European Association of Urology

# GUIDELINES ON INCONTINENCE

**Adapted by the EAU Working Group "Incontinence"**

**Ch. Hampel, M. Hohenfellner, P. Abrams, J.T. Andersen,**
**E.J. Chartier-Kastler, T.L.J. Tammela, Ph. van Kerrebroeck,**
**G. Vignoli, J.W. Thüroff (Chairman).**

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# 1. GENERAL GOALS

The purpose of these clinical guidelines is to provide useful practical information for the diagnosis and treatment of urinary incontinence. They reflect the current opinion of the specialists in the particular field of interest and thus represent a state-of-the-art reference for all clinicians.

The first contact a patient has with healthcare providers should always focus on basic diagnostic tests, a physical examination and careful assessment of the patient's history, since this approach is always readily available. If treatment is regarded as appropriate, even at this early point of evaluation, such treatment is described as 'initial' management, no matter who the responsible healthcare provider (physician or nurse) may be.

If an accurate diagnosis of the disease requires further investigation (e.g. complex situations, such as neuropathic bladder), or if the initial treatment has failed, specialized diagnostics and sub-specific treatment options may become necessary.

In summary, the guidelines should lead through the appropriate diagnostic and treatment options for a disease and should consider the qualifications of the healthcare provider, as well as the state-of-the-art standards, and the appropriate level of care, which will depend on the level of impairment of the patient's quality of life, the availability of diagnostic and treatment options, and the economic situation of the healthcare system.

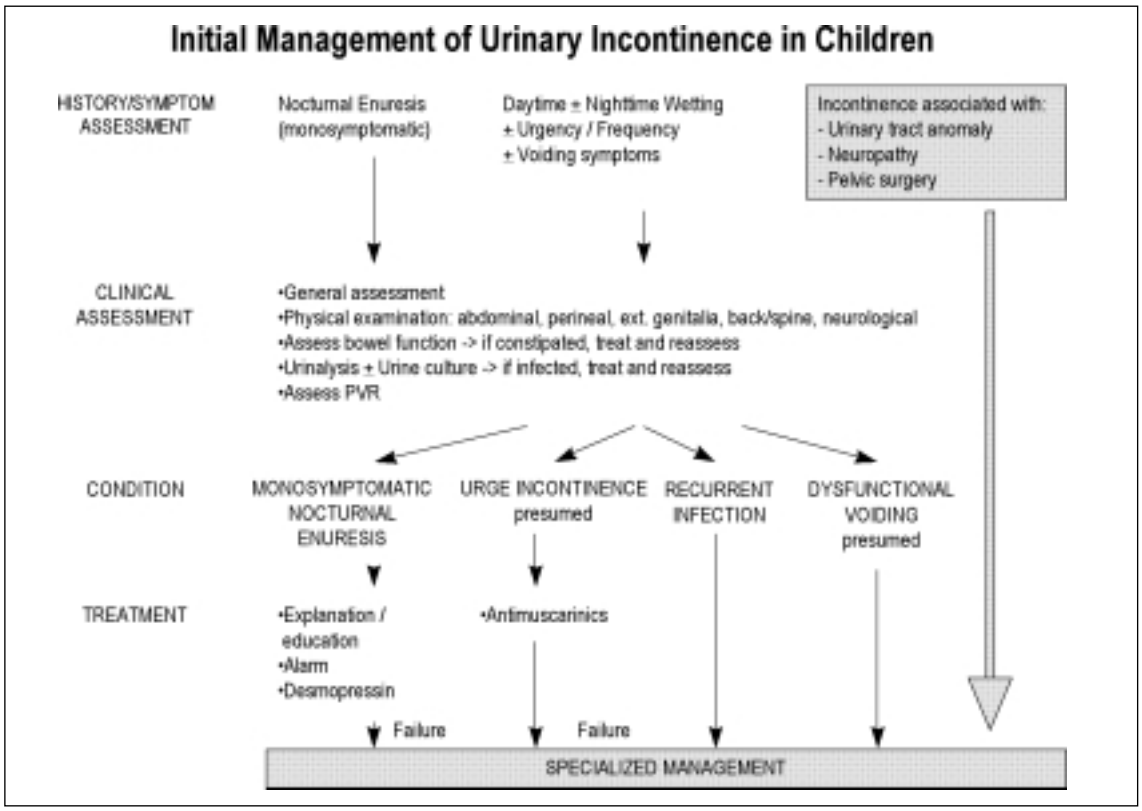
For practical reasons, the guidelines presented here have been split up according to the target sub-populations (children, women, men, patients with neuropathic bladders and elderly patients). Each management algorithm is constructed chronologically and comprises the following features:

1. Assessment of the patient's history and symptoms
2. Clinical assessment of symptoms and disorders
3. Determination of condition and underlying pathophysiology
4. Therapeutic options, split into initial treatment and specialized therapy

The terminology used is standardized throughout as recommended by the International Continence Society (ICS).

