

## CAN THE SYMPTOM OF 'HESITANCY' BE MEASURED OBJECTIVELY USING THE TOTO FLOWSKY DEVICE?

### Hypothesis / aims of study

International Continence Society (ICS) defined 'hesitancy' as when an individual describes difficulty in initiating micturition resulting in a delay in the onset of voiding after the individual is ready to pass urine (1). It is one of the bothersome voiding symptoms experienced during voiding along with slow stream, splitting or spraying, intermittency and straining. Symptom of hesitancy is subjective.

The European Association of Urology (EAU) guideline recommends uroflowmetry as a diagnostic assessment in the workup of patients with lower urinary tract symptoms (LUTS) and is an obligatory test prior to surgical intervention (2). Measurement of urine flow includes flow rate, voided volume, maximum flow rate, voiding time, flow time, average flow and time to maximum flow.

Patient's anxiety, environment, volume of voided urine and timing can affect the uroflow tracing. The current uroflowmetry device is unable to measure the symptoms of hesitancy.

Our aim was to measure the flow of urine in a normal toilet environment according to the severity of patient's LUTS using TOTO FlowSky device.

### Study design, materials and methods

The Toto Flowsky device is a toilet bowl with dynamic sensors incorporated into it, thereby allowing patients to void in a familiar environment. Patient pressed the activating button to initiate the voiding process. The whole urinary flow would capture the start to the end of the voiding phase – Time prior to initiation of voiding (hesitancy), maximum flow rate (Qmax), voiding time, volume of voided urine and residual volume.

We recruited 55 males with LUTS. After encouragement of fluid intake, a pre-void bladder scan was done once they experienced 'a sensation to void'. If the bladder scans were between 200 – 400mls, they were allowed to void.

Patients completed the International Prostate Symptom Score (IPSS) Questionnaire and a Patient's Anxiety Questionnaire (Gad-7). Analysis was done using paired student t-test.

### Results

55 subjects with LUTS (mean aged 64 years old) completed the study. Their results were summarized in Table 1.

Table1: Results according to Mild/Moderate/Severe IPSS

	MILD IPSS	MODERATE IPSS	SEVERE IPSS	p-Value
Number	18	31	6	
Age	62	66	66	
IPSS	4.9 (2-7)	12.1 (8-19)	26.5 (20-35)	
QoL	2.0 (0-6)	2.1 (0-5)	4.8 (4-6)	
Anxiety Score	1.1 (0-4)	3.2 (0-21)	9.8 (0-21)	
Mean Qmax (ml/s)	14.6 ± 6.0	14.8 ± 6.5	13.6 ± 5.9	0.913
Mean Voided Volume/ml	258.6 ± 108.1	288.1 ± 91.0	265.2 ± 85.2	0.567
Mean Residual Volume/ml	71.9 ± 98.0	65.1 ± 64.2	49.8 ± 38.2	0.822
Mean Voiding Time/sec	49.3 ± 36.5	52.3 ± 28.1	62.1 ± 45.7	0.715
Mean Time to Qmax/sec	20.1 ± 21.5	12.6 ± 10.4	13.6 ± 15.6	0.266
Mean Flow Time/sec	36.2 ± 28.1	42.5 ± 19.8	44.8 ± 18.9	0.586
Mean Hesitancy Time/sec	15.8 ± 17.7	23.2 ± 23.1	48.3 ± 46.5	0.028

Value expressed as a mean ± Standard Deviation

Qmax – Maximum flow rate

Voiding Time – The time from start to end of urination

Flow Time – Time during which there is urine flowing

Hesitancy Time – Time of initiation of urination process to the start of the urine stream

### Interpretation of results

There was no significant difference found in Qmax, VV, and residual volume, voiding time, time to maximum flow and flow time. Significant difference was found in hesitancy time with hesitancy increasing with worsening IPSS score.

### Concluding message

TOTO Flowsky device was able to capture the full spectrum of the urinary flow from initiation of the urinary process to start and end of the urine flow. This device was able to measure the 'hesitancy phase' of the urine flow. Patients with worsening IPSS score had prolonged hesitancy compared to those with mild IPSS score. It is the first device to capture this LUTS symptom in an objective manner.

By improving the quality of the uroflow tracing, clinician could quantify and assess the severity of the patient's LUTS objectively. It would allow us to determine any improvement after commencement with medical therapy or after surgical intervention.

### References

1. The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn.* 2002;21(2):167-78.
2. Guidelines on the Management of Non-Neurogenic Male Lower Urinary Tract Symptoms (LUTS), incl. Benign Prostatic Obstruction (BPO) – EAU Guidelines 2015

### Disclosures

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