

CONSENSUS DOCUMENT ON THE DETECTION, DIAGNOSIS AND MANAGEMENT OF URINARY INCONTINENCE IN OLDER PEOPLE

Task&Finish Working Group on Urinary Incontinence. European Union Geriatric Medicine Society.

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1) INTRODUCTION:

Urinary incontinence (UI) is one of the main Geriatric Giants, described initially by Sir Bernard Isaacs in 1992, and later included in the list of Geriatric Syndromes (1). However, UI is still largely undetected and undertreated, due to different, but incomprehensible reasons.

The prevalence of UI is high in the older person, affecting especially people with comorbidities, polypharmacy and functional impairment (physical as well cognitive) in whom the prevalence could be as high as 70-80% (2,3).

From our reviews of the main epidemiological studies, several potential risk factors for UI have been identified depending on the characteristics of the adult populations under study. These characteristics include social, cultural and geographical factors as well as the health systems of the particular countries/regions especially their focus and budget towards the management of incontinence

Aging tends to be associated with changing risk profiles for the different types of UI and the ways in which they present. Besides this, the risk factors for the various types of UI (urge, stress and mixed) also vary. Although there is limited evidence (level 2 from prospective cohort studies), it appears that increased body mass index, diabetes mellitus, cognitive decline, hormone therapy and vaginal trauma or prolapse are associated with developing UI in community dwelling females. In older men, consistent published evidence (level 2-3) suggests that poor general health, limitation in daily activities, stroke, diabetes mellitus, and treatment for prostate cancer (mainly surgery) were associated with higher risk of UI (4). In addition of the medical conditions per se, the effect of medication prescribed and the significant impact on continence must not be taken lightly.

In summary, a poor overall health status with medical comorbidities particularly neurological problems, polypharmacy which often includes diuretics and psychotropics, as well as a limited functional status are main risks factors for loss of continence in the frail elderly population (5).

Currently, we are well aware that UI produces numerous negative effects on quality of life (QOL) in older patients, ranging from medical problems (falls, urinary tract infections, pressure sores, skin complications, functional decline) to psychological symptoms (anxiety, depressive symptoms, insomnia, sadness, loneliness) or social limitations (social isolation and loneliness, impact on instrumental Activities of Daily Living (ADL), need for social resources, nursing home admission). Patients' perception of the impact of UI on their lifestyle is very important, and even mild UI could have a significant impact on a patient's QOL, including the frailest population (6,7).

Over the past 15 years, the International Continence Society and the World Health Organization have strongly recommended the assessment of the impact that urinary incontinence has on QOL by the use of validated questionnaires (8-10). One of the most practical questionnaires that measure the severity of symptoms of UI as well as its impact

on the QOL is the Short Form of the International Consultation Incontinence. This has been validated and translated into 30 languages and has a high level of recommendation (level 1) by the International Continence Society (11, 12). It is our role as geriatricians to raise awareness among clinicians of the adverse effects that even mild incontinence could have on patients' QOL and the documentation of the effects on QOL should be encouraged by using these validated questionnaires.

Unfortunately, both detection and index consultation for UI are low, as well as the number of older people that receive an effective treatment (about 30–50% of older patients), in spite of the valid management options that are available. Older people are less likely than younger age groups to discuss incontinence with their physician and only around half of older people with incontinence seek help for their symptoms. The most common reasons for not seeking help are the believe that incontinence is a normal part of ageing and because the older person considering the symptoms as mild or unimportant (3, 13, 14).

Geriatricians should be in the frontline of the detection of urinary incontinence. It often happens that although a change in an older person's continence status is detected under consultation, the response of professionals to this is low, or limited to passing a remark on the inevitability of this pathological condition and giving very conservative therapeutic recommendations such as only suggesting the use of incontinence pads.

In the light of the above, a multidisciplinary European group of professionals developed this scientific document in order to present the current “state of the art” management of Urinary Incontinence in the older population, as well as to propose a practical guideline for the management of this Geriatric Syndrome.

The scientific data has been analysed and presented using the Evidence Based Medicine levels (15).

The aim of this Consensus Document is to increase awareness, as well as knowledge of this under-recognized Geriatric Syndrome, in order to facilitate and improve the clinical management of older people with UI.

2) THE DETECTION OF UI AND A PROPOSAL OF WAYS TO IMPROVE DETECTION

There are wide variations in continence care service delivery across the world. Factors affecting the delivery of this service are population demographics and patient characteristics. These include: cultural differences in disease recognition and reasons to seek healthcare, variations in geographical healthcare access, financial healthcare access, maturity and development of existing continence care provision, the extent to which services are integrated, economic and regulatory levers available to influence healthcare provision, and the application of technology in the delivery of care (16).

Overall, current continence care service delivery does not adequately address this health and social care burden and in several European Union (EU) countries, the funding towards this area of health is far from adequate. This is particularly true for case-finding and provision of initial treatments which could perhaps be a result of the relative lack of continence-related content in higher education training across the major healthcare professional disciplines (16).

Up to half of older adults with UI fail to report this syndrome (17, 18). This may be due to embarrassment, lack of knowledge about treatment options, or a belief that urinary incontinence is an inevitable part of aging (18). Although age-related conditions and changes in bladder and pelvic floor function contribute to the loss of bladder control in older adults, incontinence should not be considered an inevitable outcome of the normal aging process (17). Studies suggest that men may be more likely to seek care for

UI whereas women are more likely to receive care when they inquire about their symptoms. Despite recommendations that vulnerable elders should be screened for the presence of UI, physicians are unlikely to inquire about this condition without prompting (17).

