Urinary Incontinence in Alzheimer's Disease

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INTRODUCTION

Urine control may be defined as the ability to inhibit the passage of urine until an appropriate time. This requires several factors: integrity of the genitourinary system, the cognitive ability to adequately interpret and know how to respond to the sensation of a full bladder, a degree of mobility that allows the individual to react to the sensation of a full bladder, and the motivational basis to want to inhibit the passage of urine.

Few studies have specifically explored factors associated with urine control in Alzheimer's disease. However, urinary incontinence in old people, especially the institutionalized, is associated with impaired cognition.8,15,36,39,40-41,57,61,73,75 Most studies did not distinguish between impaired cognition associated with chronic dementia, and irreversible deterioration in mental status, and acute delirium, a more sudden reversible confusional state.39-41 Similarly studies that attempted to reverse incontinence did not distinguish between dementia and delirium. Rather their samples were specified as containing patients with chronic cognitive18,41-43,64 or chronic mental patients.16,30,31,45,46,57,68,78

Some researchers did specify their samples more clearly. Sogbein and Awad did not find acute delirium in any of their incontinent subjects.73 Hodkinson divided subjects into a mentally normal group, a group with a history of intellectual deterioration of at least three months, and a third group with a
history of recent confusion. He found incontinence to be related to mental impairment irrespective of the etiology of the mental impairment. One group of researchers stated 95% of their subjects evidence "age related" organic brain syndrome. Another study found that in people 80 years or older who had dementia urinary incontinence was three and one half times more common than in those without dementia. However, the cause of this cognitive dysfunction has not been reported and only rarely has the urinary incontinence been evaluated. While there has been no specific study of urinary incontinence in Alzheimer's disease, its common association is accepted.

Prevalence and incidence of incontinence in Alzheimer's disease is not known. Reisberg and others developed the Global Deterioration Scale (GDS) for age-associated cognitive and Alzheimer's Disease and noted that incontinence might occur at stage 6, severe cognitive decline, and should be expected at final stage 7, very severe cognitive decline. The 1977 National Nursing Home Survey described 7% of patients as having chronic brain syndrome with 58% of these noted to have incontinence. This group may represent the institutionalized portion of these with final stage cognitive decline. Yet, clinical impression suggests that loss of urine control with cognitive impairment is not limited to late stages. National estimates derived from a large long-term care study reported 55% of patients incontinent, 54% disoriented, and 41% having inappropriate behavior. The extent of these findings implies
difficulties with urine control at earlier stages of cognitive dysfunction.

The lack of literature on urinary incontinence and Alzheimer's disease is thought provoking. One wonders if a pervasive hopelessness arises from these complex clinical entities to overwhelm researchers. In practice there is a tendency to dismiss incontinence associated with cognitive impairment, a coping attitude pervades with attention to urine containment at best. Yet basic clinical evaluation and attention to the environment might prevent or delay incontinence in almost all cognitively impaired elderly. These strategies in combination with treatment as medication and/or behavioral therapies should resolve or reduce wetting episodes. A best guess clinical estimate is that at least 50% of cognitively impaired elderly with loss of urine control could regain control with such evaluation and treatment. In reality, this figure is apt to be much higher. This paper will examine the etiology, evaluation, and treatment of urinary incontinence in institutionalized patients with cognitive impairment. Except for specific environmental features, this information is applicable to the non-institutionalized as well.

ETIOLOGY

RELEVANT FACTORS

A number of factors impinge on urine control, that is, they increase the difficulty of getting to the toilet to void without wetting on the way. Cognitively impaired elderly may be less able to cope with these bladder stressors.
Medications either prescribed or over-the-counter can alter urine control, causing frequency, large bladder capacity, or urinary retention with overflow. Caffeine has a natural diuretic effect and is found in coffee, tea, cocoa, and some soft drinks. Intake prominent in these liquids will increase urinary frequency. Fluid intake volume should average 14 to 20 milliliters per pound of adult body weight, e.g. 1890-2700 milliliters of fluid per day for a 135 pound adult. Too little fluid will contribute to urinary tract infection and constipation/impaction, both associated with incontinence. Too much fluid will cause frequency and in some situations electrolyte imbalance and neurological disturbance.

Accessing a toilet is a function of toilet location, patient mobility, and bladder voiding signals. A Scottish study recommended that toilets be within 30 to 40 feet of continent, mobile, mentally competent patients. Hence, they should be very close to the impaired. The ability to rise from a chair unaided is facilitated by appropriate chair design. Usual recommended ranges for chair features include seat height 15-20 inches and arm height from seat 7-10 inches. One study found that 77% of patients initially classified as chairfast were able to rise unassisted from a chair 17 inches high with chair arms 10 inches above the seat. Although half the sample had some degree of organic brain failure, the chair design was least likely to effect mobility in those with the greatest cognitive and behavioral disability.
Toilet access is also facilitated if the path to the toilet is well lighted, distinguished by color contrast, and free of obstacles. Toilets must be clearly labeled; consideration should be given to painting toilet doors a special, noticeable color, e.g., all toilet doors are red. Cognitively impaired patients need all appropriate aids for independence in toileting. Hence, they should wear their prescribed eye glasses, derived from an adequate eye examination within a reasonable past time frame. Such glasses should be clean, and, for the institutionalized, labeled to avoid loss. Most often it is the cognitively impaired who are not wearing their glasses; yet, these are the individuals who most need all the aid possible. Attention would also be paid to cane and walkerettes, that they be appropriately matched to ambulation needs and individually height adjusted. A working call system, e.g., light or bell signal, should be accessible so that those patients able to understand can seek assistance as needed for toileting desires.

