

# To Pee or Not To Pee? The Utility of Bladder Scans in Multiple Sclerosis

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## BACKGROUND

- Bladder dysfunction is common in MS and can present with detrusor overactivity and dyssynergia, urinary retention, frequency, urgency, incontinence, and incomplete bladder emptying.
- Urinary retention may be asymptomatic in some cases, increasing the risk of recurrent urinary tract infection (UTI) and resultant hydronephrosis and renal dysfunction.
- Measurement of post void residual (PVR) in the office setting may assist in making a treatment plan and the management of urinary symptoms in some cases.

## OBJECTIVE

- To evaluate the frequency of asymptomatic urinary retention and UTIs to assess the utility of PVR measurement in the office setting.
- To examine the correlation of urinary symptoms with the presence of spinal cord lesions.

## METHODS

- We prospectively studied 101 consecutive MS patients over a 3-month interval in an MS clinic during routine visits.
- Each patient was given the Urogenital Distress Inventory (UDI), Incontinence Impact Questionnaire (IIQ), and additional questions to assess UTI history and management (see below).
- A patient was considered asymptomatic if he or she scored 0 or 1 on both scales and had no history of UTIs in the past year.
- PVR was obtained using a Bladder Scan BVI3000.
  - A PVR >50 mL was defined as abnormal (+ PVR).
- Urinalysis and culture were performed on all patients, and those with abnormal PVR were further screened with renal ultrasound and serum BUN/creatinine levels.
- Patients were excluded if they had an indwelling catheter or were unable to transfer to the exam table.

### Urogenital Distress Inventory

Respond to the questions below using the following scores:

(0) = Not at all (1) = Slightly (2) = Moderately (3) = Greatly

The scores you select should reflect your present condition/situation

Do you experience, and if so, how much are you bothered by:

- |   |   |   |   |   |
|---|---|---|---|---|
| 1) Frequent urination?  | 0 | 1 | 2 | 3 |
| 2) Leakage related to feeling of urgency?                       | 0 | 1 | 2 | 3 |
| 3) Leakage related to physical activity, coughing, or sneezing? | 0 | 1 | 2 | 3 |
| 4) Small amounts of leakage (drops)?                            | 0 | 1 | 2 | 3 |
| 5) Difficulty emptying bladder?                                 | 0 | 1 | 2 | 3 |
| 6) Pain or discomfort in the lower abdominal or genital area?   | 0 | 1 | 2 | 3 |

## RESULTS

- A total of 101 patients were surveyed; 70 had relapsing-remitting multiple sclerosis (RRMS) and 31 had progressive multiple sclerosis (PMS) (Table 1).
  - 90% were female, 10% were male
  - Mean age = 51 years
- 20% of the total population had abnormal PVR.
- UTI was seen in 50% of patients with abnormal PVR compared with 26% with normal PVR.
- In the RRMS patients, 20% were asymptomatic, but of these, only one had abnormal PVR (Figure 1).
- All PMS patients had urinary symptoms, but only 39% had abnormal PVR. In PMS patients, UTIs were seen in roughly equal frequency in those with abnormal PVR (42%) and those with normal PVR (32%) (Figure 2).

Table 1. Demographics

	Total (n=101)	RRMS (69%) (n=70)	PMS (31%) (n=31)
Mean age, years	50 (26-73)	47 (26-62)	57 (26-73)
Male	10%	9%	13%
Female	90%	91%	87%
Mean disease duration since first symptom, years	12 (1-42)	11 (1-35)	16 (4-42)
Spinal cord disease on MRI	80%	73%	97%

### Incontinence Impact Questionnaire

Respond to the questions below using the following scores:

(0) = Not at all (1) = Slightly (2) = Moderately (3) = Greatly

The scores you select should reflect your present condition/situation

Has urine leakage affected your:

- |  |   |   |   |   |
|--|---|---|---|---|
| 1) Ability to do household chores (cooking, housecleaning, laundry)? | 0 | 1 | 2 | 3 |
| 2) Physical recreation such as walking, swimming, or other exercise? | 0 | 1 | 2 | 3 |
| 3) Entertainment activities (movies, concerts, etc.)?                | 0 | 1 | 2 | 3 |
| 4) Ability to travel by car or bus more than 30 minutes from home?   | 0 | 1 | 2 | 3 |
| 5) Participation in social activities outside your home?             | 0 | 1 | 2 | 3 |
| 6) Emotional Health (nervousness, depression, etc)?                  | 0 | 1 | 2 | 3 |
| 7) Feeling frustrated?   | 0 | 1 | 2 | 3 |

Figure 1. RRMS patients: Urinary retention and association with reported symptoms and UTI history

