

Special Contribution

Consensus Development Conference on Urinary Incontinence in Adults*

Abstract: Urinary incontinence, the involuntary loss of urine so severe as to have social and/or hygienic consequences, is a major clinical problem and a significant cause of disability and dependency. Urinary incontinence affects all age groups and is particularly common in the elderly. At least 10 million adult Americans suffer from urinary incontinence, including approximately 15%–30% of community-dwelling older people and at least half of all nursing home residents. The monetary costs of managing urinary incontinence are conservatively estimated at \$10.3 billion annually and the psychosocial burden of urinary incontinence is great.

Keywords: Urinary incontinence

Introduction

Urinary incontinence is a symptom rather than a disease. It appears in a limited number of clinical patterns, each having several possible causes. In some cases, the disorder is transient, secondary to an easily reversed cause such as a medication or an acute illness

like urinary tract infection. Many cases are chronic, however, lasting indefinitely unless properly diagnosed and treated.

There is a persistent myth that urinary incontinence is a normal consequence of aging. While normal aging is not a cause of urinary incontinence, age-related changes in lower urinary tract function predispose the older person to urinary incontinence in the face of additional anatomic or physiological insults to the lower urinary tract or by systemic disturbances such as illnesses common in older people.

Even frail nursing home residents or persons being cared for by family care givers often have urinary incontinence that can be significantly improved or cured. Persons with urinary incontinence should be alerted to the importance of reporting their symptoms to a health care professional and of asserting their right to proper assessment, diagnosis, and treatment. The first steps to treatment are acknowledgement of the problem and appropriate assessment and diagnosis.

Knowledge of the occurrence, causes, consequences, and treatment of the specific forms of urinary incontinence has increased. While new diagnostic tests have been developed, well-defined guidelines are needed for their application. Similarly, despite numerous new potential therapies, opinions differ widely concerning the best approach to many specific forms of the disorder. The most common treatments include pelvic muscle exercises and other behavioral treatments, local and systemic drug therapies, and a variety of surgical approaches.

The number of patients with urinary incontinence who are not successfully treated remains surprisingly high. This is due to several factors, including underreporting by patients; underrecognition as a significant clinical problem by health care providers; lack of

*Reprinted from JAMA 1989; 261: 2685–2690

Offprint requests to: Director of Communications, Office of Medical Applications of Research (OMAR), National Institutes of Health, Building 1, Room 260, Bethesda, MD 20892, USA. A bibliography (prepared by the National Library of Medicine) and a videotape highlighting the conclusions and recommendations of the conference (prepared by OMAR) are available from the same address.

education of health providers regarding new research findings; inadequate staffing in the long-term-care setting; and the persistent major gaps in our understanding of the natural history, pathophysiology, and most effective treatments of the common forms of urinary incontinence. The amount of basic research as well as research focusing on prevention is meager.

To resolve issues regarding the incidence, causes, treatment, and consequences of urinary incontinence in adults, the National Institute of Aging and the Office of Medical Applications of Research of the National Institutes of Health, in conjunction with the National Institute of Diabetes and Digestive and Kidney Diseases, the National Center for Nursing Research, the National Institute of Neurological Disorders and Stroke, and the Veterans Administration, convened a Consensus Development Conference on Urinary Incontinence in Adults on October 3 through 5, 1988. After a day and a half of presentations by experts in the relevant fields involved with urinary incontinence, a consensus panel consisting of representatives from geriatrics, urology, gynecology, psychology, nursing, epidemiology, basic sciences, and the public considered the evidence and developed answers to the following central questions:

1. What are the prevalence and the clinical, psychological, and social impact of urinary incontinence among persons living at home and in institutions?
2. What are the pathophysiological and functional factors leading to urinary incontinence?
3. What diagnostic information should be obtained in assessment of the incontinent patient? What criteria should be employed to determine which tests are indicated for a particular patient?
4. What are the efficacies and limitations of behavioral, pharmacologic, surgical, and other treatments for urinary incontinence? What sequences and/or combination of these interventions are appropriate? What management techniques are appropriate when treatment is not effective or indicated?
5. What strategies are effective in improving public and professional knowledge about urinary incontinence?
6. What are the needs for future research related to urinary incontinence?