The toilet itself should be a pleasant and comfortable room with attention to color contrast, lighting, and cleanliness. Toilet seat inserts for those patients with arthritic hips will elevate seats for ease in sitting and rising. Grab bars or frames will aid such activity and promote safety.

Fecal impaction has been described as a common cause of urinary incontinence. A stool mass in the rectum exerts pressure across soft tissue to obstruct the bladder outlet causing the bladder to distend with subsequent overflow incontinence. A study of incontinence amongst women in a
psychiatric hospital with average age 77 years found that 26% had fecal impaction and 19% chronic constipation prone to cause impaction. The author recommended a daily record of patients' bowel action, a high residue diet, and a daily fluid intake of 2,500 milliliters.

In older people bacteriuria is common with institutionalized men and women having similar prevalence rates (14-59%, 19-56%). A study of institutionalized men with bacteriuria found incontinence in 81% and impaired mental capacity/dementia in 77%. Amongst older women bacteriuria has been shown to be associated with precipitancy, i.e., the need to pass urine in a hurry. Treatment of urinary tract infections in the elderly may not effect urine control but should be pursued for those with an initial bladder infection, advanced renal involvement, or febrile patients with upper urinary tract infection.

UROLOGICAL DISORDER

Patients with cognitive impairment can be expected to experience incontinence related to known urological etiologies in the same proportion as other elderly. One study found that in a sample of 48 incontinent, institutionalized elderly, urological diagnoses did not differ according to cognitive impairment. There is no evidence that Alzheimer patients are less likely to have difficulties with sphincter weakness, detrusor instability, prostatic hypertrophy, etc. Alzheimer patients, however, will be less likely to be able to compensate for the various types of incontinence. For instance, an Alzheimer patient is not likely to remember to keep her/his bladder empty. Rather, they must
respond quickly as they sense that urine is leaking or that they feel an urgency to urinate.

Surveys of community living older women reveal that urine loss classified by symptomatology is most often stress urinary incontinence.15,38,88 This condition, characterized by loss of urine on physical activity, is caused by urethral sphincter incompetence.76 Two clinical studies of incontinent older women support the symptomatology surveys, finding stress incontinence the primary etiology.21,34 However, in general clinical studies of incontinent elderly people have most often found urge incontinence (detrusor instability) the predominant cause of wetting.17,23,26,62 This condition, characterized by loss of urine with prior intensive urgency, is caused by uninhibited bladder contractions.83 These two common urological conditions, stress and urge incontinence, may occur in combination usually called mixed incontinence.56 While sample size, selection, and measurement criteria vary across clinical studies, mixed incontinence, i.e., stress and urge, have been found in 1%,23 10%,34 17%,21 and 32%,26 of older people.

Two other types of urinary incontinence are commonly noted: overflow and functional.32 Overflow incontinence is characterized by continuous small volume urine leakage and is symptomatic of an overdistended bladder.20 While there are a variety of causes for this condition, in the elderly male, enlargement of the prostatic gland is the most common.79 Functional incontinence refers to involuntary urine loss in individuals who apparently have normal urological function but
who are unable to reach the toilet in time due to mobility, cognitive, psychological or other problems in combination or as singular entities. Notice that both these last two "types" of incontinence are really symptomatic rather than diagnostic labels. Overflow incontinence is a non-specific term and requires evaluation for the underlying cause. Functional incontinence is even more non-specific and should not be used as a diagnosis unless an appropriate evaluation has been done and pathological processes ruled out.\textsuperscript{20}

In summary, older patients with cognitive impairment may have the common urological disorders for their age group, i.e., stress incontinence in females and overflow incontinence due to benign prostatic enlargement in males. In addition, cognitive impairment arising from neurological damage is likely to affect central nervous system bladder control and result in urge incontinence, (detrusor instability).\textsuperscript{12} Therefore, the cognitively impaired older person may have several urological causes for urinary incontinence.

**COGNITIVE DISORDER**

Jirovec and Wells found of 61 nursing home residents with chronic memory difficulties, incontinent patients scored significantly lower on three measures of cognitive ability.\textsuperscript{42, 43} When the incontinent patients were divided into those who were sometimes continent and never continent, cognitive ability decreased significantly as urine control decreased. Low cognitive ability scores are associated with urinary incontinence. Cognitive impairment does not in itself cause
incontinence until the late stages of Alzheimer's disease. Several researchers, however, have demonstrated the association between cognitive impairment and incontinence.\textsuperscript{8,15,36,40-43,57,61,73,75} In Alzheimer's disease, the cognitive deficient can contribute to urinary incontinence.

As impulses reach the cerebral cortex from the bladder, the person becomes aware of the need to urinate. At that moment the individual must be able to adequately interpret the meaning of the impulse from the bladder in order to consciously inhibit urination. Problems can arise if the patient does not understand the meaning of the sensations he or she is experiencing, what the proper response to the sensations should be, where to go in response to a full bladder, or how to remove clothing and assume the position needed to maintain urine control. These are learned behaviors which are subject to memory loss.

