- Placement of an artificial sphincter.

The sling procedure has been used only occasionally in men, and the information available is insufficient for providing effective recommendations at this time.

The preoperative evaluation may require a cystoscopy, and a simple cystometry or complex videourodynamic studies, depending on the suspected etiology. Special care and followup are required in neurologically impaired individuals due to a significant incidence of bladder compliance changes following therapy to increase outlet resistance. Before injection or sphincter implantation, it is advisable to wait at least 6 months to a year and to have the patient undergo behavioral and pharmacologic intervention during the intervening months. If an artificial sphincter is being considered, it is important to assess whether the patient has enough manual dexterity and ability to operate the device.

Periurethral Bulking Injections

Periurethral bulking injections are recommended as a first-line surgical treatment for men with ISD. (Strength of Evidence = B.)

Periurethral bulking injections can improve urinary loss in men with stress incontinence. The mechanism for improvement after injection therapy is still unclear but may reflect an improvement in urethral coaptation and possibly compression. Periurethral injections are less likely to succeed in male than in female patients and in all patients who have undergone pelvic radiation therapy or who have extensive periurethral scarring. Success is more common in patients who have stress incontinence after transurethral or open prostatectomy than in those after radical prostatectomy. The literature does not support the use of bulking agents in men with severe postprostatectomy incontinence (Appell, 1994). Experience and followup are limited for treatment by injections with collagen and fat, which are absorbed by patients over time. There are no randomized studies comparing the efficacy of different materials or of injection therapy with other forms of treatment. The analysis included 9 studies of 1,005 men treated with periurethral injection (Kaufman, Lockhart, Silverstein, et al., 1984; Corrie, Rodriguez, and Thompson, 1989; Deane, English, Hehir, et al., 1985; McGuire and Appell, 1994; Osther and Rohl, 1988; Smart, 1991; Stanisic, Jennings, et al., 1991; Politano, 1992; Santarosa and Blavias, 1994). Sample sizes ranged from a minimum of 3 to a maximum of 720. The mean age was 69 years, and mean followup time was 2.0 years. The "cure" rate was reported in eight studies and ranged from 0 to 66 percent, with a mean of 20 percent. The "cure"-improvement rate was reported in nine studies and ranged from 0 to 81 percent, with a mean of 42 percent.

Complications reported with PTFE included infection, urinary retention, fever, temporary erectile dysfunction, periurethral inflammatory reaction, extrusion of the material into the urine or perineal area, and burning sensation or perineal discomfort. Particles of PTFE have been found in patients' lungs after periurethral injection of PTFE, but the exact incidence and the clinical significance of this migration are not known.

Placement of an Artificial Sphincter

Artificial sphincter may be elected for ISD during the 6 months after prostatectomy. Behavioral intervention should also be tried during this period. (Strength of Evidence = B.)

Before periurethral injection therapy became available, placement of an artificial urinary sphincter was the most commonly used surgical procedure for the treatment of underactive outlet in men. Data on the current rate of comparative utilization of these two techniques are not available. Before implantation, urodynamic evaluation to confirm a stable, compliant, low pressure bladder is critical.

The analysis included 10 studies that presented data on 346 men, with sample sizes ranging from 11 to 96 (Brito, Mulcahy, Mitchell, et al., 1993; Gundian, Barrett, and Parulkar, 1989; Marks and Light, 1989; Nordling, Holm-Bentzen, and Hald, 1986; Lowe, Schertz, and Parsons, 1988; Malloy, Wein, and Carpiniello VL, 1989; Motley and Barrett, 1990; Schreiter, 1985; Wang and Hadley, 1991; Warwick and Abrams, 1990). The average age of the patients

was 61.4 years. The "cure" rate was presented in nine studies and ranged from 33 to 88 percent, with a mean of 66 percent. The "cure" or improvement rate in the 10 studies ranged from 75 to 94.5 percent, with a mean of 85.3 percent.

Initial preoperative complications are mainly associated with urethral or bladder injury during implantation. Delayed complications included mechanical problems such as pump malfunction, fluid leak, or tubing kink; infection; or cuff-related site atrophy, incomplete compression, or erosion. In addition, urethral injury, pump erosion, and herniated reservoir were reported in fewer patients.

The utilization of the artificial urinary sphincter in patients after radiation therapy, cryotherapy, or pelvic fracture with urethroplasty is controversial because of concern about compromising the urethral blood supply. Also controversial is the use of intermittent catheterization after sphincter implantation. The experience of the implanting surgeon may be related to the incidence of complications.

Urge Incontinence: Detrusor Instability

Use of surgical procedures in the management of urge incontinence is uncommon. Surgical treatment is usually considered only in highly symptomatic patients in whom nonoperative management has failed repeatedly.

The surgical procedures reviewed for the treatment of overactive bladder include

- Augmentation intestinocystoplasty or urinary diversion.
- Bladder denervation procedures.

Augmentation intestinocystoplasty is recommended for those patients with intractable, severe bladder instability or poor bladder compliance that is unresponsive to nonsurgical therapies. (Strength of Evidence = B.)

Urinary diversion is recommended in severe intractable cases of detrusor instability or poor bladder compliance that is unresponsive to other therapies. (Strength of Evidence = C.)

Augmentation Intestinocystoplasty or Urinary Diversion

Various surgical procedures have been proposed for treating intractable, severe bladder instability and poor compliance. Augmentation cystoplasty with a patch of detubularized intestine is usually considered the procedure of choice. Urinary diversion with a urostomy or continent urinary diversion may be utilized as a last resort.

The risks of augmentation cystoplasty, in addition to those of any bowel surgery, include voiding difficulties that may require catheterization, mucus or stone formation, metabolic decompensation, and the rare long-range possibility of tumor formation. Contraindications for augmentation cystoplasty include renal insufficiency, bowel disease, intractable urethral disease, and inability to perform self-catheterization.

Twelve articles were reviewed (Bramble, 1982; Fenn, Conn, German, et al., 1992; George and Russel, 1991; Kockelbergh, 1991; Linder, Leach, and Rax, 1983; Lockhart, Ellis, Helal, et al., 1990; Mundy and Stephenson, 1985; Raz, Ehrlich, Zeidman, et al., 1988; Robertson, Davies, et al., 1991; Sethia, Webb, and Neal, 1991; Sidi, Becher, Reddy, et al., 1990; Strawbridge, Kramer, Castillo, et al., 1989). The studies included 403 subjects, with sample sizes ranging from 11 to 112. The mean age was 35.8 years and the known mean followup was 2.2 years (four studies). All studies included both men and women but did not separate out results. Thirty-eight percent of patients were rendered continent with spontaneous voiding (range 0-87 percent). If patients continent with CICS are included, then the mean "cure" rate is 82 percent (range 56-100 percent) and the improvement rate is 90 percent (71-100 percent).

Complications included recurrent UTI (29 patients), persistent mucus formation (11 patients), hourglass stricture at the vesicocecal anastomosis (1 patient), and complications from the artificial sphincter (3 mechanical problems, 1 pump erosion, 1 cuff erosion). The total complication rates were 47 of 87 (54 percent) for the augmentation and 5 of 22 (44 percent) for the artificial sphincter.

Bladder Denervation Procedures

Subtrigonal phenol injections (Blackford, Murray, Stephenson, et al., 1984; Ewing, Bultitude, and Shuttleworth, 1982; Nordling, Steven, Meyhoff, et al., 1986; Rosenbaum, Shaw, and Worth, 1990; Wall and Stanton, 1989) and bladder denervation (Alloussi, Loew, Mast, et al., 1984; Diokno, Hollander, and Alderson, 1987; Hodgkinson and Drukker, 1977; Lucas, Thomas, Clarke, et al., 1988; McGuire and Savastano, 1984; Opsomer, Klarskov, Holm-Bentzen, et al., 1984; Rockswald, Chou, and Bradley, 1978; Torring, Petersen, Kelmar, et al., 1988) are not presently recommended because the "cure" rates are low, and therefore the risk-to-benefit ratio is too great.

Subtrigonal or transvesical phenol injection

Five series of patients treated with subtrigonal phenol injections were reviewed and combined to include a total of 244 patients (Blackford, Murray, Stephenson, et al., 1984; Ewing, Bultitude, and Shuttleworth, 1982; Nordling, Steven, Meyhoff, et al., 1986; Rosenbaum, Shaw, and Worth, 1990; Wall and Stanton, 1989). "Cure" was not defined in all studies, but a short-term (< 6 months) response was reported in 142 patients. Almost all patients had relapsed by 2 years, however. For the combined series, complications included trigonal ulcer, vesicovaginal fistula, hematuria, vesicoureteral reflux, partial sciatic nerve palsy, obstructive voiding symptoms, and permanent urinary retention. The total complication rate was 12.3 percent.

Of these five studies subjected to meta-analysis, two reported treating both men and women (Nordling, Steven, Meyhoff, et al., 1986; Rosenbaum, Shaw, and Worth, 1990), and the other three included female patients only. Combined analysis of all male subjects revealed that the phenol injection produced no "cure" or improvement. Of the 234 female subjects, 8.6 percent were "cured" and an average of 52.5 percent were "cured" or improved.

Thus, transvesical phenol injection appears to be totally ineffective in "curing" or improving male continence, ineffective in "curing" female incontinence, and only possibly effective in improving female incontinence.

Bladder denervation

Eight studies of bladder denervation were reviewed. In three, bladder denervation was used to treat idiopathic DI in patients with no demonstrable neurologic lesions (Alloussi, Loew, Mast, et al., 1984; Diokno, Vinson, and McGillicuddy, 1977; Hodgkinson and Drukker, 1977). Three other studies examined patients with DH from known neurologic problems (McGuire and Savastano, 1984; Rockswald, Chou, and Bradley, 1978; Torring, Peterson, Kelmar, et al., 1988). Two studies included patients in both categories (Lucas, Thomas, Clarke, et al., 1988; Opsomer, Klarskov, Holm-Bentzen, et al., 1984).

The three studies concerning only idiopathic DI included a total of 52 patients (Alloussi, Lowe, Mast, et al., 1984; Diokno, Vinson, and McGillicuddy, 1977; Hodgkinson and Drukker, 1977). Denervation was accomplished by selective sacral rhizotomy, S3 foramen injection, or transvaginal denervation. Only 20 patients had a stated followup period longer than 1 year. Combined analysis of all treated patients revealed an average of 40.4 percent "cured" and an average of 59.4 percent "cured" or improved. The only complication listed was perineal hypoesthesia.

The three studies concerning only true neurologic disease included 34 patients (McGuire and Savastano, 1984; Rockswald, Chou, and Bradley, 1978; Torring, Peterson, Kelmar, et al., 1988). Twenty-three had multiple sclerosis, nine had paraplegia or quadriplegia, and two had cerebral lesions. Denervation was accomplished by selective sacral rhizotomy in 19, sacral rhizotomy in 12, and 2-4 dorsal root ganglionectomy in three. Followup ranged from 2 to 10 years. Combined analysis of all treated patients revealed an average of 47.1 percent "cured" or improved. Complications included one wound infection and two episodes of intra-operative bleeding. The two studies concerning both types of instability were the only studies in which long-term followup (at least 4 years) was reported for all patients after selective sacral rhizotomy (Opsomer, Klarskov, Holm-Bentzen, et al., 1984; Lucas, Thomas, Clarke, et al., 1988). Thirteen patients (50 percent) had either persistent or recurrent incontinence, and six others were dry only with additional treatment with anticholinergics. Thus, the long-term results were not favorable.

Overflow Incontinence: Bladder Neck or Urethral Obstruction

Symptoms of overflow or incontinence secondary to urethral obstruction can be addressed with a surgical procedure to relieve the obstruction. (Strength of Evidence = B.)

Intermittent catheterization or an indwelling catheter may be considered in patients who are not candidates for surgery and suffer overflow incontinence due to urethral obstruction. (Strength of Evidence= C.)

There is no evidence to support the use of urethral dilation for the treatment of incontinence in women, although it may be useful in the extremely rare cases of primary obstruction. (Strength of Evidence = C.)

Internal urethrotomy is not recommended for treating urethral obstruction in women. (Strength of Evidence = C.)

Overflow incontinence should be ruled out during the basic evaluation. PVR volume can be evaluated by catheterization or by pelvic ultrasound. If overflow incontinence is discovered, its cause -- anatomic obstruction, detrusor weakness, or both -- should be determined.

A patient with a persistently underactive detrusor with or without obstruction is best treated by intermittent catheterization (IC). A patient with an underactive detrusor and outlet obstruction has a significantly lower chance of favorable surgical outcome than a patient with normal detrusor activity. If the patient or caregivers are unable to perform urethral catheterization, other options include indwelling urethral or suprapubic drainage, or supravesical diversion.

If the etiology is anatomic obstruction with an adequately contracting detrusor and the patient has an acceptable level of surgical risk, the best treatment is surgery.

The Female Patient

In women, anatomic obstruction can result from prior anti-incontinence surgery or severe pelvic prolapse. For women who have anatomic obstruction after anti-incontinence surgery, two procedures can relieve the obstruction. Obstruction from an endoscopic needle bladder neck suspension can be relieved by cutting one of the suspending sutures. To evaluate the outcome of this procedure, five studies were reviewed (Araki, Takamoto, Hara, et al., 1990; Fowler, 1986; Huland and Bucher, 1984; Mundy, 1983; Vordermark, Brannen, Wettlauffer, et al., 1979). The combined series of 4 studies included 182 patients who had had a needle bladder neck suspension. Ten patients (5 percent) developed obstructive voiding symptoms, which were resolved after one suture was out; only one patient had a recurrence of incontinence.