What are the Prevalence and the Clinical, Psychological, and Social Impact of Urinary Incontinence Among Persons Living at Home and in Institutions?

Estimates of the occurrence of urinary incontinence depend on the nature of the study population and the definition of the disorder. Prevalence rates range from 8%–51%; an estimate of 15%–30% for community-

dwelling older persons seems reasonable, and of these 20%–25% may be classified as severe cases. Prevalence rates are twice as high in women as in men and are higher in older than in younger adults. Though these community rates are alarmingly high, rates in nursing homes are even higher. Half or more of the 1.5 million Americans in nursing homes suffer from urinary incontinence.

Little is known about the natural history of urinary incontinence, including age at onset, incidence rates, progression, and spontaneous remission. Limited data exist on associated morbidity and functional impairment. To date, most studies have been conducted in whites, and data are needed on the occurrence in nonwhite ethnic groups.

Though urinary incontinence is a symptom of many conditions, defining risk factors would be extremely useful for identifying high-risk persons and remediable environmental causes. While age, gender, and parity are established risk factors, many other factors have been suggested but not rigorously proved. These include urinary tract infection, menopause, genitourinary surgery, lack of postpartum exercise, chronic illnesses, and various medications. Identification of risk factors is essential for a concerted effort at prevention.

Clinical, Psychological, and Social Impact

In the Community. Because only about half of the people with incontinence in the community have consulted a physician about the problem, the true extent and clinical impact of urinary incontinence are not known. Rashes, pressure sores, skin and urinary tract infections, and restriction of activity are some of the problems that could be prevented or treated if the underlying incontinence were brought to medical attention. Many people with incontinence turn prematurely to the use of absorbent materials without having their difficulty properly diagnosed and treated.

The psychosocial impact of incontinence in the community falls on individuals and their care providers. Studies of women show that the condition is associated with depressive symptoms and leads to embarrassment about appearance and odor, although such reactions may be related more to illness than to incontinence. Excursions outside the home, social interactions with friends and family, and sexual activity may be restricted or avoided entirely in the presence of incontinence. Spouses and other intimates also may share the burden of this condition. A highly conservative estimate of the direct costs of caring for persons with incontinence of all ages in the community is \$7 billion annually in the United States.

In Nursing Homes. Many physicians fail to recognize the clinical impact of urinary incontinence in nursing homes, and very few nursing home residents with

incontinence had had any type of diagnostic evaluation. In this setting, fecal incontinence, physical and mental impairment, pressure sores, and urinary tract infections are commonly associated with urinary incontinence, but cause-and-effect relationships are not clear. Many nursing home residents who are incontinent are managed with indwelling catheters, which carry an increased risk of significant urinary tract infection, and the use of such devices varies widely. The odor of urine that permeates many nursing homes can be repellent to residents, staff, and potential visitors. Managing those with incontinence presents a major problem to insufficient and often untrained staff. The annual direct cost of caring for incontinence among nursing home residents is approximately \$3.3 billion.

What are the Pathophysiological and Functional Factors Leading to Urinary Incontinence?

Continence requires a compliant bladder and active sphincteric mechanisms, such that maximum urethral pressure always exceeds intravesical pressure. Normal voiding requires sustained and coordinated relaxation of the sphincters and contraction of the urinary bladder.

These functions are regulated by the central nervous system through autonomic and somatic nerves. The system requires the integration of visceral and somatic muscle function and involves control by voluntary mechanisms originating in the cerebral cortex. These voluntary mechanisms are learned and culturally prescribed (i.e. toilet training).