Many of the changes in Alzheimer's disease are related to memory losses.\textsuperscript{14,82} Pearce and Miller found that 100% of patients with senile dementia experienced memory problems early in the disease.\textsuperscript{63} The hallmark of Alzheimer's disease is impairment of recent memory. In the early phase, the patient also evidences decreases in social graces. This in part may be the result of the patient forgetting how to act with other people. Social norms are taught by society. It is not unlikely that they would be forgotten. The patient's inability to focus on important events may be related to the patient's difficulty in remembering what is or is not important. Evaluation occurs by comparing to past experience. In that way people categorize and
place events into perspective. In Alzheimer’s disease, the richness of the data available to the individual for comparison purposes decreases. The Alzheimer patient is less able to identify events that warrant attention.

Urinary incontinence in Alzheimer’s disease is likely to be at least partly a cognitive disorder. As the memory impairment increases the patient may forget where the bathroom is located, how to remove clothing in order to toilet, or how to respond to the sensation of a full bladder. The result may be loss of urine control as the bladder empties before a toilet is reached.

BEHAVIOR DISORDER

Urine control may also be viewed as learned behavior. Established behavior patterns can be influenced throughout life. Learning, in fact, occurs in complex situations where an individual and the environment influence each other in a reciprocal, continuous interactive process. As a person encounters different environmental stimuli, cognitive processes estimate the probable consequences of various responses. Responses are selected based on expectations derived from previous experiences.

Much of the incontinence seen in the cognitively impaired occurs in nursing homes. This type of patient may learn through direct experiences and the experiences of others that they are expected to assume the role of "patient", and patients “wet.” The nursing home staff approach the problem of incontinence with resignation. They do not indicate to the cognitively impaired that urine control is an expected behavior. In fact, methods to
handle the incontinence problem are quickly instituted. Seldom does handling the problem include some mechanism to compensate for the cognitive deficit while still maintaining continence. Frequently, part of the problem solution, diapering the patient, makes it more difficult for the patient to use the toilet since removing the diaper is often troublesome. After initial episodes of incontinence that result from the patient's inability to remember things that are necessary to responding appropriately to a full bladder, the cognitively impaired may learn that further attempts to control urine are futile. The environment is structured to manage the incontinence rather than maximize continence.

Residents within nursing homes are often expected to assume the role of a patient. The environment generally facilitates the "sick role." The behavioral deficits often seen in nursing home residents are partly a function of the nursing home environment and its concomitant experiences. McClannahan identified a number of environmental characteristics within nursing home settings that influence motor activity, verbal behavior, and self-care ability. A review of several studies demonstrated the importance of environmental factors in influencing resident's behavior.

Lester and Baltes studied nurse's verbal responses to various patient behaviors in a nursing home. Dependent behaviors were most often reinforced with a positive verbal response by the nurse. In contrast, independent behaviors by patients were usually followed by no verbal response. In a second study
patient behaviors were categorized as either dependent or independent. Staff behaviors were categorized as responses that encouraged dependency (dependence supportive) and responses that encouraged independence (independence supportive). They found that dependent behavior by elderly residents was most frequently followed by dependence supportive behaviors by the staff. Independent resident behavior was not followed by independence supportive staff behaviors.\(^9\)

Sperback and Whitbourne addressed the issue of nursing home environments directly by training nursing home staff to be aware of patient dependency.\(^7\) Three experimental groups were utilized. Staff caring for the four subjects in the first group were given dependency awareness training, were taught behavioral techniques, and were impressed with the importance of response contingencies in changing behavior. For the two subjects in the second group the staff caring for them were given only the awareness training. No training was given to staff caring for the two patients in the third group. Three of the four patients in the first group increased their independence while the other groups remained unchanged. Self-reports by staff showed that staff in the first group greatly decreased the time they spent reinforcing dependency. Other studies have shown that changing environmental contingencies can alter behavior of elderly nursing home residents in areas related to self-care,\(^2\) eating behavior,\(^4,5,6,27\) activity level,\(^54,57\) socialization,\(^53\) and memory.\(^50\)
The experience of patients being cared for at home while less extreme is often similar. The home environment is not designed to manage a patient with urine control problems. Family members often attempt to contain the incontinence in order to protect home furnishings. Health professionals working with families offer little advice related to decreasing the incontinence. Almost no research has been done on decreasing incontinence in Alzheimer's disease. Most frequently the family becomes overwhelmed and reluctantly places the Alzheimer patient in a nursing home. Incontinence is a common cause of admission to a nursing home.

EVALUATION

Evaluation of urinary incontinence in the cognitively impaired institutionalized elderly includes determining the history of the problem, providing a physical examination, providing selected urological tests as appropriate, and analyzing the environmental situation.

HISTORY

History gathering is a basic part of clinical evaluation; it is a process of listening to a patient's complaints and asking relevant questions about past health, current health, and symptoms. Obviously this process can be very difficult in the cognitively impaired institutionalized elderly. Because of this, some clinicians might dismiss history gathering as non-productive and not essential to the immediate problem of incontinence. While this view can be appreciated, we believe that attention to all phases of history gathering is useful. The clinician can
gain a better insight into the patient's difficulty and also demonstrate to care providers the importance of a meaningful database. Insight may improve both diagnosis and treatment/management plans. Demonstrations of data needs may generate more, provide interest and participation.

