

Clinical Guidelines

On

Geriatric Urinary Incontinence

**Guidelines Development Group on
Continence Care
Geriatrics Subcommittee
COC Internal Medicine
Hospital Authority**

December 2003

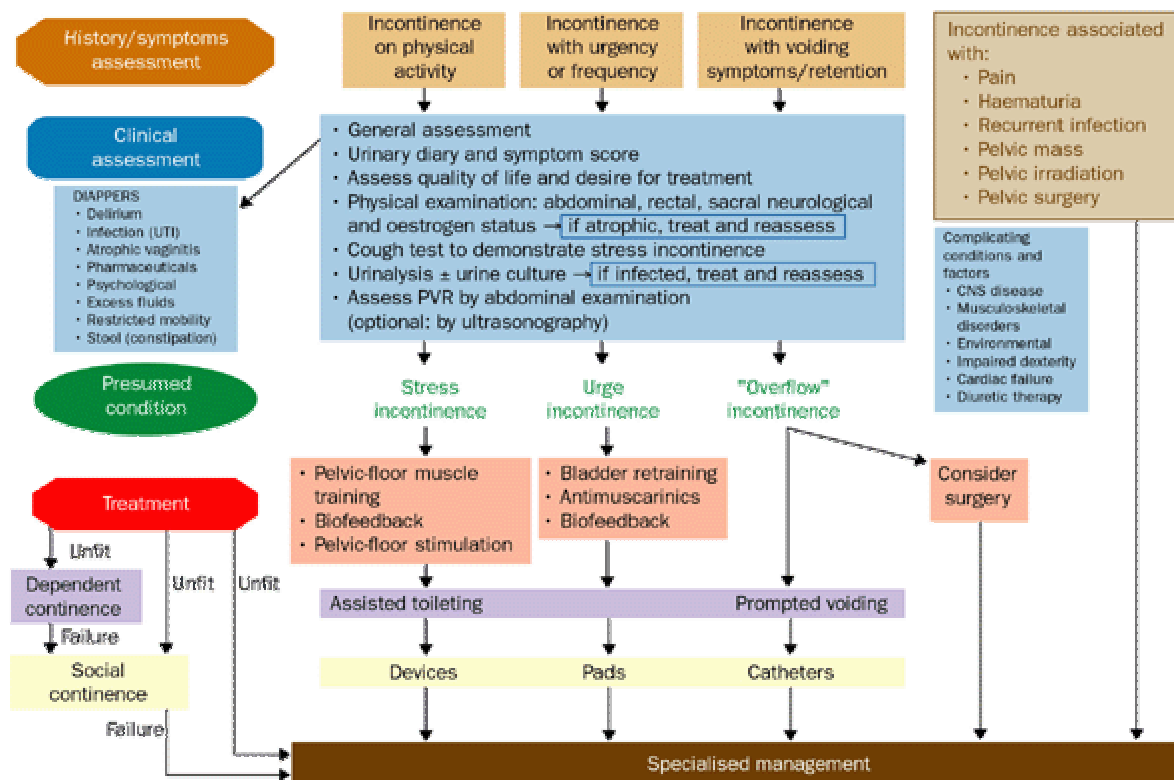
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Executive Summary

1. Urinary incontinence has been regarded as a geriatric giant because of its common occurrence among elders, complexity and gigantic impact on the elder and the society. It affects from 1/4 to 1/3 of elders in Hong Kong and is an important factor leading to functional decline, institutionalization and poor quality of life.
2. The pioneering work of early geriatricians on incontinence in old age has corrected much of the common nihilistic attitude among health care workers towards this geriatric giant, and has accumulated a body of knowledge on this subject, which is further propagated by the formation of the International Continence Society. Geriatricians, in collaboration with nurses and allied health workers, have strived to improve the continence care of elders in Hong Kong through the setting up of special continence services and promotion of continence education.
3. It is important that general practitioners and physicians be alert to the occurrence of urinary incontinence in old age, be knowledgeable of the basic assessment and approach and to make appropriate referrals to geriatricians when necessary.
4. The Guidelines Development Group on Continence Care was set up under the Geriatrics Subcommittee of the Hospital Authority on 27 February 2002. The Group, chaired by Dr. TK Kong, consists of multiple disciplines with special interests and contributions to continence care: geriatricians, nurses, physiotherapists and occupational therapists. The current group members are listed at the end of this executive summary.
5. Four group meetings were convened on 27 February 2002, 9 April 2002, 18 June 2002 and 29 August 2002. The previous published guidelines and recommendations on urinary incontinence (see references) were circulated, and these, together with other literature on the subject of urinary incontinence were discussed, in particular regarding their practicability and local relevance. The objective, the scope and format of the guidelines were discussed and proposed.
6. The objective is to develop clinical guidelines targeted at general practitioners, geriatricians and team members on the identification, evaluation, and management of geriatric urinary incontinence in outpatient, hospital and institutional settings. The ultimate objective is to promote continence by redirecting resources and attention on routine care (pads, penile sheaths, catheterization) to diagnosis and treatment rather than containment of incontinence, which should be taken as the last resort. An algorithm taken from Ref. 5 is included below for quick reference for the approach towards geriatric incontinence.
7. The guidelines will be disseminated to promote continence care via education and audit, and thus sections on education, outcome measures and clinical audit are included. Implementation of these guidelines should be followed by audit and quality assessment, in particular evaluation of continence management practices among elders in various settings and addressing any barriers to improve continence outcome.