# 2. MANAGEMENT OF URINARY INCONTINENCE IN CHILDREN

Figure 1




### 2.1 Initial management (Fig. 1)

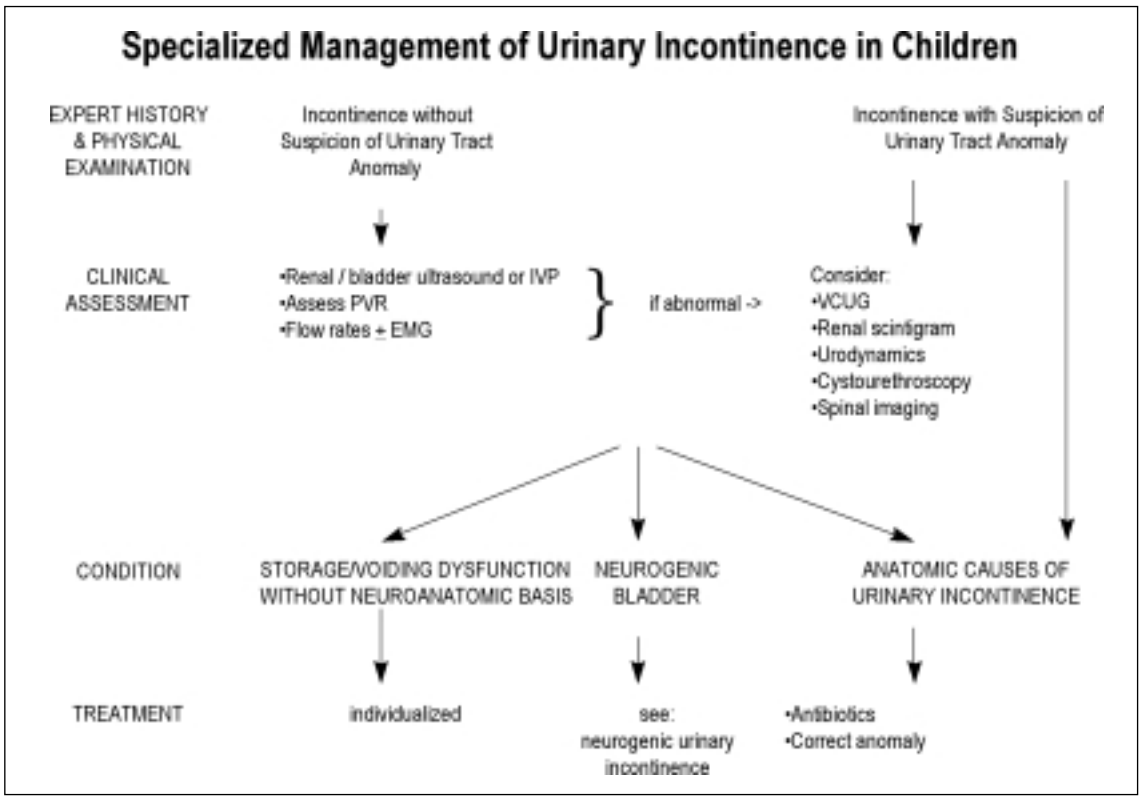
Clinical presentations by history and symptoms can be divided into three groups of increasing complexity (monosymptomatic nocturnal enuresis, wetting at any time of the day, and incontinence associated with urinary tract anomalies, neuropathies or previous pelvic surgery). All three groups should be initially evaluated with standard diagnostic studies (general assessment, physical examination, assessment of bowel function, urinalysis ± urine culture). If these studies suggest a monosymptomatic (uncomplicated) enuresis, conservative treatment (micturition training, behavioural modifications, alarm systems, vasopressin analogues) may be initiated without further diagnostic investigations (1).

Post-void residual urine (PVR) is an important diagnostic parameter that should be evaluated in patients with a complex history. In case of recurrent urinary infections, only small PVR values (<10% of bladder capacity) allow a unidirectional treatment approach with antibiotics. If infectious signs are absent and urge incontinence is assumed, large PVR values are a contraindication for antimuscarinics and require specialized management (2).

It is essential to explore the bowel function of the patient, since correction of chronic constipation (e.g. with fibers, laxatives, adequate fluid intake) may result in the resolution of urological symptoms.

Finally, specialized management (Fig. 2) is required, if any form of initial therapy fails.

Figure 2



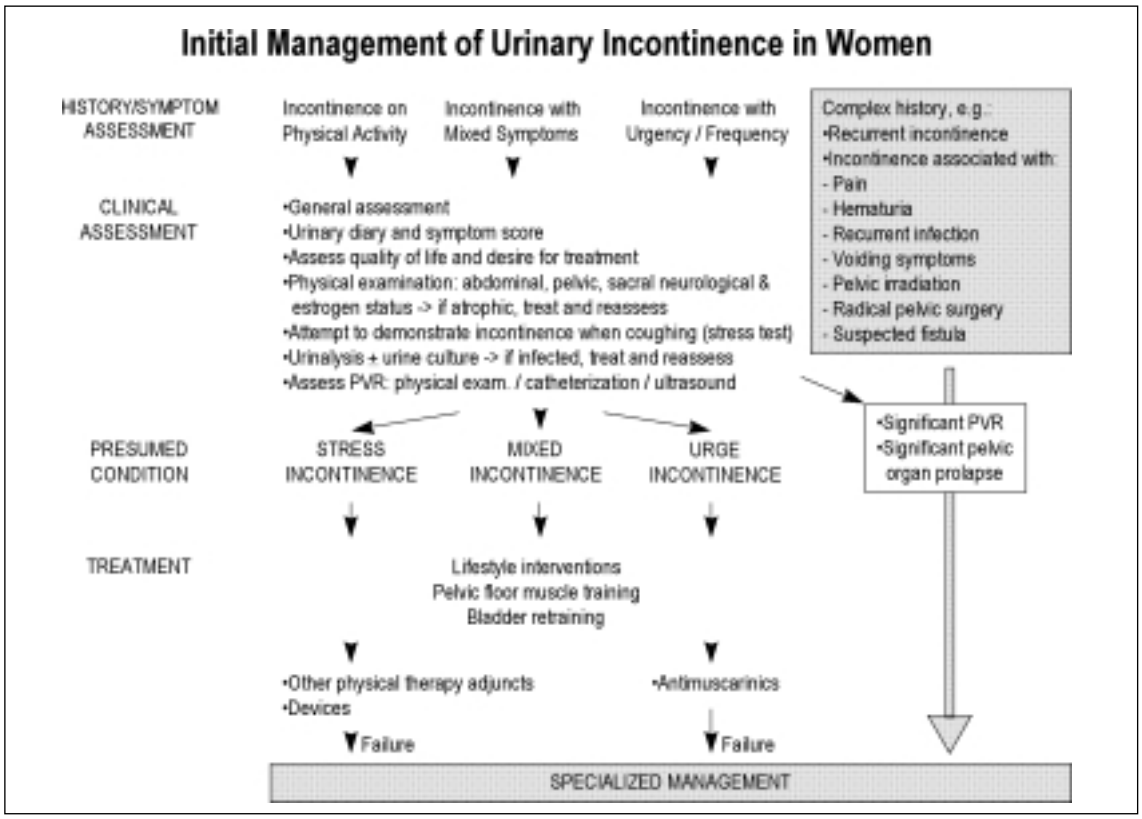

## 2.2 Specialized management (Fig. 2)

Special investigations, such as imaging studies of the upper and lower urinary tract, try to meet the increased diagnostic requirements for specialized therapeutic options. Additional functional tests (voiding cystourethrogram [VCUG], urodynamics), endoscopy or specific imaging (magnetic resonance imaging [MRI]) may be considered in the case of abnormal imaging studies.