Dependent on the degree of cognitive impairment, the elderly incontinent person may be able to understand and answer correctly, questions about both the past and present. This initial interview provides a picture of the patient's perspective, which, while it might fluctuate, gives guidance to other evaluation steps. Attention must be paid to the usual history/interview procedure with privacy provided and support of significant others as needed (e.g., a family member or trusted staff person). A warm, friendly, patient, listening approach is useful. The major goal of the patient interview may be more development of trust and understanding than clinical facts.

A meaningful point to start is awareness of voiding difficulty, e.g., Clinician: "I understand you have been having trouble controlling your urine and have been wetting your clothes. Is that true?" "Yes" responses should be followed with "tell me about it" or "What is the problem?" "No" responses should be followed with probes which also become subsequent questions for those who seem to have awareness: "Can you tell when you have to pass your urine?" "Can you get to the toilet in time?" "Does it burn or hurt when you pass your urine?" Of course many patients cannot answer these questions, and the point is not to frustrate or worry them but to establish a
relationship. It may be clear in a few minutes that at this time useful answers are not forthcoming. In that instance, clarification of the Clinician’s next evaluation step takes place, e.g., "Well, I am going to give you a check up" (proceeds to direct for urine sample or physical examination). Those who can answer questions in a sensible way may be asked to provide more symptoms or past history. Care should be taken not to fatigue or anger the patient.

Questions should be asked throughout the physical examination because this interaction helps to build a relationship and diverts the patient who may become restless or frightened. Also, patients may recall the past better when questions are focused on specific observations arising from the physical examinations, e.g., Clinician: "I notice you have had an operation. What was that?" Again, patients may or may not know, but the question is more meaningful at that point than asking abstractly during the interview: "Have you had any operations?".

Apart from the patient history, data are available in the institutional record for the patient. Important information may include current medications, drug sensitivities, physical examinations and laboratory findings, and nursing staff observations. However, on the whole, patient records in long term care may be a poor data source, but reference may be made to acute care institutions or private physicians. With patient, guardian, or other permission as appropriate, these other health care sources should be contacted for urological, neurological, and gynecology data as necessary. Useful information to
ascertain includes details of prior: urological/gynecological surgeries, urological/neurological evaluation, urological treatment, and drug sensitivities.

The patient's family and/or significant other may be able to supply details or source referral for relevant past history. Those who have lived with or had close contact in the recent past might be aware of the patient's voiding pattern history or at minimum, past social response to toilet needs. Useful questions include details about any day or night incontinence episodes, nocturia frequency, (bladder needs awaken the person at night), day toileting urgency/frequency, and the person's typical attitude to urine control, e.g., shameful, embarrassing, or forthright.

A critically important data base is the nursing staff providing the patient's care. Interviewing such staff is superior to reading record notes which usually are too summarized to be helpful. Ideally, talking with staff from all time periods provides the best picture. At minimum, discussion with the primary day staff is essential. Important questions include: Do you think she/he can tell when they have to pass urine?, How often do you find she/he wet-day/night?, How wet?, Do you take she/he to the toilet-how often?, Does she/he use the toilet?, Why do you think she/he wets?.

Most long term care institutions do not provide fluid intake-urine output records on patients. However, most staff can be persuaded to gather such data for a short period of time, i.e., 3-4 days. This short period, if planned and praised, provides a
good picture of the problem and is probably quite reliable. Such a recording can be a very simple time-volume notation, but increases usefulness if combined with two-hourly routine checks, fluid descriptions, voiding action (toilet, commode, incontinent), and prior toileting behavior (e.g., asked to go to toilet, restless, etc.).

**PHYSICAL EXAMINATION**

Physical examination starts with obtaining a clean voided urine specimen which can be spun down in a centrifuge and examined with a light microscope. Our Continence Clinic protocol has set white blood cell counts of 10 or greater per high power field (hpf), the presence of red blood cells per hpf, and/or significant bacteria as positive findings which require a catheterized urine sample for validation. Confirmation of any of these findings in a catheterized specimen requires it to be sent to a laboratory for culture of the organisms and testing of sensitivity to drug treatment.

Obtaining a urine sample in a cognitively impaired individual requires careful consideration of the patient's mood as well as usual degree of cooperation. The instruction necessary for obtaining a satisfactory sample is usually too frustrating to the patient or is such that she/he simply cannot follow the steps required. It is far more efficient and helpful to the patient to either provide close supervision and assistance as needed or do the steps for the patient directing her/him in the sequence. For patients in whom this is not possible catheterization for a specimen is the best approach. It is a waste of time and a
source of considerable patient irritation/discomfort to try to
go to clean voided specimens in those who cannot cooperate.
Yet, these individuals may be most in need of urinalysis because
an underlying urinary tract infection may be causing or making
worse their uncooperative behavior.