Incontinence can be produced by any pathological, anatomic, or physiological factor that causes intravesical pressure to exceed maximum urethral pressure. Intravesical pressure can be raised by involuntary detrusor contractions (unstable bladder or detrusor hyperreflexia), by acute or chronic bladder overdistension (urinary retention with overflow), or by an increase in intra-abdominal pressure. Similarly, a decrease in urethral pressure may occur as a result of uninhibited sphincter relaxation (unstable urethra), loss of pelvic floor support (genuine stress incontinence), and urethral wall defects from trauma, surgery, or neurological disease.

The most commonly encountered clinical forms of urinary incontinence in adults are stress incontinence, urge incontinence, overflow incontinence, and a mixed form. In stress incontinence, dysfunction of the bladder outlet leads to leakage of urine as intra-abdominal pressure is raised above urethral resistance while coughing, bending, or lifting heavy objects. The volume of urine leakage is generally modest at each occurrence and, in uncomplicated cases, postvoid residual volume is low. Stress incontinence has many

causes, including direct anatomic damage to the urethral sphincter (sphincteric incontinence), which may lead to severe, continuous leakage, and weakening of bladder neck supports, as is often associated with parity.

Urge incontinence occurs when patients sense the urge to void (urgency), but are unable to inhibit leakage long enough to reach the toilet. In most, but not all, cases, uninhibited bladder contractions contribute to the incontinence. Urine loss is moderate in volume and occurs at intervals of several hours and postvoid residual volume is low at intervals of several hours. Among the causes of urge incontinence are central nervous system lesions such as occur in stroke or demyelinating disease, which impair inhibition of bladder contraction, and local irritating factors such as urinary infection or bladder tumors. In many cases of urge incontinence, no specific etiology can be identified despite detailed clinical and laboratory evaluation.

An important variant of urge incontinence is reflex incontinence, in which urine is lost owing to uninhibited bladder contractions in the absence of the symptoms of urgency. In addition, many persons suffer from very frequent symptoms of urgency and are able to remain continent only by conducting their activities in the proximity of restrooms.

Overflow incontinence occurs when the bladder cannot empty normally and becomes overdistended, leading to frequent, sometimes nearly constant, urine loss. Causes include neurological abnormalities that impair detrusor contractile capacity, including spinal cord lesions, and any factor that obstructs outflow, including medications, tumors, benign strictures, and prostatic hypertrophy.

Many cases of urinary incontinence fall into the mixed category, displaying some aspects of more than one of the major subtypes, both clinically and on extensive laboratory evaluation.

The term *functional incontinence* is applied to those cases in which the function of the lower urinary tract is intact, but other factors such as immobility or severe cognitive impairment result in urinary incontinence.

It should be clear that urinary incontinence can be caused by multiple and often interacting conditions. Of particular importance are the transient or reversible factors, such as infection, delirium, and drugs. These causes, which may be common in the elderly patient, should be carefully considered in the pathophysiology of urinary incontinence.

There are age-related changes in the lower urinary tract that increase its vulnerability to both chronic and transient factors. Increases in uninhibited contractions, nocturnal fluid excretion, and prostate size, accompanied by decreases in bladder capacity and flow rate, all lead to greater susceptibility to urinary incontinence in the face of stresses associated with disease, functional impairment, or environmental factors. In older persons, cognitive decline, musculoskeletal impairments, and restricted access to toilets may all convert the marginally continent system to incontinence.

What Diagnostic Information Should be Obtained in Assessment of the Incontinent Patient? What Criteria Should be Employed to Determine which Tests are Indicated for a Particular Patient?

Evaluation and therapy must be tailored to the individual, taking into account clinical, cognitive, functional, and residential status in addition to the potential for correcting the problem. Just as a child is not simply a young adult, octogenarians differ from persons in their 40s. Patients with stress urinary incontinence are quite dissimilar from those with uninhibited contractions and unstable bladders. Proper diagnosis and active case finding are imperative.

