Urinary incontinence (UI) is now recognized as a growing health care problem and a personal concern for women. UI is felt to be a significant aging health issue for women. Much is known about the prevalence of UI in women. Among the United States population, women are twice as likely to experience UI as men. UI affects more than twice as many women as men. Studies have shown that one out of three women, 2 years after childbirth, report drops to small amounts of urine leakage with certain activities such as coughing, laughing, sexual intercourse, and high-impact exercises. Young adult women between the ages of 18 to 44 have reported a 6.6% prevalence of daily occurrence of urine leakage. As women approach menopause, the quantity of urine leakage often increases.

Primary care practitioners have often assumed that UI is a problem restricted to the elderly, and have viewed the problem incorrectly as a natural part of aging. However, research in healthy young women working in areas requiring increased physical activity indicates UI prevalence rates similar to those in their elder counterparts. UI prevalence in working women has been demonstrated, but the relationship between work duties and occurrence of UI is not understood. A survey of female soldiers found that up to one third complained of urine loss during exercise and field training activities. The soldiers felt that UI interfered with the performance of their duties and was socially embarrassing. Soldiers reported decreasing fluid intake to manage the urine leakage. A survey of U.S. Air Force female aircrew indicated a 26% prevalence of UI, with 18% stating that the urine leakage occurred while flying. In this group, urine loss during exercise was the most common cause if incontinence was reported. However, there was a three-fold increased risk in the development of UI in multiparous female aircrew compared with nulliparous fliers.

There has been an increased interest in the prevalence and impact of UI in working women and strategies they use to control urine loss. Palmer surveyed full-time employed women working in a large academic center and found that UI occurred at least monthly in 21% of women, but only one third of these women felt it was a problem, and fewer than half (46%) reported UI to a health care provider. Strategies used to manage or minimize urine leakage included use of perineal pads for urine collection, avoidance of caffeinated beverages, and the use of deodorants to mask odor.

Primary care practitioners provide a key position to influence prevention, screen for incontinence, and improve outcomes of women at risk for incontinence. Current research supports the value of non-invasive, conservative treatment strategies, education, and emotional support. (Prim Care Update Obstet Gynecol 2001;8:153–162. © 2001 Elsevier Science Inc. All rights reserved.)
mize the effects of the urine leakage (wearing pantyliners or feminine hygiene products). This is despite the fact that women do report that incontinence concerns about cleanliness restrict their lives. Women report secrecy to the extent that even their sexual partners are not aware of incontinence. Providers often relate that they tend not to inquire about UI because besides recommending an absorbent product, they are unsure what else to tell their patients. Despite the increased prevalence of aging women and the subsequent increased prevalence of incontinence in women, there continues to be a lack of open discussion about this problem. However, treatment never starts until incontinence is detected and evaluated.

Evaluating the Problem

Conservative management strategies require that the provider have an understanding of the underlying type of UI and basic assessment requirements. A detailed description of the types of UI is available in most basic gynecology textbooks. A focused history and physical examination are the cornerstones of the assessment of a woman with UI. Table 1 provides a simple checklist for assessment that can be used by providers.

Women Who Are at Risk

The primary care provider can play a role in identification of the woman who is at risk for developing UI, and simple and realistic lifestyle changes can be recommended (see Table 2). Documented risk factors that relate primarily to women and are associated with UI are wide-ranging and are listed below:5

- **Age.** There is consistent evidence that the frequency of UI increases with aging. Pelvic muscle relaxation accelerates rapidly after menopause and may progress with aging in general. This relaxation of the pelvic floor causes prolapse of pelvic organs. It is felt that stress UI is more common in women aged 45–54 years, whereas urge UI increases with age between 35 and 64 years. In addition, as women age, they may be using an increasing number of medications, some of which may have an effect on continence.

- **Race.** It has been suggested that Caucasian women have a shorter urethra, weaker pelvic floor muscles, and a lower bladder neck than African-American women, thus making them more likely to have incontinence. However, parity and socioeconomic factors may also contribute to the difference.