Catheterization of mentally impaired patients should be done
with consideration of standard procedure, e.g., privacy, comfort.
In many cases a single examiner with a trusting, cooperative
patient can manage the technique alone. However, it is best if
two clinicians complete the task, one to obtain the specimen and
one to be at the patient's side to divert, comfort, or prevent
disruption. If more than two clinicians are thought necessary
for the task, consideration of selecting another time when the
patient is apt to be more cooperative or giving a medication
which will elicit more compliance or less resistance is best. In
our experience providing time for a relationship between the
clinician and the patient and attention to warm and caring
behaviors on the part of the clinician to the patient minimizes
catheterization problems.

This same caring and attentive manner carries over into the
remaining parts of the examination. The patient can be examined
at the bedside, but this is not always best because of threats to
privacy, noise distractions, poor lighting, and poor positioning
for both the patient and examiner. A properly equipped
examination room is the best place to conduct the initial
physical evaluation.
Examination may focus on only the essential parts of a urological evaluation, i.e., abdomen and genitalia, but is best if it includes a more comprehensive evaluation to check for underlying chronic or acute illness as well as related functional disorders. Knowledge of current health status is a fundamental basis to determining the cause of urological difficulties. Further, exclusive and immediate focus on the patient's most private body parts may be perceived as frightening or anxiety provoking, fostering uncooperative behavior.

Careful explanation and direction to the patient is essential. The patient should toilet before the examination. She/he needs to remove regular clothing and wear an examination gown which provides cover while allowing easy access to parts of the body. Depending on cognitive ability, patients can usually independently undress or participate in this activity. Undressing time provides a further opportunity to continue building a trusting relationship. Assistance may be needed to get onto the table. Approximately half the examination occurs while the patient is sitting at the end of the table and half while lying on the table. Initially the position is sitting and the examiner evaluates blood pressure, pulse, vision, hearing, heart, lungs, musculoskeletal and neurological aspects. This patient position and examiner focus provides time to further evaluate patient response to touch, instruments and direction. The examiner needs to explain while evaluating and to praise cooperative behavior and/or signs of good health.
The patient is then asked to lie back on the table with attention paid to comfort, e.g., pillow and back adjustment, a blanket/sheet cover. The abdomen is checked for scars which may relate to previous urological surgery and bladder distention which pertains to retention of urine. The examination then varies; the female will need a pelvic examination, the male a prostate examination. Be sure of good lighting and readily available equipment before positioning the patient. Often a single examiner who has established patient trust can continue the evaluation alone. If in doubt of patient compliance or particular anxiety another clinician should be at the patient's side for the remaining examination.

Females who do not mind table stirrups will be most comfortable with shoes and stockings on and good leg coverage provided. Those with arthritic hips may prefer not to use the table stirrups. Patience in determining the best position for the female will be rewarded by a more efficient examination. Again, explain everything to the patient and continue to interact, asking about comfort or symptoms. Visually evaluate the perineal skin, noting color changes, growths, or other abnormalities. Examine the urethra for urethrocele and/or caruncle. Ask the patient to bear down or cough to determine if there is stress urine leakage. Catheterize the patient for residual urine at this time. Although such catheterization is best immediately after toileting and may in this process be 15-30 minutes later, a better examination sequence and relationship occurs for the patient. Normal urine residual should be less
than 100 milliliters but diuretic and other medication effect
need to be considered. The residual urine obtained is a useful
specimen for analysis and/or culture and sensitivity for those in
whom a prior specimen has been difficult to acquire.

After the catheterization, visually inspect the introitus for
stenosis, discharge, or evidence of prolapse, (cystocele,
rectocele, uterine). Proceed with a manual examination, having
lubricated well the gloved finger(s). Explain and be gentle so
as not to elicit pain. Those women with severe vaginal stenosis
may not be able to emit or tolerate a single finger manual
examination. No further pelvic evaluation is possible for them.
Women with moderate stenosis which permits a single finger
examination may be able to have the evaluation continued by use
of one half a small disposable clear plastic speculum. The
remaining women can be examined with the full speculum but,
again, this is usually a small size, well lubricated.

This manual and/or visual examination of the vagina and
cervix permits a better assessment of tissue health. Senile
vaginitis is common in older women. Our clinical experience with
cognitively impaired women suggests that the prevalence of severe
vaginitis in this group may be greater. Such women seldom
complain of discomfort even during a pelvic examination.
However, atrophic vaginitis and urine control are associated with
improvement in both related to estrogen treatment.67,80

The pelvic examination also provides detail of structural
alteration, i.e., prolapse which may relate to loss of urine
control or discomfort in general. While the discovery of a
possible need for surgery might not always result in a viable option for such, it provides a more meaningful data base for alternative therapies. In the cognitively impaired female it is especially important to provide a vaginal evaluation to rule out the presence of a pessary. Pessaries are soft rubber devices of various shapes which are inserted into the vagina to provide support and reduce structural prolapse. They are usually removed nightly for cleansing and tissue rest. Correctly inserted they can improve types of stress urinary incontinence. Incorrectly inserted they can obstruct urine outflow with such women commonly presenting with a urinary tract infection, painful urination, and discomfort. In some women long-forgotten and unattended to pessaries become incarcerated and may cause infection or fistulas. The institutionalized mentally impaired may not remember use of a pessary in the past and institutional records with a tendency to omit pelvic examination in older women in general and the cognitively impaired in particular may be incomplete.

The evaluation of the female is completed with a rectal examination to determine impaction or constipation as possible urine control factors.