Algorithm for Initial Management of Urinary Incontinence in Frail Disabled Elderly People (Ref. 5, UTI=urinary tract infection; CNS=central nervous system; ADL=activities of daily living)



Reported by Dr. TK Kong

On behalf of the Guidelines Development Group on Continence Care

Dr. SY Au
 Ms. SK Chan
 Ms. MW Chu
 Ms. KT Ip
 Ms. CF Lee
 Dr. MF Leung
 Dr. KH Or
 Dr. CK Tam
 Ms. YM Yeung

Dr. Felix Chan
 Dr. KC Chiu
 Ms. Becky Fung
 Dr. TK Kong (Chairman)
 Ms. Patricia Lee
 Ms. Quiteria Mok
 Ms. Katherine Siu
 Ms. SY Tong

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1. IDENTIFICATION

Urinary incontinence is defined as involuntary loss of urine which is objectively demonstrable and a social or hygienic problem (ICS, 2001). Urinary incontinence affected 28.4% of people over 60 years attending general practitioners in Hong Kong (Hong Kong Continence Society and Hong Kong College of Family Physician, 1996). It is increasingly prevalent with age.

Incontinence is a distressing and unpleasant problem. It may interfere with daily life and social activities and influence relationships, self-perception, general health and the overall quality of life. These conditions may go largely under-reported in the community because the incontinent people are frequently:

- disabled by, embarrassed and often ashamed of their condition; keeping it secret from even those closest to them
- reluctant to seek help within the family and need encouragement to seek advice from health professionals
- unaware of the treatments available to cure or manage their condition
- believe that incontinence is a part of normal aging

1.1. IDENTIFY THE INCONTINENT INDIVIDUALS

Incontinence is a syndrome of underlying problems which with thorough assessment and investigation, can be identified and treated. Although incontinence can affect people of all ages, sex or social class, there are also a number of discrete groups who are more likely to encounter problems with incontinence or have access difficulties:

- people with long term physical disabilities, neurological conditions and cognitive impairment
- frail elderly person especially in hospital and residential care
- woman who had large babies, forceps deliveries or multiparity

Professional staff should be able to identify these individuals and to offer help and advice. Moreover, education is required to encourage early reporting of symptoms and identification of at risk people.

1.2. ASSESSMENT CUES FOR EVALUATING URINARY PROBLEMS

In order to identify those incontinent people, it is important to ask specifically about incontinent symptoms. Questions that can be helpful in identifying incontinent patients include (Ouslander, 2000):

- Do you ever leak or lose urine when you don't want to?
 - Once your bladder feels full, how long can you hold it?
 - Do you ever have difficulty getting to the bathroom on time?
 - Do you ever wear a pad to protect you from wetness?
- a. To identify stress incontinence
- Do you leak when you cough, sneeze, laugh or exercise?
 - Do you leak when you go up the stairs or run for a bus?
 - Do you leak when you get up from a chair or bed?
- b. To identify frequency with urgency, urge incontinence
- Do you pass urine frequently with urgency over a 24-hour period?
 - Is the desire to go so great that you would be wet if you did not get to the toilet immediately?
 - Do you feel the sudden desire to void when you hear running water or put your key in the front door?
- c. To identify functional incontinence
- Do you have any physical limitation in movement?
 - Are you able to manipulate your clothing before voiding?
 - Are you able to gain access to toilet facilities?
- d. To identify overflow incontinence (Tan, 2001)
- Do you know when urine is leaking?
 - Are you wet all the time?
 - Do you have hesitancy?
 - Do you strain to pass urine?
 - Have you noticed that your stream is not as good as it used to be?
 - Do you find that you leak immediately after you think that your stream has finished (post-micturition dribble)?