- **Pregnancy and childbirth.** The long-held clinical impression that pregnancy and vaginal childbirth are associated with urinary incontinence in women has been confirmed.6 The physiologic basis for the association between perineal trauma during parturition and postpartum UI includes partially reversible pudendal and pelvic nerve damage due to significant pelvic floor tissue stretching or compression that leads to laxity of the pelvic ligaments.7 Many feel that UI during pregnancy may be a risk factor for permanent urinary incontinence after delivery, as well as contribute to pelvic organ prolapse and fecal incontinence. It is felt that vaginal delivery involves significant relaxation and lengthening of the pelvic floor muscles to permit the passage of an infant. The pelvic floor must contract again after childbirth to function normally. UI that occurs after childbirth has been associated with several risk factors that occur during delivery: use of forceps, episiotomy, and pudendal anesthesia.8,9 Women report a reduced ability to voluntarily contract the pelvic muscles after childbirth. It has been suggested that elective cesarean delivery would significantly decrease but not eliminate the conditions of pelvic organ prolapse and urinary incontinence. Unlike health care services in countries such as Great Britain and France, the U.S. health care environment does not promote pelvic muscle rehabilitation immediately after childbirth, although the data strongly supports that this is a crucial time, when pelvic floor muscle and nerve damage occur.

- **Menopause and depletion of estrogen.** Because incontinence is predominantly noted coincident with menopause, the role of estrogen deficiency has been studied. Estrogen helps build collagen, stimulates the development of alpha receptors in the urethra and bladder neck to aid contraction, beta receptors in the bladder to allow relaxation, and other useful effects. Estrogen depletion is associated with diminished urethral mucosa vascularity and thickness. Estrogen receptors are present in a woman’s urethra and bladder tissue. and in the musculature of the pelvic floor. This deterioration and a decline in mucous production within the urethra weaken the urethra’s ability to maintain a tight seal, especially when intra-abdominal pressure increases with valsalva. Symptoms of urgency, frequency, dysuria, and UI may occur. Sensitivity and responsiveness to estrogen have been found in epithelial, connective, muscle, and vascular tissue. Although these findings may suggest that replacing estrogen could cure or lessen incontinence, some studies have not fully supported this hypothesis.10 The estrogen loss and effects of its replacement relevant to incontinence remain unclear. However, the use of estrogen in the form of a topical cream or vaginal
ring is an option in older women with vaginal atrophy and symptoms of overactive bladder. • Pelvic surgery. A 40% increased risk of UI has been seen in women who had undergone surgical removal of the uterus.11 The reasons for the association between hysterectomy and UI are not known.
It has been suggested that the association may be due to the loss of structural support to the bladder, scarring of the urethra, or disruption of the pelvic nerve plexus.

- **Smoking.** There appears to be a relationship between smoking and UI. There is a potential bladder contractile effect from nicotine, as well as significant pressure exerted on the bladder and urethra during coughing. Chronic and frequent coughing may lead to damage of urethral and vaginal supports and cause perineal nerve damage.\(^{12}\)

- **Obesity.** Weight gain and morbid obesity may increase the susceptibility to UI, and consequently, weight loss may reduce the risk.\(^{13,14}\) The UI seen in obesity may be secondary to increased pressure on the bladder and greater urethral mobility. Also, obesity may impair blood flow or nerve innervation to the bladder. Despite this association, no studies have evaluated the effect of moderate weight loss on UI. Research has shown that UI symptoms decrease in morbidly obese women who undergo extreme weight loss.\(^{15}\)

- **High-impact physical activities.** It is known that young, nulliparous, highly fit women can have symptoms of UI when participating in sports such as gymnastics, basketball, tennis, and so on. Nygaard et al.\(^ {16}\) studied women participating in athletics at a large state university. A total of 28% reported urine loss while participating in their sport, with two thirds describing this as occurring frequently.\(^ {16}\) Overall, it is estimated that one third of women experience urine loss during physical activities. Causes of incontinence may include inadequate abdominal pressure transmission, pelvic floor muscle fatigue, and changes in connective tissue or collagen. Sports most likely to provoke incontinence include those that create a sudden increase in intra-abdominal pressure, such as by including activities like jumping, landings, and dismounts. That may be why women in the Air Force experience urine leakage when jumping out of airplanes.