The other procedure -- urethrolysis (remobilization of the periurethral adhesions) with or without resuspension -- can be used after almost any type of anti-incontinence surgery. Three studies included 41 patients who were classified by symptoms and urodynamic studies and underwent urethrolysis through a transvaginal approach in combination with a repeat endoscopic suspension regardless of the presence or absence of preoperative incontinence McGuire, Letson, and Wang, 1989; Nitti and Raz, 1994; Zimmern, Hadley, Leach, et al., 1987). Seventy-one percent of the patients had improved voiding patterns by urodynamic evaluation, and 80 percent had some improvement in symptoms, with 79 percent of those who were incontinent preoperatively exhibiting resolution of their stress incontinence.

The Male Patient

In elderly men, the most common cause of anatomic obstruction is benign prostatic hyperplasia (BPH). The treatment of BPH is multifaceted and is addressed in *Benign Prostatic Hyperplasia: Diagnosis and Treatment. Clinical Practice Guideline.*

Other Measures and Supportive Devices

Other measures and supportive devices used in the management of UI include the following:

- Intermittent catheterization.

- Indwelling urethral catheterization.

- Suprapubic catheters.

- External collection systems.

- Penile compression devices.

- Pelvic organ support devices.

- Absorbent pads or garments.

Intermittent Catheterization

IC is recommended as a supportive measure for patients with spinal cord injury, persistent UI, or chronic urinary retention secondary to underactive or partially obstructed bladder. (Strength of Evidence = B.)

IC has become standard treatment for persons with spinal cord injuries and for patients with other forms of chronic urinary retention due to an underactive or partially obstructed bladder. This procedure can be performed by patients or their caregivers using sterile or clean catheters to provide intermittent routine bladder emptying every 3-6 hours. Long-term use of IC appears preferable to indwelling catheterization in regard to complications such as infections and bladder and renal stones; however, well-designed comparison studies have not been performed (Webb, Lawson, and Neal, 1990; Warren, 1990). In spinal cord patients, the incidence of bacteriuria is 1-3 percent per IC, and between one and four episodes per 100 days of catheterization using IC four times a day Warren, 1994). Other complications include urethral inflammation, stricture, false passage, hydronephrosis, and epididymitis (Webb, Lawson, and Neal, 1990).

Clean technique for IC is recommended for young, male, neurologically impaired individuals. (Strength of Evidence = B.)

Sterile technique for IC is recommended for elderly patients and patients with compromised immune system. (Strength of Evidence = C.)

IC may be performed as a clean or sterile procedure among young, neurologically impaired individuals. The nonsterile clean approach appears to result in rates of infection lower than those noted with indwelling catheters. Furthermore, the infections that do occur are usually managed without complication provided vesicourethral reflux does not exist, and bladder overdistension and trauma are avoided (Diokno, Sonda, Hollander, et al., 1983; Perkash and Giroux, 1993; Wyndaele and Maes, 1990).

King, Carlson, Mervine, et al. (1992) compared the incidence of urinary tract infection (UTI) using sterile and clean procedures in 46 randomly assigned, hospitalized, young patients with spinal cord injuries. Sterile catheter kits and procedures were utilized during IC of 23 subjects, and the remainder used the clean technique but did use a new sterile catheter every 24 hours. Results showed no statistical differences in symptomatic or asymptomatic infections between the two groups. The investigators recommended the use of a new sterile catheter every 24 hours if the clean procedure is used.

A followup study of clean IC in 50 nonhospitalized male patients with spinal cord injuries (mean age = 46; range = 19-70 years), with a followup period of 3 months to 6.5 years (mean of 22 months), reported that 43 of the 50 subjects (86 percent) developed significant bacteriuria, and 31 genitourinary complications occurred in 21 patients (Perkash and Giroux, 1993). The investigators concluded that clean intermittent catheterization can be a long-term management

approach for spinal cord patients; however, this intervention is not without risk of secondary complications. Thus, close monitoring is required so that early and effective treatment can be provided to prevent serious problems. Furthermore, the investigators also noted that maintenance of acceptable intravesical pressures with the use of anticholinergic therapy was important in avoiding serious complications in this group of patients.

The susceptibility of older persons to develop nosocomial infections puts them at higher risk than younger persons for developing bacteriuria and other complications caused by IC. Elderly and other persons with impaired immune systems and atrophic mucosa are also at risk (Terpenning, Allada, and Kauffman, 1989; Warren, 1990). Although the incidence of infection and other complications for elderly patients using sterile versus clean IC is not well established, it appears that sterile IC is the safest method for this high-risk population (Terpenning, Allada, and Kauffman, 1989). Older persons who have the physical and cognitive abilities and who are motivated can be taught to perform IC. A caregiver can also be instructed to perform IC for impaired individuals.

> Routine use of long-term suppressive therapy with antibiotics in patients with chronic, clean IC is not recommended. (Strength of Evidence = B.)

> In high-risk populations, for example, those with an internal prosthesis or those who are immunosuppressed because of age or disease, the use of antibiotic therapy for asymptomatic bacteriuria must be individually reviewed. (Strength of Evidence = C.)

As a general rule, the use of long-term suppressive therapy with antibiotics in people regularly using clean IC is undesirable because it is associated with the emergence of resistant bacterial strains. It is generally agreed that symptomatic UTI should be treated. In high-risk populations, for example, those with an internal prosthesis or those who are immunosuppressed because of age or disease, the use of antibiotic therapy for asymptomatic bacteriuria must be individually reviewed (Joseph, Jacobson, Strausbaugh, et al., 1991; Wahlquist, McGuire, Greene, et al., 1983). Controlled trials are needed to further evaluate the benefit-risk ratio of these methods of continence management.

Indwelling Urethral Catheters

> Indwelling catheters may be recommended as a supportive measure for patients whose incontinence is caused by obstruction and for whom other interventions are not feasible. Indwelling catheters are recommended for selected incontinent patients who are terminally ill or for patients with pressure ulcers as short-term treatment. (Strength of Evidence = B.)

> Indwelling catheters are recommended in severely impaired individuals in whom alternative interventions are not an option and when a patient lives alone and a caregiver is unavailable to provide other supportive measures. (Strength of Evidence = C.)

An indwelling urethral (Foley) catheter is a closed sterile system inserted through the urethra to allow bladder drainage. The use of indwelling catheters should be restricted to persons whose incontinence is caused by urinary tract obstruction that cannot otherwise be treated and for which alternative therapy is not feasible. Examples include acutely ill persons for whom incontinence interferes with necessary monitoring of fluid balance and terminally ill or severely impaired persons for whom bed and clothing changes are painful or disruptive. In situations where the severity of the incontinence and the complexity of the person's care have contributed to skin irritation or pressure ulcers (Stage III or IV), an indwelling catheter may be indicated for short-term therapy until the skin condition resolves.

Studies suggest that approximately 50 percent of nursing home patients are incontinent and that approximately 2-4 percent may require urinary catheterization; however, the actual prevalence of use of indwelling catheters measured in several nursing homes ranges from 6 to 28 percent (Ouslander, Kane, and Abrass, 1982; Warren, Steinberg, Hebel, et al., 1989). Indwelling catheter use in the homebound patient is common and requires supervision by a registered nurse

and additional personal hygiene care by paraprofessionals. The use of these devices in homebound individuals increases the cost of caring for these persons.

Long-term use of indwelling catheters is a significant cause of bacteriuria and UTI. Bacteriuria, which may be caused by encrustation formation of mineral and bacteria complexes, develops in most persons within 2-4 weeks after catheter insertion (Bjork, Pelletier, and Tight, 1984; Cox, Hukins, and Sutton, 1989; Tenney and Warren, 1988; Warren, Muncie, and Hall-Craggs, 1988). Cases of sepsis and death from severe UTI have been reported. In a nursing home population, mortality was three times higher in those with indwelling catheters than in noncatheterized patients, with significantly increased mortality in catheterized females (Kunin, Chin, and Chambers, 1987a; Kunin, Chin, and Chambers, 1987b). Other complications associated with indwelling catheters include obstruction secondary to encrustation, leakage, unprescribed removal, pain, bladder spasms, urethral erosion, stones, epididymitis, urethritis, periurethral abscess, chronic renal inflammatory changes, fistula formation, hematuria, and urinary leakage (Kunin, 1989; Warren, Muncie, and Hall-Craggs, 1988). Patients who are being managed with indwelling catheters over a long period of time should have their bladders evaluated by urologists on a routine basis.

Management of indwelling catheters varies. The usual practice is to change indwelling catheters every 30 days, but no data are available on the optimal frequency of catheter changes. Patients found to have encrustations and blockage might do better if their catheters were changed more frequently than every 30 days Kunin, Chin, and Chambers, 1987a). If the patient has symptomatic UTI, the entire catheter and system must be changed and a new urine culture obtained when the new catheter is inserted (Grahn, Norman, White, et al., 1985; Rubin, Berger, Zodda, et al., 1980). No studies have identified an ideal catheter size, balloon size, or type of indwelling catheter, although most experts agree that the standard catheter size is 14FR, 16FR, or 18FR with a 5-cc balloon filled with 10 cc of sterile water. There is evidence to refute the practice of catheter irrigation and clamping before removal; in addition, disinfection of urinary drainage bags is ineffective in preventing infection (Thompson, Haley, Searcy, et al., 1984). Routine bladder irrigation of catheters not only is ineffective in eradicating bacteriuria but also may further disrupt the already damaged bladder epithelium, predisposing the patient to further infection (Elliott, Gopal Rao, Reid, et al., 1987; Ruwaldt, 1983). Routine irrigation is not recommended if obstruction occurs. In patients with frequent obstruction, the system should be changed and other types of catheters or alternative management should be considered. A person with an indwelling catheter must be reassessed periodically to determine whether a voiding trial or bladder retraining program might be effective in eliminating the need for the catheter or whether surgical risk might now be improved such that a surgical procedure could be performed to relieve obstruction.

It is not known which type of catheter (e.g., silicone, latex, Teflon) is best. Specific risks are difficult to assess because studies generally do not report the type or brand of catheter used. The development of silver-coated, antimicrobial, lubricous-coated, and female catheters may decrease the formation of encrustation and other complications; however, further research on these products is needed to determine their effectiveness (Blacklock, 1986; Brocklehurst, Hickey, Davies, et al., 1988; Johnson, Roberts, Olsen, et al., 1990; Kunin and Finkelberg, 1971; Liedberg and Lundeberg, 1990; Liedberg, Lundeberg, and Ekman, 1990).

Suprapubic Catheters

Suprapubic catheters are for short-term use following gynecologic, urologic, and other surgery, or as an alternative to long-term catheter use. Suprapubic catheterization is contraindicated as a long-term management option in persons with chronic unstable bladder (DI, DH) and ISD. (Strength of Evidence = B.)

Suprapubic catheterization involves percutaneous or surgical introduction of a catheter into the bladder through the anterior abdominal wall. Indications include short-term use following gynecologic, urologic, and other types of surgery or as an alternative to long-term catheter use in men and in women with urethral closure. Suprapubic catheters are contraindicated in persons with chronic unstable bladder (DI, DH) or ISD. Stower, Massey, and Feneley (1989) treated 50 patients with diagnoses of neurogenic bladder with suprapubic catheterization and urethral closure. Patients in this series had either severe neurologic disease or pressure ulcers, or had refused an ileal conduit. Complications

included leakage around the catheter (17 percent), bladder stone formation (21 percent), symptomatic UTI (90 percent), and recurrent blocked catheter (10 percent).

Barnes, Shaw, Timoney, et al. (1993) studied 40 outpatients (23 women, 17 men) with a mean age of 45 years in whom suprapubic catheters were used to manage UI over a 2-year period. Thirty-five of the subjects had suffered traumatic spinal cord injury, and five had spinal cord lesions of nontraumatic origin. All had failed or declined to use IC to empty their bladders. Catheter-related problems were common, and only five patients had experienced no problems since insertion. The researchers reported good results utilizing size 14-16 French catheters, anticholinergic drug therapy, and daily clamping of the catheter. Only patients not using the medication and daily clamping regimen experienced reflux and decrease in bladder capacity. Leakage from the urethra and blocking of the catheter was reported for five patients. No discussion of problems with bacteriuria was presented. Immediate complications included cellulitis, hematoma, and bowel injury of 32 patients who expressed an opinion; 27 were satisfied with this form of bladder management. Long-term complications were similar to those associated with the use of indwelling catheters (Feneley, 1983; Stower, Massey, and Feneley, 1989).

Further studies are needed on the use of suprapubic catheterization for long-term management of UI. In the absence of data, panel consensus is that a suprapubic catheter is preferable to an indwelling catheter in the patient who requires chronic bladder drainage and for whom no other alternative therapy is possible, because it eliminates urethral complications. However, management of suprapubic catheters presents potential problems such as uncontrolled urine leakage, skin erosion, and hematoma, and problems with catheter reinsertion. Long-term medical management of suprapubic catheterization may also be problematic if health care providers lack knowledge and expertise and if the homebound patient lacks quick access to medical care if a problem arises. Suprapubic catheterization may be preferable to urethral catheters; however, additional studies are needed to better describe the benefits and risks of this treatment.

External Collection Systems

External collection systems are recommended for incontinent men and women who have adequate bladder emptying, who have intact genital skin, and in whom other therapies have failed or are not appropriate. (Strength of Evidence = C.)