Because of a high incidence of UI, lack of self-reporting and because the consequences affect health as well as quality of life of the affected individual (19), all older adults presenting to their primary care physician should be screened for symptoms of UI (level of evidence 3) (19). Currently no specific screening recommendations are provided. However, one can presume that screening for UI is likely to be of maximum benefit to those older adults whose quality of life could possibly be affected (18).

In many countries, but particularly in low income ones, incontinence is usually not a priority with only basic levels of care performed by community care providers, if at all (16,20).

One of the main problems with the detection of incontinence in older persons could be the methods used to assess the continence status. For this reason, we would like to propose several ways for improving its detection, but obviously these are not exclusive and perhaps using them in combination would be ideal (2, 9, 21):

- The most holistic method is through the utilization of the Comprehensive Geriatric Assessment (CGA). This is the “gold standard” scientific method for assessing and establishing the global plan of management and treatment tailored to the needs of each individual older patient. Since UI does not come in isolation, so it should be assessed and managed using a multidimensional approach.

- There are other possibilities as well, such as the use of brief clinical questions or clinical questionnaires.

Asking about bladder health (or urinary problems) instead of mentioning incontinence, may engage more older persons to discuss their continence problems. Some of the most useful and practical questions include:

“Do you have any problem or trouble with your bladder?”

“Do you perceive any complaint from your bladder or urine?”

“Do you lose urine when you don’t want to?”

Using a specific validated clinical questionnaire is another possibility and could be used in combination with the CGA. Several guidelines have proposed the use of specific tools or questionnaires for screening UI. Current evidence favours the use of the International Consultation on Incontinence Questionnaire UI (ICIQ-UI – Short Form) which has the highest level of scientific recommendation (level of evidence 1, Figure 1).

ICIQ-SF											
Initial number						DAY MONTH YEAR					
Today's date											

Many people leak urine some of the time. We are trying to find out how many people leak urine, and how much this bothers them. We would be grateful if you could answer the following ques

**Figure nº 1: The International Consultation on Incontinence Questionnaire
UI (ICIQ-UI – Short Form. Modified from reference 9**

In summary the following are the recommendations for improving detection of UI (16, 20).

- Screen all frail older persons for UI (*level of evidence 1*).
- Develop/use a standard screening questionnaire to create uniformity.
- Ensure ease of access by the establishment of robust referral pathways from detection of incontinence through to appropriate assessment and treatment.
- Shift the responsibility of basic continence care away from primary care physicians to continence nurse specialists in primary care, where this service is available.
- Where continence nurse specialists are unavailable, train existing healthcare professionals such as primary care-based nurse practitioners, community nurses, physicians' assistants, or, in developing countries, local community healthcare workers, to provide evidence-based continence care.
- Specialists – geriatricians, gynaecologists and urologists should be integrated in this care pathway and not function in isolation.
- Establish accredited programmes of training for nurses wanting to become continence nurse specialists and other health or social care professionals such as social workers wishing to improve their competence in delivering continence care.

A shift away from physician-provided care towards a community-delivered, nurse-led model appears to be associated with efficient and cost-effective care for people with urinary incontinence. Where nurse specialists are not available, other healthcare workers can be trained to identify cases and provide initial assessment and management. In resource-poor areas, self-management and innovative uses of technology to support this may prove to reduce the burden of care (16).

3) ASSESSMENT OF URINARY INCONTINENCE (UI) IN THE FRAIL OLDER PATIENT AND AS PART OF COMPREHENSIVE GERIATRIC ASSESSMENT (CGA)

Comprehensive Geriatric Assessment (CGA) with a special focus on urinary incontinence:

Given the syndromic nature of UI in the older population and in spite of limited evidence on the treatment of UI in frail older patients, UI assessment should be included as a part of the CGA especially in the frail older individual. Given the risk of adverse events associated with UI treatments, the CGA should also be carried out when planning pharmacotherapy or invasive treatment options for UI in the frail older patient. One should always take the patients' and caregivers' needs and preferences into consideration at every stage.

UI can be broadly subdivided into transient and established UI. In most cases UI presents as transient UI which either resolves with management or progresses to established UI. Although in the frail elderly, causes and mechanisms of transient and established UI overlap, it might be useful to make a distinction between these presentations since the earlier the cause/s of transient UI are established, the higher is the likelihood of its reversibility with an early and focused intervention (22,23). Transient incontinence has been reported to occur in up to half of hospitalized older and in up to one third of elderly persons living in the community (22,24,25).

Basic evaluation of UI:

- The short form of the International Consultation on Incontinence questionnaire on urinary incontinence (ICIQ-UI-SF) can be used for initial assessment (26). This will help to distinguish between the different types of UI (urgency, stress and mixed). This should be included in the symptom assessment which should form part of the CGA as well as define the impact that UI is having on the older person's QOL.

- Other lower urinary tract symptoms (LUTS) may co-occur with UI in both older males and females. Nocturia may present as a part of the overactive bladder symptomatology or as a symptom complex of its own (27). Age-associated nocturnal polyuria or nocturnal polyuria associated with chronic heart failure or sleep apnea may underlie nocturia and UI (28). Voiding symptoms occur especially in older men and are typically associated with urinary bladder outlet obstruction (BOO) due to benign prostatic enlargement (BPE) caused by benign prostatic hyperplasia (BPH). Similar symptoms have been reported among men without BOO, as well as in older women (29).

