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MARY HERRIGAN CONNORS  
CENTER FOR WOMEN'S HEALTH

# URINARY INCONTINENCE:

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*Guide to Diagnosis and Management*®

WOMEN'S HEALTH CARE



# Urinary Incontinence Guideline Authors

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## Medical Impact

Urinary incontinence is a common health problem among women and is associated with impaired quality of life, social isolation, and poor self-rated health. Often, urinary incontinence places burdens on the caregivers and influences decisions to institutionalize elderly women. The medical consequences of incontinence include perineal candidal infections, cellulitis, and pressure ulcers. About 10-30 percent of women under age 65, 15-30 percent of women over age 65, and 50 percent of women living in nursing homes have urinary incontinence. Physicians must initiate a discussion about incontinence, since only half of incontinent women mention the problem at office visits, and often, when they do, their providers fail to prescribe treatment.

### The primary care clinician can play an important role in the management of urinary incontinence by

- diagnosing the disorder
- identifying its cause
- instituting appropriate therapy
- referring to subspecialists for treatment when indicated

## Types of urinary incontinence

There are three types of urinary incontinence, listed below. It is important to remember that some women, especially elderly women, may have a multifactorial etiology to their incontinence. Often, medications (such as diuretics) and co-morbid conditions (congestive heart failure, chronic obstructive pulmonary disease) can stress a barely compensated system and lead to incontinence. Also, dementia and arthritis can affect a woman's ability to get to the bathroom on time, leading to episodes of incontinence.

Type of Incontinence	Etiology	Clinical Presentation	Risk Factors
<b>Urge Incontinence (overactive bladder)</b>	<ul style="list-style-type: none"> <li>• Hyperactivity of detrusor muscle surrounding the bladder</li> <li>• Can occur with aging, or as the result of loss of CNS inhibitory pathways</li> <li>• Or from local bladder irritation</li> </ul>	<ul style="list-style-type: none"> <li>• Large volume</li> <li>• Patients complain of urgency, frequency</li> <li>• Urination stimulated by cues such as running water, opening door to the bathroom</li> <li>• Nocturia (&gt;2x/night) is a common feature</li> </ul>	<ul style="list-style-type: none"> <li>• Age—most common type of incontinence in elderly women</li> <li>• Dementia</li> <li>• Stroke and cervical spine stenosis can interrupt inhibitory pathways to the detrusor muscles</li> <li>• Bladder irritants (infection, bladder stones, neoplasms)</li> <li>• Poor functional status</li> <li>• History of urethral suspension or sling procedure</li> <li>• Childhood enuresis</li> </ul>
<b>Stress Incontinence</b>	<ul style="list-style-type: none"> <li>• Poor urethral support from pelvic floor structures</li> <li>• Incomplete closure of urethra due to mucosal atrophy (often from postmenopausal low estrogen; also called intrinsic sphincter deficiency)</li> </ul>	<ul style="list-style-type: none"> <li>• Small volume leakage with coughing, sneezing, exercise</li> <li>• Continuous dribbling can occur in women with incomplete closure of urethra due to atrophy or post-surgical changes</li> </ul>	<ul style="list-style-type: none"> <li>• Most common cause of incontinence in younger women</li> <li>• Vaginal delivery</li> <li>• Forceps delivery</li> <li>• Pelvic radiation</li> <li>• Operative trauma and scarring of the urethra</li> <li>• Increased parity</li> <li>• Increased BMI</li> <li>• Chronic increased abdominal pressure (chronic constipation, cough)</li> </ul>
<b>Mixed Incontinence</b>	<ul style="list-style-type: none"> <li>• Combination of urge and stress incontinence</li> </ul>	<ul style="list-style-type: none"> <li>• May be confusing. Often, diagnosis of mixed incontinence is made when incontinence continues in spite of appropriate treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• See risk factors for urge and stress incontinence, above.</li> </ul>
<b>Overflow Incontinence</b>	<ul style="list-style-type: none"> <li>• Hypoactivity of detrusor muscle</li> <li>• Bladder outlet obstruction secondary to surgery, cystocele</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous dribbling; small volume</li> <li>• Elevated post-void residual volume</li> <li>• Rare (&lt;5% of all incontinence).</li> </ul>	<ul style="list-style-type: none"> <li>• Neurologic problems (spinal cord injuries, multiple sclerosis, peripheral neuropathy, Parkinson's, disc herniation, alcoholism)</li> <li>• Obstructive overflow incontinence is uncommon in women. When it occurs, it is usually the result of corrective surgery for incontinence, or a large cystocele.</li> </ul>

