

Wireless device enables catheter-free bladder pressure monitoring

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A wireless device called the UroMonitor enables accurate, noninvasive monitoring of bladder pressure in patients with overactive bladder, reports a pilot study in the July issue of *The Journal of Urology*, an official journal of the American Urological Association (AUA).

"The UroMonitor is the first device to enable catheter-free telemetric ambulatory [bladder pressure](#) monitoring in humans," comments senior author Margot S. Damaser, Ph.D., of Cleveland Clinic. "With further evaluation, the UroMonitor may provide a safe and reliable way to identify bladder events under more [natural conditions](#), compared to standard testing in the urodynamic lab."

New technology for continuous, catheter-free bladder pressure monitoring

Patients with incontinence and other urinary problems routinely undergo urodynamic testing to assess functioning of the lower urinary tract. However, these tests have important limitations—including the need for catheter placement and instillation of fluid into the bladder, which can be uncomfortable for the patient and may not reflect normal daily functioning.

The UroMonitor was developed as a noninvasive approach for assessing function of the lower urinary tract, without the need for catheter placement. The UroMonitor is a small, flexible device—no more than two inches across—that is placed into the patient's bladder. Once in place, the device wirelessly transmits bladder pressure data to a small radio receiver taped to the lower abdomen.

In a [pilot study](#) to evaluate clinical safety and accuracy, Dr. Damaser and colleagues tested the UroMonitor in 11 women (median age 67 years) with symptoms of [overactive bladder](#). After the patients underwent initial urodynamic testing, the UroMonitor device was inserted into the bladder via the urethra. Urodynamic testing was then repeated, with simultaneous transmission of bladder pressure data.

After catheter removal, the UroMonitor provided further bladder

pressure measurements as the patients ambulated (average time 60 minutes) and eventually urinated, after which the device was easily removed. Patient comfort and pain scores were monitored throughout the study and at two days' follow-up.

With further study, UroMonitor may avoid invasive urodynamic testing in some patients

The UroMonitor device was quickly and easily placed: median insertion time 17.5 seconds. There were no changes in urodynamic measurements made before versus after device placement. One patient had signs of bladder muscle spasms (detrusor overactivity) after UroMonitor placement. However, detrusor overactivity was much more frequent during urodynamic testing, possibly due to catheter-related irritation of the bladder.

Clinically relevant changes in bladder pressure detected by the UroMonitor aligned well with those measured on urodynamic testing. Ninety-eight percent of bladder pressure events detected by urodynamic testing were accurately detected by the UroMonitor. A few events were missed due to radio interference—a technical issue that was corrected later in the study.

Average differences in simultaneous urodynamic and UroMonitor measurements were small. Patients reported little or no pain during most phases of the study, and there were no adverse effects or complications related to the device.

The UroMonitor provides "a safe and clinically feasible approach for telemetric ambulatory urodynamic monitoring," the preliminary study suggests. The device seems to perform "exceedingly well" in identifying clinically significant bladder pressure events that could otherwise be

captured only by standard urodynamic studies with catheter placement.

While further studies are needed, the UroMonitor may "more accurately reproduce bladder function" in patients with lower urinary tract symptoms. Using this along with other noninvasive methods, "Urologists may be able to more adequately capture a patient's true voiding behaviors and defer invasive urodynamic studies in select [patients](#)," Dr. Damaser and co-authors conclude.

More information: Brendan T. Frainey et al, First in Human Subjects Testing of the UroMonitor: A Catheter-free Wireless Ambulatory Bladder Pressure Monitor, *Journal of Urology* (2023). [DOI: 10.1097/JU.0000000000003451](#)

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