

Urodynamic Testing

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MCG Health
Ambulatory Care
30th Edition

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Clinical Indications

- Urodynamic testing may be indicated for **1 or more** of the following(1)(2):
 - Bladder outlet obstruction, suspected(4)(6)[N](#)
 - Diagnosis of type of urinary incontinence (eg, stress, urgency, mixed) remains uncertain based on history or clinical findings.(4)(7)(8)[N](#)
 - Failure of conservative care for incontinence (eg, pelvic floor muscle training)(3)[N](#)
 - Neurogenic bladder, known or suspected (eg, due to multiple sclerosis, spinal cord injury, spina bifida)(10)(11)(12)(13)[N](#)
 - Overactive bladder, and failure of pharmacologic therapy (eg, anticholinergic medication, onabotulinumtoxinA)(4)[N](#)
 - Pelvic organ prolapse greater than 1 cm proximal to the hymen (ie, Pelvic Organ Prolapse Quantification system stage II or greater or Baden-Walker grade 2 or greater)(4)(16)(17)[N](#)
 - Postvoid residual urine volume greater than 150 mL(4)(18)[N](#)
 - Presurgical evaluation needed for **1 or more** of the following(4)(8)(19)(20)(21):[N](#)
 - Artificial urinary sphincter(25)
 - Retropubic suspension (eg, Burch colposuspension)
 - Sling procedure(23)(25)

- Urinary incontinence, with history of **1 or more** of the following:^{[N](#)}
 - Anti-incontinence surgery(18)(29)
 - Gynecologic surgery(18)
 - Radiation therapy
 - Radical pelvic surgery (eg, prostatectomy)(30)
 - Repair of hypospadias(31)
- Voiding dysfunction (eg, hesitancy, sensation of inadequate bladder emptying)(32)^{[N](#)}

Alternatives

- Alternatives include(18):
 - Cystoscopy. See Cystoscopy ^{[AC](#)} for further information.
 - Empiric therapy (eg, antimuscarinic medications for overactive bladder, pelvic floor rehabilitation). See Pelvic Floor Rehabilitation ^{[AC](#)} for further information.(4)(34)
 - Renal and bladder ultrasound. See Renal Ultrasound ^{[AC](#)} for further information.
 - Voiding cystourethrography. See Voiding Cystourethrography (VCUG) ^{[AC](#)} for further information.

Evidence Summary

Background

Urodynamic testing (eg, postvoid residual, cystometry, abdominal leak point pressure, pressure-flow studies, uroflowmetry, videourodynamics, pelvic floor electromyography) attempts to reproduce patient urinary symptoms in a monitored setting.(1)(3)(4)(5) **(EG 2)**

Criteria

The evidence for the clinical indications found in this guideline includes 23 published peer reviewed articles, 5 specialty society or other evidence-based guidelines, and 2 Cochrane systematic reviews.

For bladder outlet obstruction, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** A specialty society guideline based on a systematic review recommends urodynamic testing for patients with refractory urgency incontinence after bladder outlet procedures, for patients with neurogenic bladder to distinguish bladder outlet obstruction from detrusor hypocontractility or acontractility, and for men with lower urinary tract symptoms when invasive or irreversible interventions are being considered.(4) **(EG 2)**

When diagnosis of the type of urinary incontinence remains uncertain, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** A specialty society guideline based on a systematic review recommends urodynamic testing for patients with symptoms of stress, urgency, or mixed urinary incontinence prior to consideration of invasive or irreversible interventions.(4) **(EG 2)** An observational study of 263 patients with symptoms of pure stress urinary incontinence who underwent urodynamic testing found that 75% had the diagnosis confirmed, 11% had detrusor overactivity, 8% had combined stress urinary incontinence and detrusor overactivity, and 7% had inconclusive findings. At 12-month follow-up, of the 63 patients who did not have pure stress urinary incontinence, 52% were cured with antimuscarinic treatment.(9) **(EG 2)**

For failure of conservative care for incontinence, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Specialty society guidelines support the use of urodynamic testing after failure of conservative care

for incontinence.(3) **(EG 2)**

For neurogenic bladder, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** An evidence-based specialty society guideline based on a systematic review recommends pressure-flow analysis and postvoid residual determinations for evaluation of patients with neurologic conditions that may predispose to upper urinary tract complications.(4) **(EG 1)** A clinical guideline based on a systematic review recommends videourodynamic studies in individuals with neurologic disorders (eg, spinal cord injury, spina bifida) who are at high risk of renal complications and prior to surgery for neurogenic lower urinary tract dysfunction.(14) **(EG 2)** A specialty society guideline supports the use of urodynamic testing to supplement the clinical assessment of patients with neurogenic lower urinary tract dysfunction.(15) **(EG 2)**

For overactive bladder, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** An evidence-based specialty society guideline based on a systematic review recommends urodynamic testing in patients who desire surgical intervention following failure of conservative or pharmacologic therapy.(4) **(EG 1)**