Urinary tract anomalies (ectopic ureter, vesicoureteric reflux) are usually treated with antibiotics and surgical repair of the anomaly. Any complex urinary incontinence which is considered to need specialized management requires further urodynamic evaluation and repeated PVR assessments, since the manifold treatment strategies strongly depend on the correct diagnosis, and usually have to be individualized (3-5).

# 3. MANAGEMENT OF URINARY INCONTINENCE IN WOMEN

Figure 3



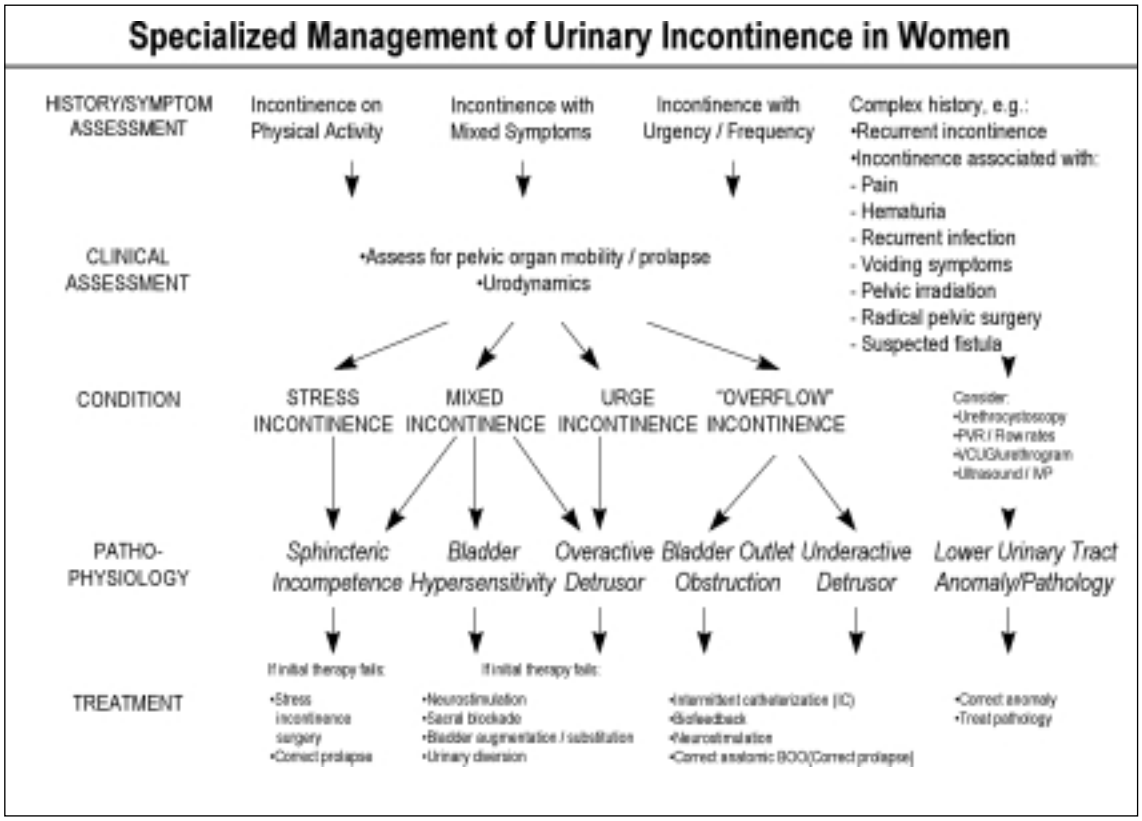

### 3.1 Initial management (Fig. 3)

Clinical presentations in women can be appropriately grouped into four categories of different complexity and diagnostic requirements (incontinence on physical activity, incontinence with mixed symptoms, incontinence with frequency/urgency and incontinence with a complex history). Basic tests and assessments (patient history, urinary diary, symptom score, quality-of-life-impairment, physical examination) apply for all four groups. Urine culture and PVR assessment provide additional essential information.

Lifestyle interventions, pelvic floor muscle training and bladder retraining may be the preferred forms of initial treatment for patients with symptoms suggestive of stress incontinence in the absence of a complex history or pelvic organ prolapse (6,7). Physical adjuncts may comprise vaginal cones, Kegel manometers, and external electrical stimulation (8). In contrast, antimuscarinics are the first choice for the initial therapy of patients with symptoms suggestive of urge incontinence. If the patient presents with mixed symptoms, the predominant symptom should be treated first.

The PVR plays an important role in patients with a complex history. Primary empirical therapy, as mentioned above, should be used only if the PVR is small. A proven urinary tract infection (UTI) should be treated prior to any further therapy. Specialized management is necessary in women with complex history whose PVR exceeds 10% of the bladder capacity. Additionally, patients with significant pelvic organ prolapse and/or failed initial therapy should be referred to specialists promptly.

Figure 4




### 3.2 Specialized management (Fig. 4)

Besides the basic clinical evaluation, urodynamic studies and assessment of pelvic organ mobility help to establish an accurate diagnosis of the incontinence type prior to specialized treatment.

The degree of sphincteric incompetence in stress-incontinent patients is determined by measurement of the urethral pressure profile (UPP) and/or the Valsalva leak point pressure (VLPP). Urethrocystoscopy may be considered prior to planned surgical intervention. Stress-incontinence surgery (with correction of concomitant pelvic organ prolapse) is particularly indicated in patients where conservative treatment has already failed.