Male genitalia are initially examined while the patient is lying on his back on the table. Visual evaluation of the perineal skin is made with attention to skin color, rash, growths, or discharge. Note is made if the penis is retracted (sunk into the surrounding tissue) and if the patient is circumcised. For males with penile foreskin, the foreskin should
be retracted and checked for ease of movement and cleanliness. The scrotum is examined for size, symmetry, and tenderness. Catheterize the male patient at this point to determine the volume of residual urine.

The patient is then turned onto his left side and with his right leg drawn up to his abdomen, has a rectal examination. This provides evaluation for impaction and constipation but also it permits assessment of the lower one third of the prostate gland for size, consistency, and tenderness. This prostate check is both a screening for carcinoma as well as acute inflammatory conditions. A normal prostate on rectal examination does not rule out prostatic hypertrophy of the gland lobes unable to be assessed in this manner.

At the end of the physical examination both general health and urological structural status are known within the limits of clinical evaluation. In combination with history, a clinical diagnosis can be made. Such a diagnosis is impressionistic and for treatment which carries considerable risk, e.g., surgery, further urological testing should be done. But for many patients and for most of the cognitively impaired the clinical diagnosis is often sufficient to institute immediate treatment. Therapies may carry little or no risk and be very successful. In those for whom therapies fail, further testing might be beneficial but only in balance with realistic treatment options.

UROLOGICAL TESTS

There are a large number of urological tests available. These should be carefully selected by a qualified urologist with
consideration of the clinical diagnosis and realistic treatment options. A simple, non-invasive test is uroflowmetry in which the patient sits (female) or stands (male) to void into a device which profiles the characteristics of urine flow. Abnormal urine flow patterns can help detect bladder dysfunction, outflow obstruction and bladder-sphincter dysfunction. However, most tests involve instruments passing along the urethra and into the bladder. Patient cooperation is essential not only to avoid tissue damage but to follow directions as part of the tests. For these reasons and because treatment options are not thought to change, invasive urological tests are not common for the cognitively impaired. However, if patient cooperation is possible, modest testing should be done because treatment options indeed may change.

Totterman tested twenty-four institutionalized incontinent patients, most of whom had moderate to severe mental impairment, with cystometrics. This test involves catheterization and bladder filling with fluid or gas to determine capacity and filling dynamics. Fifty-four percent of his sample had uninhibited contractions (urge incontinence) suitable for medication treatment; the remainder had normal studies, suggesting a functional type of incontinence appropriate for behavioral therapies. Soybein and Awad did cystometric studies on thirty institutionalized memory impaired males. They found that twenty-four had detrusor hyperreflexic (urge incontinence) and four had normal bladders; all these were treated with behavioral therapies and a few with medication added. Two
patients had hypotonic bladders which required individual treatment. Thus, cystometric evaluation is a very useful urological test. The reported studies reveal a patient compliance range of 48-89% for the cystometric test. The lower percentage is a mix of both non-consent from the patient and his family. While the higher percentage is noted in a study which does not report consent per se. The possibility exists that some cognitively impaired patients might tolerate the procedure well but are restricted from such testing by family concerns.

THE ENVIRONMENTAL SITUATION

The environmental situation includes consideration of people, space, and equipment within the sphere of the cognitively impaired individual. Among the institutionalized these factors may be limited: shortage of staff, crowded space, inadequate or insufficient equipment. Even with a reasonable amount of all these factors a pervasive negative atmosphere may be predominant because of the incompetency associated with the mentally impaired.

If such patients try to walk around alone, even to go to the bathroom, they are often restrained. Rather than being allowed to dress themselves, they are often dressed. Research has shown that individuals can erroneously infer their own incompetence from situational factors. One experiment involved three phases. Initially, college students successfully performed a two-part task. Subjects were then paired and randomly assigned the label of assistant or boss. The pairs were asked to work together to complete a task similar to part two of the first
task. In the final phase, subjects again were asked to complete a task similar to part one of the first task working alone. Subjects who were labeled as the assistant in the second part did only half as well on the third task when compared to the corresponding part they completed on the first task. It was thought that these subjects inferred thier own incompetence from interpersonal situational factors. When labeled as less competent, they came to believe in their own incompetence. Subsequent behavior reflected those beliefs.

Social breakdown theory supports the effects of the nursing home environment on residents. The theory suggests that an individual's sense of self, ability to interact with the social environment, and feelings of self-efficacy are related to the social labeling processes experienced. When people are deprived of important roles, normative information, and reference groups, they are especially vulnerable to labeling processes. Entering a nursing home is atypical. The new resident is expected to give up most previous roles and assume the role of patient. Usual norms regarding her/his behavior are no longer applicable and usual reference groups are gone. A new resident sees others spending the day doing little, often still in pajamas and a robe. Some residents are restrained and incontinent. According to social breakdown theory, a syndrome ensues whereby the elderly person begins to believe he or she is like the other residents. As a result, many behaviors are not attempted and skills atrophy. This results in the resident demonstrating the incompetence he or she has come to believe of themselves.
It is important then to evaluate the environment for passive, negative messages. Useful questions to pursue include: Is there a dominant urine smell? Are patients dressed appropriately in day clothing during day hours? Are incontinence pads (blue pads) and/or diapers easily visible? Are meaningful activities evident? Are there homely and attractive furnishings?