Core Evaluation

History. The evaluation of all patients with incontinence requires a thorough history, including medical, urologic, gynecologic, and neurological assessment, with particular attention to those factors that influence bladder function. The duration, frequency, volume, and type of incontinence should be described and validated by a voiding diary. Other important information includes associated illnesses, previous operations, and current medications.

Physical Examination. Physical examination is required, with emphasis on mental status; mobility and dexterity; and neurological, abdominal, rectal, and pelvic findings. A provoked full-bladder stress test is recommended. Since prostate enlargement is often asymmetric, the size of the prostate as estimated on rectal examination may be misleading when evaluating the possible contribution of prostatic hypertrophy to urinary obstruction.

In addition to the history and physical examination, core measurements to be obtained in all patients are urinalysis values, serum creatinine or blood urea nitrogen levels, and postvoid residual urine volume. Other tests such as urine culture, blood glucose, and urinary cytology may be useful.

Based on the findings from the core evaluation, a decision for treatment or more definitive evaluation is made, taking into consideration the type and degree of incontinence.

Specialized Studies

The tests currently available for specialized study include the following:

Cystometrogram – to be used as the basic study in cases requiring more than core evaluation – should be accompanied by measurement or estimation of abdominal pressure.

Electrophysiological sphincter testing.

Ultrasound evaluation of the bladder or kidneys may detect residual urine or hydronephrosis.

Cystourethroscopy with or without cytological analysis is indicated in patients with hematuria or the recent onset of urgency or urge incontinence who are at increased risk for carcinoma.

Uroflometry has wide application in the evaluation of obstructive disease in men, but a limited role in the evaluation of women.

Video urodynamic evaluation requires special expertise. Its role is limited to the more elusive incontinence problems.

Urethral pressure profilometry is a controversial test. Its predictive value has been questioned, and it requires further validation before it can be recommended for widespread use.

These numerous noninvasive and invasive tests must be used selectively. Examples of patients rarely requiring further diagnostic testing after the core examination include the young woman with classic stress incontinence or the 80-year-old woman with a recent stroke and the new onset of urge incontinence. Patients with stress incontinence and a significant urge component or those in whom previous operations have failed may require combined cystography and fluoroscopy with urge or mixed incontinence, or those who are not helped by empirical therapy or operation, also will require more complete urodynamic testing. Some patients may not be candidates for sophisticated studies owing to inability to cooperate or a poor prognosis for correction. Armed with this information, the investigating physician should be able to reach an accurate diagnosis leading to appropriate therapy.

What are the Efficacies and Limitations of Behavioral, Pharmacologic, Surgical, and Other Treatments for Urinary Incontinence? What Sequences and/or Combination of These Interventions are Appropriate? What Management Techniques are Appropriate when Treatment is not Effective or Indicated?

General principles of treatment are as follows:

All persons with incontinence should be considered for evaluation and treatment.

Treatment decisions should be based on a diagnosis made after a reasonable evaluation of anatomy and function of urine storage and emptying.

Treatment for incontinence is given to a specific individual, whose personality, environment, expectations, and clinical status are important determinants of treatment modalities to be used and the order of their application.

The patient requires sufficient information and explanation to be able to make a choice among therapeutic options.

Environmental constraints in the community or in an institution that may impede treatment are common and strategies to circumvent impediments are a part of the therapy.

In particular, availability of adequate numbers of properly constructed public toilets is an important adjunct to incontinence management.

Pharmacologic Treatment

Most drugs currently used in managing the varied causes of urinary incontinence have not been studied in well-designed clinical trials. Nevertheless, it has been suggested that many agents are beneficial, especially for patients with urge incontinence due to uninhibited detrusor contractions. For these patients, drugs that increase bladder capacity can be helpful. One attendant risk is the precipitation of retention. Accordingly, outlet obstruction or a weak detrusor should be looked for as possible contraindications to these agents.