A history of comorbid conditions should be elicited as a part of a urinary continence assessment in the frail older patient. Cardiovascular diseases (heart failure in particular), sleep apnea, type II diabetes, chronic obstructive pulmonary disease, musculoskeletal disorders and neurological pathologies such as cerebrovascular processes, memory problems and Parkinson's disease may contribute to UI (7). Urgency Urinary Incontinence (UUI) may occur in patients with subcortical cerebrovascular white matter lesions detected in brain imaging (30). A less common cause of UI is Normal Pressure Hydrocephalus (NPH), where the syndrome triad includes cognitive impairment and a typical gait disturbance besides UI (7).

Complementary to UI, a CGA should include assessment of activities of daily living (ADL), mobility and use of walking aids, history of falls, environmental circumstances, assessment of cognition and mood by standardized measures such as the Mini Mental State Examination (MMSE) and the Geriatric Depression Scale (GDS) and bowel symptoms (both fecal incontinence and constipation).

A detailed review of the patient's medications is highlighted with specific attention to medications which may affect the urinary bladder such as diuretics, opioids, psychotropic drugs, calcium channel antagonists and drugs with anticholinergic properties. It is worth noting, that acetylcholinesterase inhibitors used for Alzheimer's disease have a cholinergic effect and may thus induce detrusor contractility leading to UI (31).

Voiding diaries should be included for the initial assessment of incontinence as well as in the management of incontinence. They measure the frequency and severity of symptoms and can quantify frequency of incontinence episodes as well as volumes of urine passed, pads used, and fluid intake over a particular time interval. This information can help in arriving at a diagnosis such as polyuria or UUI secondary to an overactive bladder. Voiding diaries can also be used to monitor treatment response of UI. Not all patients will be able to complete a voiding diary, and its use will be limited in those with significant cognitive problems, in very frail patients, patients with restricted mobility and functional difficulties and inability to write. Current evidence shows a correlation between the data acquired from standard symptom evaluation and data obtained from a voiding diary (32,33) as well as their reproducibility in both sexes (34), (level of evidence 2) (12). A voiding diary duration of 3-7 days is recommended (level of evidence 2) (35).

Pad testing is another non-invasive diagnostic test that can be used to detect and quantify the severity of UI (36) (level of evidence 2) (12) as well as to assess response to treatment. It basically consists of wearing a pre-weighed pad which is then weighed after a stipulated period of time. For every 1ml of urine lost there is a 1gr increase in the weight of the pad. Several protocols are available, a short (1-2hr) with a standard exercise

protocol and a long (24hr) pad test without exercise protocol. In the older population, more specifically in the frailest older patients, the 24hr test is more practical even though the variation in level of activity is more difficult to standardize. Since it does not require symptom reporting and can be performed in both domiciliary as well as hospital/care home settings, it is particularly useful among frail and cognitively impaired older persons.

‘Dipstick’ Urinalysis is a useful test especially in the context of recent onset UI since a urinary tract infection (UTI) can present with UI or sudden worsening of symptoms in an older person with established incontinence. A urinalysis that is negative for nitrites and leucocytes has a high specificity to exclude a UTI in older persons with incontinence (37) (level of evidence 1) (12). A positive urinalysis for nitrites and leucocytes should be followed by a culture and sensitivity test and correlated to the clinical picture since patients with asymptomatic bacteruria will experience harm rather than benefit from antibiotic treatment (7). This test will also identify glycosuria since poorly controlled diabetes can worsen or precipitate UI.

Further serological/hematological tests, particularly a renal profile, might be required as part of the diagnostic work-up depending on the patients’ clinical presentation.

Post-voiding Residual Volume (PVR) measures residual urine volume in the bladder after voiding and is a very useful tool in the assessment of patients with UI or related LUTS (7) particularly in assessing voiding dysfunction and identifying BOO. PVR can be performed by sterile urethral catheterization or by bladder ultrasound. PVR has been facilitated by portable bladder scanners which besides being convenient, accurate, and cost-effective, carry no risk of urethral trauma or UTI, both of which are associated with catheterization. It is therefore recommended that all older patients with UI undergo PVR measurement using ultrasound, particularly those with outflow symptoms and patients on medications (such as psychotropic drugs or drugs with anticholinergic properties) that can result in or worsen voiding difficulties (12). It is also recommended in older women with a history of diabetes, older patients with neurological problems that can result in bladder dysfunction, recurrent UTIs, and during a trial without catheter (TWOC) to exclude the recurrence of retention of urine. This test can be performed in all older patients including the very frail, those in a post-operative stage, those with cognitive problems and those suffering from delirium in which case the exclusion of urinary retention as a cause is essential.

It is important to highlight that there is no standardized definition of an abnormal PVR in older patients but generally higher volumes are accepted than in younger adult patients. A PVR of 150- 200 ml is the most common cut-off deemed as significantly elevated in the literature and may be used as a limit value for clinical decision making in this patient group (38). In cases of significantly elevated PVRs, urinary drainage preferably by means of intermittent catheterization should be carried out. When suspecting BOO underlying urinary retention, consulting a urologist in men and a gynecologist in women is of benefit.