# Approach to the Patient with Urinary Incontinence

**Step 1:** Screen: “Do you ever lose control of your urine and wet yourself?” (NOT: Are you incontinent?).

**Step 2:** Perform history and physical.

<b>History</b>	<ul style="list-style-type: none"> <li>• Duration of symptoms</li> <li>• Frequency, volume, and timing of incontinence</li> <li>• Precipitants to incontinence (sneezing, coughing, caffeine, alcohol, exercise, sound of water)</li> <li>• Pregnancy history and mode of delivery</li> <li>• Past surgeries</li> <li>• Sexual function</li> <li>• Bowel function—history of constipation, fecal incontinence</li> <li>• Social and personal impact (on work, family, sexual function)</li> <li>• Medications</li> <li>• History of prolapse</li> </ul>
<b>Physical exam</b>	<ul style="list-style-type: none"> <li>• Note presence of vaginal atrophy</li> <li>• Cystocele</li> <li>• Have patient cough with speculum in place. Look at movement of urethra, as an assessment of pelvic support (should not move very much if good support). If urethra is prolapsed beyond introitus, refer to urologist or urogynecologist.</li> <li>• Direct observation of urine loss using cough stress test</li> <li>• Neurologic exam: Cognitive function, Babinski, test of peripheral nerves</li> </ul>

**Step 3:** Look for potential treatable causes of incontinence. “DIAPPERS” acronym.

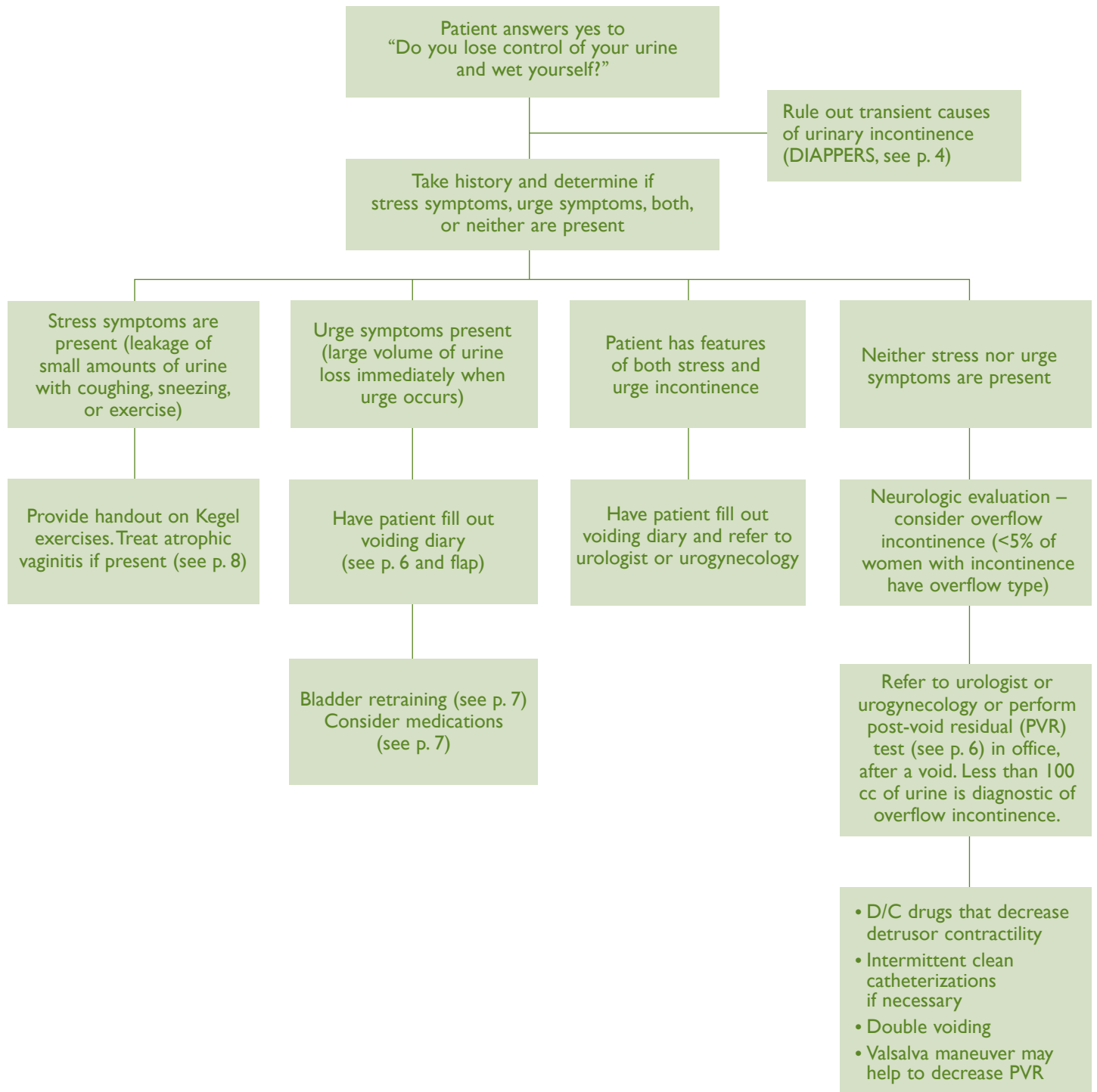
<b>Delirium</b>	Look for metabolic, infectious, neurologic causes
<b>Infection</b>	Treat underlying infection
<b>Atrophic urethritis/vaginitis</b>	Treat with topical estrogens
<b>Pharmaceuticals</b>	Consider stopping or substituting if appropriate— <ul style="list-style-type: none"> <li>• Drugs causing urinary retention <math>\pm</math> urinary frequency               <ul style="list-style-type: none"> <li>• Alpha-adrenergic agonists (phenylpropanolamine, Sudafed)</li> <li>• Anticholinergic medications (tricyclics antidepressants, antipsychotics, older antihistamines, cogentin/artane, disopyramide, antidiarrheals (e.g., Lomotil))</li> <li>• Opiates</li> </ul> </li> <li>• Drugs causing stress incontinence               <ul style="list-style-type: none"> <li>• Alpha blockers (e.g. prazosin, terazosin, doxazosin)</li> <li>• ACE inhibitors (if they induce cough)</li> </ul> </li> <li>• Loop diuretics (and alcohol), if they overwhelm ability to get to the bathroom in time</li> </ul>
<b>Psychological</b>	Severe depression—rare
<b>Excess excretion</b>	Heart failure, diabetes, peripheral edema, diuretic use, excess intake
<b>Restricted mobility</b>	Use commode or urinal; adjust fluid excretion
<b>Stool impaction</b>	Treat appropriately