Bladder Relaxants. These agents are generally used for urge incontinence:

Anticholinergics. – Anticholinergic agents inhibit detrusor contraction and may produce increased bladder capacity and delay and reduction in amplitude of involuntary contractions. Propantheline is frequently effective, although high doses may produce unacceptable side effects such as dry mouth, dry eyes, constipation, confusion, or precipitation of glaucoma.

Direct smooth-muscle relaxants. – These antispasmodics work directly on bladder muscle, but they have a mild anticholinergic effect as well. A randomized, double-blind, placebo-controlled study has shown benefit with oxybutynin in patients with detrusor instability, some but not all of whom were incontinent. Favorable reports also exist about flavoxate and dicyclomine, the other two agents in this class.

Calcium channel blockers. – These agents, used clinically for cardiovascular indications, have a depressant effect on the bladder as well, but they have not been studied rigorously for the treatment of urge incontinence in comparison with other agents. In the patient being considered for treatment for heart disease, the bladder effects of calcium antagonists must be kept in mind for both their potential benefit as well as risk of retention.

Imipramine. – This tricyclic antidepressant has anticholinergic and direct relaxant effects on the detrusor and an alpha-adrenergic enhancing (contracting) effect

on the bladder outlet, all of which enhance continence. Although imipramine is commonly used, potential side effects of postural hypotension and sedation as well as all peripheral anticholinergic effects make caution imperative when considering this agent in older persons.

Bladder Outlet Stimulants. Alpha-adrenergic agonists, used in treatment of stress incontinence, produce smooth-muscle contraction at the bladder outlet and may improve continence. Pseudoephedrine and ephedrine both are active, but phenylpropanolamine has been used most often and objective benefit by urodynamic study has been shown.

Estrogens. Because urinary incontinence increases in women with increasing age, and because menopause results in estrogen deficiency, estrogen replacement has been thought to be helpful for urinary incontinence. Several studies have shown no improvement in stress incontinence, but women with postmenopausal urge incontinence, urgency, and frequency have shown improvement. Long-term use should be considered in view of other risks and benefits.

Surgery

Surgery is particularly effective in treatment of pure stress incontinence associated with urethrocele. A variety of surgical techniques for the transvaginal or transabdominal suspension of the bladder neck yield a success rate between 80% and 95% in appropriately selected patients with stress incontinence at 1-year follow-up. Long-term results require study. When incontinence in men is secondary to outflow obstruction and chronic retention is secondary to prostatic enlargement, it is best treated with prostatectomy.

In addition, there are several specialized and more extensive surgical procedures. When incontinence is due to intrinsic sphincter dysfunction, which may occur after the surgical trauma of radical prostatectomy or sphincter denervation, the compressive action of the sphincter is lost. An implantable prosthetic sphincter can restore this compression. Continence is restored in 70%–90% of patients in various series. A complication rate greater than 20% includes erosion of the urethra, infection, and mechanical failure. Reoperations are frequently required.

Urethral sling procedures pass a ribbon of fascia or artificial material beneath the urethra. The sling, fixed to the anterior body wall, serves to elevate and compress the urethra, restoring continence in 80% of patients. Bladder augmentation with isolated bowel segments will increase bladder capacity and vent excessive bladder pressure. This procedure is limited to certain specific bladder problems such as the contracted bladder of neurological disease or tuberculosis. Bladder replacement with continent diversion can also be offered to the cystectomy patient.

There are no simple procedures to control bladder instability or sensory urgency. When incontinence is due to a mixture of stress and urge, pharmacologic or behavioral treatment may be employed in conjunction with surgery, but results are not as good as when stress incontinence exists alone.

Selection of patients for surgical procedures depends on the diagnosis and on the condition of the patient. The frailty of the patient, the condition of tissues, and the state of nutrition bear on the ability to heal. The severity of symptoms must be considered in relation to the risk the patient must undertake for their surgical correction. Finally, such factors as the durability of the treatment and the incidence of complications must also be considered in choosing a treatment option.