Use of clothing or chair restraints should be explored. Sometimes their use reflects a safety need arising out of poorly designed equipment, e.g., too high and too deep a chair, which can be corrected. At other times their use reflects a realistic desire to limit wandering behavior but with little consideration of possible alternative strategies and/or the need to regularly provide exercise and toilet access. Jirovec and Wells found that urine control differed significantly according to whether the memory impaired patient was more or less mobile. Continental patients with some type of chronic degenerative brain disease could walk faster, walk farther, and balance longer than incontinent patients. Continental patients needed less help in walking and were better able to get out of a chair alone when compared to incontinent patients. When patient variables were used to predict if the patient would be continent or incontinent, mobility emerged as the first predictor for the urine control group. If the patient could get to the bathroom alone, the patient was likely to be continent. If the patient needed help getting to the bathroom, the patient was most likely to be incontinent. A patient who is diapered, restrained in a chair, and not released and helped to the bathroom is likely to conclude
he/she is not expected to use the bathroom. When repeated
attempts to rise from the chair are unsuccessful the patient is
likely to give up all attempts to toilet. An environment that
limits patient mobility can be especially detrimental to
maintaining urine control.

TREATMENT

Treatment of urinary incontinence in the cognitively impaired
elderly relates to understanding the cause of the incontinence.
Active treatment follows active evaluation and may include
pharmacological, behavioral, or surgical approaches in a singular
or combined manner.\textsuperscript{32} Attention to enhancing mobility may be a
significant treatment to effect urine control. In addition
external equipment is available to help manage wetting episodes,
e.g., protective pants.\textsuperscript{32} Unfortunately, care of the cognitively
impaired incontinent elderly is commonly directed solely to
passive management of wetting episodes.

Pharmacological treatment for urge incontinence (detrusor
instability) is most often anticholinergic medication, e.g.,
propantheline (Pro-Banthine). Such medication works by either
competing with Acetylcholine at the post ganglionic receptors or
by interrupting transmission at the ganglion level.\textsuperscript{10} Yet,
reduction in Acetylcholine-medicated transmission of impulses has
been posed as a hypothesis to explain Alzheimer's disease.\textsuperscript{86} No
study has been done to evaluate the effect of anticholinergic
medication on cognitive impairment. However, many drugs other
than those prescribed for urge incontinence have anticholinergic
effects and the risk of anticholinergic toxicity in the elderly
is of concern in general. In practice, low dosage monitored treatment with anticholinergic medication for urge incontinence in cognitively impaired elderly persons tends to improve urine control and has not appeared to increase cognitive difficulty.

Pharmacological treatment for stress incontinence is most often with alpha-adrenergic agonists, e.g., Phenylpropanolamine hydrochloride (Rhindecon) but these medications can increase blood pressure and have other side effects including nervousness and insomnia. There is no study of use of this medication in the cognitively impaired elderly. In the Continence Clinic we rarely prescribe this type of medication for such patients. A possible exception is Imipramine (Tofranil) which is primarily a central nervous system depressant used as an antidepressant but which includes both anticholinergic and alpha-adrenergic agonist properties. For selected cognitively impaired elderly the drug may improve urine control.

Behavioral manipulation effect on the toileting behavior of cognitively impaired elderly has been demonstrated by several researchers. Terminology is not standardized for these treatments. It may be helpful to understand behavioral treatments from the most simple to the complex. Scheduled toileting is a staff routine to take patients to the toilet at fixed intervals whether or not the patients desire to toilet. The schedule is usually set at two hour intervals throughout a twenty-four hour day with commodes used as toilet substitutes during the night. This is probably the most common behavioral program in institutional care. Toilet retraining is a slightly
more complex behavioral treatment in which observations are made of the individual's fluid intake and toileting desire/wetting episodes with an effort to match the toileting program to the individual's pattern. Behavioral modification is the most complex treatment with an individualized selection of rewards for appropriate toileting combined with the individualized fluid intake/toileting performance pattern. A system of specific reward for correct toileting and withholding of reward for wetting enhances and reinforces the desired behavior.

Sogbein and Awad used scheduled toileting, called "a timed-voiding routine," in a sample of cognitively impaired men. Attention was given to day toileting only at two hour intervals. Eighty-five percent of the twenty patients with hyperreflexia (urge incontinence) reduced their incontinence to less than 20% of the time.

King used psychogeriatric patients to study urine control. Fifteen patients selected from various wards were moved to a new trial ward where regular toileting was initiated with a variety of other interventions. Urinary incontinence was decreased for all but one of the subjects.

Toilet retraining has been used with an informal system of rewards. Clay attempted to reverse incontinence with four elderly with some type of dementia. Toilet retraining was used with social reinforcement and self-reinforcement. Two of the four patients improved; one was completely continent with reminders; and one did not improve.
Behavioral modification has been most studied. Sanavio used a repeated treatment design with two elderly with senile dementia in long-term care.\textsuperscript{68} Environmental contingencies were related to soiling versus toileting. These were alternated with consequences not contingent on toileting behavior. Both patients improved when the consequences were contingent on their behavior. Pollack and Liberman did a similar study with six geriatric patients with chronic brain failure.\textsuperscript{64} However, reinforcements and punishments were given irregularly. The result was no improvement in any of the patients. Two of the patients worsened.