Elevated PVR without BOO in the older patient may suggest detrusor underactivity (DU), a poorly understood and researched geriatric condition (38, 39). DU is known to be especially common in institutionalized older persons and may coexist with detrusor overactivity (DO) presenting a condition known as detrusor hyperactivity with impaired contractility (DHIC) (40). Up to one third of institutionalized older individuals have been reported to suffer from DHIC (41)

4) CRITERIA FOR FURTHER EVALUATION OF OLDER PATIENTS WITH UI

The goals of the basic evaluation of UI are to identify conditions that may contributing to UI, patients who can start treatment without further testing and patients

who require further evaluation before initiating therapeutic interventions (42). Based on the findings of the initial evaluation, a treatment decision is made or a more specialized evaluation is suggested.

Patients requiring further evaluation include those who meet one or more of the following criteria:

- Uncertain diagnosis and inability to develop a reasonable management plan based on the basic evaluation
- Failure to respond to an adequate therapeutic trial
- Abnormal post voiding residual (PVR)
- Hematuria without infection
- Consideration of surgical intervention
- History of previous anti-incontinence surgery, as well as radical pelvic surgery or pelvic radiotherapy
- The presence of other comorbid conditions such as:
 - Beyond hymen symptomatic pelvic prolapse
 - Incontinence associated with recurrent UTI
 - Persistent symptoms of difficult bladder emptying
 - Prostate nodule, asymmetry or other suspicion of prostate cancer
 - Neurologic conditions, such as multiple sclerosis, spinal cord lesions or injury, stroke or Parkinson's disease (42).

Other guidelines recommend further evaluation in case of neurogenic bladder and negative stress test with SUI symptoms. The patient's willingness to undergo these studies following adequate explanation of what they entail must also be considered (43).

Available methods to extend the diagnosis are:

- Urodynamic studies (UDS): the rationale for using UDS is to aid in arriving at a diagnosis and possibly affect outcome of treatment. However, variability in results, both in the same session and between different sessions has been noted (*level of evidence 3*) (12). Considering that most studies were done in younger age groups, these variabilities will be enhanced in the elderly and particularly in frail older patients. Also, these tests cannot be performed in persons with significant cognitive problems. Although in the conservative management of UI, preliminary urodynamics can influence the decision making process, it does not influence the outcome of treatment (*level of evidence 1*) (12). Therefore, routine urodynamic testing is not necessary and may be misleading because of the high prevalence of detrusor overactivity in healthy, continent older persons (44). Generally, UDS are indicated when the diagnosis remains uncertain after history and physical examination, when the symptoms do not correlate with physical findings, when empiric treatment has failed, or when the results of the test may alter treatment recommendation and management. The clinical value of UDS is increased in patients undergoing invasive treatment of UI. Most guidelines recommend UDS in the preliminary evaluation of these patients and all guidelines recommend UDS if there is a recurrence of incontinence after invasive treatment (10,43). Again we emphasize that variability of results of the UDS lowers its practical value.

- Imaging: some imaging techniques, particularly Ultrasound and Magnetic Resonance Imaging, can define anatomical and functional abnormalities such as bladder

neck and urethral mobility. However, this has not been translated into evidence of clinical improvement in these patients because of a lack of correlation between observed patterns of urethra vesical movements and UI (45) (level of evidence 2) (12). Similarly measurement of bladder wall thickness using ultrasound in patients suffering from OAB has not found to be useful in their management (45, 46) (level of evidence 3) (12). In patients with recent onset UI or with sudden worsening or change in the clinical presentation, imaging can play a role in excluding other underlying pathologies. In conclusion, all guidelines agree with high level of evidence that routine imaging is not recommended unless there is a concern for other underlying pelvic disorders (43).

- Cystoscopy: there is agreement that routine cystoscopy should not be performed in the uncomplicated patient with incontinence (43). It is considered necessary for haematuria or UI with unexplained pelvic pain (44).

- Other specialized studies currently available include: uroflowmetry, cystometry, cystourethrography, urethral pressure, electrophysiological sphincter testing, video urodynamics, and electromyography. These numerous noninvasive and invasive tests must be used selectively, usually only in complicated cases. Most of them are performed by urologists or others specialized in urinary incontinence. Many older patients may not be candidates for sophisticated studies due to inability to cooperate or because of a poor prognosis for successful correction.

In summary, in cases of UI associated with *pain, hematuria, recurrent symptomatic UTI, pelvic mass, pelvic irradiation, pelvic surgery, prolapse beyond introitus in women or suspected fistula*, one should consider specialist referral as appropriate according to patient preferences and the CGA (7,12,19). The CGA is the backbone of this holistic evaluation and the other investigations provide corroborative evidence that strengthens the diagnostic pathway and management plan.

5) SPECIFIC CONSIDERATIONS ON UI IN ACUTELY ILL HOSPITALIZED PATIENTS

UI remains understudied in acute care (47). It affects over one-third of older patients at some point during their stay in an acute care hospital. Its prevalence is increasing with age and reaches almost 70% in patients over the age of 85 years with a risk of prolonged hospital stay or admission to long-term care (48, 49).

This document proposes several strategies regarding preservation of urinary continence and management of incontinence when an older patient is admitted to hospital for an acute problem:

- On admission, irrespective of the reason for admission, UI should be traced routinely.

There is lack of assessment for UI due to low expectations of cure, lack of knowledge, unawareness of assessment tools, lack of time and support, as well as a conflict of priorities in a culture that fails to promote holistic care (50,51). Moreover, assessment strategies focus on basic containment of incontinence rather than treatment.

The presence of UI on admission is an independent risk factor for functional decline at 3 months after admission while the presence of a catheter on admission is an

independent risk factor for functional decline at 3 and 12 months and for institutionalization and mortality at 12 months (52).