## Treatment of UI

Conservative treatment options are increasing in popularity as more health care providers are offering choices to women with UI. The use of medications for treatment, and the use of conservative surgical approaches, are not discussed in this article, since they are covered so thoroughly elsewhere in the gynecology literature. This article focuses on other conservative approaches. These treatments are usually a form of behavioral methods that include the use of fluid schedules, avoidance of dietary irritants, and bowel programs. Additional methods include pelvic muscle rehabilitation programs that are self-directed bladder retraining and pelvic muscle exercise programs or the use of assisted-exercise tools involving vaginal weights, biofeedback, or electrical stimulation.
Adequate Fluid Intake—Individuals with urinary symptoms often limit fluids so that they will not have to urinate as often. Individuals with urge incontinence who have a high fluid intake (>2,400 cc/d), may show a reduction in incontinent episodes and voiding frequency by lowering their fluid intake. Incontinent persons with low fluid intakes (<1,500 cc/d) may benefit from increasing their fluid intake. Reducing fluid intake after 6 PM and concentrating fluid intake during morning and afternoon hours may decrease nighttime incontinence episodes.

Stop Smoking—Nicotine is irritating to the detrusor muscle causing bladder contractions and urgency. A smoker’s repeated chronic coughing may cause urinary leakage. Smoking cessation may help to decrease urine leakage.

Dietary Modification—Individuals with urge UI may benefit from caffeine reduction. Significant rise in detrusor pressure has been demonstrated with caffeine administration. The effect of other foods and beverages on the bladder is not understood but elimination of one or all of the items listed below may improve bladder control. They are as follows:

- alcoholic beverages
- beer, wine
- carbonated beverages
- milk/milk products
- soft drinks with caffeine, tea, coffee even decaffeinated

Maintaining Optimal Weight—Weight reduction is associated with improvements in urinary symptoms because of less pressure on the bladder.

Maintaining Bowel Regularity—Constipation and difficulty with defecation (straining during bowel movements) causes increased pressure on the bladder leading to UI. Individuals should keep regularity through increased fiber, exercise, and fluid. A successful way to adequately increase fiber is by using a “special bran recipe.” Mix together: 1 cup applesauce, 1 cup coarse unprocessed wheat bran, and ¾ cup prune juice. Refrigerate mixture and take 2 tablespoons of the mixture every day. Take the mixture in the evening for a morning bowel movement. Increase the bran mixture by 2 tablespoons each week until bowel movements are regular. Always drink one large glass of water with the mixture.

These treatments involve no risk to the patient and should be considered as initial treatment options for many women. Several treatments are available for the management of UI, and outcomes are encouraging, as many women with UI achieve good control of their symptoms, and some can even be cured.

**FLUID, DIET AND THE BOWELS—WHAT WORKS**

Women with UI can decrease urine leakage through modification of certain diet habits. It is important to teach women that adequate fluid intake is necessary to prevent UI. Dehydration can potentiate constipation, concentrate the urine, and increase the irritative effects of dietary substances. The recommended daily intake is 1500 mL, but many feel that a more appropriate intake is 1800–2400 mL/d. Some women, especially chronic dieters, drink excessive fluids, mainly water, that may total 4000 mL/d. If they are experiencing UI, they should be encouraged to decrease the amount.

The timing of fluid may be important in women who have problems with nocturia. To decrease nocturia precipitated by drinking fluids primarily in the evening or with dinner, instruct the woman to reduce fluid intake after 6 PM and to shift intake toward the morning and afternoons.

