

Urinary Incontinence and Pelvic Organ Prolapse



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KEYWORDS

- Urinary incontinence • Stress urinary incontinence • Urinary urge incontinence
- Pelvic organ prolapse • Geriatric assessment • Urinary tract disorders

KEY POINTS

- Urinary continence and pelvic organ prolapse in the elderly is widely prevalent and significantly affects quality of life. The primary care physician should ask about urinary incontinence in all geriatric patients.
- Accurate characterization of type of incontinence and prolapse is essential in forming an appropriate treatment plan.
- Behavioral and lifestyle modification is the cornerstone in treatment for stress, urgency, and functional incontinence.
- Frail elderly require special attention to avoid complications of urinary incontinence and prolapse. Care should be delivered with a multidisciplinary team-based approach.

INTRODUCTION

Urinary incontinence (UI) as defined by the International Continence Society is the complaint of any involuntary leakage of urine.¹ Urinary incontinence affects approximately 36% of women older than 60 years and 11% to 16% of men older than 65 in the United States.^{2,3} An increase in UI prevalence with age is caused by multiple factors including increased incidence of comorbidities such as obesity and diabetes, polypharmacy, and age-related cognitive and functional decline. Urinary incontinence in the community and care facility setting is a significant economic burden with as estimated \$19.5 billion spent in 2000 on the care of incontinence.⁴ Pelvic organ prolapse (POP) can occur concomitantly with urinary incontinence. It can significantly affect quality of life in women of all ages. It is estimated that 3% and 4.1% of women age 60 to 79 and greater than 80, respectively, are affected by POP.⁵

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Lower urinary tract function is dependent on 2 basic processes: the ability to fill or store urine and the ability to empty urine. In the absence of filling-phase dysfunction, the bladder is able to accommodate an increasing volume of urine at low pressures. This must occur in the absence of involuntary bladder contraction with adequate bladder outlet resistance to avoid unwanted leakage of urine. Normal emptying requires a coordinated contraction of detrusor muscle with a simultaneous decrease in outlet resistance provided by the voluntary and involuntary sphincter mechanisms. Lower urinary tract dysfunction can be broadly categorized as failure to fill or store or empty owing to failure of the bladder, bladder outlet, or a combination (Fig. 1). Urinary incontinence can result from a failure of either of these mechanisms or a combination. Urinary incontinence is categorized as outlined in Table 1.

This article reviews the diagnosis and medical management of urinary incontinence and prolapse in the outpatient primary care setting. Conditions that should prompt referral to a surgical specialist are also briefly discussed.

INITIAL EVALUATION OF URINARY INCONTINENCE AND PELVIC ORGAN PROLAPSE

The initial evaluation in primary care should include a careful history, physical examination, and urinalysis. A thorough history can aid in distinguishing between the different types of incontinence, although this can be difficult in elderly patients with cognitive decline. Correctly identifying the type of urinary dysfunction is important when considering management options, although many patients will have a combination of symptoms (Table 2). Additionally, it is important to determine if the UI is acute or an established condition. Acute incontinence is typically a result of an acute change that, once corrected, may resolve the incontinence. Consideration should be given to various conditions that cause incontinence that may prompt referral to a surgical specialist after the initial visit (Table 3). Microscopic (≥ 3 red blood cells per high-power field on microscopy) or gross hematuria, rectal or prostatic mass, palpable bladder, and failure of initial therapies should also prompt referral to a specialist (Fig. 2).

Similar to UI, POP should be initially evaluated with a careful history and physical examination. A thorough history can aid in distinguishing between the different types of prolapse. The most common prolapse complaint is the awareness of a vaginal

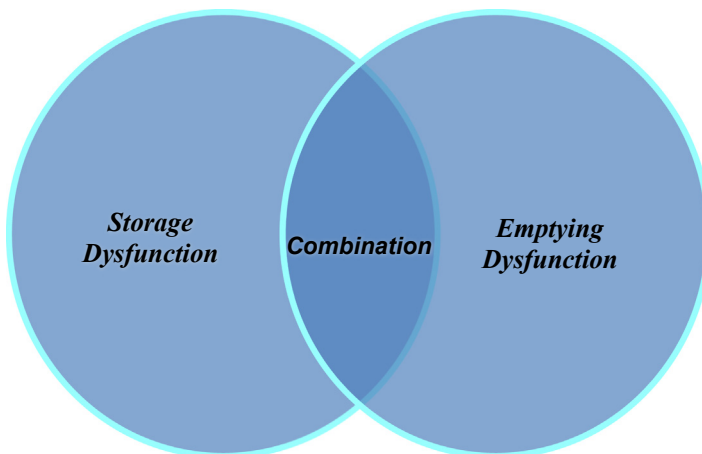


Fig. 1. Categorization of lower urinary tract dysfunction.