- Transient causes should be identified and treated.

Patients in acute care are especially prone to some causes of transient UI. Several commonly used medications can initiate or exacerbate UI, such as intravenous fluids or hyperalimentation. Surgery, illness or disability, or the use of restraints can limit an older person to reach the bathroom. Stool impaction, due to medication, mobility restriction or inadequate hydration can cause urinary urgency or retention. The hospital environment should be modified to facilitate continence (50). Table 1 enlists the most common causes of transient UI in acutely ill patients that one should consider and try to exclude during the multidimensional assessment of older patients.

DRIP acronym		DIAPPERS acronym	
D	Delirium	D	Delirium
R	Retention Restricted mobility	I	Infection
I	Infection Inflammation Impaction	A	Atrophic vaginitis
P	Pharmaceuticals Polyuria	P	Pharmaceuticals
		P	Psychological causes
		E	Excess urine output
		R	Restricted mobility
		S	Stool impaction

Table 1: Transient causes of UI (modified from references 53,54)

- Inappropriate use of urinary catheters as well as continence aids should be avoided

Evidence shows an excessive use of incontinence briefs/diapers/pads (34 – 50%) in acute hospitalized patients with no prior incontinence and when there is no identifiable condition that necessitates such intervention (55). In these cases, use of incontinence pads negatively influences older person's self-esteem and perceived quality of life and is related to the development of dermatitis, pressure ulcers and urinary tract infections, when appropriate hygiene routines are lacking. Moreover diaper use might make it difficult to regain continence once back home.

On admission, acutely ill older patients are often catheterized. In almost 33% of patients there is no clear medical indication for this procedure. Catheter use is related to restricted mobility, bacteriuria, urinary tract infections, discomfort, UI and death.

In one study the risk of developing new-onset UI during hospital stay was 4.26 times higher in those patients who had a urinary catheter for most of their stay and 2.62 times higher for adult diaper users (56).

Formal caregivers should be aware of alternatives such as prompted voiding, urinals/commodes, or condom catheters. There is a lack of agreement regarding appropriate use of urinary catheters in acute care. Agreement however exists on the fact that, in acutely ill patients with urinary incontinence with intact skin and where skin protections is possible, catheterization is never appropriate, as the increased risk of complications outweighs benefits (9,57). Given the risks and harms associated with indwelling urinary catheters, its use should be limited to a minimum. Instead, intermittent

urinary catheterization should be preferred, even in acute care. The use of a portable ultrasound device to detect urinary retention should be encouraged.

In summary, currently, in acute care, the evidence on the appropriate management of incontinence is weak. More research is needed to develop processes and/or policies, and to determine effective interventions to enhance the care of patients with UI. At least there should be a policy to document the patient's premorbid continence state as well as his continence state on acute referral and a strategy to preserve or restore continence during the hospital stay.

6) THE CURRENT STATE OF THE CONSERVATIVE TREATMENT OF URINARY INCONTINENCE WITH A SPECIAL FOCUS ON THE REHABILITATION TECHNIQUES"

The conservative treatment of UI is considered to be the mainstay of its management, using an individualized treatment plan, in order to address the older patient's specific needs.

The main conservative strategies are:

A- Lifestyle interventions

Patient education is crucial in managing UI. According to Wagg et al. (7), no specific data is available on lifestyle interventions in the frail elderly, neither is it clear if all of these interventions are appropriate in this population. However, Fung et al. (58) propose that lifestyle interventions should be offered in ambulatory vulnerable elders who are cognitively intact and have urgency, stress or mixed UI, because incontinence episodes could be decreased without significant side effects. Since vulnerable elders are not clearly defined, a translation of this message into the general geriatric population is uncertain.

- Weight reduction

Obesity is associated with an increased risk of stress UI (59) and weight loss and exercise are recommended by the American College of Physicians in obese women with UI (60). The benefits of weight loss in obese patients are furthermore not limited to urinary incontinence but have a positive effect on general health and mobility as well. However, there is insufficient data to make a recommendation towards the general geriatric population (61). It should be remembered that the health benefits of weight loss in elderly, particularly by calorie restriction, are uncertain. Any weight loss at advanced age should be recommended carefully, minimizing muscle and bone loss always keeping in mind that sarcopenia can also be present in the obese frail elderly person (62).

- Fluid intake

Swithinkbank et al. (*level of evidence 3*) showed that changing caffeinated to decaffeinated drinks had no effect on urinary symptoms (63). NICE guidelines (2013) however recommend caffeine reduction in women with UI (64). The negative effect of carbonated beverages was demonstrated in a survey-based study, which showed an association between a high consumption and an increased risk of stress UI and detrusor overactivity. When corrected for fluid intake, the effect of carbonated beverages still remained significant (65).

In general, fluid restriction may decrease UI in frail elderly; however evidence on this is very poor (7). Advice on modifying fluid intake may be given if intake is either

excessive or poor, as the latter can lead to concentrated urine and irritate the bladder with worsening of incontinence (59) as well as contribute to constipation, which is a risk factor on itself.

- Constipation

Chronic constipation is a likely risk factor for overactive bladder and UUI due to associated straining (66), and treatment may reduce this effect (59). In frail elderly, constipation may cause difficulties in bladder emptying or result in delirium, which may precipitate or worsen incontinence. This is particularly pertinent in the acutely hospitalized elderly persons and continence problems, retention and delirium occurring after acute neck of femur surgery are a frequent occurrence. Patients should be advised to avoid constipation, by responding promptly to the urge to defecate. Engaging in exercise and increasing dietary fibre are other possible recommendations (66).