The type of fluid or food is important. Dietary substances that are spicy, acidic, or carbonated can irritate the bladder, causing urinary symptoms. The most common offenders are caffeinated and carbonated beverages, citrus fruits, and tomatoes. Research has shown that UI decreased when caffeine consumption was reduced \(^{17,18}\). Women should gradually reduce caffeine intake and “wean” themselves off these products.

Dietary changes to assist women who have constipation should be recommended, as chronic constipation can contribute to incontinence. The history should include a review of bowel function. Suggestions for managing constipation are found in Table 2.

**BLADDER TRAINING**

The basis of a bladder-training regimen includes education, followed by a strict schedule of voluntary voiding, with specific instructions to avoid responding prematurely to urinary urgency. Education focuses on the cortical ability to delay voiding and on strategies for distraction. Concentration on an attentional task is useful in distracting the individual from the sensation of urgency.\(^ {19}\) Improving the ability to suppress the urge sensation and eventually diminish urgency will enable the woman to adopt a more normal voiding pattern. A useful strategy to control and inhibit the urge sensation is the use of slow, deep breathing to relax and reduce or eliminate the urge. Another method is to have the women perform five or six rapid intense pelvic muscle contractions, or “flicks,” as pelvic muscle contractions have also been found to reduce the sensation of urgency. Urinary leakage secondary to a detrusor contraction can be reduced by a strong sus-
tained contraction of the pelvic floor musculature. A strong voluntary contraction may interrupt urinary leakage not only by simply obstructing the urethral outlet but also by suppressing detrusor activity. Women are instructed to practice learned inhibition when they have an urge to void or before ambulating to the toilet. Tracking the woman's progress through the use of bladder diaries is very helpful.

**Pelvic Muscle Rehabilitation**

Pelvic muscle exercises (PMEs) are effective for women with UI but require a strong commitment from both the patient and health care provider. The actual effects of PMEs on actual lower urinary muscle function are not completely understood, although it is felt that there is a relationship between changes in various measures of pelvic floor strength, such as anal sphincter strength or increased urethral closure pressure and resistance, all of which will prevent urine leakage. It is felt that improved neuromuscular coordination also accounts for the success of PME in women. Gains in continence occur when the women practicing PME learn to effectively contract the pelvic floor muscles when increases in intraabdominal pressure occur during routine daily activities and when quick muscle contractions are used at the time of urinary urgency.

Since these exercises were first described, a large body of research has been published in the literature that has been outlined in the 1996 Agency for Health Care Policy and Research Urinary Incontinence Clinical Practice Guidelines. Most studies report more than a 50% reduction in incontinence episodes, and 25% report a 100% cure. Persons who should be excluded from PME include those with spinal cord injuries and central nervous system defects.

The levator ani muscle group comprises the pelvic floor and is a supportive mechanism for the pelvic organs. This group of muscles found at the base of the pelvic floor is made of approximately 70% slow-twitch and 30% fast-twitch muscle fibers. Slow-twitch muscle fibers produce less force on contraction and assist in improving muscle endurance by generating a slower, more sustained, but less intense contraction. Fast-twitch fibers, which aid in quick and forceful contractions, can be used during sudden increases in intra-abdominal pressure by contributing to urethral closure. PMEs consist of repeated, high-intensity pelvic muscle contractions of both types of muscle fibers.

Brief verbal instructions are not adequate to teach the woman how to perform pelvic muscle contractions. The assumption that the appropriate muscles are identifiable by the patient cannot be made unless directly tested. It is important for the provider to take the time to work with the woman in identifying the muscle. If the woman does not isolate the correct muscle, she may mistakenly bear down or exercise ineffectively. Therefore, women should be taught to identify and isolate the pelvic floor at the time of a bimanual physical examination. Pelvic floor muscle strength can be assessed by use of a clinical rating scale. An example is in Figure 1.