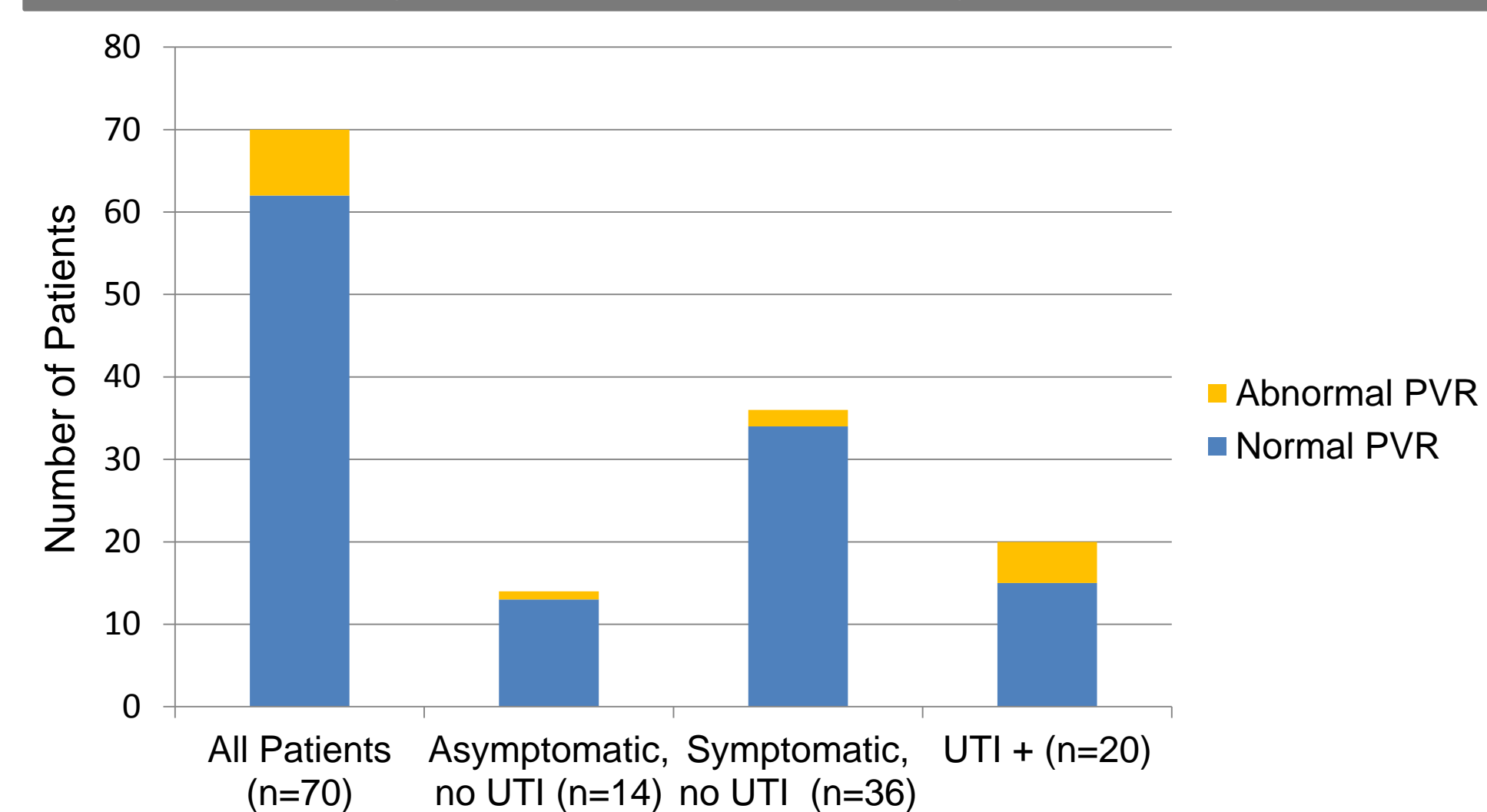


Table 2. Urinary retention and association with reported symptoms and UTI history