- Smoking

Smoking is associated with urgency in older people, and this is especially seen in current smokers (67). Despite lack of randomised controlled trials (61), advising smoking cessation in general might just be good clinical practice.

B- Behavioural interventions

Behavioural interventions can be readily incorporated into daily lives of patients who possess the necessary cognitive and functional capabilities. Non-pharmacological approaches require considerable motivation from the patient and caregiver, and attrition rates may be high without adequate follow-up (66).

Therapeutic measures need to be individually tailored, taking into account patients mobility, motivation, and cognitive competence (68).

Some behavioural interventions have been especially designed for frail older people with cognitive and physical impairments whose ability to learn new behaviours or to actively participate in self-care activities might be affected. However, cognitive and physical impairment may preclude the use of some of these interventions (7, 69). Also, many studies exclude the frail older adult who cannot respond to a one-step command, who has poor language ability or who suffers from terminal illness (7).

- Timed voiding

Timed voiding is defined by the European Association of Urology as fixed pre-determined time intervals between toileting, applicable in those with or without cognitive impairment (12). No attempts are made at patient education, reinforcement of behaviours or re-establishing voiding patterns (7). It is uncertain whether timed voiding reduces urinary incontinence in frail older people (7). The exact indication for this intervention remains unclear, mainly due to lack of consensus in terminology.

- Pelvic floor muscle training (PFMT)

Pelvic floor muscle training is used to improve pelvic floor function, with improvement of urethral stability (12). High quality evidence showed that PFMT is an effective first line treatment for stress UI in women (60). A therapeutic effect is seen in women with UUI, as well as in mixed UI, though the effect in the latter is lower than in pure stress urinary incontinence (12). In patients with overactive bladder improving pelvic floor function may help inhibit bladder contraction (12).

It is recommended to implement PFMT for at least 3 months (59). As with all muscle strengthening exercises, the pelvic floor requires continuous exercise to maintain the gained benefit (66).

In the frail older person PFMT, both with and without biofeedback (60), has not been studied extensively, but in the patient with enough cognition to participate, PFMT could be implemented (7).

- Bladder training

In UI, bladder training is a possible treatment, in which a progressive voiding schedule is used in combination with relaxation and distraction techniques to restore normal bladder function (59, 60). Evidence supports the use of bladder training for urgency suppression (66). A bladder diary can help identify an individual person's toileting pattern as well as urinary incontinence episodes, in order to monitor progression of treatment (7, 66).

Bladder training can be offered as well to any patient irrespective of the type of UI as a first line treatment for at least a short period of time (12). A patient's motivation to follow instructions is important as well as his capability to learn and practice the techniques, which unfortunately might exclude a large proportion of the nursing home population (66).

The ideal intensity of a bladder training program remains unclear (12). NICE guidelines (2013) recommend trying a total duration of minimum 6 weeks in women with urgency or mixed urinary incontinence, before considering other treatment options (64).

Due to various interpretations of bladder training by authors, a consensus about this intervention is lacking.

- Prompted voiding

This technique is designed to increase the patient's demand to toilet and to decrease the number of urinary incontinence episodes (7).

Positive reinforcement is provided to the patient by a caregiver when requesting toileting assistance, spontaneously or following verbal prompts and is often used in care dependent people residing in nursing homes (12).

Care burden in nursing homes is often high and the intervention can lead to a high work load demanding a high number of staff-members. Nevertheless prompted voiding is not excluded in the domiciliary setting especially where there is a supportive caregiver (7).

In summary, in the older patient with UI, a combined therapy, consisting of lifestyle and behavioural interventions, is advised. Positive effects can be achieved in community dwelling elderly, as well as in nursing home residents with UI of all types, taking the individual patient's functional and cognitive disabilities into account.

C) Absorbent aids:

The use of absorbent continence aids is extensive today, but it must be underscored that these aids should be used in combination with a holistic continence management plan and never replace it. The choice of the right product for the specific needs of the patient, combined with correct cleaning and skincare routines, can have a positive impact on the hygiene and wellbeing of patients and caregivers.

TABLE2: RECOMMENDATIONS ON CONSERVATIVE MANAGEMENT OF UI IN OLDER PEOPLE

LIFESTYLE INTERVENTIONS	
No specific data available in frail elderly	
Weight reduction	Insufficient data available in the geriatric population May be inappropriate in frail elderly
Fluid intake	Only modify if excessive intake
	Avoid high consumption of caffeinated beverages
	Avoid high consumption of carbonated beverages
Smoking	Advising cessation may considered good clinical practice
Constipation	Chronic constipation should be addressed
BEHAVIOURAL INTERVENTIONS	
Continuous incorporation into daily life is desired Motivation of patient and possible caregiver is needed	
Timed voiding	Exact indication unclear in literature due to lack of consensus Applicable in elderly with and without cognitive impairment
Pelvic floor muscle training	Advised in stress urinary incontinence Could be implemented to decrease bladder contractions in OAB Continuous exercise is desired to maintain beneficial effect
Bladder training	Can basically be used in any type of urinary incontinence Sufficient motivation is required Consensus is lacking due to various interpretations
Prompted voiding	Golden standard in care dependent people residing in nursing homes