External (condom) systems for men are catheters or devices made from latex rubber, polyvinyl, or silicone that are secured on the shaft of the penis by a double-sided adhesive, latex inflatable cuff, jockey's type strap, or foam strap, and connected to urine collecting bags by a tube. Condom catheters should not be used in patients with chronic obstruction. Frail, elderly males with cognitive impairment, who are considered candidates for condom catheter use, should be evaluated for symptomatic UTI, urinary retention, and upper tract damage before using these devices.

Patients and their caregivers should be carefully instructed in the proper application of external catheters and taught to check for possible complications. Although external catheters are preferable to indwelling catheters, they are also associated with UTI Johnson, 1983; Ouslander, Greengold, and Chen, 1987b). Mechanical irritation and penile constriction may also occur from the friction caused by an external catheter (Jayachandran, Mooppan, and Kim, 1985). Therefore, the penis should be inspected daily, and careful attention must be given to avoid contact dermatitis, maceration of the penis, ischemia, and penile obstruction. Most complications result from improper and prolonged use of these devices. Also, persons with sensory loss secondary to neuropathy are unable to appreciate the potential for trauma to the area associated with improper use of the condom device (Jayachandran, Mooppan, and Kim, 1985).

Female external urine-collecting systems are available, but little research on their use and efficacy is available. External urine-collecting devices for women differ in their use of a vaginal locator, adhesive, suction, support belt, potential length of wear, and mobility with use (Pieper, Cleland, Johnson, et al., 1989). Johnson, O'Reilly, and Warren 1989) studied 63 applications of an external urine-collection device on incontinent women in a nursing home. The device was a flexible, plastic pouch that funneled urine through a connecting tube into a bedside collector. This device

was allowed to remain in situ for a maximum of 48 hours. Only 14 percent of the devices required premature replacement because of unacceptable leakage. The primary adverse reaction was mild erythema. However, removal of the device was required for two patients with severe irritation and one patient with periurethral edema. Johnson, Muncie, O'Reilly, et al., (1990) studied the use of external collecting devices in 26 women (mean age 79.8) residing in a rehabilitation center. Of 2,461 external device applications, almost 80 percent were adherent and leak free at 24 hours, and almost half were still adherent and leak free at 48 hours. There was no difference in mean wear time among 13 patients who were strictly bedridden; however, device leakage increased when a transfer (bed to chair) took place compared with no transfer. Periurethral erythema was observed in 1.6 percent of patients after removal of the device. The incidence of episodes of bacteriuria was 3.1 episodes per 100 days of external device use. Reported adverse reactions to the use of these devices include periurethral erythema and perineal itching (Johnson, Muncie, O'Reilly, et al., 1990; Johnson, O'Reilly, and Warren, 1989).

Penile Compression Devices

Penile compression devices are known to be used in clinical practice in the treatment of UI. No scientific literature was found to support the use of these devices. The panel recognizes the temporary use of penile compression devices in males in selected circumstances under the supervision of a health care provider. (Strength of Evidence = C.)

Mechanical devices for males, such as penile clamps, are reserved for temporary use in patients with ISD. Clamps must be removed at 3-hour intervals to empty the bladder. Several types are available; however, complications such as penile and urethral erosion, penile edema, pain, and obstruction can occur if clamps are improperly used.

Pelvic Organ Support Devices

Pessaries are recommended for women who have symptomatic pelvic organ prolapse. (Strength of Evidence = C.)

Data are not available to recommend or discourage the use of pessaries for the treatment of UI in women. (Strength of Evidence = C.)

Pessaries are devices made of rubber or silicone materials, or both, designed to reduce pelvic prolapse temporarily and alleviate symptoms of pelvic organ prolapse in females with and without incontinence. Pessaries are available in various sizes and shapes depending on the type and severity of prolapse and the integrity of the perivaginal muscles. Pessaries are recommended for women with symptomatic pelvic organ prolapse in two circumstances: (1) as a temporary measure for women awaiting surgical correction and (2) for treatment of women who are either unable, for medical reasons, or are unwilling to undergo correction of the prolapse. Use of the Smith Hodge vaginal pessary is reported to be an effective preoperative device for predicting the relative success of incontinence surgery for SUI (Bhatia and Bergman, 1985b). Objective evidence regarding their effectiveness in reducing UI has not been reported. 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 Goldstein, Wise, and Tancer, 1990). These devices should not be used in women with vaginal prolapse, in those who have vaginitis, or in those who cannot remove or insert the device without routine access to a health care provider.

A new vaginal device specifically designed to support the bladder neck in women with stress incontinence may hold promise for those who have sufficient manual dexterity and can learn to insert and remove the device. Davila and Osterman (1994) reported that of 30 physically active women studied, 25 were dry with the device. The mean number of weekly incontinent episodes decreased from 10 per week before treatment to 3 per week with the device in place (P 0.009).

Absorbent Products

Absorbent products are recommended during evaluation, as an adjunct to other therapy, and for long-term care of patients with chronic, intractable urinary incontinence. (Strength of Evidence = C.)

Absorbent products and garments include the following:

- Shields, which are small absorbent perineal inserts.

- Guards, close-fitting products designed for light incontinence.

- Undergarments, which consist of full-length pads usually held in place by waist straps.

- Combination pad - pant systems.

- Adult diaper garments.

- Bed pads.

Absorbent pads and garments, either disposable or reusable, are widely used by persons with UI. Many community-dwelling persons use these products because of the protection they provide and because they can avoid seeking professional help for their problem. Others resort to pads because they have been dismissed rather than treated when seeking help for UI. From their perspective, absorbent products are a useful and rational way to manage the problem.

The widespread use of these products is reflected in the growth of the market of disposable pads and adult diapers from $99 million in 1972, to $173 million in 1982, to $496 million in 1987. Costs vary depending on the product and can be excessive for those on limited incomes. In 1987, these costs contributed to approximately half of the direct care costs for incontinence among residents in nursing homes (Sowell, Schnelle, Hu, et al., 1987). Although the quality and materials used in these products vary widely, little objective evaluation of disposable products has been conducted. Studies comparing cloth protective garments with disposable products have been conducted (Hu, Kaltreider, and Igou, 1990), but research comparing effectiveness and adverse effects of the various disposable products is lacking. Absorbent products are helpful during assessment and treatment of urinary incontinence. They also have a place as an adjunct to behavioral and other therapies, and in the care of persons with intractable incontinence. However, these products should not be used in place of therapeutic interventions to decrease or eliminate UI. Early dependency on absorbent pads may be a deterrent to continence, giving the wearer a sense of security and acceptance of the condition that removes the motivation to seek evaluation and treatment (Starer and Lobow, 1985). In addition, improper use of absorbent products may contribute to skin breakdown and UTI. Thus, appropriate use, meticulous care, and frequent garment changes are needed.

The following factors should be considered when absorbent products are used:

- Functional disability of the patient.

- Type and severity of incontinence.

- Gender.

- Availability of caregivers.

- Failure with previous treatment programs.

- Patient preference.

- Optimal product for individual patient.

- Skin integrity.

- Comorbidity.

- Incidence of vaginitis and bacteriuria.

- Quality of the product.

- Cost of the product.

In addition, it is recommended that the absorbent product industry standardize terminology and describe content and product performance (e.g., absorbency) to facilitate patient selection National Kidney and Urologic Diseases Advisory Board, 1994). Research needs to be conducted to compare various factors of available products. Such studies would help health care providers make recommendations based on fact and will ultimately lead to the development of better products.

This publication is provided for historical reference only and the information may be out of date.

4   Chronic Intractable Urinary Incontinence

Prevalence and Incidence

The 1979 National Nursing Home Survey estimated the prevalence of UI in nursing homes at 50 percent (National Center for Health Statistics, 1979). A more recent study of 434 nursing home admissions reported the prevalence of incontinence to be 39 percent 2 weeks after admission (Palmer, German, and Ouslander, 1991). The incidence of new cases of incontinence after 1 year for the studied cohort was 27 percent, and remission during the same time period was 30 percent for women and 11 percent for men. The risk factors for UI included physical and mental impairment at both time periods.

Preliminary data from a survey of 8,400 home and hospice health agencies indicate that genitourinary conditions were among the 20 leading first-listed diagnoses for patients added to their caseloads (Strahan, 1994). An earlier study ascertained that UI was one of the 10 leading diagnoses for homebound individuals and first in total charges to Medicare for nursing services per person served (Ruther and Helbing, 1988). In a study of four home care programs in southern Ontario, an average of 22 percent of residents were assessed as incontinent Mohide, Pringle, Robertson, et al., 1988). In a study of low-income, elderly individuals receiving publicly funded home care services, 23 percent were incontinent of urine and generated greater costs because of paraprofessional and other supportive care (Baker and Bice, 1995). In a study of family caregivers, 53 percent of care recipients were found to be incontinent (Noelker, 1987).

These data indicate that UI is common among both nursing home and home care populations. In addition, the number of disabled, dependent nursing home residents increased between 1977 and 1985 Special Committee on Aging, 1988). Homebound individuals, by definition, either cannot leave their homes or do so with considerable difficulty as a result of a temporary or chronic disability (Strahan, 1994). The combination of decreased functional ability and UI is a particular challenge to caregivers in both settings. The magnitude of the problem of caring for incontinent homebound individuals will no doubt increase as the absolute number of aged persons increases and as maintenance of dependent, elderly persons at home becomes more common.

Assessment

Since 1990, nursing homes have been required by statute to perform standardized comprehensive assessment and screening of residents upon admission, annually, and when there is a significant change in condition. The Resident Assessment Instrument (RAI), which includes the Minimum Data Set (MDS) and utilization guidelines -- including the Resident Assessment Protocols (RAPs) and triggers -- was developed by the Health Care Financing Administration (HCFA) to improve the quality of care through maintenance and restoration of function (Health Care Financing Administration, 1995). When a patient is incontinent or has an indwelling catheter, assessment is performed using the UI RAP (Boulter, 1993; Resnick and Baumann, 1990). The RAP guides nurses and physicians through the evaluation process to ascertain the cause (including any reversible factors), chronicity (acute vs. chronic), and type of UI experienced by the patient (Resnick and Baumann, 1990). A stress test and evaluation of PVR volume are recommended, and general guidelines are provided for referral for additional evaluation.

The UI RAP does not include evaluation of daily voiding habits, or the frequency, volume, and circumstances of urinary incontinent episodes. Thus, an evaluation using bladder records should be added because it is often important to determine the frequency and severity of the UI to provide appropriate treatment (Wyman, Choi, Harkins, et al., 1988). Formalized assessment of cognitive function is a part of the RAPs. Instruments such as the Folstein Mini Mental State Examination (MMSE) may be helpful in selecting appropriate behavioral intervention (Folstein, Folstein,

and McHugh, 1975). Recent data suggest that a short trial is pivotal to assessing responsiveness to a particular intervention Ouslander, Schnelle, Uman, et al., 1995).

Fonda's (1990) definitions of continence status among short-term elderly rehabilitation patients and long-term nursing home residents in Australia can be helpful in evaluating and classifying incontinence. Fonda describes persons who have "independent continence" as those who are able to maintain continence without assistance. "Dependent continence" applies to persons who are physically or mentally impaired and are kept dry through the efforts of others. "Social continence" applies to those incapable of maintaining continence independently or through regular toileting by caregivers and who depend on absorbent products and other measures to contain urine leakage.

The combination of the RAP to assess incontinence and the use of Fonda's definitions can help in evaluating residents and selecting appropriate intervention. The MDS, RAP, and other evaluation tools, however, are not mandated for home care agencies providing skilled nursing visits. Thus, identification of hidden UI depends on the quality of continence questions included in each agency's nursing assessment, and on the skill and knowledge of the nurse. Research in the area of assessment and management of UI among homebound individuals has been performed by nurse investigators (McDowell, Engberg, Weber, et al., 1994; Rose, Baigis-Smith, Smith, et al., 1990). The negative psychological, physical, social, and financial impact of UI on homebound individuals and their caregivers points to the need for a systematic, consistent approach to this problem.

Interventions for Chronic UI

Care of persons with chronic UI should include attention to toileting schedules, fluid and dietary intake, strategies to decrease urine loss at night, use of the most absorbent and skin-friendly protective garments possible, and prevention and early treatment of skin breakdown. (Strength of Evidence = B.)

Before a patient is classified as suffering from chronic intractable UI, the most appropriate intervention should be attempted. This guideline and the consensus of most experts suggest that if the person has stress, urge, or mixed UI, low-risk behavioral treatments should be attempted first if there are no contraindications. Persons with overflow UI who do not have a correctable obstruction may benefit from intermittent catheterization. Some patients may be candidates for surgical or pharmacologic interventions. However, side effects and complications of these treatments are major factors to consider in the treatment of dependent homebound or long-term care patients.

Behavioral Interventions

Studies indicate that behavioral interventions are effective if used by clinicians with training and experience in these methods. Success depends, in part, on using the most appropriate behavioral intervention for each patient. A method for correctly targeting behavioral interventions is to assess cognitive function using a formal test such as the Folstein MMSE (Folstein, Folstein, and McHugh, 1975). Persons who score within the normal range may benefit from interventions that require learning and recall abilities such as PME programs and bladder retraining (Burgio and Engel, 1990; Burns, Pranikoff, Nochajski, et al., 1990; Fantl, Wyman, McClish, et al., 1991; McDowell, Burgio, Dombrowski, et al., 1992; Wells, Brink, Diokno, et al., 1991). On the other hand, persons who demonstrate cognitive impairment on formal testing may benefit from scheduled voiding programs (e.g., prompted voiding or regular scheduled toileting) described in the Behavioral Techniques section of Chapter 3 of this guideline (Colling, Ouslander, Hadley, et al., 1992; Jirovec, 1991; Lekan-Rutledge, Hogue, and Miller 1992; Palmer, Bennett, Marks, et al., 1994; Schnelle, Newman, and Fogarty, 1990).