---

**SCALE FOR GRADING DIGITAL EVALUATION OF PELVIC MUSCLE STRENGTH**

*CHECK EXAM PERFORMED*

<table>
<thead>
<tr>
<th>Score</th>
<th>Vaginal Exam</th>
<th>Rectal Exam</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No contractions</td>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>1/5</td>
<td>Trace contraction: &lt; 1 second</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/5</td>
<td>Weak contraction: with or without posterior elevation of fingers, contraction held for &gt; 1 second but ≤ 3 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/5</td>
<td>Moderate contraction: with or without posterior elevation of fingers, contraction held for at least 4 – 6 seconds, repeated 3 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/5</td>
<td>Strong contraction: with posterior elevation of fingers, contraction held for at least 7-9 seconds, repeated 4-5 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/5</td>
<td>Unmistakably strong contraction: with posterior elevation of fingers, contraction held for at least 10 seconds, repeated 4-5 times</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**USAGE OF ACCESSORY MUSCLE GROUPS**

<table>
<thead>
<tr>
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<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gluteal</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Thigh/abductor</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**EVALUATION – MUSCLE HYPERTONUS/SPASM**

<table>
<thead>
<tr>
<th>Circle One</th>
<th>0</th>
<th>No pressure or pain associated with exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Comfortable pressure associated with exam</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Uncomfortable pressure associated with exam</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Moderate pain associated with exam, intensifies with contraction</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Severe pain associated with exam; unable to perform muscle contraction due to pain</td>
<td></td>
</tr>
</tbody>
</table>

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properly performed contraction will displace the anterior vaginal wall in a caudal-ventral direction as the levator ani contracts. The contraction is then rated for pressure generated, duration of palpable contraction, and vaginal wall displacement or elevation. The woman is also asked to contract the anal sphincter around the examining finger as if she were trying to contain flatus. A correct pelvic muscle contraction visually causes a downward movement of the clitoris, inward pulling of the vaginal introitus, and tightening of the anus.

Women should be instructed about correct technique for PMEs using specific protocols that include a planned exercise program. A PME protocol should consist of contractions of both types of muscle fibers. Usually, the woman is instructed to perform a series of “quick 2-second muscle contractions (flicks),” followed by 5- to 10-second-long muscle contractions, several times a day. An adequate period of muscle relaxation between contractions is recommended. Women should be encouraged to aim for a high level of concentrated effort with each pelvic muscle contraction. Women should optimally perform the exercises in three positions: lying, sitting, and standing. A gradual increase in number of contractions, usually a total of 60 per day, over a period of time, has been shown to significantly increase muscle strength and decrease urine loss. Women should be instructed to contract the muscle at the time of the UI episode.

Contracting it before sneezing, coughing, lifting, or standing can prevent stress UI from occurring. The muscle also can be contracted when the woman feels a strong urge to void. Women should be told that increasing muscle strength and coordination takes time and that major change may not occur before 4 weeks. Because patient compliance is critical to a successful pelvic rehabilitation program, the woman needs to work the exercises into activities of daily living, such as showering or driving.

**Adjunct Techniques for Pelvic Muscle Rehabilitation**

Biofeedback, when used as part of a pelvic muscle rehabilitation program for UI, translates imperceptible pelvic muscle activity to the patient in a readily understandable signal. Biofeedback has been shown to improve both effort and coordination of the pelvic muscles. This technique may be especially helpful in women who are having difficulty identifying and isolating the correct muscle. Biofeedback equipment varies from a simple pressure perineometer, first described by Dr. Kegel, to sophisticated computer-based devices that use either pressure (manometry) or electromyography (EMG) and are capable of storing information and printing pelvic muscle activity data, usually in a graph or numerical form. Currently, there are sophisticated computerized EMG biofeedback units for muscle evaluation and training. Surface, vaginal, and anal electrodes can be used to measure muscle contraction. Biofeedback devices for use at home may benefit a home exercise program.