Table 1
Types of urinary incontinence

Stress incontinence	The complaint of involuntary leakage on effort or exertion or on sneezing or coughing
Urge incontinence	The complaint of involuntary leakage accompanied by or immediately preceded by urgency
Mixed incontinence	Combination of stress and urge incontinence
Overflow incontinence	Involuntary leakage of urine from a bladder at or near volume capacity in the absence of detrusor contraction
Functional incontinence	Leakage of urine in the presence of physical or cognitive deficits and in the absence of urinary system pathologic abnormality

bulge, fullness, or pressure. These indicators are owing to prolapse of the bladder (cystocele), rectum (rectocele), or uterus (uterine prolapse). Patients with a cystocele will frequently complain of difficulty emptying the bladder, urinary urgency, incomplete emptying, and, rarely, urinary retention. Patients with a rectocele will complain of difficulty with fecal evacuation and the need to splint to have a bowel movement. Constipation may cause or be the result of a rectocele. Correctly identifying the type of prolapse is important when considering management options. Failure of initial therapies should also prompt referral to a specialist.

The evaluation in a specialist's office will include components of the initial evaluation and use of validated questionnaires, pad test to determine degree of incontinence, bladder log (voiding diary), and assessment of postvoid residual. Cystoscopy and urodynamic testing may be indicated in more complex cases to characterize the type of incontinence and direct overall treatment goals of both the patient and caregiver if applicable.

CLASSIFICATION AND TREATMENT OF URINARY INCONTINENCE

Urinary incontinence is typically classified as stress, urge, overflow, or functional incontinence. As previously stated, successful treatment is dependent on correctly identifying the type of incontinence. Regardless of the type of incontinence, most patients will initially use diapers or urinary pads. Although effective at allowing patients to maintain dryness, pad usage is costly and can affect quality of life because of the need for frequent changes and odor. For the frail elderly with limited mobility, infrequent pad or diaper changes can lead to skin breakdown and complex wounds. Caregivers should be educated on the importance of frequent diaper/pad changes to limit the risk of skin complications.

Table 2
Common symptoms of lower urinary tract dysfunction

Storage Dysfunction	Emptying Dysfunction
Urinary frequency	Hesitancy
Urinary urgency	Straining
Nocturia	Urinary retention
UUI	Urinary frequency
SUI	

Local Pathology	Female Factors
Bladder calculi	Vaginal atrophy
Bladder tumor	Vesicovaginal fistula
Metabolic Factors	Male Factors
Diabetes	Benign prostatic hypertrophy
Polydipsia	Prostate cancer

ACUTE INCONTINENCE

Acute onset of incontinence is typically caused by conditions separate from pathologic or anatomic changes in the genitourinary system. The most common causes can be remembered with the mnemonic “DIAPERS” (Box 1). Once the underlying cause of delirium is treated, UI typically resolves. Infection is a cause of acute incontinence and can be diagnosed based on symptoms, urinalysis, and urine culture. Prescribing antibiotics in the setting of asymptomatic bacteremia should be avoided, as this can result in adverse effects of antimicrobial medications and increase the probability of developing drug-resistant microbial isolates in the future.⁶ The optimal duration of antibiotics for an uncomplicated urinary tract infection is unknown. A