Behavioral Techniques

Behavioral techniques increase the patient's awareness of the lower urinary tract and environment and can enhance control of detrusor and pelvic muscular function. Such techniques are participatory, relatively noninvasive, and generally free of side effects and do not limit future options. They do require time, effort, and continued practice. Some patients become dry, while a larger number experience important reduction of wetness and others receive no benefit. Those who appear to benefit most are highly motivated individuals without cognitive deficits. Men and women with stress and urge incontinence have benefited, whereas patients with severe sphincter damage (such as in patients with constant leakage after radical prostatectomy) generally do not benefit.

Behavioral techniques should be offered as a choice to patients who are motivated to put in the time and effort and wish to avoid a more invasive procedure. Commonly employed techniques include the following:

Pelvic muscle exercises strengthen the voluntary periurethral and pelvic floor muscles, the contraction of which exerts a closing force on the urethra. These techniques have been emphasized for women with stress incontinence but appear to be useful in men as well. Benefit has been reported in 30%–90% of women, but criteria for improvement differ among studies. Patients with mild symptoms may improve most. Continued exercise is required for continued benefit.

Biofeedback is a learning technique to exert better voluntary control over urine storage. Biofeedback uses visual or auditory instrumentation to give patients moment-to-moment information on how well they are controlling the sphincter, detrusor, and abdominal muscles. After such training, successful patients typically learn to perform the correct responses relatively automatically. Patients with urinary incontinence are trained to relax the detrusor and abdominal muscles and/or contract the sphincter, depending on the form of incontinence. When used in patients with stress and/or

urge incontinence, biofeedback has been shown to result in complete control of incontinence in approximately 20%–25% of patients and to provide important improvement in another 30%. There are two caveats: the degree of improvement is variable and long-term follow-up data are not available. It is important to recognize that biofeedback requires sophisticated equipment and training. The benefit of adding biofeedback to pelvic muscle exercise regimens has not been adequately evaluated.

Bladder training instructs patients to void at regular short intervals, usually hourly during the day, and then at progressively longer intervals of up to 3 h during a training period of a few to a dozen weeks. Bladder training appears to be effective in reducing the frequency of stress and urge incontinence. Studies have indicated cure rates of 10%–15% and improvement in the majority of patients.

Behavioral techniques in the nursing home. For the institutionalized elderly, almost any consistent attention to the problem, including bladder training and frequent scheduled checks for dryness, appears to reduce incontinence in at least some patients. Another technique applicable in the nursing home is prompted voiding, in which frequent (every 1–2 h) checks for dryness are made, reminding the patient to void and praising success.

Staging of Treatment

As a general rule, the least invasive or dangerous procedures should be tried first. For many forms of incontinence, behavioral techniques meet this criterion. When behavioral techniques do not achieve the desired result, pharmacologic treatment can be initiated. Clear indications for surgical intervention must be respected, however, and surgical treatment should not be withheld inappropriately. Overflow incontinence due to prostatism and urge incontinence due to carcinoma of the bladder or prostate must be recognized and treated promptly. After having been informed of surgical and nonoperative options, the patient who is a surgical candidate and wants prompt treatment (e.g. as in the case of stress incontinence) should be operated on. In patients with mixed incontinence, a combination of surgery, behavioral techniques, and pharmacotherapy may be helpful.

What Management Techniques are Appropriate when Treatment is not Effective or Indicated?

For patients who have not been successfully treated, management plans must be developed to maximize their wellbeing. Even when permanent improvement is not expected, techniques such as frequent toileting and reminders may be useful in reducing the impact of the patient's incontinence. Careful evaluation of the timing

and pattern of incontinence may suggest helpful changes such as bedtime fluid restriction, provision of easier access to toilet facilities, and temporary or permanent arrangements for protection of the patients, their clothing, and the environment.

Currently available modes of protection include absorbent pads or garments, indwelling catheters, and external collection devices such as condom catheters. Absorbent pads or garments provide comfort and convenience when used temporarily in conjunction with therapy; no method is entirely satisfactory for long-term use. For long-term use with incapacitated patients, absorbent materials are expensive, require personnel time, and can be associated with pressure sores when circumstances prevent meticulous attention to prompt changes.