In addition to biofeedback therapy, devices such as vaginal weights and electrical stimulation can be used with PMEs. Intravaginal weights are readily available in different shapes, and weights, and can be found in medical supply catalogs. The research has primarily centered on a set of vaginal weights that are of identical shape but increase in weight from 20 to 100 g. The woman is taught to insert the lightest weight into the vagina and retain it for a maximum of 15 minutes, twice a day. The woman moves on to a heavier weight as her muscle strength increases. The exact mechanism by which these weights improve UI is not understood. Pelvic floor electrical stimulation (PFES) is the application of electrical current to the pelvic muscle. Pelvic muscle electrical stimulation, combined with biofeedback, may prove useful in that the electrical stimulation provides a passive contraction with increased awareness of pelvic muscle contractions. The exact mechanism for why PFES may work with both stress and urge UI is not clear, but it may be that low-level electrical currents might stimulate reinnervation of the pelvic floor or modulate a change in muscle fibers in terms of the ratio of slow- to fast-twitch muscle fibers. Low-level electrical currents through the pudendal afferents may cause increased inhibition of the detrusor and increased tone of the pelvic floor.

Recently, the Health Care Financing Administration issued a positive national coverage decision for persons covered by the Medicare program for both biofeedback therapy and pelvic floor electrical stimulation for the treatment of urinary incontinence in patients with stress and/or urge incontinence who have undergone and failed a trial of PMEs. This represents a major step forward in the wide usage and acceptance of these modalities.

**Managing Urine Leakage**

The need for managing and collecting urine leakage is a growing and frustrating problem for women. Despite the growing need, there are very few viable options for the female patient.

**Urine Collection Systems**

External collecting devices are placed over the urethral meatus within the introitus area; are se-
cured by straps, adhesive, or suction; and empty into a drainage bag. External systems for women are usually made from polyvinyl material. Although there are a few products that have been developed, tested, and reported on their use, they are not widely distributed and sold. The major difficulties are due to variations in patient anatomy, anatomical positioning of the device, and adherence to the periurethral area. There is a disposable female pouch available that is secured over the labia majora by adhesive and connected to a urine collection bag by a tube. The device has been worn up to 24 hours. This female pouch has been primarily used on frail, older women living in institutions or being cared for in their home. There are no devices for the collection of urine that have been successfully developed or tested in an ambulatory female population.

**ASSISTIVE TOILETING OR COLLECTION DEVICES**

The use of specific toileting or collection containers that are designed to be used when the woman voids are an important component of managing UI. Female urinals available in the United States have not been successful with women lying down or sitting upright, especially in wheelchairs. However, there are urinals available in Canada and England that are very successful with this population. Often the provider will forget that improving access to toileting by the addition of a more portable toilet, such as a bedside commode or bedpan, may be the most effective and only management strategy available in certain populations of women.

**PELVIC ORGAN SUPPORT DEVICES**

A device inserted intravaginally may assist women with pelvic organ prolapse (POP). The most common device used is a pessary made of silicone material that comes in several shapes and sizes. Vaginal support devices are recommended to provide support to women with POP and to alleviate symptoms of urgency, frequency, and urinary incontinence. Pessaries are available in various sizes and shapes, depending on the type and severity of prolapse and the integrity of the perivaginal muscles. A pessary is inserted into the vagina to rest against the cervix, similar to use of a diaphragm in birth control. Use of pessaries requires fitting and frequent and regular monitoring by trained health care providers. Complications can result when the pessary is misused or neglected and can include ulceration of the vagina and rectovaginal and vesicovaginal fistula. These devices should not be used in women with vaginitis or in those who cannot remove or insert the device without routine access to a health care provider. Although a pessary has been primarily used for POP, this device has been used for the prevention of exercise UI.