Schnelle, Traughber, Morgan, Embry, Binion, and Coleman studied 21 incontinent geriatric nursing home residents with some type of physical limitation.\textsuperscript{69} Using randomly assigned experimental and control groups, all patients were checked for wetness on a regular basis. The experimental group was prompted to toilet at each check and was given social approval or disapproval at the check depending on if they were wet or dry. Patients were not toileted unless they requested help when prompted. This required the patient's involvement in the toileting procedure. At the end of the 21 days of treatment, the experimental group was significantly less incontinent and requested toileting more frequently than the control group. Clay also attempted to reverse incontinence with four elderly with some type of dementia. Habit training was used with social reinforcement and self-reinforcement.\textsuperscript{18} Two of the four patients
improved; one was completely continent with reminders; and one did not improve.

Other researchers have studied the effect of behavioral manipulation on urine control using psychogeriatric patients. Grosicki studied the effect of social and material rewards using a non-random control group and experimental group.\textsuperscript{30} There was no improvement for the experimental group, while the control group decreased incontinence. The appropriateness of the experimental manipulation could be questioned. Improvement in the control group would seem to demonstrate the impact of regular checks for wetness. Hartie and Black focused on nighttime toileting with social and material rewards if the bed was dry.\textsuperscript{31} Using five long-term psychogeriatric patients, bed wetting was decreased by almost fifty percent.

Two researchers used long-term psychiatric patients to study incontinence. It probably can be assumed that some of their samples were patients with Alzheimer's disease. Carpenter and Simon employed four groups.\textsuperscript{16} The three experimental groups were given habit training, habit training with social reinforcements, and habit training with material reinforcements respectively. The fourth group was used as the control group and given the usual care. The two habit training groups with reinforcements decreased in urinary incontinence. The control group's incontinence increased, demonstrating further the impact of environment on urine control. Wagner and Paul studied 35 chronic psychiatric patients.\textsuperscript{78} After baseline data were collected, material and social rewards and long-term incentives
to maintain continence were given. Thirteen of the patients became continent during the baseline period when they were being checked regularly for wetness. The other subjects demonstrated significantly less incontinence when compared to their baseline incontinence levels.

Thus, behavioral manipulation as simple scheduled toileting, combined with attention to the patient's voiding pattern (toilet retraining), and toileting with attention to contingencies (behavior modification) are useful therapies to improve urine control and/or reduce wetting in cognitively impaired institutionalized elderly. Behavioral therapies which focus on learning of exercise, e.g., bladder retraining and pelvic floor exercise are usually not successful in such patients because of difficulty concentrating and learning or remembering instructions.

Selected surgery may be helpful in some cognitively impaired elderly with consideration of overall health status and risk versus benefit ratios. Vaginal surgery as hysterectomy for severe uterine prolapse or cystocele/rectocele repair may be indicated and useful to some women. Prostate surgery as a urethral procedure (transurethral resection) may be helpful to some men.

Programs to increase mobility through exercise and improved environmental access may directly effect urine control in cognitively impaired institutionalized elderly. Patient should be exercised consistently and regularly. Restraints should be used sparingly and only in combination with an exercise program.
The exercise routine should effectively challenge the patient and should be implemented with an attitude toward maximizing patient capabilities. Mobility skills can quickly atrophy with this use. As getting the patient to the toilet becomes increasingly difficult for caretakers, toileting is less likely to be attempted. A better alternative is to work to prevent loss of mobility in the Alzheimer patient.

Management of wetting through use of external equipment is a helpful adjunct to more active treatment. Such equipment includes products for the individual to wear as well as those used to cover bed or chair. Obstructing devices such as the penile clamp are not appropriate for the cognitively impaired. Collecting devices are most often used for males in the form of condom drainage systems. This type of drainage has a variety of problems such as skin damage and is not always well tolerated. In addition urinary tract infection has been associated with patient lack of cooperation and condom drainage manipulation in short term use, extended use in general, and nosocomial infection.

Absorbent products which resemble and fit more like ordinary pants are usually better tolerated and facilitate toileting in the cognitively impaired. Thus, washable pants with disposable inserts may be more useful than fully disposable products even though laundering must be carefully considered. A range of such products are available, although none have had comparative trials with such patients in the United States.
Protective underpads for bed or chair are typically poor quality disposables. Consideration of available larger sized and improved quality disposables might yield greater patient comfort and greater efficiency. In addition washable underpads are available. One innovative design has had comparative studies which reported increased patient comfort, decreased skin redness, reduced bed linen changes, and reduced costs.\textsuperscript{70,84}

Effective treatment for urinary incontinence begins with a questioning systematic exploration as to the cause of the lack of urine control. Dismissing such exploration as unnecessary or unproductive in the cognitively impaired is improper. Attention to physical, environmental and behavioral factors will identify multiple possible etiologies which can be treated or resolved.

**SUMMARY**

Urinary incontinence in the cognitively impaired elderly has had little research in etiology, evaluation, or treatment. Amongst the institutionalized, translation of current and forthcoming knowledge into practice is dependent on adequate staff numbers to provide care, the knowledge level of such staff, and the professional leadership available.
REFERENCES


presented at the meeting of the Gerontological Society of America, New Orleans, La.


