatment after diagnosis. In URO 1,

Table 4 Use of healthcare resources associated with BPH follow-up in primary care.

	PC 1			PC 2			PC 3			PC 4		PC 5	PC 6	PC 7
	MIL	MOD	SE	MIL	MOD	SE	MIL	MOD	SE	MIL	MOD			
Number of visits/year	4.7 [2–12] 94%	5.7 [2–12] 77%	7.2 [2–12] 94%	5.8 [1–12] 74%	7.1 [1–12] 77%		6.0 [1–12] 57%	5.7 [2–12] 57%	6.6 [2–12] 86%	6.9 [1–12] 67%	4.7 [1–12] 67%	3.9 [1–12] 72%	2.8 [2–12] 74%	5.2 [2–12] 100%
PSA	83%	71%	89%	74%	71%		86%	86%	86%	67%	67%	49%	48%	78%
Rectal examination	44%	24%	61%	22%	24%		29%	43%	29%	20%	33%	15%	26%	22%
Urinalysis	89%	59%	89%	63%	59%		71%	57%	86%	60%	67%	51%	41%	78%
Creatinine	83%	77%	83%	78%	77%		71%	57%	71%	53%	67%	46%	33%	78%
Glycemia	78%	41%	78%	41%	41%		29%	29%	29%	27%	0%	41%	22%	44%
Dipstick	44%	53%	50%	37%	53%		57%	57%	43%	20%	67%	36%	33%	11%
Abdominal ultrasound	33%	24%	44%	11%	24%		14%	14%	14%	13%	0%	23%	7%	44%
Transrectal ultrasound	6%	0%	11%	0%	0%		14%	0%	0%	0%	0%	0%	0%	11%
Uroflowmetry	0%	0%	6%	0%	0%		0%	0%	0%	0%	0%	0%	3%	3%
Urodynamics study	6%	0%	11%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%
Cystoscopy	0%	0%	6%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%

Patterns PC 5, 6, 7 do not differ in symptomatology; patterns PC 1, 3 follow mild, moderate, and severe patients; patterns PC 2 and 4 follow mild and moderate patients and refer severe ones. SE: severe; IPSS: International Prostate Symptom Score; MIL: mild; MOD: moderate; PSA: prostate specific antigen.

**Table 5** Clinical management of BPH management identified in Urology.

Perform diagnosis	% (N)	Classify BPH	% (N)	Start treatment	% (N)	Perform follow-up	% (N)	Clinical pattern
Yes	100% (154)	Yes	85% (131)	Yes	78% (120)	Yes	78% (120)	URO 1
				No	7% (11)	No	0% (0)	–
				No	7% (11)	Yes	7% (11)	URO 2
		No	15% (23)	Yes	14% (22)	No	0% (0)	–
				Yes	14% (22)	Yes	14% (22)	URO 3
				No	1% (1)	No	0% (0)	–
No	0% (0)	Yes	0% (0)	Yes	0% (0)	Yes	0% (0)	–
				No	0% (0)	No	0% (0)	–
				No	0% (0)	Yes	0% (0)	–
		No	0% (0)	Yes	0% (0)	No	0% (0)	–
				Yes	0% (0)	Yes	0% (0)	–
				No	0% (0)	No	0% (0)	–

the starting prescribed pharmacological treatment varies depending on the severity of the patient, phytotherapy being the most prescribed in mild patients and combination of  $\alpha$  blocker with 5-alpha reductase inhibitor (5-ARI). The most common treatment in the URO 3 pattern is  $\alpha$  blockers.

### Referral of clinical level

The most common reasons for referral from PC to Urology are confirmation of the diagnosis performed in PC (98%) or lack of response to the treatment (91%). Patients are also referred to the urologist in the case of abnormal results of some tests such as PSA (95%) or rectal examination (86%). 51% of the GPs refer patients to Urology for the prescription for a 5-ARI as the main reason for referral. Conversely, 86% of urologists prescribe referral of the patient to the GP after diagnosis for him to do the follow-up of the patient, regardless of the follow-up performed in Urology.

### Discussion

Improving the quality and efficiency of healthcare is one of the main aims of health systems.<sup>14</sup> We need to know the actual management of the diseases to find areas of improvement. Publications about the current state of the healthcare received by the patient in different pathologies in Spain are more and more abundant<sup>15,16</sup>; however, up to date, the care received by the patient with BPH had not been studied.