Only through cystometry one can differentiate between motor urge (overactive detrusor) and sensor urge (bladder hypersensitivity) in patients with symptoms suggestive of urge incontinence.

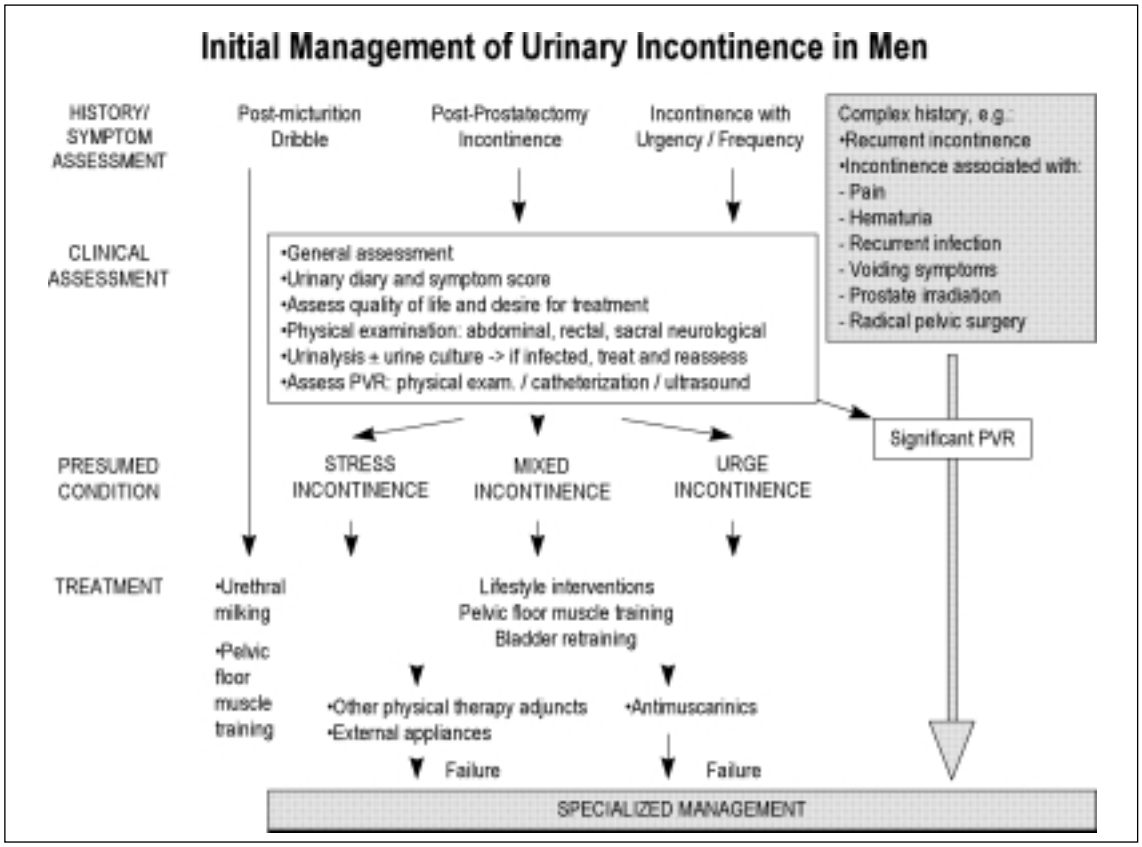
Neurostimulation, sacral nerve blockade, bladder augmentation/substitution and urinary diversion are more aggressive therapeutic options if the initial conservative treatment of urge-incontinent patients fails (9). However, these radical approaches are predominantly dedicated to severe cases of neurogenic bladder and interstitial cystitis (see section Management of Neurogenic Urinary Incontinence), since most other cases respond to antimuscarinics (10).

Bladder outlet obstruction and/or detrusor underactivity may lead to high PVR and finally to ‘overflow’ incontinence. If the subvesical obstruction is of functional origin, it can be treated with biofeedback, neurostimulation or clean intermittent catheterization (CIC). Anatomical bladder outlet obstruction (BOO) is most frequently associated with a stenosis of the urethral meatus, which is surgically correctable. However, in these cases, one has to be aware of coincident detrusor weakness (idiopathic acontractility due to denervation/decentralization), which would prevent symptom improvement after surgery and requires additional (temporary) CIC or intravesical neurostimulation.

Additional special investigations, such as urethrocystoscopy and imaging of the lower and upper urinary tract, may be necessary in complex cases with previously failed incontinence surgery, irradiation or radical pelvic surgery. If the results indicate that a urinary tract anomaly or pathology is responsible for the incontinence symptoms, further treatment has to focus on its correction (11).