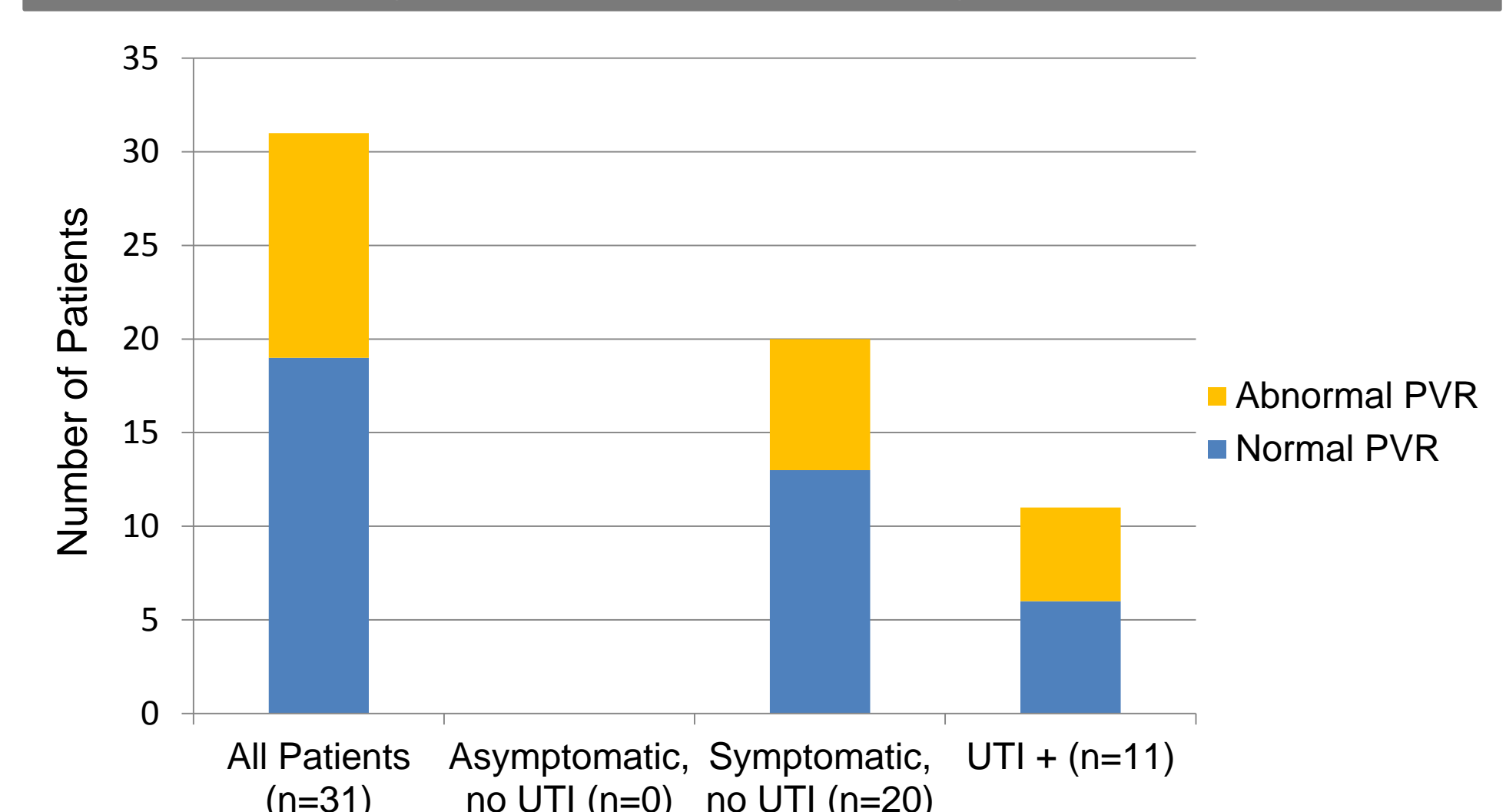
	Asymptomatic*	+ UTI
<b>Total</b>		
+ PVR (n=20)	1 (5%)	10 (50%)
- PVR (n=81)	13 (16%)	21 (26%)
<b>RRMS</b>		
+ PVR (n=8)	1 (13%)	5 (63%)
- PVR (n=62)	13 (21%)	15 (24%)
<b>PMS</b>		
+ PVR (n=12)	0	5 (42%)
- PVR (n=19)	0	6 (32%)

\*Asymptomatic on both scales and no history of UTI.

### Additional Questions

- Have you ever had a urinary tract infection?
  - If yes, were you treated with antibiotics?
- Approximately how many UTIs have you had in the past year?
- In ounces, what is your average fluid intake per day of water, other decaffeinated beverages, and caffeinated beverages?
- Approximately how many times do you urinate per day?
  - OR- Approximately how many times do you urinate every few hours?
- Approximately how many times do you need to get up at night to urinate?
- Are you currently on any medications for urinary symptoms?
  - If yes, provided medication(s), dosage, and frequency
- Do you take cranberry tabs, cranberry products, or vitamin C to help with urinary symptoms?
  - If yes, provide product(s), dosage, and frequency
- Do you wear a pad on a daily basis due to leakage or incontinence?

Figure 2. PMS patients: Urinary retention and association with reported symptoms and UTI history



## CONCLUSIONS

- In our population, there was a high incidence of urinary symptoms (RRMS, 80%; PMS, 100%), as well as a high percentage of patients with spinal cord disease on MRI (RRMS, 73%; PMS, 97%).
- All PMS patients had urinary symptoms (regardless of PVR), and there was no correlation between PVR and UTI risk in these patients.
- In RRMS patients, there was only one asymptomatic patient with abnormal PVR who barely met criteria (PVR 51cc), suggesting that occult retention may be relatively infrequent.
- As expected, those who retained were more likely to have a history of UTI (50%) compared with normal PVR (26%), but this association was predominant in RRMS patients. None of the patients who retained had abnormalities associated with their renal scans or serum BUN/creatinine.
- Measurement of PVR in the office can be used to identify urinary retention, but presence of symptoms may be of equal sensitivity (but not necessarily specificity) in detecting abnormal PVR.
- In our population, all but one patient with abnormal PVR had symptoms and/or history of UTI.
- The standardized questionnaires (UDI, IIQ) did not identify symptomatic patients better than a careful and thorough clinical history.
- For symptomatic patients, measurement of PVR did not alter clinical decision-making or provide additional useful information.
- Occult retention may occur in a small but meaningful percentage of patients with RRMS, and measurement of PVR is most valuable for identifying this group.