Toileting Assistance

Prompted voiding and regularly scheduled toileting are effective for preventing urinary accidents in some long-term care or homebound persons (Burgio, Engel, McCormick, et al., 1988; Schnelle, Newman, and Fogarty, 1990; Schnelle, Newman, Fogarty, et al., 1991).

These toileting procedures require the assistance of staff, following a predetermined protocol. Prompted voiding programs require the discernment of wet or dry status and the ability to request toileting, whereas neither of these criteria is necessary for regularly scheduled toileting programs.

Several multisite clinical trials have studied a prompted voiding or scheduled toileting intervention strategy to decrease UI in nursing homes. One study using a 2-week baseline assessment and a 5-week intervention phase examined the effects of a prompted voiding intervention in 30 women whose average age was 85 Creason, Grybowski, Burgener, et al., 1989). Objective evaluation using the Folstein MMSE and the Katz Activities of Daily Living (ADL) measure indicated that 65 percent had severe mental impairment and 78 percent had severe physical impairment. During the intervention, staff approached subjects hourly during waking hours and prompted them to void. Results showed that the experimental group's UI (i.e., percentage of time the patient was wet when checked) was reduced from 40 to 30 percent by the end of the study. The control group's UI increased from slightly more than four episodes to over five per day. Furthermore, all but one of those in the experimental group demonstrated definite patterns of UI that were incorporated into nursing care plans for toileting, and these patients showed continued improvement in UI status. Variations in staff adherence to the intervention may decrease the magnitude of the effect of this treatment.

In a 13-week behavioral therapy program in seven nursing homes carried out by project-trained research assistants 14 hours per day 7 days per week, 133 elderly women were checked hourly and prompted to toilet (Hu, Igou, Kaltreider, et al., 1989). Subjects' age averaged 85 years, and most were highly physically and mentally impaired as determined by the Katz ADL instrument and Folstein's MMSE. Subjects in the treatment group decreased the number of their wet episodes from 2 to 1.4 per day. Those who had severe incontinence, more physical dependence, and less mental impairment, as well as normal CMG and bladder capacity, responded better to the training program.

Schnelle, Newman, and Fogarty (1990) enrolled 126 subjects in a multiphase prompted treatment program. Subjects' average age was 82, the majority had severe mental impairment as determined on Folstein's MMSE, and only 11 percent could ambulate independently. During phase 1, which served as baseline, research staff checked each subject hourly for 12 hours per day over a 5-day period and changed them when they were wet. During phase 2, subjects were randomly assigned to immediate- and delayed-treatment groups for 5 days. Those in the immediate-treatment group were prompted to void every hour, asked if they were wet or dry, and then apprised of the accuracy of their response. Finally, they were asked to try to toilet, but were not toileted unless they requested assistance. Subjects were praised both for staying dry and for toileting successfully. Subjects in the delayed-treatment group continued to be checked hourly. Both the immediate and delayed groups participated in the prompted toileting treatment in phase 3. Subjects responded to prompted voiding as follows: 42 percent had less than one incontinent episode per 12 hours; 35 percent decreased their UI by two episodes per 12 hours but were still incontinent one or more times over the 12-hour period; and the rest did not reduce their UI by two or more episodes per 12 hours. The most successful subjects were less than 50-percent incontinent, could recognize when they needed to void, and had higher voided volumes and lower frequency of voiding.

Colling, Ouslander, Hadley, et al. 1992) conducted a clinical trial study among 88 subjects in four nursing homes over a 37-week period. Only subjects with urge or mixed UI were included in the study. Subjects' average age was 85, and all subjects were moderately to severely impaired, physically and mentally, as measured by the Katz ADL and the Short Portable Mental Status Questionnaire (SPMSQ). The study design consisted of a 12-week baseline period, a week during which subjects' individual patterns of voiding were established using an ambulatory electronic monitoring device over a 72-hour period, and a 12-week treatment period with habit training intervention carried out 24 hours per day 7 days per week, followed by a 12-week maintenance period. Data were gathered by research staff for one 24-hour period every 3 weeks throughout the duration of the study by checking subjects every hour. The intervention had three parts: nursing staff received a 4-hour inservice on how to accomplish the treatment, an individual toileting schedule was constructed for each subject based on the electronic monitoring data, and staff and patients received positive reinforcement for adhering to the toileting program and for successful toileting behavior, respectively (Harke and Richgels, 1992). Overall, the intervention significantly decreased UI for 86 percent of the experimental group, with one-third of the group improving more than 20 percent. Incontinence decreased an average

of one episode per 24 hours for the entire group. Subjects with greater bladder capacity and less mental impairment responded best to treatment. There was resistance to changing nursing staff routines because of staff shortages, and nursing staff complied with the treatment regimen only 70 percent of the time.

Schnelle, Newman, Fogarty, et al. 1991) noted that 35 percent of nursing home residents were poor candidates for prompted voiding, specifically those who had frequent incontinent episodes, did not respond to prompts, and could not cooperate with toileting. Up to 40 percent of those in the study responded well. Responders can be identified by assessing their responsiveness to a 3-day trial of prompted voiding (Ouslander, Schnelle, Uman, et al., 1995). This may be true for homebound patients as well. Toileting persons according to their individual voiding habits (Colling, Ouslander, Hadley, et al., 1992) is an excellent means of avoiding accidents. If staff is untrained or undersupervised in nursing homes, this intervention is difficult; however, it provides caregivers of homebound patients with a viable management option.

Although research indicates that toileting interventions are promising, they may be compromised, depending on compliance of nursing staff (Campbell, Knight, Benson, et al., 1991; Schnelle, 1990). Nursing staff often expect total continence when these procedures are implemented and become disappointed when this does not occur (Schnelle, Newman, and Fogarty, 1990; Colling, Ouslander, Hadley, et al., 1992; Harke and Richgels, 1992). Several studies point to the importance of monitoring staff implementation of these procedures and providing feedback regarding performance (Burgio and Burgio, 1990; Schnelle, 1990). More research is needed to determine if using predictability of the resident's need to void for an individualized or fixed toileting schedule is more cost-efficient. Future studies should address formal mechanisms of performance appraisal and incentives to increase and maintain staff behaviors that affect patient outcomes. All studies, however, report a modest saving to institutions in laundry and supply costs with the decrease in incontinent episodes.

Homebound Patients

Although management of UI for homebound populations has not been as thoroughly studied as that for those receiving care in a nursing home or ambulatory care setting, two reports focused on the use of PME programs in homebound individuals. Rose, Baigis-Smith, Smith, et al. (1990) reported the successful use of PME training augmented by biofeedback therapy for cognitively intact home care subjects. McDowell, Engberg, Weber, et al. (1994) reported two case studies of severely disabled but cognitively intact homebound individuals who were successfully treated with a biofeedback-assisted PME program. A study of homebound elderly women found that women with UI had significantly less social interaction than continent women (Breakwell and Walker, 1988). Several studies are ongoing using a variety of treatment modalities for both cognitively impaired and cognitively intact homebound persons living in both urban and rural areas.

Physical and Environmental Alterations

All caregivers for elderly or disabled individuals must assess the environment in which the patient resides. Simple alterations, or the addition of toileting or ambulation devices, can often eliminate or reduce episodes of involuntary urine loss. (Strength of Evidence = C.)

Strategies that maintain or improve mobility are likely to prevent or reduce incontinent episodes in the frail elderly. (Strength of Evidence = B.)

Improvement of environmental factors such as access to toilets is likely to enhance treatment and may prevent UI in some cases. Persons who are cognitively intact but who have mobility or balance problems may be unable to suppress an urge until a caregiver arrives to toilet them, or, if they are independent, they are unable to walk or propel their wheelchair to the toilet in a timely fashion. These individuals may benefit from commodes or other external collecting devices such as urinals so that toileting can be achieved more easily. Other persons who can reach the bathroom may find the toilet inaccessible if grab bars and raised toilet seats are not in place.

Studies indicate that improved mobility is associated with remission of incontinence (Jirovec, 1991; Jirovec and Wells, 1990; Palmer, German, and Ouslander, 1991). These studies describe secondary prevention strategies and suggest that a simple walking exercise program not only increases mobility but also decreases the occurrence of UI.

Equipment that enhances mobility such as canes, walkers, and wheelchairs should be available for persons who have problems with ambulation. Toilets need to be at least 17 inches high with arms to assist the patient in lowering to or rising from the toilet seat. Some persons may be unable to reach the bathroom because of distance barriers such as furniture or other objects, poor lighting, or the need to climb stairs (McDowell, Engberg, Weber, et al., 1994). Chairs designed for ease in rising are especially helpful. In one study of elderly, institutionalized residents who were considered chairbound, 77 percent could rise unaided from a chair that was 17 inches at seat height and had arms 10 inches above the seat (Finlay, Bayles, Rosen, et al., 1983).

The use of restraints has been targeted as contributing to UI (Evans and Strumpf, 1990). Physical restraints include various straps and ties as well as "geri-chairs." In addition, sedating drugs can act as chemical restraints that also increase the potential for UI. It is now recognized that alternatives to restraints that maximize freedom of movement but ensure safety of the individual are almost always available.

Studies of specific environmental factors in the management of UI are inadequate to date. Those factors that discourage continence and promote incontinence should be identified and targeted for future research.

Fluid and Dietary Management

Constipation is a common problem for patients with chronic UI. Establishing a bowel regimen based on adequate fiber and fluid intake is often helpful. Elimination of bowel impaction and consequent pressure on the bladder and urethra are often necessary first steps in the treatment of chronic UI. (Strength of Evidence = C.)

Eliminating dietary caffeine such as in coffee, tea, colas, and chocolate is particularly important for persons with urge UI and frequency of urination (Crieghton and Stanton, 1990). However, limiting overall fluid intake is not effective for managing UI. Contrary to popular belief, maintaining adequate fluid intake is important especially for older adults who already have a decrease in total body water and are at risk for dehydration (Davis and Minaker, 1994; Schrier, 1990). In addition, inadequate fluid intake contributes to constipation. Routine use of stool softeners or laxatives should not be encouraged for management of bowel function and prevention of constipation. Laxatives are appropriate for facilitating bowel action prior to other management techniques including dietary fluids and physical activity, but should not be routinely used. Their use may be excessive and inappropriate in older adults. Emphasis should be on dietary measures such as high-fiber foods and fiber supplementation with unprocessed wheat bran and other high-fiber preparations, or the use of bulk-forming agents if dietary measures are neither feasible nor effective.

Management of Nocturia

Night-time voiding and incontinence are major problems for adults of all ages. Preventive measures to decrease night-time voids are recommended. The use of simple electronic urine detection devices should be encouraged for more efficient and effective patient monitoring of night-time urine loss. (Strength of Evidence = B.)

Persons who have nocturia greater than twice a night or who experience enuresis may benefit from fluid restriction and elimination of caffeine-containing beverages in the evening. These individuals should maintain adequate fluid intake by drinking the bulk of their liquids before dinner. Individuals who develop edema of the lower extremities during the day should be advised to elevate their lower extremities several hours during the late afternoon or evening to stimulate a natural diuresis and limit the amount of edema present at bedtime (O'Donnell, Beck, and Walls, 1990). In addition, the use of diuretics has been associated with lower night-time urine volumes; altering the timing of the administration of diuretics may decrease nocturia (Ouslander, Schnelle, Simmons, et al., 1993).

In a 10-day study of incontinence in 66 elderly, inpatient men, O'Donnell, Beck, and Walls (1990) found that the highest frequency of incontinent episodes occurred during the 4 p.m. to midnight shift, and the largest volume of urine loss per episode occurred during the night between midnight and 8 a.m. This study utilized an electronic sensor device to measure the frequency and used-pad weight to measure the volume of incontinent episodes. The lower level of physical activity and the mobilization of interstitial fluid that occurs in the supine position were cited as possible causes for these findings. A study by Ouslander, Schnelle, Simmons, et al. 1993), which measured the frequency and volume of urinary accidents for 136 male and female nursing home residents, showed that about 25 percent of the subjects produced significantly more urine at night than during the day.

Although larger studies are needed to better describe the time of day when urine production and excretion occurs, the findings of these two studies point to the need to reconsider continence care during the evening and night-time hours. The issues surrounding continence care during these times are complex and will require coordination of the efforts of long-term care managers, nurses, physicians, manufacturers, and researchers. Some of the issues include adequate staffing during evening and night-time hours, alterations in change routines, use of external collecting devices during these hours for both men and women, and the use of daytime diuretic therapy, as well as other measures described above to decrease edema and the volume of night-time urine production. The continued improvement of absorbent products and the correct use of skin cleaners, barrier creams, and powders are also important. Electronic urine detection devices may in some settings be useful to alert nursing staff of a patient's incontinent void. This would allow wet patients to be changed and permit dry patients to sleep uninterrupted by routine pad checks (O'Donnell, Beck, and Walls, 1990).

Other Measures and Supportive Care

Largely because of the introduction and emergence of behavioral therapies to treat UI during the past decade, the aim of continence experts and those who care for incontinent individuals has been to greatly decrease the indiscriminate use of such measures as absorbent pads and garments, external collecting devices, indwelling catheterization, and suprapubic catheters through the successful treatment of UI. However, these measures are beneficial for persons who fail treatment and remain incontinent, who are too ill or disabled to participate in behavioral programs, who cannot be helped by medications, or who have a type of UI that cannot be alleviated by surgical interventions. The judicious use of products to contain urine loss and maintain skin integrity are a first-line defense in these cases.