# 4. MANAGEMENT OF URINARY INCONTINENCE IN MEN

Figure 5

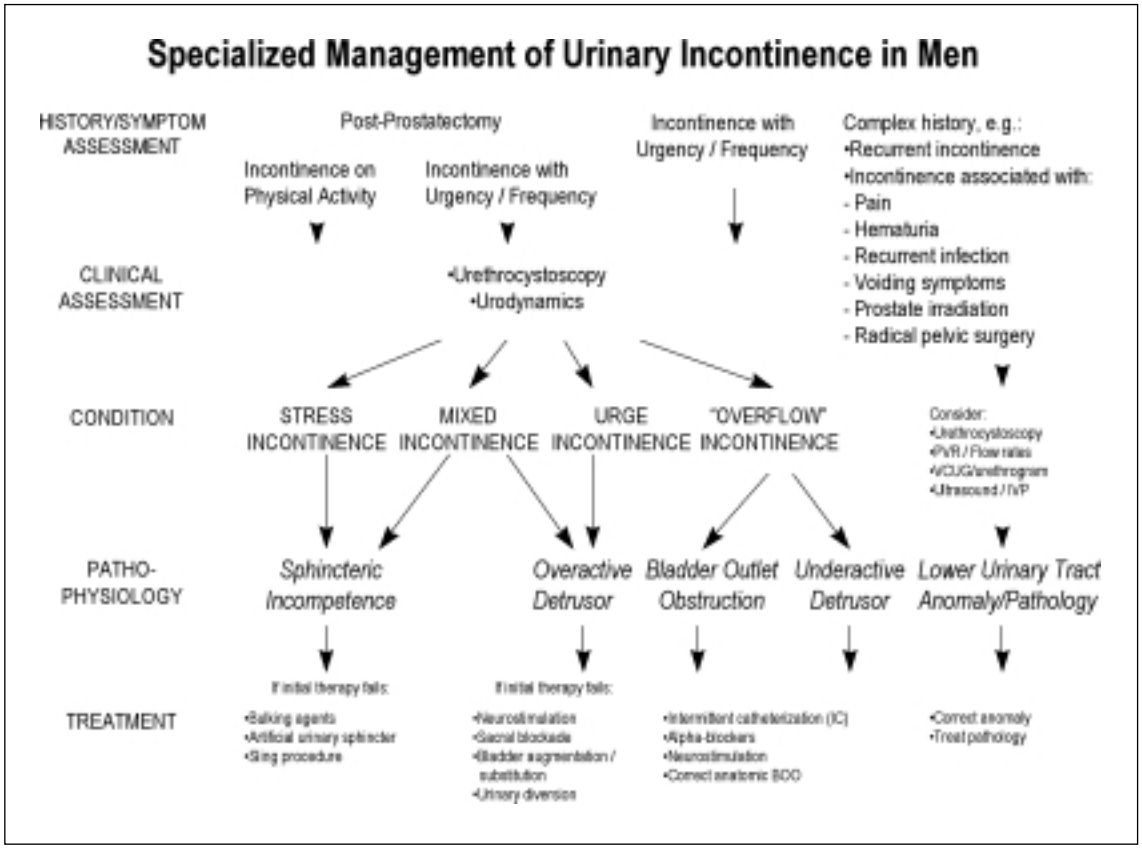



### 4.1 Initial management (Fig. 5)

The clinical presentations of men with symptoms and history of urinary incontinence may be grouped into four subdivisions (post-micturition dribbling, post-prostatectomy incontinence, incontinence with frequency/urgency and incontinence with a complex history). In case of post-micturition dribble, intensive diagnostics are unnecessary and may be omitted. Urethral milking and pelvic floor exercises are the recommended treatment options for this condition. For all other presentations, the standard diagnostics should include general assessment, urinary diary and symptom score, and quality-of-life assessment, as well as desire for treatment. Physical examination with abdominal and rectal examination, urinalysis and/or urine culture and determination of PVR should also be performed. Depending on the results, lifestyle interventions, pelvic floor muscle training with or without physical therapy adjuncts (external electrostimulation), external appliances (pads) and bladder retraining, with or without the additional use of antimuscarinics, are possible treatment strategies for patients with post-prostatectomy incontinence (suggestive of stress incontinence) or frequency/urgency symptoms (suggestive of urge incontinence) (12,13).

If the PVR in a patient with a complex history is smaller than 10% of the bladder capacity, primary empirical therapy is appropriate and should address the predominant symptom. Otherwise (PVR >10% of bladder capacity), those patients should be referred for specialized management. Specialized management is also recommended for all incontinent patients in whom primary empirical therapy has failed. Prior to any therapy, proven urinary infections should be treated with antibiotics.

Figure 6




### 4.2 Specialized management (Fig. 6)

Extended diagnostics recommended in the algorithm for specialized management of incontinent males comprise cystometry (for establishment of an urodynamic diagnosis). In addition, and – in patients with post-prostatectomy incontinence – urethrocystoscopy should also be performed (for evaluation of the presence and extent of urethral sphincter damage and/or other urethral and bladder anomalies). The determination of UPP and/or VLPP provides additional information about patients with stress incontinence of any origin. Stress-incontinent patients, in whom initial therapeutic options have failed, may be treated endoscopically or with open surgery for correction of their condition (14-16).

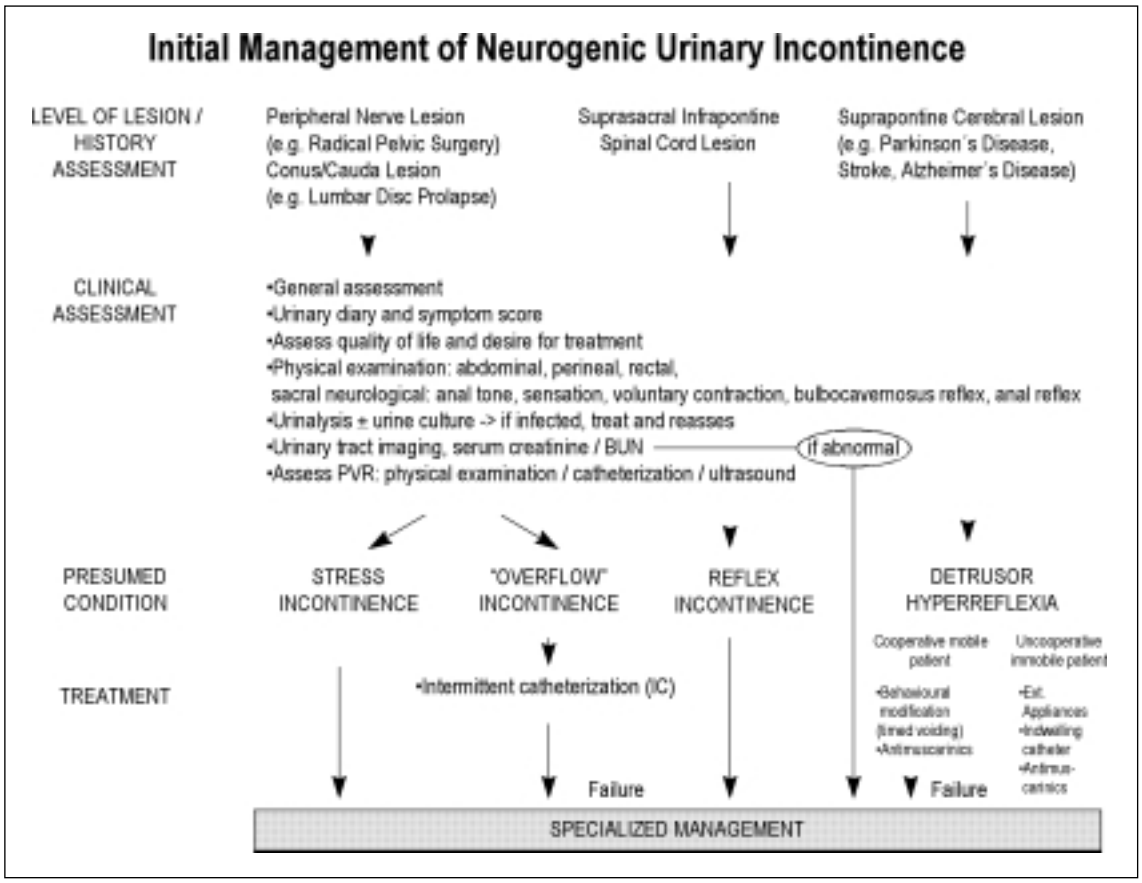
Neurostimulation, sacral nerve blockade, bladder augmentation or urinary diversion may be indicated as second-line regimen for patients with motor urge incontinence (overactive detrusor), in whom previous conservative approaches have been unsuccessful. These treatment options are usually dedicated to severe cases of neurogenic bladder or radiation cystitis, since even patients with severe idiopathic urge incontinence normally respond to less aggressive and invasive therapies (see section Initial Management) (10).