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2. EVALUATION

2.1. GOALS

- to determine the causes of transient or persistent incontinence
- to detect uncommon but serious conditions that may underlie incontinence, including lesions of the brain and spinal cord, carcinoma of the bladder or prostate, bladder stones, hydronephrosis, decreased bladder compliance and bladder-sphincter dyssynergia¹
- to assess the patient's environment and the available support and resources¹

2.2. COMPONENTS

2.2.1. History

- i. Type of incontinence (urge, stress, overflow, functional or mixed urge and stress)
Classical history
Urge: urgency, frequency, usually larger but variable amount
Stress: leaking on exertion, e.g. coughing, laughing & sneezing, usually small amount
Overflow: hesitancy, intermittence, straining, terminal dribbling, incomplete emptying, poor stream, usually small amount
Functional: leakage associated with inability to toilet, usually larger amount
- ii. Frequency, volume, severity, duration, pattern (diurnal, nocturnal, or after taking medication), and relationship to posture
- iii. Associated symptoms (straining to void, incomplete emptying, dysuria, haematuria, suprapubic / perineal discomfort)
- iv. Alteration in bowel habit / sexual function
- v. Significant past and present medical, surgical, urologic, gynaecologic and neurologic history (e.g. cancer, diabetes, acute illness, neurological disease, urinary tract infections, and pelvic or lower urinary tract surgery or radiation therapy) and previous medical or surgical treatment (type, outcome, protective devices)
- vi. Medications including non-prescription agents

- vii. Functional assessment (mobility, manual dexterity, mentation, motivation)
- viii. Assessment of living conditions and social environment
- ix. Assessment of effect of incontinence on patient and / or carer
 - a. Their view and attitude on the problem
 - b. How severe is the problem to them
 - c. How bothered is the problem to them
 - d. Effect on quality of life

2.2.2. Physical examination

- i. Abdominal examination
 - a. Palpate for bladder distension after voiding
- ii. Rectal examination check for
 - a. Skin irritation
 - b. Symmetry of gluteal creases
 - c. Perineal sensation
 - d. Resting tone and voluntary control of anal sphincter
 - e. Prostatic enlargement (although its size correlates poorly with obstruction)
 - f. Faecal impaction
 - g. Masses
- iii. Pelvic examination

Looks for obvious gynaecological abnormalities, if detailed gynaecological examination is warranted, please refer to gynaecologist.

Look for:

 - a. Atrophic vaginitis
 - b. Urethritis
 - c. Pelvic muscle laxity
 - d. Pelvic mass
 - e. Pelvic organ prolapse
- iv. Neurological examination

Check for signs of neurologic disease (dementia, delirium, stroke, Parkinson's disease, cord compression, peripheral / autonomic neuropathy), mental status and spinal deformities
- v. Identify general medical illnesses (e.g. orthostatic hypotension, heart failure, peripheral edema, abdominal organomegaly or mass)

- vi. Stress test for incontinence
 - a. The bladder should be full
 - b. The best position is an upright position, however, supine position may be adopted if necessary
 - c. The patient should relax the perineal muscles (confirmed by checking of the gluteal folds and assume a position as close to upright as possible)
 - d. The patient should cough or strain vigorously once while the examiner observes for urine loss from the urethra (typical of stress incontinence: is an instantaneous squirt that coincides with the increase in abdominal pressure and ceases as it declines)
 - e. Note stress-induced detrusor activity: the leakage is delayed and follows increased abdominal pressure

2.2.3. Post-void residual (PVR) urine measurement

Abdominal examination should be performed to look for palpable bladder. There is no standard maximal PVR volume that is considered normal, nor is there a standard minimum that is considered abnormal.

Exact measurement of PVR, by (i) catheterization or (ii) pelvic ultrasound, has important diagnostic implications in the incontinent elderly; <50ml is empirically considered normal (more appropriately, an indication of acceptable bladder emptying), whereas >100ml may be considered abnormal and may justify further evaluation.

2.2.4. Urinalysis

Urinalysis is designed to detect associated or contributing conditions such as haematuria (suggestive of carcinoma, infection, calculus), pyuria and bacteriuria, as well as glycosuria and proteinuria.

- i. Dipstick (enzymatic) testing of urine is an acceptable screening method of urinalysis
- ii. Microscopic evaluation of urinary sediment may be used for detailed analysis
- iii. Urine culture should be obtained to exclude infection

2.2.5. Micturition diary / voiding record / bladder chart / frequency volume chart to document all voids and incontinence episodes and related habits or conditions for 2-7 days.