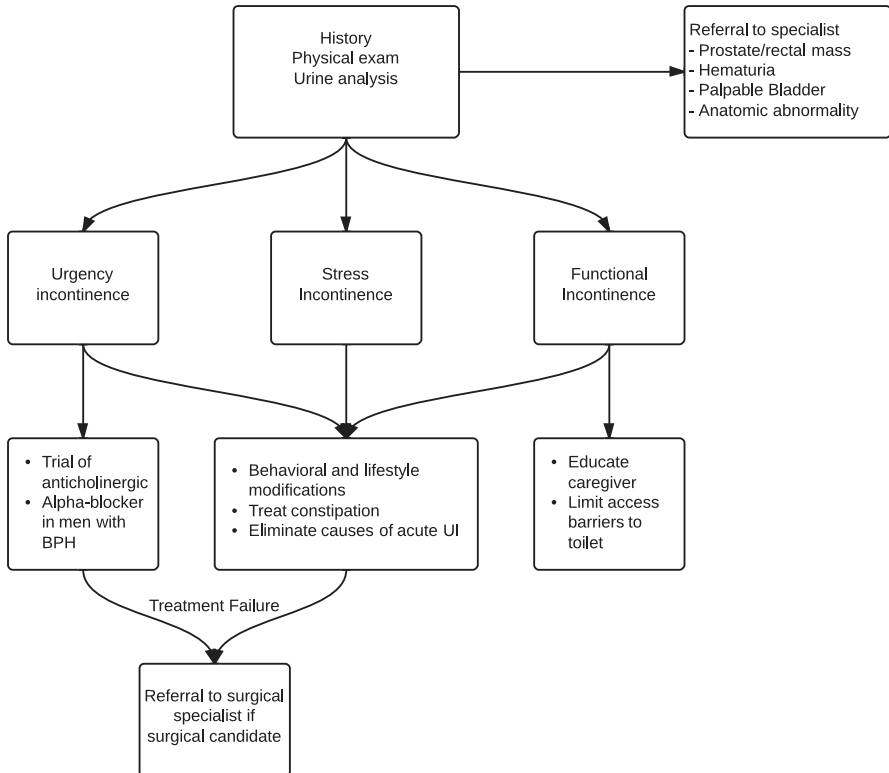


Fig. 2. Urinary incontinence management algorithm. BPH, benign prostatic hypertrophy.

Box 1**Causes of acute urinary incontinence**

Delirium
 Infection
 Alcohol
 Pharmaceuticals
 Excess urine production
 Reduced mobility
 Stool impaction

Cochrane review found no difference in clinical failure rates when comparing a 3- to 6-day course of antibiotics with a 7- to 14-day course in older women with uncomplicated urinary tract infection. Thus, a shorter course in such patients is recommended to limit adverse effects of a prolonged course of antimicrobials.⁷

Alcohol and pharmaceuticals can also contribute to urinary incontinence by various mechanisms of action (Table 4). Excess urine production can also precipitate UI. Increasing volume of urine can be a result of increased urine production caused by diuretic medications, excessive fluid consumption, and glucosuria. Additionally, conditions such as congenital heart failure, peripheral venous insufficiency, and hypoalbuminemia/malnutrition can cause fluid retention that can result in excess urine production. These conditions often occur in combination, and medical optimization of each can reduce high volumes of urine production that may be precipitating UI. Restricted mobility will be discussed further in the section covering functional incontinence. Finally, constipation is a risk factor for both transient and chronic urinary incontinence.⁸ It is present in approximately one-third of people 60 years and older.⁹ In a cohort of women age 65 to 89 years with lower urinary tract symptoms and constipation, treatment of constipation resulted in decreased rates of urinary frequency and urgency and reduced postvoid residual urine volume.¹⁰

STRESS URINARY INCONTINENCE

Stress urinary incontinence (SUI) is the involuntary leakage of urine during activities that increase intra-abdominal pressure such as straining, lifting, or coughing. Stress incontinence is uncommon in men with the exception of men who have had surgical therapy of the prostate for benign or malignant disease. In women, stress incontinence occurs primarily because of urethral hypermobility and intrinsic sphincter deficiency.

Table 4
Medications and mechanisms of action affecting continence

Mechanism of Action	Class of Medication
Increased urine production	Diuretics, thiazolidinediones, calcium channel blockers, some anticonvulsants (latter 3 medications for fluid retention)
Sedation/immobility	Sedative hypnotics, antipsychotics, some antidepressants, opiates
Increased bladder outlet resistance and/or inhibited bladder contractility	α -adrenergic agonists, anticholinergics, opioids, muscle relaxants

Treatment of Stress Urinary Incontinence

Self-care, also known as lifestyle modification, should be the cornerstone of nonoperative management of UI. For example weight loss, smoking cessation, and avoidance of triggers are simple nonoperative measures that can be effective in the motivated patient. Obesity increases the risk of developing stress incontinence.¹¹ In a randomized controlled trial of women with a mean body mass index of 36 and urinary incontinence, a 6-month diet and exercise program resulting in weight loss significantly decreased the frequency of self-reported UI episodes.¹²

If self-care is ineffective, pelvic floor muscle training (PFMT), commonly referred to as Kegel exercises, has been shown to improve the volume of leakage and number of incontinent episodes in older men and women.^{13,14} Although the exact mechanism by which improving strength of pelvic floor musculature improves continence is not clear, there is sufficient evidence that PMFT is an important component of nonoperative management of SUI. The optimal regimen of PFMT has not been determined; however, the slight variation in techniques is less important in improving results than maintaining a regular schedule of pelvic floor exercise. A suggested exercise regimen is shown in **Box 2**. As with many lifestyle modifications programs, ensuring continued adherence to the PMFT program is challenging. In a review of women 15 years after the end of a formal PMFT program, only 28% maintained exercise at least on a weekly basis.¹⁵ The clinician should encourage the patient to incorporate PMFT into a daily routine and ask at scheduled visits about adherence to their exercise program.