Bladder outlet obstruction, as well as detrusor underactivity, may lead to ‘overflow’ incontinence, requiring urodynamics for correct diagnosis. CIC, alpha-blockers and surgical correction of the anatomical disorder (urethral stricture, benign prostatic hyperplasia) may be indicated for BOO patients, whereas intravesical neurostimulation and/or CIC are recommended for patients with an acontractile detrusor due to denervation (e.g. pelvic surgery), decentralization (e.g. stroke) or decompensation (e.g. chronic obstruction).

If the patient presents with a complex history, additional investigations (urethrocystoscopy, flow rates, VCUG, retrograde urethrogram, imaging of the upper urinary tract) may be indicated. Any anomaly or pathology of the lower urinary tract that may be a cause for the patient’s incontinence should be treated according to the findings.

# 5. MANAGEMENT OF NEUROGENIC URINARY INCONTINENCE

Figure 7




### 5.1 Initial management (Fig. 7)

The clinical presentations of patients with neurogenic incontinence can be grouped into three categories according to the level of neurological lesions:

1. Peripheral nerve lesion (e.g. after radical pelvic surgery) and conus/cauda lesion (e.g. after lumbar disc prolapse)
2. Suprasacral infrapontine spinal cord lesion and
3. Suprapontine cerebral lesion (e.g. Parkinson's disease, stroke, Alzheimer's disease)

General assessment, urinary diary and symptom score, quality-of-life assessment, determination of desire for treatment, physical examination including abdominal, perineal, rectal and sacral neurological examination (anal tone, sensation, voluntary anal sphincter contraction, bulbocavernosus reflex, anal reflex), urinalysis and/or urine culture, PVR, urinary tract imaging, and serum creatinine/blood urea/nitrogen (BUN) are components of the basic diagnostic regimen (17).

If patients with urinary incontinence after radical pelvic surgery or conus/cauda lesion (including generalized neuropathies, such as multiple sclerosis), show only small PVR volumes (<10% of bladder capacity), their condition is suggestive of stress incontinence (sphincteric incompetence), whereas significant PVR (>50% of bladder capacity) indicates 'overflow' incontinence which should be treated with clean intermittent catheterization (18).

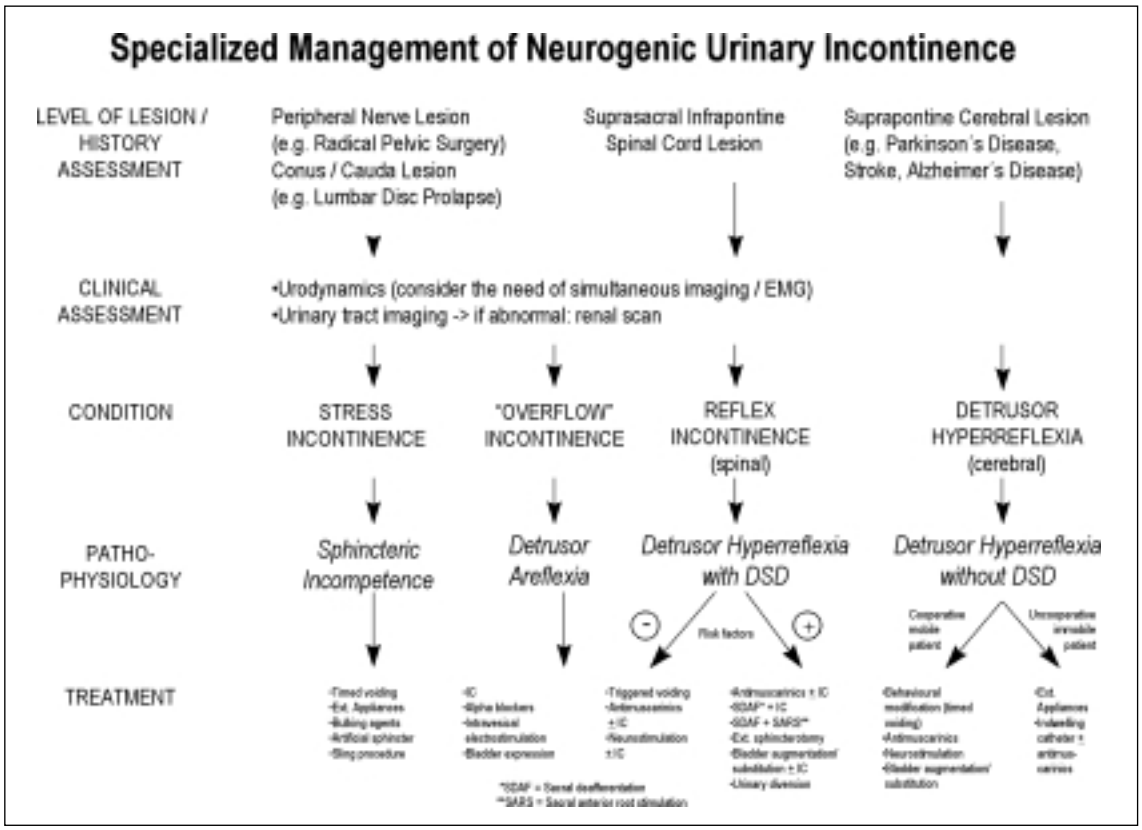
Suprasacral infrapontine spinal cord lesions (including generalized neuropathies, such as multiple sclerosis) usually result in reflex incontinence, which is generally associated with detrusor-sphincter-dyscoordination (DSD). Chronic DSD leads to increased intravesical pressure, vesicorenal reflux and finally deterioration of renal function. Hence the predominant aim of treatment in these patients is protection of the upper urinary tract by early intervention (see section. Specialized management).