We describe the actual management of the patient with BPH in the two clinical levels and the relations between the two levels. In the field of PC, the healthcare received by the patient is more variable. Regarding the use of healthcare resources in PC, there is some homogeneity in the diagnosis. The most frequently performed tests are PSA and urinalysis. However, there is significant heterogeneity in the follow-up, both in the annual average number of visits and in the tests performed. If we look specifically at rectal examination, PSA, and IPSS, three of the tests recommended by

both the European guidelines<sup>17</sup> and the Spanish scientific societies,<sup>18</sup> there is also considerable heterogeneity regarding their implementation during the follow-up. The PSA is performed in 71% of cases, the IPSS in 57%, the rectal examination in 27%, and only in 21% are the three tests performed simultaneously. If analyzed according to the patterns, completion of the PSA ranges from 57 to 100%, the IPSS between 48 and 89%, and the rectal examination between 15 and 61%. Considering the three tests at the same time, the percentage of doctors who prescribe performing them during the follow-up ranges from 4 to 67%.

This variability found poses problems regarding quality and lack of equity in the care provided to patients, and inappropriate use of health resources, as patients receive different intensity of care depending on the patterns. In Urology, health resource consumption is more homogeneous than in PC, but it is also greater. A number of different tests that are not carried out in PC, such as uroflowmetry or urodynamic study, are performed both at diagnosis and follow-up. The greater intensity of resources devoted to specialized care, when compared to primary care, is a fact in the literature.<sup>19</sup>

Some of the sociodemographic and clinical characteristics of the PC sample could explain the great variability detected. The active implementation of guidelines and protocols for clinical practice in PC, linked to training, communication, or even specific indicators, might help reduce the variability found and improve clinical quality.<sup>20</sup> Interestingly, 98% of the GPs prescribe referral to Urology for confirmation of the diagnosis made in PC, even when PC provides the material means to do so.<sup>21</sup> On the other hand, the fact that 86% of urologists prescribe referral of the patient to PC to perform a follow-up at both levels also indicates the overuse of medical resources and duplication of tests, so, it would be advisable to increase greater coordination among levels of care.

Several studies have shown that the results of the telephone interviews and personal interviews are similar, making phone interviews a valid option for health research.<sup>22–25</sup>

**Table 6** Use of healthcare resources associated with the diagnosis and follow-up of BPH in Urology.

Tests	Diagnosis			Follow-up					
	URO 1	URO 2	URO 3	URO 1			URO 2		
				MIL	MOD	SE	MIL	MOD	SE
PSA	100%	100%	100%	92%	91%	92%	100%	100%	100%
IPSS	80%	91%	86%	65%	65%	65%	82%	82%	100%
Rectal examination	98%	100%	96%	73%	79%	81%	64%	64%	64%
Urianalysis	86%	82%	64%	66%	64%	66%	64%	65%	64%
Creatinine	89%	82%	64%	63%	65%	71%	73%	73%	73%
Glycemia	68%	54%	50%	41%	43%	78%	46%	46%	46%
Dipstick	34%	27%	27%	21%	20%	49%	27%	27%	27%
Abdominal ultrasound	84%	91%	82%	50%	65%	76%	55%	64%	82%
Transrectal ultrasound	44%	27%	55%	21%	23%	47%	27%	18%	27%
Uroflowmetry	76%	91%	90%	41%	59%	74%	36%	73%	73%
Urodynamic study	25%	27%	23%	6%	8%	20%	9%	9%	9%
Cystoscopy	26%	36%	23%	4%	8%	20%	9%	9%	9%
Visits	1.9	2.0	2.0	1.9	2.4	3.2	1.8	2.0	3.2
	[1–9]	[1–4]	[1–4]	[1–4]	[1–4]	[1–4]	[2–4]	[2–2]	[2–4]

Pattern URO 3 does not distinguish by symptoms. SE: severe; IPSS: International Prostate Symptom Score; MIL: mild; MOD: moderate; PSA: prostate specific antigen.

However, this work has a number of limitations that must be taken into account when interpreting the results. The first limitation, inherent to the methodology itself, which collects the information from interviews with physicians and not from review of medical records, is a possible recall bias,<sup>12</sup> also underestimating the healthcare resources consumed. The second limitation is the definition of the clinical pattern, since another definition could lead to different results. However, this definition was made in response to the recommendations and guidelines for clinical practice in Spain and Europe.<sup>17,18</sup> In relation to the panel, its members were selected based on their clinical experience recognized, and no member has a conflict of interest, as it is indicated in the methodological recommendations on expert panels.<sup>26,27</sup> The study was not designed with statistical power to obtain representative data of autonomous communities.

In conclusion, this study reflects the current management of BPH in Spain and it shows clinical variability, mainly in clinical settings of primary healthcare. The spreading and implementation of clinical practice guidelines and protocols might help reduce the variability found and optimize the use of resources, improving coordination between the two clinical levels and the efficiency of the health system itself.

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## Conflict of interest

Drs. Isabel Pérez Escolano and Alicia Huerta are employees of GlaxoSmithKline.

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