Another form of nonsurgical treatment of SUI in women is the vaginal pessary. Although primarily used for pelvic organ prolapse, pessaries are found to improve stress incontinence in women.¹⁶ Appropriate device and size selection is important to optimize outcome. Care should be taken in the elderly population, as adequate dexterity and cognitive function are essential to care for the device to avoid devastating complications from the neglected pessary.

In patients do not respond to nonsurgical therapy or those who are not motivated to adhere to PMFT, there are several surgical options. Surgical therapy in women typically includes bulking agents, colposuspension, and slings. In women fit for surgery who are older than 70, slings are found to significantly improve continence and patient-reported quality of life.^{17,18} Surgical therapy in men for SUI also includes bulking agents and slings and artificial urinary sphincter placement for more severe cases.

Box 2

Suggested pelvic floor muscle training and bladder training techniques

Pelvic floor muscle training

- Contraction of pelvic floor muscle group for 2–10 seconds (maximum duration possible, with progressive goal of 10–15 second contraction)
- Sets of 10 pelvic floor muscle contractions
- Repeat 3 times/d

Bladder training

- Scheduled voiding with increasing intervals between voids to goal
- Fixed interval voiding (in setting of pure stress incontinence to reduce bladder volume)
- Urge inhibition techniques (meditation, distraction techniques, prompted pelvic floor contraction)

URGENCY INCONTINENCE

Urinary urgency is the sudden compelling desire to void that is difficult to defer. When this symptom coexists with incontinence, it is referred to as urge urinary incontinence (UUI). Differences between SUI and UUI are outlined in [Table 5](#). Overactive bladder is the symptom complex of urinary urgency with frequency or nocturia with or without incontinence. Normal bladder filling and storage is a result of complex interaction between the cellular components of the bladder and the central and peripheral nervous system that innervate and control voiding. Disruption of these components can affect normal filling and result in unwanted bladder contraction and resultant UI. Management options of UUI consists of behavioral and lifestyle modification, pharmacologic treatment, and surgery.

Treatment of Urgency Incontinence

Behavioral and lifestyle modification is the cornerstone in the initial management of UUI ([Fig. 3](#)). The relationship between diet and urinary incontinence is not well established. Limiting alcohol intake and reducing caffeine intake to less than 200 mg/d (<2 cups of regular coffee) is suggested to reduce symptoms of urgency, although the effects on incontinence are unknown.¹⁹ Pelvic floor muscle training may reduce episodes of urgency incontinence; however, the benefits are less clear when compared with improving SUI. Bladder training (see [Box 2](#)) should also be a component of lifestyle modification, although there are limited data showing significant improvement.²⁰ Bladder training and pelvic floor muscle training should be done in combination when possible to reduce episodes of UUI.²¹

Pharmacologic management of UUI consists primarily of anticholinergic medications that block the effects of acetylcholine on the muscarinic receptors in the bladder. Several antimuscarinic medications are available ([Table 6](#)) and data are insufficient to suggest greater clinical efficacy for any one anticholinergic. These agents are generally well tolerated but can cause significant dry mouth and constipation and are contraindicated in patients with closed-angle glaucoma. There have been reports of impaired cognition with anticholinergic medications; however, this is uncommon. Immediate-release oral oxybutynin in doses greater than 10 mg/d has been associated with significant cognitive decline; however, in doses less than 10 mg/d the cognitive side-effect profile is similar to that of other antimuscarinics. Anticholinergics should be used with caution in patients with Alzheimer's disease or in those taking an acetylcholinesterase inhibitors because of risk of acute worsening of dementia and delusions.²² Additionally, caution should be exercised in elderly patients with elevated postvoid residual (PVR) urine volume. There is no well-established PVR above which initiating an anticholinergic medication is absolutely contraindicated, although caution