Detrusor hyperreflexia with consecutive urinary incontinence is a common sequel of suprapontine

cerebral lesions, such as stroke, Alzheimer's disease or Parkinson's disease. It is usually not associated with DSD and bladder sensitivity may be unchanged or increased. Therefore, these patients present with symptoms of motor urge incontinence. Since the same treatment options apply for either detrusor instability (urge incontinence due to idiopathic detrusor hyperactivity) or detrusor hyperreflexia (urge incontinence due to a known neurological disorder), conservative therapeutic regimens, such as behavioural modification (timed voiding) and antimuscarinics may be chosen initially. However, globally impaired patients (stroke, Alzheimer's disease) with negligible mobility and/or cooperation may require external appliances or indwelling catheters.

If the initial empirical treatment fails, special management is indicated for all cases of neurogenic incontinence.

Figure 8




## 5.2 Specialized management (Fig. 8)

Specialized diagnostic studies for neurogenic incontinence include video-urodynamics, determination of the detrusor leak point pressure (DLPP) and repeated urinary tract imaging (follow-up studies). A renal scintigram should be obtained in case of presumed deterioration of the renal function.

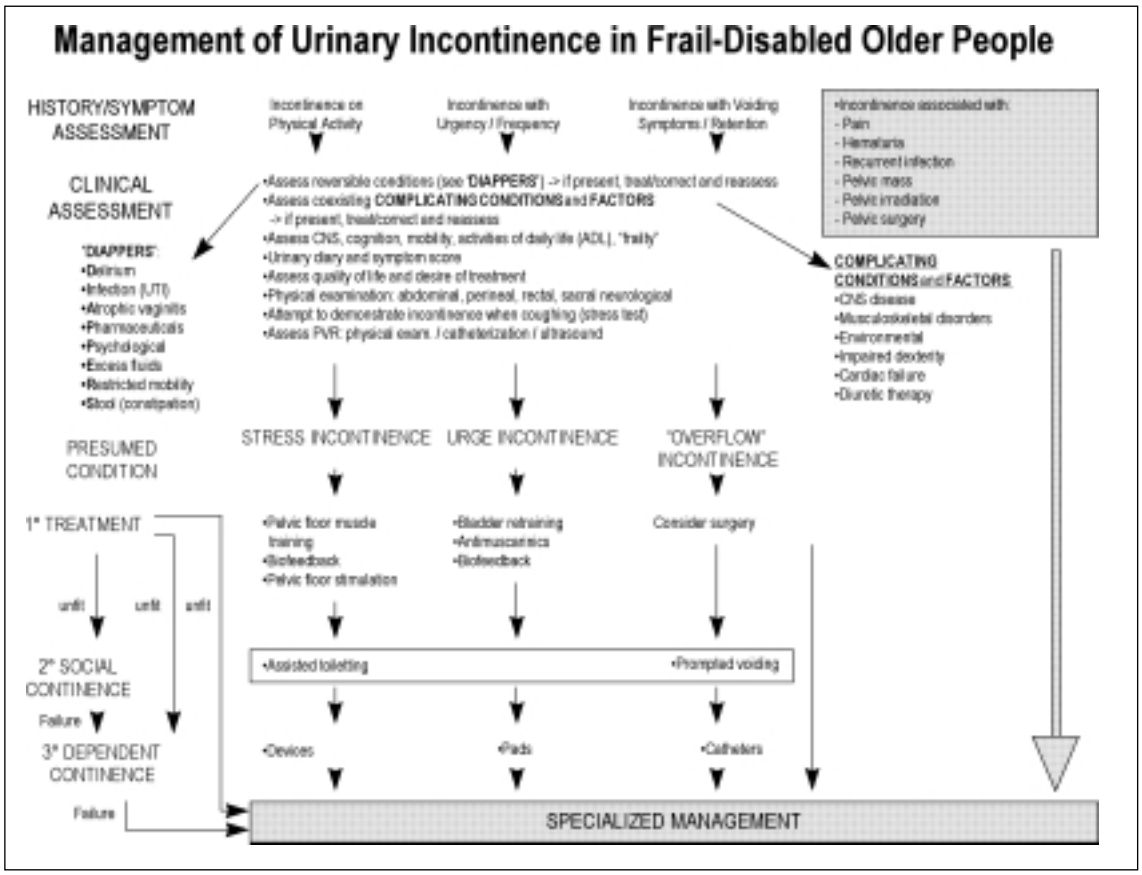
Small PVR amounts and incontinence in the presence of a peripheral nerve lesion indicate sphincteric incompetence (stress incontinence). Determination of the UPP prior to surgical intervention may be of prognostic value in these cases. Sufficient sphincteric pressure can be restored with transurethrally applied bulking agents, artificial sphincters or sling procedures. Behavioral modification (timed voiding) and external appliances do not improve the sphincteric competence but help to reduce frequency and severity of symptoms. If the peripheral nerve lesion is associated with incontinence and high PVR values, predominant detrusor arreflexia and consecutive 'overflow' incontinence have to be assumed. CIC, alpha-blockers, Credé manoeuvre (bladder expression) and intravesical electrostimulation may be considered in these patients (19).