> Protective garments and external collecting devices have a major part in the management of chronic incontinence. The most absorbent and skin-friendly products should always be utilized. However, no scientific literature is available to guide selection of the most effective product. (Strength of Evidence = C.)

Protective Pads and Garments

Absorbent products, classified as disposable or washable, include underpads, pant liners (shields and guards), adult diapers (briefs), and a variety of washable pants and disposable pad systems or combinations (Brink, 1990). In a survey questionnaire mailed to 36,500 Help for Incontinent People (HIP) members throughout the United States, more than 50 percent of the 10,427 respondents reported that they had used some form of protective garment (Jeter and Wagner, 1990). In addition, a survey of 512 community-dwelling elderly men and women with UI showed that 47 percent used absorbent products (Herzog, Fultz, Normalle, et al., 1989). Although there are no studies describing the prevalence of the use of protective garments among incontinent nursing home residents, results of most scheduled voiding programs in nursing homes directly indicate that disposable diapers or reusable pad and pant systems are used by their study subjects (Colling, Ouslander, Hadley, et al., 1992; Schnelle, Newman, Fogarty, et al., 1991).

Very little research has focused on these products despite their frequent use. Brink (1990; 1994) reported that of 30 studies performed between 1965 and 1987 and 14 studies between 1988 and 1993, all but 3 of the latter were performed outside of the United States. One study reported that continence care was labor intensive, requiring 25 minutes per day to change residents (Cella, 1988). In a cost study of UI in nursing homes, Hu, Kaltreider, and Igou 1990) randomly assigned 42 matched pairs of residents to treatment with either disposable or reusable cloth diapers.

The total number of pads per day was 5.9 for the disposable pad users and 6.6 for those in the reusable pad treatment group. The average cost per day per person was $2.48 for disposable products and $2.61 for cloth products. Daily cost of disposable products when related to laundry cost revealed a lower daily cost for disposable products ranging from $0.44 to $0.68 or annual savings of $161-$248 per person. In addition, the skin of those using disposable products showed improvement after 1-1/2 months; the skin of subjects using cloth pads and diapers deteriorated.

At present, there are no studies regarding the advantages or disadvantages of the various products available on the market. Data also are lacking comparing reusable with disposable products. Most evaluations are carried out by product manufacturers rather than independent researchers in the health care field and thus carry a bias. This limits their usefulness in assisting nurses, long-term care administrators, and consumers in deciding what products to use. Until objective information is available regarding patient comfort, ease of application and removal, containment of urine, and control of odor, product selection will be made by trial and error or will depend on product availability in the practice setting.

External Collection Devices

External collection devices such as condom catheters can be useful for management of UI in men because they contain urine and keep the skin dry. Although these devices are preferable to indwelling catheters, which have many side effects, adverse reactions do occur. Abrasion, dermatitis, ischemia, necrosis, edema, and maceration of the penis, as well as UTI, can be problems, especially as a result of improper or prolonged use (Ouslander, Greengold, and Chen, 1987a). External catheters need to be applied carefully and changed according to product recommendation and institutional or agency policy. Careful observation of the penile skin and the urine for adverse changes is mandatory.

Although a variety of external catheters is available, no comparative studies have been conducted. There is a need for studies to address the optimal length of time external catheters should be worn before changing and to compare the incidence of UTI and other complications between catheters and external and suprapubic catheters.

Acceptable external collecting devices for women are not widely available. Pieper and Cleland (1993) report that most products developed to date have never been marketed or sold. Still others have been removed from the market because of major problems of leakage and skin abrasions. The literature regarding these products consists of small descriptive studies performed outside of the United States (Pieper and Cleland, 1993). The results of two small studies performed in the United States are encouraging (Johnson, Muncie, O'Reilly, et al., 1990; Johnson, O'Reilly, and Warren, 1989); however, comparative or randomized studies have not been conducted. Thus, conclusions as to the efficiency and safety of these devices cannot be made.

Intermittent Catheterization

Intermittent catheterization appears to be preferable to the use of indwelling catheters for the management of urinary retention and overflow incontinence. (Strength of Evidence = B.)

Persons who have overflow incontinence can benefit from IC. Several studies indicate that IC is preferable to indwelling catheters for both men and women (Kuhan, Rist, and Zaech, 1991; Webb, Lawson, and Neal, 1990; Perkash and Giroux, 1993; Warren, 1990). However, the use of IC in the homebound patient may present considerable difficulty. Most studies have been conducted in young patients with spinal cord injuries. The section on Other Measures and Supportive Devices in Chapter 3 describes the various benefits and problems associated with IC.

Suprapubic Catheters

Suprapubic catheters may be an acceptable alternative for indwelling urethral catheters when patient choice or circumstances require the use of a bladder drainage device. (Strength of Evidence = B.)

Suprapubic catheterization may be an acceptable alternative to indwelling catheters or IC in some patients (Barnes, Shaw, Timoney, et al., 1993; Feneley, 1983; Hebel and Warren, 1990; Stower, Massey, and Feneley, 1989). Small descriptive studies indicate that suprapubic catheterization is a promising method of emptying the chronically full bladder. Large, randomized studies need to be conducted to compare the benefits and risks of this intervention with those of IC and indwelling catheters. In addition, studies should be performed on techniques that prevent the occurrence of complications.

Indwelling Catheters

The use of indwelling catheters should be avoided with few exceptions. They may be useful as comfort measures for the terminally ill, to avoid contamination of decubitus ulcers, and for management of UI in patients with inoperable obstruction that prevents bladder emptying. In Chapter 3, the section on Other Measures and Supportive Devices describes the serious problems associated with long-term use of indwelling catheters.

Skin Care

Recommended measures of cleansing the skin immediately before and after urine loss are helpful in preserving skin integrity. (Strength of Evidence = B.)

Some pads and garments may provide some protection from skin damage. (Strength of Evidence = C.)

Individuals with severe intractable incontinence are often immobile and at major risk for skin breakdown. No one would dispute the importance of good skin care and preventing skin breakdown, yet no randomized, controlled clinical trials have examined the methods most likely to achieve this goal. Recommendations about skin care are generally based on experience or made through marketing materials provided by product manufacturers (DeWitt, 1988; Fowler and Goupil, 1987; Klein, 1988). The most common directions to nurses are to keep the skin dry and keep the patient off any areas of skin breakdown.

Incontinence was noted as one of the risk factors for pressure ulcers in the AHCPR *Pressure Ulcers in Adults: Prediction and Prevention. Clinical Practice Guideline* (1992). The AHCPR guideline panels for Prediction and Prevention of Pressure Ulcers in Adults (1992) and Treatment of Pressure Ulcers (1994) made several recommendations for the prevention of skin chafing and, ultimately, ulcer formation. Because of the lack of scientific evidence, these suggestions were based on expert opinion. Suggested preventive measures included regular inspection of the skin, gentle cleansing with a mild cleansing agent immediately after soiling, avoidance of force and friction during cleansing, use of absorptive briefs or pads, use of topical barriers to protect the skin from moisture, and minimizing skin injury caused by friction and shear through proper positioning, turning, and transfer techniques.

For a full discussion of skin breakdown, with recommendations for prevention and treatment of pressure ulcers, refer to the Clinical Practice Guidelines on pressure ulcers (Bergstrom, Bennett, Carlson, et al., 1994; Panel for the Prediction and Prevention of Pressure Ulcers in Adults, 1992).

Social and Organizational Milieu of UI

The social and organizational environment of the long-term care facilities can also impact on delivery of continence care. Training programs alone are not effective in changing practice routines from custodial to restorative (Campbell, Knight, Benson, et al., 1991; Colling, Ouslander, Hadley, et al., 1992). Even when well-planned programs exert a positive change on knowledge and attitude, nursing aide behavior may be unchanged (Lekan-Rutledge, Hogue, and Miller, 1992; Smyer, Brannon, and Cohn, 1992; Wagner and Colling, 1993). Long-term care staff are engaged in difficult work with few rewards. Burgio and Burgio (1990) noted in one study analyzing staff behavior that most staff time was spent in patient care activities. Certainly, before practice and management styles in long-term care can be changed, the current physical and social environment, including work patterns and numbers and type of staff, must be thoroughly explored. New nursing practice models such as the use of nurse practitioners and clinical nurse specialists

have shown positive impact on resident health outcomes through improved care and decreased hospitalization of residents (Garrard, Kane, Radosevich, et al., 1990; Kane, Garrard, Skay, et al., 1989; Mezey, Lynaugh, and Cartier, 1989).

The few studies of UI in the dependent population in the community have focused on the burden experienced by unpaid caregivers, such as family members caring for dependent elderly persons with UI, and the effect of UI on the health and psychosocial adjustment of incontinent individuals. In all the studies, functional disability (physical, cognitive, or both) was associated with UI Flaherty, Miller, and Col, 1992; Noelker, 1987; Ouslander, Zarit, Orr, et al., 1990). In a study of 299 family caregivers who cared for persons with UI, Noelker (1987) reported significantly more negative effects on family relationships than for caregivers of family members who were continent. However, nearly one-half of the caregivers of persons with UI stated that incontinence was not a problem for them. In another study of 148 caregivers of community-dwelling, chronically ill older persons, 75 percent of those who cared for incontinent family members found maintaining continence burdensome because of time spent in providing care, the care receiver's immobility, and lack of social supports (Flaherty, Miller, and Col, 1992). In a study of caregivers of community-dwelling dementia patients with UI, Ouslander, Zarit, Orr, et al. (1990) found that although incontinence was an important factor in many decisions to institutionalize elderly care receivers, UI was rarely the primary reason for nursing home placement, and other factors contributed more to perceived burden. Most of the caregivers indicated that they would be interested in education regarding the care of persons with UI if the sessions were provided in the home.

Although most persons can benefit from behavioral, pharmacologic, or surgical interventions for UI, many others cannot. Typically, these persons reside in long-term care facilities or are homebound and have cognitive or physical impairments that prevent them from learning or performing PME, bladder retraining, or other learned strategies to prevent urine leakage. They do not respond to regular toileting schedules. In addition, these dependent individuals often cannot tolerate or would not benefit from pharmacologic or surgical interventions.

In long-term care facilities, this population is largely cared for by nonprofessional nursing staff. Others are cared for at home most often by family members. Most of the research on UI has focused on reducing or eliminating leakage. Little attention has been given to how to provide the best care for those who do not respond to standard therapies. Studies to ascertain the most effective and efficient methods for specific situations and individual patients are needed to further advance optimal continence care. The care of persons who do not or cannot respond to available therapies must be addressed in randomized, clinically based studies. Currently, continence care for these persons is often based on personal opinion, manufacturers' claims, convenience of the caregiver, or cost of the products.

This publication is provided for historical reference only and the information may be out of date.

5 Education

Public Education

Increased efforts to inform and educate the public about incontinence are essential. (Strength of Evidence = C.)

The public should be aware that incontinence is not inevitable or shameful but is treatable or at least manageable. (Strength of Evidence = C.)

Patient education needs to be comprehensive and multidisciplinary so as to explain all management alternatives. (Strength of Evidence = C.)

More research is needed to test the effectiveness of patient education activities. (Strength of Evidence = C.)

UI has the stigma of a socially unacceptable condition because of public lack of knowledge, misconceptions, and intolerance. This leads to personal isolation, social embarrassment, and delays in seeking medical advice. The public needs to know that many therapy and management problems surround UI (Burton, 1984; Goldstein, Hawthorne, Engeberg, et al., 1992; Herzog, Fultz, Normolle, et al., 1989; Joseph Rowntree Foundation, 1991; Holst and Wilson, 1988; Lagace, Hansen, and Hickner, 1993; Norton, MacDonald, Sedgwick, et al., 1988; O'Brien, Austin, Sethi, et al., 1991; Thomas, Plymat, Blannin, et al., 1980). Since 1983, national and international groups have concluded that there is a lack of professional and public education about UI (Association for Continence Advice, 1993; Jeter and Gartley, 1994; Kings Fund, 1983; National Institutes of Health, 1990). In 1988, the National Institutes of Health (NIH) Consensus Development Conference on UI in adults concluded that there was a greater need for efforts to inform and educate the public about this common problem. However, specific education interventions were not designated. The research necessary to evaluate education programs specific for incontinence is lacking.

Since the 1988 NIH conference, public knowledge has increased somewhat through publication of the 1992 AHCPR guideline documents and the efforts of two self-help groups, Help for Incontinent People and the Simon Foundation for Continence. More than 1.3 million English-version and 125,000 Spanish-version AHCPR patient guides have been distributed since their 1992 release. The Continence Foundation offers public access to services and information in the United Kingdom. Education advocacy and support groups bridge the gap between the public, affected individuals, and the health care providers and provide multimedia resources, patient and health professional education, and patient referral services. Patients often turn to these groups for guidance and support. Letters to syndicated columnists Ann Landers and Abigail Van Buren (Dear Abby) about UI have also gained widespread reader attention. Product manufacturers are addressing UI through extensive media advertisements and publication of brochures, and in the United Kingdom some companies sponsor telephone helplines. One pharmaceutical company's pilot media program has attracted considerable public interest in seeking more information and medical advice on UI (Association for Continence Advice, 1993).

Healthy People 2000 recommends an increase in public education and self-help resources as well as a reduction in major activity limitations for the management of chronic conditions U.S. Department of Health and Human Services, 1990). However, these efforts need to be increased so that the entire public is made aware that incontinence is neither inevitable nor shameful but instead treatable or at least manageable. The public should be encouraged to seek professional information and advice. Unfortunately, information alone is not enough to change behavior. A

comprehensive and effective patient education program needs to determine what the patient wants to know as well as what the health care provider determines is necessary.