Table 5
Differences between stress and urgency incontinence

Symptoms	Urgency Incontinence	Stress Incontinence
Urgency	Yes	No
Frequency	Yes	No
Leakage with activity	No	Yes
Amount leaked with incontinence episode	Large	Small/moderate
Ability to reach toilet in time with urge to void	No	Yes
Waking to void at night	Usually	Seldom

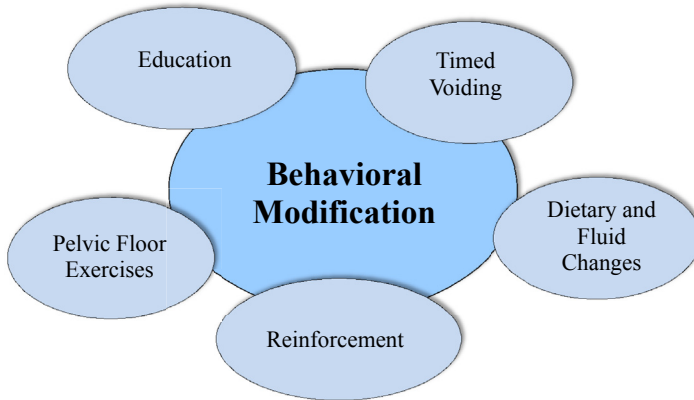


Fig. 3. Behavioral and lifestyle modification principles.

should be exercised when PVR is greater than 150 mL. After initiating treatment with an antimuscarinic in patients with an elevated PVR, it should be periodically monitored to ensure adequate bladder emptying.

Mirabegron was recently introduced as an alternative to anticholinergics. It is a β -3 adrenergic receptor agonist and avoids the classic anticholinergic side effects such as dry mouth, dry eyes, and constipation. The β -3 adrenergic receptor in the bladder wall is normally stimulated by norepinephrine in the sympathetic pathway promoting bladder relaxation during filling. This is a new class of medication that is promising in the treatment of urinary urgency and UUI. It is found to be effective and well tolerated in patients older than 65 years with 1 year of follow-up.²³

In patients with UUI refractory to lifestyle modification and pharmacologic therapy, referral to a specialist is recommended. Surgical options for UUI include intravesical injection of botulinum A toxin, percutaneous tibial nerve stimulation, and sacral nerve stimulation and, in the most severe cases, bladder augmentation and urinary diversion.

Table 6	
Medications for treatment of urinary urgency and urgency incontinence	
	Common Dosing
Anticholinergic Medications	
Oxybutynin (immediate release, extended release oral, patch, gel)	2.5–5 mg PO BID-TID 5–15 mg PO qd 1 patch (3.9 mg/d) q 3 d 10% gel topically once daily
Tolterodine (immediate release, extended release)	1–2 mg PO BID 2–4 mg PO qd
Darifenacin	7.5 mg–15 mg PO qd
Solifenacin	5–10 mg PO qd
Trospium (immediate release, extended release)	20 mg PO BID 60 mg PO qd
Fesoterodine	4–8 mg PO qd
β-3 adrenergic agonist	
Mirabegron	25–50 mg PO qd

OVERFLOW INCONTINENCE

Overflow incontinence is a result of failure to empty the bladder from bladder outlet obstruction or inadequate bladder contractility. In men, the most common etiology is bladder outlet obstruction from prostatic enlargement. In women, the most common etiology is an acontractile bladder.

Treatment of Overflow Incontinence

In the acute setting, this should be managed with placement of a urethral catheter as urine retention can cause acute kidney injury. Clean intermittent catheterization (CIC) is preferred over continuous catheterization to lower the risk of urinary tract infection.²⁴ However, in many elderly patients with retention, CIC is not practical because of impairments in cognitive and physical skills. In this setting, an indwelling urethral or suprapubic catheter may be more appropriate. In men and women with overflow incontinence, referral to a specialist is recommended.

FUNCTIONAL INCONTINENCE

Functional incontinence is the term to describe UI in the presence of physical or cognitive deficits and in the absence of urinary system pathologic abnormality. It is commonly diagnosed in the frail elderly. However, functional impairment should be considered a risk factor for other types of incontinence, as most elderly patients with a diagnosis of functional incontinence also have underlying stress, urge, or mixed incontinence.²⁵ Identifying functional barriers to normal voiding is an important part of minimizing UI. In the acute setting, such as after hip fracture, barriers to toilet use should be minimized. Use of bedside commode, condom catheters in men, and timing of fluid intake to coincide with availability of caregivers may improve the immobile patient's ability to remain dry. Additionally, having caregivers available for toilet assistance can prevent episodes of incontinence.²⁶