**Step 4:** Exclude serious underlying causes/consequences.

- Treatable neurologic lesions (e.g., disc, brain/cord tumor, conus medullaris lesion)
- Lower urinary tract lesion (e.g., cancer of the bladder or bladder stone)
  - Check urinalysis for hematuria
  - Check urine cytology

**Step 5:** Determine lower urinary tract cause and treat accordingly.

# Evaluation and Management of Urinary Incontinence



# Diagnostic Testing

## Voiding Diary

Consider giving a voiding diary and a urine measurement container to patients at the first visit if they have symptoms consistent with urge incontinence, or if the type of incontinence is unclear. At the follow-up visit, calculate the total daily urine excretion, as well as daytime and nighttime urinary volumes. (See flap for a voiding record and patient information.)

### In interpreting the voiding record, consider the following:

- Large volume losses (incontinent episodes) suggest urge incontinence.
- Increased daily urinary volume can contribute to urgency, frequency, and incontinence. Adjust output to 1-1.5 l/day by discontinuing diuretics or by decreasing intake. Ethanol use and hypercalcemia also contribute to increased excretion.
- Increased nighttime excretion suggests peripheral edema or late fluid ingestion.
- Comments help differentiate urge from stress incontinence.
- Be sure to reconsider causes of transient incontinence as you interpret the voiding record. Sedatives, diuretics, alpha-blockers or anticholinergics may be confusing the picture.

## Post-void residual (PVR) measurement

The patient should void, without straining, and within 10 minutes the PVR should be measured either by straight catheterization or ultrasound. The patient should be instructed not to re-void before the measurement. If using catheterization to measure PVR, if the catheter is inserted correctly, there should be some urinary drainage. When this is complete, slowly withdraw the catheter, with the patient straining, to ensure complete collection.

## Urodynamic Testing

After referral to urologist or urogynecology, the patient may undergo urodynamic testing. Urodynamic studies involve urethral catheterization of the patient for approximately one hour. During this time, fluid is instilled into the bladder and pressure measurements and xrays are obtained which evaluate the storage function of the bladder. These tests can be used to assess objectively the underlying etiology of the bladder dysfunction.