This provides:

- i. Diagnostic information on characteristics of voiding and incontinence, functional bladder capacity (largest single void), excess nocturnal fluid output, excess fluid intake, and subtle precipitants
- ii. Clues to simple effective treatment without further evaluation
- iii. Baseline data to gauge the efficacy of treatment

2.2.6. Blood test

Renal function test should be performed.

2.2.7. Optional investigations

- i. Blood test
Glucose, calcium
- ii. Urine cytology: for patients with haematuria, suprapubic / perineal pain, or unexplained new onset or worsening of incontinence
- iii. Urinary tract imaging
- iv. Cystoscopy: for patients with haematuria, suspicion of lower urinary pathology (e.g. bladder fistula, stone, or tumour; urethral diverticulum), or need for lower urinary tract surgery

2.2.8. Urodynamics

A good urodynamic practice comprises three main elements

- a clear indication for and appropriate selection of, relevant test measurements and procedures
- precise measurement with data quality control and complete documentation
- accurate analysis and critical reporting of results

Indications:

1. To increase the diagnostic accuracy above that which can be achieved by non-urodynamic means.
2. To make a diagnosis on which a management plan can be based.
3. If there are coexisting abnormalities to provide evidence to determine which should be treated first.
4. To define current situation as a baseline for future surveillance.
5. To predict problems that may follow treatment interventions.
6. To assess the natural history of lower urinary tract dysfunction.

7. To provide evidence that influences the timing of treatment.
8. To exclude abnormalities which might interfere with the management of that patient.
9. To assess the results of treatments designed to affect lower urinary tract function.

Principles of urodynamic technique

- must be carried out in a safe and scientific manner
- ensuring privacy and comfort of the patient
- proper care must be applied to the infection control aspects of investigation and the principle of sterility followed
- the investigations must be free of technical errors
- the investigator must be satisfied as to the reproducibility of urodynamic results

Standardization of technique

Both technique and terminology should be standardized. The standardization from International Continence Society should be followed in the technique and terminology used in the reporting of the urodynamic findings.

Common urodynamic tests

- Uroflowmetry
- Cystometry – filling / voiding
- Videourodynamics
- Ambulatory Urodynamics
- Urethral Pressure Profile
- Neurophysiological Testing

a. Uroflowmetry

Uroflowmetry is non-invasive and relatively inexpensive. It is an indispensable first line screening test for most patients with suspected lower urinary tract dysfunction.

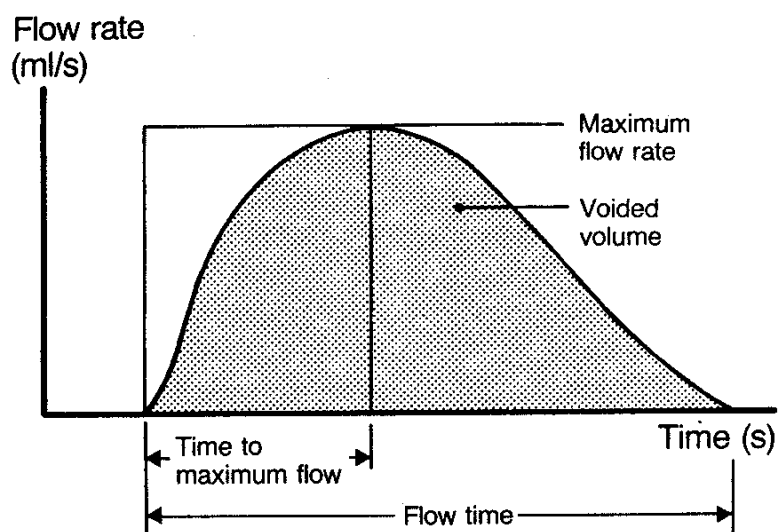
Indications:

- patients with stress incontinence
- symptoms suggestive of outlet obstruction

Measurements

- flow rate (ml/sec)
- maximum flow rate (Qmax)
- voided volume (VV)
- flow time
- average flow rate (Qave)
- time to maximum flow

Typical flow diagram



b. Cystometry

The aims of cystometry are to define detrusor function and urethral function during both filling and voiding. This will give four possible diagnoses during cystometry, for example: on filling, detrusor function normal, urethra incompetent (patient leaked); on voiding, detrusor underactive (low flow rate, patient strained to void), and urethra normal.