INCONTINENCE IN THE FRAIL ELDERLY

Incontinence in elderly persons who require assistance for activities of daily living can adversely affect the patient's overall health and quality of life and that of the caregiver. An estimated 65% of nursing home residents have UI, and it is a leading cause for placement into a long-term care facility.²⁷ The International Consultation on Incontinence has issued guidelines for management of the frail elderly. Recommended lifestyle and behavioral modifications in this population are presented in **Table 7**. An important component is caregiver investment into the goals of improving continence.²⁸ The United States Center for Medicare and Medicaid services has issued guidelines on

Prompted voiding	Prompting toilet use with contingent approval/praise Goal of increasing patient requested/self-initiated toilet use
Habit retraining	Use of bladder diary and identification of timing of voiding with goal of preempting incontinent episodes with planned toilet use
Timed voiding	Fixed interval toilet use in patients in absence of reinforcement or patient education
Combined toileting and exercise therapy	Physical exercise and pelvic floor training incorporating toilet mobility techniques

Table 8 Stages of pelvic organ prolapse	
Stage 1	The most distal prolapse is more than 1 cm above the level of the hymen
Stage 2	The most distal prolapse is between 1 cm above and 1 cm below the hymen
Stage 3	The most distal prolapse is more than 1 cm below the hymen but no further than 2 cm less than TVL
Stage 4	Represents complete vault eversion; the most distal prolapse protrudes to at least TVL 2 cm

Abbreviation: TVL, total vaginal length.

urinary incontinence in the surveyor community; however, it has been questioned whether these guidelines have improved the quality of UI care in nursing home residents.^{29,30}

CLASSIFICATION AND TREATMENT OF PELVIC ORGAN PROLAPSE

Pelvic organ prolapse is typically classified by prolapsing organ and stage (1–4) (Table 8).³¹ Stages 3 and 4 prolapse usually cause symptoms, such as incomplete bladder emptying, severe enough to warrant intervention. Regardless of the type of POP, most women will be candidates for nonoperative management. Lifestyle modifications to avoid triggers that increase intra-abdominal pressure, such as constipation, obesity, chronic cough, and lifting, should be eliminated. Similar to treatment for UI, PFMT is also effective in strengthening the pelvic floor and improving POP.³² A pessary is a silicone device that is inserted into the vagina to provide support and improve symptoms of vaginal pressure and improve bladder emptying. Pessaries come in various shapes and sizes and need to be fitted properly to fit the patient's anatomy (Fig. 4). Proper fitting, education, and careful follow-up by a pelvic floor specialist are paramount in optimizing outcomes and avoiding a forgotten foreign body.

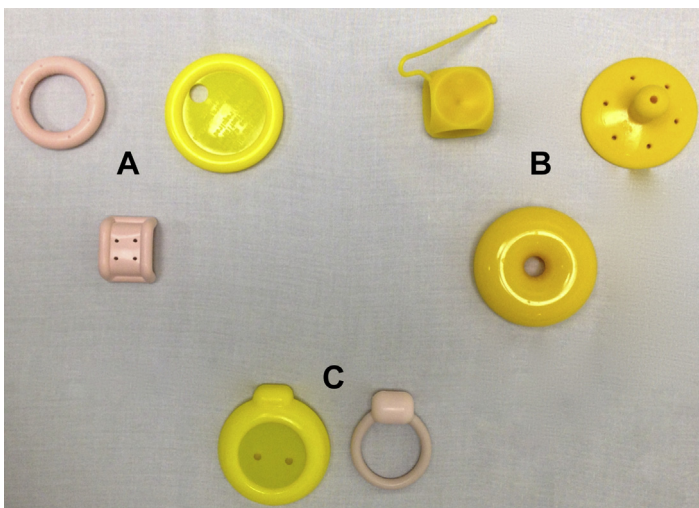


Fig. 4. Commonly used pessaries: Support (A), space filling (B), incontinence support (C).

SUMMARY

Urinary incontinence and pelvic organ prolapse are widely prevalent problems in the elderly population in both community and care facility settings. The primary care physician should be proactive in identifying UI and POP and engaging the patient and caregivers in a multimodal approach to management. Ancillary health care staff also serves as an important adjunct in sustaining improvements obtained through lifestyle and behavioral modifications. Referral to surgical specialists in the appropriate setting is an important component of the multidisciplinary approach that is necessary in achieving patient and caregiver goals.

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