Two reports assess the information needs of the incontinent person (Jeter and Wagner, 1990; Moore and Saltmarche, 1993). An information-seeking instrument developed by Moore and Saltmarche has been tested for reliability and validity and will be used for data collection to guide patient education.

Because the problem of UI crosses all social, economic, racial, and gender lines, educational programs need to be diverse, person- or consumer-friendly, and understandable in a variety of media. Teaching should be a collaborative effort involving medical, nursing, and allied health care providers working with education and communication experts, and local, regional, and national government employers. Education should be individualized for each patient but also should include family and friends who may be involved in the patient's care. Sharing experiences and education in a nonthreatening atmosphere is a major technique of UI support groups and should be encouraged. Research to test educational effectiveness of these programs should be encouraged, developed, and evaluated, because specific research on UI patient teaching is lacking.

From available research, the main teaching goals that should be implemented are that (1) misconceptions about UI should be corrected, and information that incontinence can be helped should be disseminated to the widest possible audience; (2) patients with UI who seek health care need customized yet flexible patient teaching resources because of cultural, age, and educational differences; and (3) the learning experience should provide problem-solving and self-management skills that are integrated into daily living patterns. To accomplish these goals, a multimedia approach is needed that can provide information and education about UI misconceptions and management options at the learner's pace. Examples include use of public service announcements, public talk shows or interviews, health lectures, and toll-free telephone messages or helplines. Programs can be facilitated through pamphlets, booklets, audiotapes, videotapes, movies, slides, slidetapes, film strips, computers, and interactive videodiscs. For example, an interactive laser disc program on treatment options for benign prostate hypertrophy led to a 60-percent drop in requests for prostatectomy (Borzo, 1994). The applicability of such a program for incontinence should be tested. It is essential that teaching effectiveness be evaluated because instructing patients is insufficient (Garding, Kerr, and Bay, 1988).

Similarly, knowledge on ways to prevent UI is lacking. Examples of possible preventive maneuvers include teaching women about gestational and postpartum PME, and teaching both men and women about scheduled voiding and proper bladder-emptying techniques. Other health promotion models describe primary prevention mechanisms including education programs regarding estrogen use to treat atrophic vaginitis, postmenopausal changes of the genitourinary tract, and the elimination of fluids with diuretic effects (Palmer, 1994). When the public learns to better manage UI and to seek early treatment, the personal, social, psychological, and economic costs of the condition will decrease.

Professional Education

Education about UI evaluation and treatment should be included in the basic curricula of undergraduate and graduate training programs of all health care providers. Continuing education programs on UI should be offered to all health care providers. (Strength of Evidence = C.)

Education about UI for professionals, paraprofessionals, and survey teams is urgently needed. First and foremost, information about UI should be included in the curricula of undergraduate and graduate health care professional schools. Schools of nursing and physical therapy and for physician assistants should consider educating specialists on incontinence care who can then serve as expert advisers to other health care providers regionally, on the State level, in teaching hospitals, and in every nursing home.

To increase practitioners' knowledge of UI, continuing education courses should focus on the types of incontinence and on appropriate, state-of-the-art diagnostic techniques and treatments (Morishita, Uman, and Pierson, 1994). Professionals most likely to provide care to UI patients should be encouraged to attend these courses. Education on UI

should also be part of the training programs for paraprofessional students, such as licensed vocational nurses, practice nurses' aides, and auxiliary workers in the community. Because UI is a major problem in long-term care settings, special emphasis should be directed to encouraging alliances among all professions responsible for the care of persons with UI. In this setting, education may need to be geared to the different levels of nursing personnel. Palmer (1995) in a survey about nurses' knowledge and beliefs about continence interventions in one nursing home found differences between attributions of cause of UI between LPNs and RNs, indicating a need for continued education.

A survey of physicians in an Oklahoma demonstration project revealed that 17 percent of medical physicians had seen or read the 1992 AHCPR guideline on UI. This group included internists (113), obstetricians and gynecologists (134), family practitioners (115), and urologists (14) (McFall, Yerkes, Belzer, et al., 1994). Many physicians do not discuss nonsurgical therapy alternatives with their patients because they have a selection bias. UI should be included in the curricula along with practical applications and demonstrations that the majority of UI patients can be managed in primary care settings.

Major nursing organizations recognize the significance of UI and the vital role of nursing professionals. Plans are ongoing for development of continence care nursing practice guidelines. Emulation of the United Kingdom Continence Advisors program is a plausible solution but necessitates government involvement. A number of education organizations exist in the United Kingdom that provide training and education and whose members work in collaboration with other health care providers (Association for Incontinence Advice 1993). Education and competency training for nurse practitioners in UI assessment and management can duplicate the Continence Advisors program. Conferences similar to the Multispecialty Nursing Conference on UI (held in Phoenix, Arizona, January 1994) can offer indepth education and provide training on technical skills so that these individuals can become productive and valued members of the UI team.

UI outcome measures need to be developed so that nursing home surveyors are better able to assess the effectiveness of interventions for UI in this setting.

Bookshelf ID: NBK52161

This publication is provided for historical reference only and the information may be out of date.

Abbreviations

ADL: Activities of Daily Living

BPH: Benign prostatic hyperplasia

BUN: Blood urea nitrogen

CMG: Cystometrogram

DHIC: Detrusor hyperactivity with impaired bladder contractility

DI: Detrusor instability

EMG: Electromyography

HCFA: Health Care Financing Administration

ISD: Intrinsic sphincter deficiency

MDS: Minimum Data Set

MMSE: Mini-Mental State Examination

NSAID: Nonsteroidal anti-inflammatory drug

PME: Pelvic muscle exercise

PPA: Phenylpropanolamine

PVR: Postvoid residual volume

RAI: Resident Assessment Instrument

RAP: Resident Assessment Protocol

SUI: Stress urinary incontinence

TCA: Tricyclic antidepressant

UI: Urinary incontinence

UPP: Urethral pressure profilometry

UTI: Urinary tract infection

This publication is provided for historical reference only and the information may be out of date.

Glossary

Absorbent products:: Pads and garments, either disposable or reusable, worn to contain urinary incontinence or uncontrolled urine leakage. Absorbent products include shields, guards, undergarment pads, combination pad-pant systems, diaperlike garments, and bed pads.

Algorithm:: A step-by-step method for solving a problem. In health care decisionmaking, an algorithm is a defined and prescribed sequential process whereby clinical and diagnostic findings at a particular point in the process determine the next diagnostic, clinical, or therapeutic decision or action to be made or taken.

Anti-incontinence surgery:: The use of surgical procedures to treat urinary incontinence (see artificial urinary sphincter, bladder suspension, periurethral bulking injections, sling procedures).

Artificial urinary sphincter:: A mechanical device surgically implanted into the patient that consists of a cuff, placed around the bulbar urethra or bladder neck, a pressure-regulating balloon, and a pump. The device is used to control opening and closing of the urethra manually and is the most commonly used surgical procedure for the treatment of male urethral insufficiency.

Behavioral techniques:: Specific interventions designed to alter the relationship between the patient's symptoms and his/her behavior and/or environment for the treatment of maladaptive urinary voiding patterns. This may be achieved by modification of the behavior and/or environment of the patient (see biofeedback, bladder training, electrical stimulation, habit training, pelvic muscle exercises, prompted voiding).

Benign prostatic hyperplasia (BPH):: A common disorder of men over the age of 50 characterized by enlargement of the prostate which may press against the urethra and obstruct the flow of urine. BPH is the most common cause of such anatomic obstruction in elderly men.

Biofeedback:: A behavioral technique by which information about a normally unconscious physiologic process is presented to the patient and the clinician as a visual, auditory, or tactile signal. The signal is derived from a measurable physiologic parameter which is subsequently used in an educational process to accomplish a specific therapeutic result. The signal is displayed in a quantitative way, and the patient is taught how to alter it and thus control the physiologic process.

Bladder suspension:: Also called bladder neck suspension. A term for several surgical procedures employed to treat urethral hypermobility by elevating and securing the bladder to its proper position within the body. The two major types of bladder suspension surgical procedures are:

Retropubic suspension:: Consists of several different surgical techniques performed through a low abdominal incision. All techniques are designed to elevate the lower urinary tract within the retropubic space, differing only in the structures used to achieve the elevation.

Needle bladder neck suspension:: Consists of several different surgical techniques performed through a vaginal approach and small low abdominal incision; all involve the use of a long needle to transfer the sutures adjacent to the urethra and bladder neck through the retropubic space into the abdominal wall anterior to the rectus fascia where the sutures are fastened or anchored.

Bladder training:: A behavioral technique that requires the patient to resist or inhibit the sensation of urgency (the strong desire to urinate), to postpone voiding, and to urinate according to a timetable rather than to the urge to void.

Catheterization:: Techniques for managing urinary incontinence that involve the use of a slender tube inserted through the urethra or through the anterior abdominal wall into the bladder, urinary reservoir, or urinary conduit to allow urine drainage (see indwelling catheters, intermittent catheterization).

Clinical practice guidelines:: A set of systematically developed statements or recommendations designed to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances. Such guidelines are designed to assist health care practitioners in the prevention, diagnosis, treatment, and management of specific clinical conditions.

Condom catheters:: A condomlike device placed over the penis to allow bladder drainage and collection of urine (see external (condom) catheters).

Cystometry:: A test used to assess the function of the bladder by measuring the pressure/volume relationship of the bladder. Cystometry is used to assess detrusor activity, sensation, capacity, and compliance. There are different variations of the test depending on the problem being investigated, but regardless of the technique, cystometry involves insertion of a catheter into the bladder.

Cystourethrography:: The use of x-ray imaging to examine the urinary bladder and urethra. In voiding cystourethrography, an x-ray picture of the bladder and urethra is obtained during urination.

Cystoscopy:: Also called cystourethroscopy. A procedure used to diagnose urinary tract disorders and provide a direct view of the urethra and bladder by inserting a flexible scope into the urethra and then into the bladder.

Decreased bladder compliance:: A failure to store urine in the bladder caused by the loss of bladder wall elasticity and of bladder accommodation. This condition may result from radiation cystitis or from inflammatory bladder conditions such as chemical cystitis, interstitial cystitis, and certain neurologic bladder disorders.

Detrusor:: General term for any part of the body that pushes down. In the urinary system, the detrusor muscle is the smooth muscle in the wall of the urinary bladder that contracts the bladder and expels the urine.

Detrusor sphincter dyssynergia (DSD):: An inappropriate contraction of the external sphincter concurrent with an involuntary contraction of the detrusor. In the adult, DSD is a common feature of neurologic voiding disorders.

Detrusor hyperactivity with impaired bladder contractility (DHIC):: A condition characterized by involuntary detrusor contractions in which patients either are unable to empty their bladder completely or can empty their bladder completely only with straining due to poor contractility of the detrusor.

Detrusor instability (unstable bladder):: Involuntary detrusor contraction in the absence of associated neurologic disorders (see urge incontinence).

Electrical stimulation:: The application of electric current to stimulate or inhibit the pelvic viscera or their nerve supply in order to induce a direct therapeutic response.

Electromyography (EMG):: The study of electrical potentials generated by the depolarization of muscle. EMG of the striated urethral sphincter measures the integrity and function of its nerves and is used to evaluate the neurophysiologic status of the urinary tract during filling and voiding.

External (condom) catheters:: Devices for externally draining the bladder made from latex rubber, polyvinyl, or silicone that are secured on the shaft of the penis by some form of adhesive and are connected to urine collecting bags by a tube.

Habit training:: A behavioral technique that calls for scheduled toileting at regular intervals on a planned basis. Unlike bladder training, there is no systematic effort to motivate the patient to delay voiding and resist urge.

Hydronephrosis:: Dilation of the renal pelvis and calices, and sometimes, collecting ducts, secondary to obstruction of urine flow by calculi, tumors, neurologic disorders, or any various congenital anomalies.

Hypermobility of bladder neck:: A condition characterized by the descent and displacement of the urethra and bladder neck from their normal anatomic position during physical exertion, usually resulting in leakage of urine. This condition is the most common cause of stress urinary incontinence. Various surgical procedures can be employed to treat this condition (see bladder suspension).

Hyperreflexia:: Any exaggeration of reflexes. In urinary incontinence, an involuntary detrusor contraction resulting from a neurologic disorder.

Indwelling catheters:: Tube devices inserted into the bladder, urinary reservoir, or urinary conduit for a period of time longer than one emptying.

Intermittent catheterization:: The use of catheters inserted through the urethra into the bladder every 3-6 hours for bladder drainage in persons with urinary retention.

Intrinsic sphincter deficiency (ISD):: A cause of stress urinary incontinence in which the urethral sphincter is unable to contract and generate sufficient resistance in the bladder, especially during stress maneuvers. ISD may be due to congenital sphincter weakness, such as myelomeningocele or epispadias, or it may be acquired subsequent to prostatectomy, trauma, radiation therapy, or sacral cord lesions.

Involuntary detrusor contraction:: A cause of urinary incontinence resulting from uncontrolled contractions of the detrusor.

Mixed urinary incontinence:: The combination, in a patient, of urge urinary incontinence and stress urinary incontinence (see urge incontinence, stress incontinence).

Nocturnal enuresis:: The involuntary loss of urine (urinary incontinence) during sleep. Also called bed-wetting.

Overactive bladder:: A condition characterized by involuntary detrusor contractions during the bladder filling phase, which may be spontaneous or provoked and which the patient cannot suppress.