For men, external collection devices are less expensive and less time-consuming for patient and care giver, but they are associated with increased incidence of urinary tract infection and other complications. Practical external collection devices for women are not generally available.

Indwelling urethral or suprapubic catheters may be necessary for selected patients, but almost invariably lead to bacteriuria within a few weeks and have been associated with sepsis.

What Strategies are Effective in Improving Public and Professional Knowledge About Urinary Incontinence?

There have been limited efforts to inform the public and professionals about urinary incontinence. The effectiveness of these strategies has not been evaluated. Education about incontinence, therefore, must rely on methods that have been used in other areas of health education. Effective strategies to improve public and professional awareness need to be developed, implemented, and evaluated.

Negative societal attitudes about urinary incontinence have been a barrier to increasing public and professional knowledge. The scientific study of incontinence and the dissemination of research findings will help professionals and laypersons realize that loss of continence need not be a condition that is inevitable or shameful.

Strategies for Improving Public Knowledge

Providing accurate information on the management of incontinence to persons with this problem and their families is a challenging and important task. Studies suggest that only half of the people with incontinence report their condition to a physician. Strategies that will reach the largest number of people will be effective in encouraging them to seek professional help. These include informative newspaper and magazine articles,

radio and television programs, and special educational programs in senior centers.

One innovative suggestion that deserves consideration is the mandatory labeling of all absorbent products, informing the public that persistent urinary incontinence should be evaluated and that effective treatments are available.

Strategies for Improving Professional Knowledge

There is an urgent need to educate professionals and paraprofessionals about urinary incontinence.

First and foremost, information on urinary incontinence should be included in the core curricula of undergraduate and graduate professional schools. Schools of nursing should consider the feasibility of educating specialists on incontinence care, who can serve as expert advisers to health care professionals.

To increase practitioners' knowledge of this important condition, continuing education courses focusing on the types of incontinence and appropriate diagnostic measures and treatment should be offered. Professionals most likely to provide care to people with incontinence should be encouraged to attend these courses.

Education on the topic of urinary incontinence should also be a part of the training programs for paraprofessional students such as licensed vocational nurses, nurse's aides, and auxiliary workers in the community. Because urinary incontinence is a problem of great magnitude in long-term-care settings, special emphasis should be placed on educating nurse's aides.

Last, coordinated care for people with incontinence will be facilitated by encouraging alliances among all professionals responsible for caring for people with incontinence.

What are the needs for Future Research Related to Urinary Incontinence?

The Consensus Development Conference on Urinary Incontinence in Adults has provided an overview of current knowledge on the etiology, pathophysiology, sequelae, and management of this prevalent clinical problem. Although information on incontinence is increasing, this field has long been neglected, and numerous gaps exist in our knowledge. While many controversies were addressed, numerous questions were identified that await answers and thus serve as the focus for future research directions. These issues will require the collaborative input of investigators from the spectrum of relevant disciplines and the rigorous application of appropriate research principles.

Directions for future research include the following:

Basic research on the mechanisms underlying the etiology, exacerbation, and response to treatment of specific forms of urinary incontinence and urgency. Epidemiologic studies with emphasis on elucidation of

risk factors for development of urinary incontinence, its occurrence in specific populations (particularly men and nonwhites), and the natural history of the various clinical and physiological subtypes.

Studies of strategies to prevent urinary incontinence. Randomized clinical trials, including longitudinal studies in well-specified populations, of algorithms for the systematic assessment of patients with incontinence and of specific behavioral, pharmacologic, and surgical treatment, either alone or in combination.

Development of new therapies, including pharmacologic agents with greater specificity for the urinary tract and new behavioral and surgical strategies and other innovative techniques, including electrical stimulation.

Conclusions

Urinary incontinence is very common among older Americans and is epidemic in nursing homes.