7) PHARMACOLOGICAL TREATMENT OF UIIN THE OLDER PATIENT

Pharmacological treatment for UI should be undertaken only after adequate non-pharmacological therapy has been attempted for at least three months, and non-pharmacological treatments should be continued after initiation of pharmacological treatment (14). The type of incontinence that is most amenable to pharmacological treatment is UUI. For stress incontinence few pharmacological agents have been studied, and data is available mostly for their use in women. At any rate, evidence pertaining to the frail older person is relatively scant, as is evidence on the effects of these drugs on the central nervous system (7).

a) Antimuscarinic drugs

For both men and women with symptoms of overactive bladder/urgency or mixed incontinence, antimuscarinic drugs usually are the first-line treatment (12). These drugs are relatively effective (*level of evidence 1*) (70), but their long-term efficacy has not been established (*level of evidence 1*) (71). A recent review focused on elderly patients found that these drugs have a limited, albeit significant, effect on urinary leakage, but they have substantial side-effects and their use in the frail elderly is not evidence-based (*level of evidence 1*) (72). Relatively few data on the effect of these drug are specific for older people. Probably most evidence is available for fesoterodine, with two randomized clinical trials in patients aged over 65 years (*level of evidence 2*) (73,74).

The systemic anti-cholinergic side-effects are frequent and include dry mouth, constipation, blurred vision, somnolence, and dizziness. Dry mouth is more common in patients taking immediate-release oxybutynin compared to immediate-release

tolterodine. With extended-release formulation, the incidence of this side effect is lower with only small differences between drugs (*level of evidence 1*) (75).

Side effects impact substantially on compliance with treatment. At three months, only 40% of patients who were treated with oxybutynin (immediate release) were still taking the drug, while solifenacin seems to be better tolerated, with 58% of patients still on the drug after 3 months (*level of evidence 3*) (76).

Antimuscarinic drugs have the potential to interact with M₁ receptors in the brain, affecting cognition. This issue is of particular concern in elderly people, who are more likely to have impaired baseline cognition and are more prone to worsening cognitive performance. Individual drugs carry different risk of inducing cognitive impairment, depending on their affinity for M₁ receptors and their ability to cross the blood-brain barrier, which in turn is a function of molecule size and lipophilicity. From a clinical point of view, a detrimental effect on cognition has been demonstrated for oxybutynin but not for darifenacin, solifenacin, and tolterodine (7). At any rate, it seems sensible to perform a cognitive evaluation before starting an anticholinergic drug, in order to be able to detect changes in cognition over time.

As polypharmacy is very common in the elderly, potential pharmacodynamic interactions must be taken into account when prescribing anticholinergic drugs.

b) Mirabegron

Mirabegron is a beta₃ receptor agonist used in the treatment of overactive bladder/UUI. It seems to have a better tolerability profile in the elderly compared to anticholinergic drugs (77). Very few information, however, is available on the effectiveness and safety of this drug in elderly patients, and thus should be used with caution in this population (78).

c) Drugs for benign prostatic hypertrophy

In males, overactive bladder and UUI are often secondary to benign prostate hypertrophy (BPH). In this situation, antimuscarinic drugs or mirabegron can be used, usually as a second-line drug, in association with drugs for BPH (*level of evidence 2*) (79). Both 5- α -reductase inhibitors and α -adrenergic antagonists are effective in reducing symptoms, and their combination seems to be more effective than either drug alone (*level of evidence 2*) (80). In the older, α -adrenergic antagonists are associated with increased risk of hypotension and falls, and while the risk is smaller with prostate-specific drugs, it is still significant (*level of evidence 3*) (81).

d) Duloxetine

Duloxetine is the most commonly used drug for stress incontinence. It may also improve symptoms due to overactive bladder, although no evidence is available of a curative effect on either type of incontinence. It is associated with significant side effects including nausea, dry mouth, insomnia, constipation, and dizziness, that lead to discontinuation in approximately 20% of cases (*level of evidence 1*) (82). Duloxetine has been also tested in men suffering from post-prostatectomy incontinence, providing small benefits on symptoms (83).

e) Topical estrogens

While systemic estrogen therapy has been shown to worsen UI, topical estrogens have a beneficial effect on incontinence of any type in females although results of clinical trials have been inconsistent (*level of evidence 1*) (82). However, a Cochrane review concluded that local estrogen therapy may improve or cure urinary incontinence in post-

menopausal women. There is insufficient information to provide evidence-based recommendations on type of estrogen, dose, and duration of therapy (*level of evidence 1*) (84). They are well tolerated and safe, and can thus be used as a first option in postmenopausal women (12). As there is a possibility of some systemic absorption, they should be used with caution in women with history of breast cancer (2).

8) SURGICAL MANAGEMENT

The decision to perform surgery for the treatment of UI should be made after comprehensive clinical evaluation with an objective confirmation of the pathophysiologic diagnosis and severity of urinary loss, a correlation of the anatomic and physiologic findings with the surgical plan, an estimation of the surgical risk and of the impact on quality of life and patient preference. The availability of minimally invasive procedures for some of the types of incontinence enables to offer them to a select group of older people.

a) Surgical management for overactive bladder

For selected patients with overactive bladder, after failure of conservative and medical therapy, several surgical interventions can be offered.

- Botulinum toxin (BTX) intravesical injections result in variable continence rates, ranging from 29% to 87% (85). Data suggest durability of 6-12 months. It is an outpatient, minimally invasive procedure. Repeat injections maintain efficacy without increasing adverse events. There is risk of urinary retention requiring clean intermittent self-catheterization in about 5% of patients. The grade of recommendation varies between different guidelines (43).