Overflow incontinence:: The involuntary loss of urine associated with overdistension of the bladder. Overflow incontinence results from urinary retention that causes the capacity of the bladder to be overwhelmed. Continuous or intermittent leakage of a small amount of urine results.

Pelvic muscle exercises (PMEs):: A behavioral technique that requires repetitive active exercise of the pubococcygeus muscle to improve urethral resistance and urinary control by strengthening the periurethral and pelvic muscles. Also called Kegel exercises or pelvic floor exercises.

Periurethral bulking injections:: A surgical treatment for urethral sphincter insufficiency that involves injecting materials such as polytetrafluoroethylene (PTFE) or collagen into the periurethral area to increase urethral compression.

Pessaries:: Devices for women that are placed intravaginally to treat pelvic relaxation or prolapse of pelvic organs.

Pharmacologic treatment:: The use of medications to treat urinary incontinence.

Post-void residual (PVR) volume:: The amount of fluid remaining in the bladder immediately following the completion of urination. Estimation of PVR volume can be made by abdominal palpation and percussion or bimanual examination. Specific measurement of PVR volume can be accomplished by catheterization, pelvic ultrasound, radiography, or radioisotope studies.

Prompted voiding:: A behavioral technique for use primarily with dependent or cognitively impaired persons. Prompted voiding attempts to teach the incontinent person awareness of his/her incontinence status and to request toileting assistance, either independently or after being prompted by a caregiver.

Sensory urgency:: Urgency associated with bladder hypersensitivity (see urge/urgency).

Sling procedures:: Surgical methods for treating urinary incontinence involving the placement of a sling, made either of tissue obtained from the person undergoing the sling procedure or of tissue obtained from another source, under the urethrovesical junction and anchored to retropubic and/or abdominal structures.

Stress urinary incontinence:: A form of urinary incontinence characterized by the involuntary loss of urine from the urethra during physical exertion; for example, during coughing. The stress incontinence symptom or complaint may be confirmed by observing urine loss coincident with an increase in abdominal pressure in the absence of a detrusor contraction or an overdistended bladder (see hypermobility of bladder neck and intrinsic sphincter deficiency).

Suprapubic cystostomy:: A surgical procedure involving insertion of a tube or similar instrument through the anterior abdominal wall above the symphysis pubis into the bladder to permit urine drainage from the bladder.

Transient urinary incontinence:: Temporary episodes of urinary incontinence that are reversible once the cause or causes of the episode(s) are identified and treated.

Ultrasonography:: A technique that uses ultrasound to obtain visual images of the urinary tract for the purpose of assessing its anatomic status.

Underactive bladder:: A condition characterized by a bladder contraction of inadequate magnitude and/or duration to effect bladder emptying in a normal timespan. This condition can be caused by drugs, fecal impaction, and neurologic conditions such as diabetic neuropathy or low spinal cord injury or as a result of radical pelvic surgery. It also can result from a weakening of the detrusor muscle from vitamin B12 deficiency or idiopathic causes. Bladder underactivity may cause overdistension of the bladder, resulting in overflow incontinence (see overflow incontinence).

Urethral pressure profilometry (UPP):: A technique used to measure resting and dynamic pressures in the urethra.

Urethral sphincter mechanism:: The segment of the urethra that influences storage and emptying of urine in the bladder. It controls bladder voiding by relaxing, which opens the outlet from the bladder, allowing urine to flow from the bladder to the outside of the body. A deficiency of the urethral sphincter mechanism may allow leakage of urine in the absence of a detrusor contraction.

Urge incontinence:: The involuntary loss of urine associated with an abrupt and strong desire to void (urgency). Urge incontinence is usually associated with the urodynamic findings of involuntary detrusor contractions or detrusor overactivity (see detrusor external sphincter dyssynergia, detrusor hyperactivity with impaired bladder contractility, detrusor instability, hyperreflexia, sensory urgency).

Urge/urgency:: A strong desire to void.

Urinary incontinence (UI):: Involuntary loss of urine sufficient to be a problem. There are several types of UI, but all are characterized by an inability to restrain or control urinary voiding (see mixed urinary incontinence, nocturnal enuresis, overflow incontinence, stress incontinence, transient urinary incontinence, urge incontinence).

Urinary tract:: Passageway from the pelvis of the kidney to the urinary orifice through the ureters, bladder, and urethra.

Urinary tract infection (UTI):: An infection in the urinary tract caused by the invasion of disease-causing micro-organisms, which proceed to establish themselves, multiply, and produce various symptoms in their host. Infection of the bladder, better known as cystitis, is particularly common in women, mainly because of the much shorter urethra, which provides less of a barrier to bacteria. In men, infection is usually associated with obstruction to the flow of urine, such as prostate gland enlargement.

Urodynamic tests:: Tests designed to determine the anatomic and functional status of the urinary bladder and urethra (see cystometry, electromyography, urethral pressure profilometry, uroflowmetry, videourodynamics).

Uroflowmetry:: A urodynamic test that measures urine flow either visually, electronically, or with the use of a disposable flowmeter unit.

Vesicoureteric reflux:: Backflow of urine from the bladder into the ureter, unilaterally or bilaterally, during rest or especially during urination. The condition may be congenital, secondary to obstruction of the urinary outflow tract, or any disease involving the urinary ureteral orifices.

Videourodynamics:: A technique that combines the various urodynamic tests with simultaneous fluoroscopy. Fluoroscopy is a technique for examining internal structures by viewing the shadows cast on a fluorescent screen by objects or parts through which x-rays are directed.

Voiding or bladder diary (record):: Also called an "incontinence chart." A record maintained by the patient or caregiver that is used to record the frequency, timing, amount of voiding, and/or other factors associated with the patient's urinary incontinence.

Copyright Notice

Bookshelf ID: NBK52173

This publication is provided for historical reference only and the information may be out of date.

Contributors

Urinary Incontinence in Adults Guideline Update Panel

J. Andrew Fantl, MD

Co-Chair

Professor and Vice Chairman

Department of Obstetrics, Gynecology and Reproductive Medicine

Division of Gynecology and General Obstetrics

State University of New York at Stony Brook

Stony Brook, New York

Specialty: Obstetrics/Gynecology

Dr. Fantl served for 20 years as professor in the Department of Obstetrics and Gynecology before assuming his present position. Dr. Fantl is past president of the American Urogynecologic Society and the Society of Gynecologic Surgeons. He currently serves on advisory groups to the International Continence Society and help for Incontinent People. His research interests have been urinary incontinence and pelvic organ prolapse in women, areas in which he has published for the past 15 years. He has been the principal investigator of NIH-NIA funded collaborative research on urinary incontinence and has patented a sensor catheter in collaboration with the National Aeronautics and Space Administration.

Diane Kaschak Newman, RNC, MSN, FAAN

Co-Chair

Adult Nurse Practitioner

Access to Continence Care & Treatment, Inc.

Philadelphia, Pennsylvania

Specialty: Nursing

Ms. Newman is an adult nurse practitioner, consultant, educator, and international speaker specializing in the areas of urinary incontinence and the management of incontinence. She holds a Master's degree in Nursing from the University of Pennsylvania. Her private practice, DKN & Associates and Golden Horizons, provides evaluation and treatment in office practice, long-term care settings for adult patients, and home care services for incontinent clients. Ms. Newman is founder and President of Access to Continence Care & Treatment, Inc., an organization that actively promotes the development of incontinence services and produces educational materials on incontinence for health care providers. Ms. Newman participated in the University of Pennsylvania School of Nursing Urinary Incontinence Project in 1986 and was involved with several research projects on the effect of behavioral treatment for urinary incontinence. She was a nurse practitioner consultant to the VNA of Trenton/Robert Wood Johnson Foundation demonstration project, Urinary Incontinence in a Visiting Nursing Agency. Ms. Newman is a clinical faculty preceptor in the geriatric and adult nurse practitioner programs at the University of Pennsylvania School of Graduate Nursing and was chair of the Second National Multi-Specialty

Nursing Conference on Urinary Continence held in January 1994. Ms. Newman has presented scientific papers at national and international meetings, written journal articles, and contributed chapters to publications on the subject of incontinence. She is the editor of the geriatric nursing textbook, Geriatric Care Plans.

Joyce Colling, PhD, RN, FAAN

Professor and Chairperson

Community Health Care Systems Department

School of Nursing

Oregon Health Sciences University

Portland, Oregon

Specialty: Nursing

Dr. Colling is a nurse and professor specializing in issues of gerontology. She has contributed much to research on incontinence in the frail elderly in the community and particularly in long-term care settings, with emphasis on staff education to improve incontinence care, and has published numerous research articles on incontinence in the elderly. She provides continence services to clinic patients and consultation to nursing home and community agencies. She is a fellow of the American Academy of Nursing and the Gerontological Society of America and currently serves on two international panels on urinary incontinence.

John O.L. DeLancey, MD

Associate Professor and Director of Gynecology

Department of Obstetrics and Gynecology

University of Michigan Medical Center

Ann Arbor, Michigan

Specialty: Obstetrics/Gynecology

Dr. DeLancey's area of research focuses on understanding the pathophysiology of urinary incontinence and problems with pelvic organ support. His clinical practice centers around surgical management of urinary incontinence and pelvic organ prolapse. He is president-elect of the American Urogynecologic Society and has lectured extensively in the United States and abroad concerning urinary incontinence.

Christopher Keeys, PharmD

President

Clinical Pharmacy Associates

Calverton, Maryland

Specialty: Pharmacy

Dr. Keeys is presently co-founder and president of Clinical Pharmacy Associates, Inc. He received his Bachelor of Science degree, magna cum laude, from Howard University in 1980 and his Doctor of Pharmacy degree in 1982 from the Philadelphia College of Pharmacy and Sciences. He is a registered pharmacist in Washington, DC, Maryland, Virginia, and Pennsylvania. During the past 15 years of professional life he has provided, through innovation and team building, progressive pharmaceutical services for many health care organizations, and served as a teacher of students and colleagues. His works and writings on the subjects of drug information, adverse drug reactions, and contemporary pharmacy practice have been published in professional and public

press both in the United States and abroad. He has been active in local and national professional organizations and is currently serving as Chairman, Drug Use Review Board, District of Columbia, and Co-Vice Chairman, Chesapeake Research Review, Inc., an ethical research committee. Dr. Keeys has been honored as the recipient of the Honored Preceptor Award from the Doctor of Pharmacy Class, Howard University; Pharmacist of the Year award from the Washington Metropolitan Society of Hospital Pharmacists; and Distinguished Pharmacy Alumnus Award from the Howard University Pharmacy Alumnus Association.

Richard M. Loughery, LFACHA

Planning Consultant

National Museum of Health and Medicine

McLean, Virginia

Specialty: Hospital Administration, Consumer Representative

Mr. Loughery served as special assistant and director of the Advisory Committee Office of the Secretary of the Department of Health and Human Services, Public Health Service. In this position, he advised the Secretary about a variety of health care and policy issues. For over 20 years he was the chief executive officer and president of the Washington Hospital Center, a 910-bed teaching hospital. He has served in leadership positions with the American Hospital Association and the American College of Hospital Administrators.

B. Joan McDowell, PhD, CRNP, FAAN

Associate Professor of Nursing

University of Pittsburgh

Pittsburg, Pennsylvania

Specialty: Nursing

Dr. McDowell received her doctorate in Higher Education Administration at the University of Pittsburgh. Since 1981, she has been affiliated with the University of Pittsburgh School of Medicine, where she serves as associate professor of nursing, director of the continence program, and assistant research professor of medicine. Dr. McDowell is a Fellow in the American Academy of Nursing and the recipient of many awards, including the Pennsylvania Nurses Association Commonwealth Award for Nursing Practice, the Award of Excellence from the American Academy of Nurse Practitioners, and inclusion in Who's Who in American Nursing. She has been the principal investigator for the Behavioral Treatment of Urinary Incontinence in Homebound Elderly since 1992, and during that time has authored and coauthored several articles on the identification and treatment of urinary incontinence.

Peggy A. Norton, MD

Associate Professor

Department of Obstetrics and Gynecology

University of Utah School of Medicine

Salt Lake City, Utah

Specialty: Obstetrics/Gynecology

Dr. Norton is a gynecologist specializing in urodynamics and surgery for urinary incontinence and genital prolapse. She has published numerous papers on these two subjects, and has co-authored three textbooks on urinary incontinence. She is principal investigator on an NIH-funded study on the role of connective tissue in

genitourinary prolapse. She is currently the research chairman for the American Urogynecologic Society and serves on several national and international advisory panels for the NIH, Society of Gynecologic Surgeons, and the International Continence Society. She recently won a teaching award from the American College of Obstetricians and Gynecologists.

Joseph Ouslander, MD

Vice President, Medical Affairs

Jewish Home for the Aging

Associate Professor

Multicampus Division of Geriatric Medicine and Gerontology

UCLA School of Medicine

Reseda, California

Specialty: Geriatrics

Dr. Ouslander is associate professor of medicine in the Multicampus Division of Geriatric Medicine and Gerontology at the University of California, Los Angeles School of Medicine, associate director of the Borun Center for Gerontological Research, and director of Gerontology at Encino Hospital. Dr. Ouslander has served on several national and international panels on urinary incontinence, has published numerous research articles on incontinence and has coauthored two books. He currently serves on the Board of Directors of the American Geriatrics Society and has served on the Geriatric Medicine Test Committee of the American Board of Internal Medicine/American Board of Family Practice.