For pelvic organ prolapse greater than 1 cm proximal to the hymen (ie, Pelvic Organ Prolapse Quantification system stage II or greater or Baden-Walker grade 2 or greater), evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** An evidence-based specialty society guideline based on a systematic review recommends urodynamic testing prior to pelvic organ prolapse repair in patients without symptoms of stress urinary incontinence because of the risk of postoperative occult stress urinary incontinence.(4) **(EG 1)**

For postvoid residual urine volume greater than 150 mL, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** Specialty society guidelines recommend urodynamic testing for patients with elevated postvoid residual urine volumes. Pressure-flow studies can help to differentiate between outflow obstruction and an underactive detrusor.(4)(18) **(EG 2)**

For presurgical evaluation, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** A systematic review and meta-analysis of 47 studies concluded that preoperative maximum urethral closure pressure and Valsalva leak point pressure results may be helpful in predicting the outcome (ie, persistent stress urinary incontinence) following midurethral sling surgery; however, specific predictive threshold values could not be established.(22) **(EG 1)** A systematic review and meta-analysis of 3 randomized controlled trials that compared presurgical office evaluation with or without urodynamic testing for women with suspected stress or mixed urinary incontinence found that there was no significant difference between groups with regard to subjective cure, objective cure, or complications such as voiding dysfunction or urinary urgency. The authors concluded that urodynamic testing does not add value to a comprehensive office evaluation in this clinical situation.(20)(23) **(EG 1)** A specialty society guideline states that urodynamic testing does not affect outcomes for women with uncomplicated stress urinary incontinence who have failed conservative treatment and are candidates for a urethral sling. However, urodynamic testing may be of benefit for patients with complicated stress urinary incontinence (eg, symptoms of urgency, incomplete emptying, incontinence associated with chronic urinary retention, functional impairment, or continuous leakage).(19) **(EG 2)** An observational study of 105 women with stage III and IV pelvic organ prolapse found that physical examination and urodynamic testing had a sensitivity of 89% and 87%, respectively, for the diagnosis of occult urinary stress incontinence. The authors concluded that urodynamic testing was not necessary to confirm the diagnosis of occult urinary stress incontinence.(24) **(EG 2)**

For urinary incontinence, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** A multicenter randomized trial involving 630 women with uncomplicated stress-predominant urinary incontinence reported that preoperative office evaluation was not inferior to urodynamic testing in terms of predicting postoperative treatment success at 12-month follow-up.(23) **(EG 1)** A secondary analysis of the 315 subjects who underwent urodynamic testing revealed that urodynamic study results changed the clinical diagnosis in nearly 57% of individuals, and the treatment plan, including surgical intervention, was altered in 14% of cases.(26) **(EG 2)** A systematic review and meta-analysis of 7 randomized (and quasi-randomized) controlled trials involving 1036 women concluded that, while urodynamic testing alters clinical decision making, there was some evidence that this effect did not result in better urinary incontinence rates after treatment.(27) **(EG 1)** Practice guidelines recommend that urodynamic testing is indicated to differentiate stress incontinence from urgency or mixed incontinence if the diagnosis cannot be made by history and physical examination. Guidelines also recommend urodynamic testing prior to invasive treatment of urinary incontinence, for evaluation of stress urinary incontinence coexistent with pelvic organ prolapse, and for investigation of treatment failure.(1)(3)(4)(28) **(EG 2)**

For voiding dysfunction, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** A systematic review of 2 studies (339 patients) of men with lower urinary tract symptoms and voiding dysfunction found limited evidence that urodynamic testing changed clinical decision making, resulting in fewer men undergoing surgery. However, there was no evidence to determine if urodynamic testing resulted in fewer symptoms or improved quality of life after treatment. Additional studies were recommended.(32) **(EG 1)** Retrospective review of data from 159 children with lower urinary tract dysfunction found that urodynamic testing was able to differentiate between 4 types of dysfunction that allowed targeted treatment. At a median follow-up of 13 months, repeat urodynamic testing and electromyography showed significant improvement in all groups. In addition, 85% of patients reported subjective improvement, 90% of incontinent patients had a decrease in the number of incontinent episodes, and 55% of patients were completely continent on targeted therapy.(33) **(EG 2)** A specialty society guideline recommends urodynamic testing for patients with symptoms suggestive of voiding dysfunction.(3) **(EG 2)**

Rationale

Use of this MCG care guideline helps the clinician determine if a particular treatment, medication, or service might be appropriate for a specific patient, taking into account their unique health complexities.

Use of these evidence-based clinical criteria to support decision making benefits the patient by identifying patient-specific complex clinical factors and conditions, promoting personalized treatment. Utilizing evidence-based clinical criteria promotes patient safety by helping ensure that potential patient benefits outweigh the risks. In addition, the use of evidence-based guidelines can increase consistency in treatment thresholds, leading to less variation in care and promoting equitable treatment among patients.

Related CMS Coverage Guidance

This guideline supplements but does not replace, modify, or supersede existing Medicare regulations or applicable National Coverage Determinations (NCDs) or Local Coverage Determinations (LCDs).

Code of Federal Regulations (CFR): 42 CFR 419.22(35); 42 CFR 422.101(36)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 14 - Medical Devices(37); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(38); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 16 - General Exclusions from Coverage(39)

Medicare Coverage Determinations: Medicare Coverage Database(40)

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