As mentioned above, reflex incontinence with concomitant DSD due to a suprasacral infrapontine spinal cord lesion puts the upper urinary tract at risk. Periodical follow-up imaging studies are therefore necessary. Frequent determination of the DLPP helps to estimate the individual risk profile. Triggered voiding, antimuscarinics and CIC are feasible management options, as long as the DLPP remains below 40 cm3 of water. Higher pressure values require more aggressive approaches to protect renal function. Additionally CIC and antimuscarinics, sacral deafferentation, sacral anterior root stimulation, external sphincterotomy, bladder augmentation/substitutition and urinary diversion may be considered appropriate (20).

Since detrusor hyperreflexia due to a suprapontine cerebral lesion is usually not associated with DSD, the risk for impairment of renal function is rather low. Behavioural modifications (timed voiding), antimuscarinics, neurostimulation and even bladder augmentation are possible treatment options, although the general health status of the patient and the effort-to-benefit ratio has to be taken into account. Especially immobile and/or uncooperative patients are potential candidates for indwelling catheters or external appliances (21).

# 6. MANAGEMENT OF INCONTINENCE IN FRAIL-DISABLED OLDER PEOPLE (FIG. 9)

Figure 9




In these guidelines, only the initial management of urinary incontinence in frail-disabled older people will be described, since the specialized management has to be individualized as it depends heavily on the patient's general conditions.

According to the complexity of the clinical presentations, the patients may be grouped into four categories with different diagnostic requirements (incontinence upon physical activity, incontinence with frequency/urgency, incontinence with retention/voiding symptoms, and incontinence associated with complicating factors). Basically, central nervous system (CNS), cognition, mobility, activities of daily life (ADL), degree of 'frailty', micturition behavior, quality-of-life impairment and desire of treatment have to be investigated. A mnemonic ('DIAPPERS') may be useful for better recollection of the standard diagnostic studies that assess reversible predispositions for incontinence. Complicating conditions and factors should also be evaluated (see Fig. 9 box listing). The physical examination has to include abdominal, perineal, rectal and sacral neurological examinations. Stress test (objectivation of urine loss during coughing) and determination of PVR complete the recommended list of diagnostics.

If a patient presents with a history of incontinence on physical activity and shows a positive stress test with minimal PVR, the most probable diagnosis is stress incontinence. In contrast, a history of incontinence associated with urgency and frequency in concurrence with a negative stress test and low PVR values would

be indicative of urge incontinence as the presumed condition. Finally, if the patient's voiding symptoms are combined with a significant PVR (>50% of bladder capacity), 'overflow' incontinence has to be assumed.

Prior to any specific urological therapy, correction of all revealed reversible predispositions and complicating factors should be attempted. Thereafter, the primary urological treatment options (pelvic floor muscle training, biofeedback and electrical stimulation of the pelvic floor for stress incontinence, bladder retraining, antimuscarinics and biofeedback for urge incontinence, surgical BOO removal for 'overflow' incontinence) are intended to improve or cure the presumed condition. Due to their frequently impaired general health status, frail-disabled older people may be unfit for primary treatment regimens. In this case – or if primary treatment attempts fail – second-line options (assisted toiletting, prompted voiding) are indicated in order to achieve what is called 'social continence'. Third-line interventions (use of devices, pads and catheters) are dedicated to patients, who are unfit for secondary regimens or in whom those approaches failed. The status that is provided by successful tertiary therapy is called 'dependent' continence (22,23).

Specialized management is necessary for patients with persistent therapy failure or complex symptoms, such as incontinence associated with pain, haematuria, recurrent infection, pelvic mass, or a history of previous pelvic surgery/irradiation.

# 7. CONCLUSIONS

The basis for the presented algorithms is formed by the commonly accepted evidence from the scientific literature. The algorithms are not only intended to be as clear and easy to use as possible, but are supposed to reflect the quintessence of the entire empirical and rationalized clinical practice in Europe.

Since urological specialists are generally available throughout Europe, their intervention should not be restricted to the 'specialized' level of management. Although it may appear to challenge the division of the algorithms into 'initial' and 'specialized' management, early specialist involvement - even at the level of the patient's first presentation - is highly recommended in order to avoid needless and expensive diagnostics, discouraging treatment failures and an unnecessarily prolonged course of the disease due to the lesser experience of 'generalists'.

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# 9. ABBREVIATIONS USED IN THE TEXT

| | |
|---|---|
| ADL: | activities of daily life |
| BOO: | bladder outlet obstruction |
| BUN: | blood urea/nitrogen |
| CIC: | clean intermittent catheterization |
| CNS: | central nervous system |
| DIAPPERS: | Delirium |
| | Infection |
| | Atrophic vaginitis |
| | Pharmaceuticals |
| | Psychologic dysfunction |
| | Endocrine disorders |
| | Restricted mobility |
| | Stool impaction |
| DLPP: | detrusor leak point pressure |
| DSD: | detrusor-sphincter-dyscoordination |
| EMG: | electromyelogram |
| IC: | intermittent catheterization |
| ICS: | International Continence Society |
| IVP: | intravenous pyelogram |
| MRI: | magnetic resonance imaging |
| PVR: | post-void residual urine |
| UPP: | urethral pressure profile |
| UTI: | urinary tract infection |
| VCUG: | voiding cystourethrogram |
| VLPP: | Valsalva leak point pressure |

* The ICI Guidelines served as the basis for these EAU Guidelines on Incontinence. The authors of the ICI guidelines are: J.W. Thüroff, P. Abrams, W. Artibani, F. Haab, S. Khoury, H. Madersbacher, R. Nijman, P. Norton.