Urodynamic tests include:

1. Cystometry: bladder pressure is measured during filling and emptying phases to evaluate detrusor function.
2. Uroflowmetry: measures urine flow rate during voiding to evaluate for emptying dysfunction.
3. Ureteral pressure profile: measures sphincter function.

Urodynamic testing is 91 percent sensitive and 51 percent specific in diagnosing pure stress incontinence and 73 percent sensitive and 55 percent specific in diagnosing urge incontinence. Therefore, urodynamic testing should not be used as a single diagnostic test to determine the cause of lower urinary tract disorders. After the patient has been fully evaluated with a history, examination, and laboratory testing, urodynamic testing may be done for the following indications:

- Uncertain diagnosis or mixed symptoms
- Failure to respond to intervention
- Proposed surgical intervention

## Treatment of Urge Incontinence

Non-pharmacologic treatment	
<b>Adjust urine output</b>	Urine output should be 1-1.5 liters/day (as measured by voiding record)
<b>Urge suppression training</b>	Instruct patients to: <ul style="list-style-type: none"> <li>• Stay put when you get an urge—sit down when possible, or stand quietly.</li> <li>• Squeeze pelvic floor muscles quickly several times (Kegel exercises), but do not relax fully between squeezes.</li> <li>• Relax the rest of your body. Try to focus on another task to distract yourself.</li> <li>• When the urge subsides, see how long you can wait before going to the toilet, then increase this time. Example: try to hold for 30 seconds the first time, then a minute the next time.</li> </ul>
<b>Bladder retraining</b>	<ul style="list-style-type: none"> <li>• Bladder training can take several weeks before effects are appreciated.</li> <li>• Randomized controlled trials have indicated that bladder training can be more successful at decreasing incontinence than medications.</li> <li>• After reviewing the voiding record, instruct patients to:               <ul style="list-style-type: none"> <li>➢ Time voids to occur at regular intervals (6-8 times during the daytime), and gradually increase interval length by 30 to 60 minutes until able to void every 3 to 4 hours while awake.</li> <li>➢ Concentrate on suppressing the urge to urinate between voids (see above).</li> </ul> </li> </ul>
<b>Prompted voiding</b>	<ul style="list-style-type: none"> <li>• Should occur every 2 to 3 hours.</li> <li>• Is effective in cognitively impaired individuals.</li> <li>• Successful in individuals who do not void more often than 4 times in a 12-hour period and who are continent 75% of the time.</li> <li>• Requires a great deal of effort on the part of the caregiver.</li> </ul>

Pharmacologic treatment			
Drug	Dose	Cost per month	Comments
Oxybutynin (Ditropan®, Ditropan XL®)	Immediate release: 5 mg po bid or tid. Extended release: 5 mg po qd. Titrate up to 25-30 mg per day.	\$3 (IR) \$94 (XL)	Also available in transdermal form. May take up to two weeks for full effect to be appreciated. Adverse effects: dry mouth, constipation. May increase postvoid residual and lead to overflow incontinence.
Tolterodine (Detrol®, Detrol LA®)	1-2 mg po bid immediate release; 2-4 mg po qd extended release	\$107 (IR) \$89 (ER)	Causes dry mouth less frequently than oxybutynin.
Propantheline	15-30 mg po qd	\$30	Must be taken on an empty stomach.
Dicyclomine	10-20 mg po qd	\$2	Anticholinergic. Contraindicated in lactation and for patients with glaucoma.
Tricyclic antidepressants	Imipramine—10 to 25 mg po qid	\$29	Not recommended for older patients—anticholinergic side effects and orthostatic hypotension may be limiting.

## Treatment of Overflow Incontinence

Non-pharmacologic treatment	
Medication changes	Discontinue medications that decrease detrusor contractility.
Clean catheterizations	As needed
Decrease post-void residual	<ul style="list-style-type: none"> <li>• Encourage double voiding. (Instruct patient to attempt to void for 1 minute; dress and leave bathroom for &lt;5 minutes and then try again. If no spontaneous voiding the second time, patient may apply pressure in suprapubic area to empty bladder.)</li> <li>• Valsalva maneuver during voiding to decrease postvoid residual.</li> </ul>

