### Background
Management of lower urinary tract symptoms (LUTS) in male patients using current diagnostic categories, such as benign prostatic hyperplasia (BPH), or based on a single symptom, such as urgency urinary incontinence (UUI), is sometimes unsatisfactory.

### Objective
To improve our understanding of the subtypes of men with LUTS, and to explore an alternative to extant diagnostic categories using a novel method of unbiased classification of symptom clusters based on detailed multi-symptom information.

### Methods
We analyzed baseline symptom questionnaire data from 503 care-seeking men enrolled in the LURN Observational Cohort study. Symptoms were measured using the LUTS Tool and AUA Symptom Index (52 questions total). A probability-based consensus clustering algorithm was used to identify groups with distinct symptom signatures.

### Results
Figure 1. Consensus matrix as a color map and dendrogram for hierarchical clustering. Each element of the 503 by 503 matrix represents the probability that the respective pair of participants both belong to the same cluster. Probability is color-coded: bright blue (0.0) – probability close to one, dark blue (1.0) – probability close to zero. Four respective pair of participants both belong to the same cluster.

Figure 2: Symbol signatures of four clusters as radar plots

Figure 3: Pairwise comparison of the clusters. Severity of LUT symptoms

Figure 4: Pairwise comparison of the clusters. Patient reported outcomes (PROs) not used for clustering

Figure 5: Summary / Conclusions

### Summary / Conclusions
Four distinct clusters of men with LUTS were identified. Patients in cluster M1 (n=166) had predominant symptoms of frequency, hesitancy, straining, weak stream, intermittency and incomplete bladder-emptying, consistent with “classic” bladder outlet obstruction. Patients in cluster M2 (n=93) endorsed mainly post-micturition symptoms (e.g., post-voiding dribbling), with some weak stream and post-void leakage. Patients in cluster M3 (n=114) reported mostly frequent while those in cluster M4 (n=130) reported severe frequency, urgency and urinary incontinence. The majority of symptoms were statistically different between pairs of clusters. Patient reported outcomes of bowel symptoms, mental health, sleep dysfunction, erectile function, and urologic pain presented at significantly different levels across the clusters. Further subtype refinement will incorporate clinical assessments and other data collected.