John F. Schnelle, PhD

Director and Professor-in-Residence

Borun Center for Gerontological Research

UCLA School of Medicine and Jewish Home for the Aging

Reseda, California

Specialty: Psychology, Gerontology

Dr. Schnelle is director of the Borun Center for Gerontological Research and a professor at the Multicampus Division of Geriatric Medicine and Gerontology, School of Medicine, University of California, Los Angeles. He is known for his role as principal investigator on several major clinical trial intervention grants designed to improve care and management in nursing homes and has received awards for his outstanding contributions to behavior therapy. Among his most notable contributions is his innovative work in incontinence care, comprehensively described in his book, Management of Urinary Incontinence in the Frail Elderly. Dr. Schnelle has published in the areas of quality control in institutional settings and quality of life issues in the frail elderly, with over 100 publications in professional books and journals.

David R. Staskin, MD

Director

Urodynamics and Incontinence Center

Harvard Medical School

Beth Israel Hospital

Boston, Massachusetts

Specialty: Urology

Dr. Staskin is an assistant professor of surgery/urology at Harvard Medical School and Director of the Urodynamics and Continence Center at Beth Israel Hospital in Boston, where he holds teaching positions in both the divisions of Urology and Gynecology. He is also the Chief of Surgery at Malden Hospital. He currently serves on the Outcome Measures Committee for the International Continence Society, the Board of Directors of the American Urogynecologic Society and the Massachusetts Multiple Sclerosis Association, and is a member of the Urodynamics Society of the American Urological Association. His research and clinical interests are concentrated in the evaluation and treatment of incontinence and voiding dysfunction.

Jeannette M. Tries, MS, OTR

Director

Biofeedback and Incontinence Centers

Sacred Heart Rehabilitation Hospital

Milwaukee, Wisconsin

Specialty: Occupational Therapy, Psychology

Ms. Tries is president of the Clinic for Neurological Learning and is a consultant to the University of Illinois Incontinence Service within the Colon-Rectal Surgery Department. A registered occupational therapist and certified biofeedback therapist, Ms. Tries has developed neuromuscular reeducation and incontinence biofeedback programs. She is past president of the Biofeedback Society of Wisconsin, past board member of the Biofeedback Certification Institute of America, as well as consultant to faculties developing electromyographic neuromuscular reeducation and incontinence programs. Ms. Tries has a strong interest in development of behavioral and reeducation strategies for the neurologically impaired.

Vernon C. Urich, MD

Chief

Urology Section and Urodynamic Lab

Carl T. Hayden VA Medical Center

Phoenix, Arizona

Specialty: Urology

Dr. Urich is a urologist, surgeon, and educator, whose main interest is patient education. He was president of the Michigan Urological Society in 1990 and was on that Society's Board of Directors for 5 years. He is currently on the editorial board of Patient Education and Counseling and formerly was on the board of directors of the International Patient Education Council and the board of trustees of the Center for Gerontology. He was a member of the Urinary Incontinence Guideline Panel and now serves on the VA Institute of Quality Management Guideline Panel. Prior to recent relocation, he was on the faculty of the University of Michigan and Michigan State University.

Sharon H. Vitousek, MD

Waimea Medical Associates

Lucy Henriques Medical Center

Kamuela, Hawaii

Specialty: Primary Care, Community Health

Dr. Vitousek received her medical degree from the John Burns School of Medicine in Hawaii. Currently, she is president of the State of Hawaii Board of Health, and maintains a part-time internal medicine practice with Waimea Medical Associates. She has also worked as a clinical professor of medicine for Queen Emma Clinic. Dr. Vitousek has long been involved in community efforts to improve the health status of individuals in North Hawaii. She wrote the mission statement for North Hawaii Community Hospital, Inc., worked with the Department of Health to develop a public/private partnership for its funding, developed a proposal to procure a $2 million grant for the hospital, and served as its president. In 1994, Dr. Vitousek was elected to the Hawaii Medical Association House of Delegates.

Barry D. Weiss, MD

Professor of Family Medicine

Department of Family and Community Medicine

University of Arizona

College of Medicine

Tucson, Arizona

Specialty: Family Medicine, Geriatrics

Dr. Weiss serves on national committees of the American Academy of Family Physicians, the National Cancer Institute, and the Agency for Health Care Policy and Research. He is editor of Family Medicine, the national journal of the Society of Teachers of Family Medicine. Dr. Weiss is the author of over 80 publications in peer-reviewed medical journals, and serves on the Arizona Board of Medical Examiners, the regulatory agency responsible for licensing and disciplining physicians who practice medicine in Arizona.

Kristene Whitmore, MD

Chief of Urology

Director of the Incontinence Center

The Graduate Hospital

Philadelphia, Pennsylvania

Specialty: Urology

Dr. Whitmore, in addition to her responsibilities at The Graduate Hospital, also serves on the urology staff for the Philadelphia Veteran's Administration Hospital and is a clinical professor of urology at the University of Pennsylvania. Over the past 16 years, Dr. Whitmore has presented nationally and internationally and has authored or coauthored more than 100 articles and books. Dr. Whitmore has made numerous television appearances, and served for 3 years as a medical consultant for the Emmy award-winning drama, "St. Elsewhere." She has also provided consultation to Searle, Merck, Sharp and Dohme, Marion, Johnson & Johnson, and Wang laboratories. Dr. Whitmore is a member of the American Medical Association, American Association of Clinical Urologists, American Urogynecological Society, American Foundation for Urologic Diseases, National Kidney Foundation, and International Continence Society. She was the 1994 president of Women in Urology and was listed in Who's Who Worldwide.

Consultants

Patricia Burns, PhD, RN, FAAN

Director, School of Nursing

Department of Graduate Education

SUNY of Buffalo

Buffalo, New York

Ananias Diokno, MD

Chief, Department of Urology

William Beaumont Hospital

Royal Oak, Michigan

Teh-Wei Hu, PhD

Professor of Health Economics

Department of Social and Administrative Health Sciences

Berkeley, California

Donna Katzman McClish, PhD

Associate Professor

Department of Biostatistics

Medical College of Virginia

Richmond, Virginia

Thelma Joan Wells, PhD, RN, FAAN

University of Wisconsin School of Nursing

Madison, Wisconsin

Matthew Zack, MD, MPH

Centers for Disease Control and Prevention

Atlanta, Georgia

AHCPR Staff

Douglas B. Kamerow, MD, MPH

Director

Office of the Forum for Quality and Effectiveness in Health Care

Francis Chesley, MD

Senior Health Policy Analyst

Margaret Coopey, MGA, RN

Senior Health Policy Analyst

Stan Edinger, MD

Senior Health Policy Analyst

Carole Hudgings, PhD

Senior Health Policy Analyst

Lawrence C. McMurtry, MSSW

Senior Health Policy Analyst

Randie A. Siegel

Managing Editor

Karen N. Carp

Public Affairs Specialist

Contract Support

Technical Resources International, Inc

Gail J. Herzenberg, MPA

Project Director

Cheryl Campbell

Panel Manager

Marcia Feinleib

Managing Editor

Joan A. Saunders

Panel Editor

Joanna Taylor

Production Editor

David Tran

Literature Acquisition Specialist

John Warner, MS

Research Analyst

Peer Reviewers [a]

[a] These individuals provided peer review. Their participation does not necessarily imply endorsement of the guideline.

Anne Alberg

Vice President, Sales and Marketing

Diagnostic Ultrasound Corporation

Redmond, Washington

Margaret M. Baumann, MD

Section of Geriatric Medicine

University of Illinois at Chicago

Chicago, Illinois

Kari Bo, PE, PT, PhD

Associate Professor

The Norwegian University of Sport and Physical Education

Oslo, Norway

Carol Brink, MPH, RN

Associate Professor of Clinical Nursing

University of Rochester School of Nursing

Rochester, New York

Norman Bruckner, PhD

Director, Product Development

Johnson & Johnson

Arlington, Texas

Richard Bump, MD

Associate Professor

Department of Obstetrics/Gynecology

Duke University

Durham, North Carolina

Kathryn Burgio, PhD

Associate Professor of Medicine

Division of Gerontology and Geriatric Medicine

University of Alabama

Birmingham, Alabama

Amanda Clark, MD

Oregon Health Sciences University

Portland, Oregon

Dr. Alan Cottenden

Lecturer

Department of Medical Physics and Bioengineering

University College London

London, England

Molly Dougherty, PhD, RN

Professor and Research Coordinator

University of Florida

College of Nursing

Gainesville, Florida

Carol Einhorn, RN

Gerontological Nurse Practitioner

VA West Side Medical Center

Chicago, Illinois

Sheila Fiers, RN, BSN, CETN

Rochester, Minnesota

Norman F. Gant, MD

Executive Director

American Board of Obstetrics/Gynecology

Dallas, Texas

Mikel Gray

Department of Urology

University of Virginia Health Sciences Center

Charlottesville, Virginia

Constance Halverson, RN

Clinical Research Advisor

EMPI, Inc.

Minneapolis, Minnesota

Kay E. Jewell, MD

Health Care Financing Administration

Baltimore, Maryland

Aaron Kirkemo, MD

Director, Urodynamics Laboratory

Henry Ford Hospital

Detroit, Michigan

Beverly Korfin, RN

Urologic Division

CR Bard, Inc.

Covington, Georgia

Rhonda Kotarinos, MS, PT

President

Women's Therapeutic Services, Ltd.

Chicago, Illinois

Gary Leach, MD

Department of Urology

Kaiser Permanente Medical Center

Los Angeles, California

Deborah Lekan-Rutledge, MSN

University of North Carolina, Chapel Hill

Chapel Hill, North Carolina

Edward McGuire, MD

Professor and Director

Division of Urology

University of Texas-Houston

Houston, Texas

Mark McIntyre

American Medical Systems

Minneapolis, Minnesota

Joseph Montella, MD

Assistant Professor

Department of Obstetrics and Gynecology

Jefferson Medical College

Philadelphia, Pennsylvania

Julie Graves Moy, MD

American Academy of Family Physicians

Houston, Texas

Christine Norton, MA, RN

Director

The Continence Foundation

London, England

Mary Palmer, RNC, PhD, FAAN

Senior Staff Fellow

National Institute of Nursing Research

National Institutes of Health

Baltimore, Maryland

Richard Reed, MD

Director, Geriatric Programs

University of Minnesota Medical School

Minneapolis, Minnesota

Patricia Rowell, RN

American Nurses Association

Washington, DC

Carolyn Sampselle, PhD, RN

Associate Professor

University of Michigan

School of Nursing

Ann Arbor, Michigan

Dr. Kathleen Siegwart

Personal Products

Johnson & Johnson

Dayton, New Jersey

Stuart Smythe

Vice President

Laborie Medical Technologies Corporation

South Burlington, Vermont

Christopher Steidle, MD

Urologist

Northeast Indiana Urology, PC

Fort Wayne, Indiana

Morton A. Stenchever, MD

Professor and Chairman

Department of Obstetrics & Gynecology

University of Washington School of Medicine

Seattle, Washington

Jim Stupar

Incare Medical Products

Libertyville, Illinois

Kathe Wallace, PT

Northlake Physical Therapy

Seattle, Washington

John Warren, MD

Head, Division of Infectious Diseases

University of Maryland School of Medicine

Baltimore, Maryland

Adeline Yerkes, MPH

Chief, Chronic Disease Services

Oklahoma State Department of Health

Oklahoma City, Oklahoma

This publication is provided for historical reference only and the information may be out of date.

Availability of Guidelines

For each clinical practice guideline developed under the sponsorship of the Agency for Health Care Policy and Research (AHCPR), several versions are produced to meet different needs.

The *Clinical Practice Guideline* presents recommendations with brief supporting information, tables and figures, and pertinent references.

The *Quick Reference Guide for Clinicians* is a distilled,version of the *Clinical Practice Guideline,* with summary points for ready reference on a day-to-day basis.

The *Consumer Version,* available in English and Spanish, is an information booklet for the general public to increase patient knowledge and involvement in health care decisionmaking.

For this guideline update, a separate *Caregiver Guide* provides instructions to persons caring for incontinent patients either at home or in long-term care facilities.

To order single copies of guideline products or to obtain further information on their availability, call the AHCPR Publications Clearinghouse toll-free at 800-358-9295 or write to: AHCPR Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907.

Single copies of the *Clinical Practice Guideline Update* are available for sale from the Government Printing Office, Superintendent of Documents, Washington, DC 20402, with a 25-percent discount given for bulk orders of 100 copies or more. The *Quick Reference Guide for Clinicians,* the *Consumer Version* in English, and the *Caregiver Guide* are also available for sale in bulk quantities only. Call (202) 512-1800 for price and ordering information.

The *Guideline Technical Report* contains complete supporting materials for the *Clinical Practice Guideline,* including background information, methodology, literature review, scientific evidence tables, recommendations for research, and a comprehensive bibliography. It is available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. Call (703) 487-4650 for price and ordering information.

The full text of guideline documents for online retrieval may be accessed through a free electronic service from the National Library of Medicine called HSTAT (Health Services/Technology Assessment Text). Guideline information is also available through some of the computer-based information systems of the National Technical Information Service, professional associations, nonprofit organizations, and commercial enterprises.

A fact sheet describing Online Access for Clinical Practice Guidelines (AHCPR Publication No. 94-0075) and copies of the *Quick Reference Guide for Clinicians* and the *Consumer Version* of each guideline are available through AHCPR's InstantFAX, a fax-on-demand service that operates 24 hours a day, 7 days a week. AHCPR's InstantFAX is accessible to anyone using a facsimile machine equipped with a touchtone telephone handset: Dial (301) 594-2800, push "1," and then press the facsimile machine's start button for instructions and a list of currently available publications.

Copyright Notice

Bookshelf ID: NBK52165