Urinary incontinence costs Americans more than \$10 billion each year.

Urinary incontinence is not part of normal aging, but age-related changes predispose to its occurrence.

Urinary incontinence leads to stigmatization and social isolation.

Of the 10 million Americans with urinary incontinence, more than half have had no evaluation or treatment.

Contrary to public opinion, most cases of urinary incontinence can be cured or improved.

Every person with urinary incontinence is entitled to evaluation and consideration for treatment.

Most health care professionals ignore urinary incontinence and do not provide adequate diagnosis and treatment.

Inadequate nursing home staffing prohibits proper treatment and contributes to the neglect of nursing home residents.

Medical and nursing education neglects urinary incontinence. Curriculum development is urgent.

A major research initiative is required to improve assessment and treatment for Americans with urinary incontinence.

Review of Current Literature

Behavioral Training for Urinary Incontinence in Elderly, Ambulatory Patients

Burton JR, Pearce KL, Burgio KL, et al.

Johns Hopkins University School of Medicine, the Francis Scott Key Medical Center, and The Gerontology Research Center, National Institute on Aging, Baltimore, Maryland, USA

J Am Geriatr Soc 1988; 36:693-698

Twenty-seven mentally competent elderly ambulatory patients with a history of long-standing stress or urge incontinence had office assessment to rule out urinary tract infection, functional and overflow incontinence, and major psychiatric or physical disability. After keeping daily bladder records for 2 weeks, they were assigned to six treatment sessions with either behavioral therapy alone or in association with bladder-sphincter biofeedback. A 1-month follow-up the reduction in wetting episodes was 82% for the behavioral therapy group and 79% for the group that included biofeedback. Eight patients (30%) were cured, and results persisted at the 6-month follow-up. Behavioral modification is very successful in controlling incontinence in this patient population.

Comment

Although extensive evaluation and urodynamic techniques were purposely omitted for both diagnosis and follow-up, this compact study analyzed the symptomatic response to therapy in incontinent ambulatory elderly patients. The behavioral intervention for stress incontinence consisted of pertinent information on simple measures to control the problem, as well as a program 17 pelvic floor contractions performed three times daily. Urge incontinence was treated by teaching the patient how to handle the urge sensation to prevent urinary leakage. The modifications almost seem too simple to have provided such a marked improvement. Physicians may be reluctant to devote full confidence in the techniques until objective measures are applied for diagnosis and assessment of results.

However, no one can deny clinical improvement, and the patient's wellbeing is obviously foremost in management protocols. There appears to be merit in applying these methods for the chosen patient group and reserving more complete evaluation for those patients not controlled by the intervention.

Dipstick Urinalysis Screening of Asymptomatic Adults for Urinary Tract Disorders

Pels RJ, Bor DH, Woolhandler S, et al.

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JAMA 1989; 262:1221-1224

Urinalysis screening with nitrite and leukocyte esterase dipstick tests in asymptomatic adults showed greater than a 12% positive predicted value for detecting bacteria in those with a 5% or greater prevalence of bacteriuria. Those groups include pregnant patients, diabetics, those over the age of 60 years, and the institutionalized elderly. The long-term effect of asymptomatic bacteriuria or its treatment in diabetics or community-dwelling elderly is unknown. Treatment of institutionalized elderly patients with bacteriuria consistently fails due to rapid recurrence. Only in pregnancy has treatment of bacteriuria been shown to prevent serious sequelae. It is recommended that only pregnant patients should be screened, but by the more sensitive urine culture.

Comment

In clinical practise, pregnant patients should be screened for bacteriuria in the first trimester, preferably by using urine cultures, since the sensitivity of dipstick screening is not acceptable. Treatment of bacteriuria in these patients prevents pyelonephritis in most. Nonpregnant symptomatic patients should probably have nitrite testing and/or microscopic analysis of an unspun urine specimen prior to initiating therapy of uncomplicated urinary tract infection, and urine culture should be sent at the initial visit if the former tests are negative.