# Treatment of Stress Urinary Incontinence

Non-pharmacologic treatment			
<b>Urethral compression</b>	Have patient insert tampon (largest size) to compress urethra before exercising.		
<b>Pelvic muscle exercises (Kegel exercises)</b>	<ul style="list-style-type: none"> <li>• Increase strength in the muscles responsible for urethral closure.</li> <li>• Studies in younger women show improvements in women who do exercises compared with no treatment.</li> <li>• Involves contracting the muscles that close the urethra (same muscles that allow one to “stop” midstream while urinating) ten times, at least 3 times daily, holding contractions the count of 10. Patients should not practice Kegels by routinely starting and stopping flow of urine as this may disrupt micturition reflex. Contractions can be performed with assistance of vaginal cones, which are teardrop-shaped weights. The cone is placed in vagina and held in place while patient ambulates, for 15 to 20 minutes, about 3-5x per week, using progressively heavier weights of the same size and shape.</li> <li>• Biofeedback techniques may help patients identify the pelvic muscles to contract. This involves referral to a trained physical therapist who places pressure sensitive monitors in the vagina to measure muscle contraction and provide auditory or visual feedback information to improve exercise performance.</li> </ul>		
<b>Pessary</b>	<ul style="list-style-type: none"> <li>• Most common type looks like a diaphragm, with holes in it to allow for passage of secretions.</li> <li>• Usually fitted by gynecologist. Patients can remove by themselves at night or for cleaning (weekly cleaning is recommended). Alternatively, they can return every three months to gynecologist for removal and cleaning.</li> <li>• For postmenopausal women, should be used with topical estrogen to avoid ulceration.</li> <li>• May be left in during intercourse.</li> <li>• Can be used as a diagnostic test to determine if corrective surgery will be effective.</li> <li>• Useful in following situations:               <ul style="list-style-type: none"> <li>➢ Slight bladder or uterine prolapse</li> <li>➢ Poor surgical risk or aversion to surgery</li> <li>➢ Future childbearing plans</li> <li>➢ Pregnancy</li> <li>➢ Anticipated poor surgical outcome (obesity or ongoing chronic cough—e.g. chronic obstructive pulmonary disease).</li> </ul> </li> </ul>		
<b>Surgical treatment:</b> Most effective treatment and should be strongly considered, even in elderly women, since it has an enormous impact on quality of life.			
<b>Bladder neck (retropubic) suspension procedures</b>	<ul style="list-style-type: none"> <li>• Pelvic fascia is lifted up and stabilized against the superior pubic ramus.</li> <li>• Most effective type of surgery with 85-90% of women continent at one year and 70 to 90% at five years.</li> <li>• Complications include urinary retention, hemorrhage, rectocele, and injury to bladder or ureter; infection, and detrusor overactivity.</li> </ul>		
<b>Sling procedures</b>	<ul style="list-style-type: none"> <li>• Involve the use of autologous or synthetic material to support the urethra. Newer procedure, “tension free vaginal tape” (or TVT), can be done as an outpatient as a minimally invasive procedure. It is not an office procedure and is usually done under local, spinal, or general anesthesia.</li> <li>• Cure rates range from 80-95% at 5 years. Similar rates of cure as bladder neck suspension surgery but more voiding problems with the sling procedure.</li> <li>• Complications include bladder laceration, urinary retention, sling erosion requiring revision, infection.</li> </ul>		
<b>Minimally invasive needle vaginal suspensions</b>	<ul style="list-style-type: none"> <li>• Procedure involves supporting the bladder neck and proximal urethra using sutures to attach the fascia to the rectus fascia or pubic bone. Advantage over retropubic approach is that it is transvaginal, and therefore is associated with an easier post-operative recovery.</li> <li>• Less effective than the retropubic suspension procedures. Cure rates are about 40-80%.</li> <li>• Complications include de novo urge incontinence, bleeding, infection, entrapment of ilioinguinal nerves</li> </ul>		
Pharmacologic treatment			
Drug	Dose	Cost/mo	Comments
Estrogen cream	1 g qhs x 2 wks then 3x/week	\$31	Not recommended for women with absolute contraindication to estrogen.
Estrogen-containing ring (Estring®, FemRing®)	Inserted by patient or in the office q 3 months	\$34	Acceptable for use in women with history of breast cancer because of minimal to no absorption systemically.
Imipramine	10-25 mg po bid to qid	\$29	Useful in mixed incontinence, since has both alpha adrenergic effect on urethral closure and anticholinergic inhibition of detrusor.
Pseudoephedrine	15-60 mg po tid	\$20-\$25	OTC. Alpha-adrenergic receptor effects on urethral closure. Not very effective, but useful in patients who are poor surgical risks.
Duloxetine (Not yet FDA approved)	20 mg po qd		Selective serotonin and noradrenergic re-uptake inhibitor. Increases sphincter contraction via alpha agonist effects and 5-hydroxytryptamine-2 receptors.







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