**OCCLUSIVE URETHRAL DEVICES**

These block leakage when inserted into the urethra. They have been used primarily in women with stress UI. Similarities among the devices include means to 1) prevent intravesical migration; 2) enhance device retention within the urethra through the use of inflatable balloons, flanges, or a magnet; and 3) accomplish bladder emptying by removal of the device using a string or through a pumping mechanism. The current one available in the United States is a sterile, disposable, single-use intravaginal device. It consists of a narrow silicone tube entirely enclosed in a soft, thin, mineral oil–filled silicone sleeve. The silicone sleeve forms a balloon on the tip of the insert. As the urethral insert is advanced into the urethra, fluid in the balloon is trans-ferred toward the external retainer to facilitate passage through the urethra. Once the tip of the insert has entered the bladder, the fluid returns to fill the balloon, forming a mechanical barrier to retain urine within the bladder. To assist with insertion, the insert is supplied on a disposable applicator and with a lubricating gel. The device is easily removed for normal voiding and should be removed at least once every 6 hours. This product is a one-time use, disposable device. The device has been released in certain markets throughout the United States. Most women who utilize an intravaginal device report dryness. Side effects include discomfort, urinary tract infection, and hematuria.

**EXTERNAL OCCLUSIVE BARRIER DEVICES**

External occlusive barrier devices that block urinary leakage at the urethral meatus have been developed. These devices use either adhesive or mild suction to prevent urine loss by occlusion. In addition to a simple barrier effect, compression of the wall of the distal urethra has been hypothesized to contribute to continence. Most of the devices that have been developed are not currently available in the U.S. market.

**PROTECTIVE PADS**

Many sizes and styles of protective absorbent pads are currently available to manage UI. The woman should choose the type of protective product depending on the amount and type of urinary leakage. Most providers see women with mild infrequent stress incontinence wearing feminine hygiene pads (panty liner, mini pad, and maxi pad) or using toilet tissue or paper towels instead of a pad to save on cost. If the amount of urine loss is moderate to large with stress, urge, and/or mixed UI, products specifically de-
signed to absorb urine should be used. These incontinence pads have a special super-absorbent polymer or absorbent gelling material, which is concentrated in the crotch area to absorb the urine. Super absorbers hold much more urine—weight—than fluff pulp and retain it far more tenaciously under pressure. There are a number of categories of absorbent products:

- **Inserts**, sometimes referred to as liners or perineal pads, are plastic-backed pads held in place by adhesive or close-fitting underwear.
- **Briefs** are adult-sized diapers, which are intended primarily for women with severe incontinence because they are difficult to remove if self-toileting.
- **Protective underwear** is a new product that is pulled on like underwear but is disposable. Since their release, they have become very popular with women with mild to moderate urine leakage.
- **Pad/pant system** is a two-part system that uses a disposable pad in different absorbencies that is inserted and kept in place by a reusable mesh pant. These are most appropriate for the woman with moderate to severe urine leakage who is independent in toileting.

Women with irritation or skin breakdown from the wearing of pads can use cloth panties that have removable washable inserts. Skin care must become an important part of the woman’s daily routine in regard to adequate hygiene, with the application of barrier ointments to the perineal area to promote skin healing and prevent further skin deterioration.

The provider must provide assistance in the choice of the appropriate protective product to manage incontinence. When assisting the patient, it is important to consider the functional state, lifestyle, comfort, skin health, and financial concerns of the patient. If immobility exists with excessive incontinence, a full adult brief with protective pads for the bed may be the appropriate choice. Active women with moderate to severe incontinence might find the brief functional, but psychologically objectionable.

**Conclusion**

UI affects a substantial number of women, resulting in considerable financial expenditure and reduction in quality of life. Many treatments are available, including surgical and nonsurgical options. Considering the surgical risks, cost, and effect on work productivity, a conservative treatment approach seems reasonable for many women. Primary care providers are in a position to provide these types of treatments to women of all ages; however, they often lack the necessary training, knowledge, or confidence to manage incontinence successfully in the primary care setting. Conservative interventions are within the purview of the primary care provider. These treatments can be implemented successfully in this environment.

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