- The modulation of bladder reflex pathways via percutaneous tibial nerve stimulation (PTNS) or via implanted sacral nerve stimulation (SNS) has been acknowledged as third line treatment algorithm of care in patients with refractory OAB. Percutaneous tibial nerve stimulation is an outpatient clinic procedure. Patients must be willing and able to make frequent clinic visits, usually every 2 weeks (86). Sacral neuromodulation is delivered via an implantable system (InterStim system) which sends electrical pulses to an area near the sacral nerve to modulate the neural activity that influences the behavior of the pelvic floor, lower urinary tract, urinary and anal sphincters, and colon. Unlike oral medications that target the muscular component of bladder control. Sacral Neuromodulation offers control of symptoms through direct modulation of the nerve activity. It is recommended in refractory cases and requires motivated patient with adequate cognition. NICE recommends counseling patients on long term complications (43).

- Augmentation cystoplasty has been employed as a surgical alternative. The use of this invasive intra-abdominal procedure is limited. It is rarely used in older patients. It is reserved mostly for patients with underlying pathophysiology (spina bifida, spinal cord injury) or those failing other treatments (43).

b) Surgical management for Stress Urinary Incontinence (SUI)

SUI is a common condition that is often treated effectively with surgical procedures.

- Tension-free vaginal tape procedures have gained popularity in the last decade due to relatively diminished invasiveness and as such, can be suitable even in older women. If conservative treatment has failed, women should be offered a procedure using a synthetic mid-urethral tape, such as TVT (Tension free vaginal tape) or TVTO (Tension free vaginal tape obturator) (64). Long-term data are only now becoming available. The

significant reported complications of tension-free tape procedures include bleeding, de novo urgency and voiding dysfunction, tape erosion and bladder perforation. Overall, complication rates are similar to those of other accepted surgical procedures for the treatment of incontinence. Only surgeons who have been properly trained in the use of these procedures should be performing them, as the surgeon's experience is one of the only significant predictors of successful outcome. Patients must be informed about the success rates and complications of the various surgical procedures (87).

- Periurethral injections of bulking agents allow for short term improvement in SUI symptoms. The benefit and adverse risks are both low, compared with open surgery (43). NICE guidelines and Canadian Urological Association give a Grade B recommendation to offer this treatment, but they recommend that patients should be counselled on the likelihood of requiring repeat injections, that the efficacy is inferior to conventional surgical techniques, and that efficacy decreases over time (43, 82). The procedure is recommended for indications such as old age, patients with risk for anaesthesia and patients' preference.

- Women with good manual dexterity are candidates for intravaginal support devices or urethral occlusion inserts. These devices offer the option of temporary or occasional use and are suitable for patients with exercise induced SUI. Pessaries may benefit women whose stress or UI is exacerbated by bladder or uterine prolapse (44). Insertion is performed by a health care provider, and the pessary can be removed for cleaning and reinserted every 4-6 weeks. Monitoring for vaginal infection and ulcerations is critical for safe use of these devices.

Other available surgical procedures are beyond the scope of this review.

c) Surgical Treatment in the Frail Elderly

Information on surgical management of the frail elderly is scarce. The outcomes of corrective surgery for incontinence in frail older patients may be affected by inherent comorbidities, as well as impaired bladder and pelvic floor function. There are still very few studies of gynecological surgery in frail older women, surgical treatment for post-prostatectomy UI in frail men, and minimally invasive procedures, or peri-operative care (7).

No studies were identified regarding gynecological surgery in institutionalized older women (7). Injection of bulking agents in women appears to be effective in older women, and age does not appear to correlate with outcomes (20, 88). Most published reports about tension free vaginal tape in an older population are limited by short term follow up, small patient groups and confounding variables (7).

Important factors in the surgical care of frail patients include pre-operative risk stratification, ensuring adequate nutrition, and management of comorbidities. Other important issues are prevention, recognition and treatment of postoperative delirium, pain assessment especially in cognitively impaired, recognition of hazards of immobility during hospitalization, and need for assistance and rehabilitation after the procedure (20, 88).

9) KEY POINTS:

- Urinary incontinence supposes the loss of a basic function
- The impact of urinary incontinence on Quality of Life is very high
- Disabled older people, as well as older people with multiple comorbidities and the frailest older, suffer more frequently from urinary incontinence

- Urinary incontinence is still under-diagnosed and under-treated. We have to be more proactive in the detection of urinary incontinence and in its management
- Older people with urinary incontinence need a Comprehensive Geriatric Assessment in order to improve detection, using validated assessment is required.
- One must always look for possible reversible factors.
- Currently, several clinical tools are available to adequately assess a high percentage of older people with urinary incontinence, and then to organize their plan of treatment.
- Older people with urinary incontinence need a multidimensional treatment plan and require team management. The conservative management of older people with urinary incontinence should be the first step in their treatment
- Conservative treatment including lifestyle and behavioral interventions are considered as the first step in every type of urinary incontinence.
- Pharmacological treatment should be considered after adequate non-pharmacological treatment during at least 3 months.
- In the management of urgency urinary incontinence, pharmacological treatment has a high level of evidence.
- Urodynamic studies are only needed if invasive treatment is considered
- Selected older patients could benefit from a further evaluation, in order to establish the definitive diagnosis, and then to receive the best type of treatment. In some selected cases, surgery is possible.
- Promoting continence should become the new attitude rather than accepting incontinence.

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