Measuring pressure correctly

There are three fundamental and vital steps in measuring pressure correctly:

- set zero
- calibrate the transducers
- establish the pressure reference level

Filling cystometry

Four essential measurements must be made throughout filling:

- intravesical pressure (p ves)
- intra-abdominal pressure (p abd)
- detrusor pressure (p det = p ves – p abd)
- urine flow rate to detect leaks

Optional measurements during cystometry

- bladder volume
- simultaneous video cystography
- electromyography
- urethral pressure measurement

Rates of bladder filling

- slow-fill cystometry – up to 10 ml per minute
- medium-fill cystometry – between 10 and 100 ml per minute
- fast-fill cystometry – when the rate is greater than 100 ml per minute

Patient positioning

Patient should either sit or stand after putting in all catheters throughout the filling cystometry

Assessment during bladder filling

- bladder sensation
- detrusor activity
- bladder compliance
- urethral function
- bladder capacity

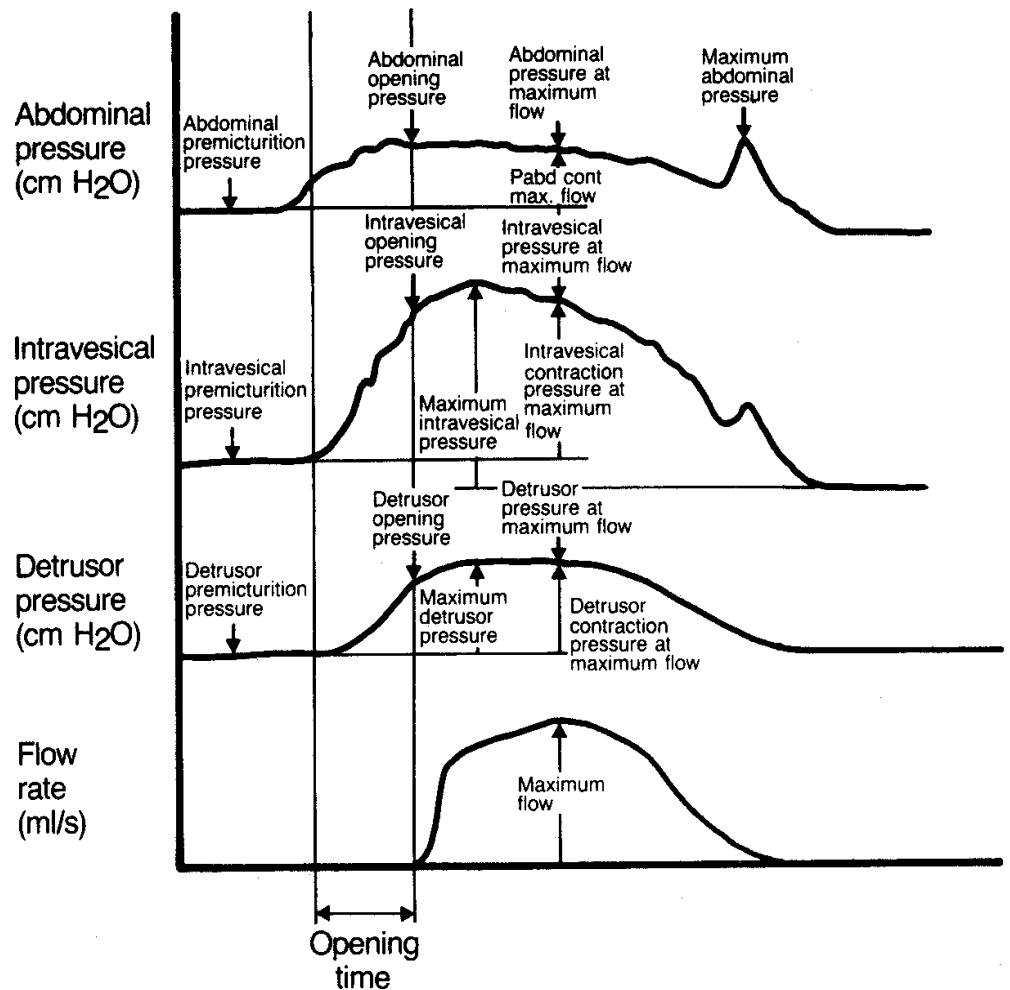
Voiding cystometry

During a pressure-flow study of voiding, intravesical pressure and flow rate are measured continuously

- pre-micturition pressure
- opening time
- opening pressure
- maximum voiding pressure
- pressure at maximum flow
- contraction pressure at maximum flow

- after-contraction

Pressure flow recording with micturition



c. Video-urodynamics

Videourodynamics has advantage over the basic urodynamics because combining X Ray and urodynamic investigations, videourodynamics offers the most comprehensive means of assessment. The prime indication for videourodynamics is when anatomical information is required as well as physiological data.

Indications for videourodynamics

- defining the site of bladder outlet obstruction: videourodynamics is the best method and is important when the level of obstruction cannot be predicted

- patients with neurological disease likely to cause vesico-urethral dysfunction are best investigated by videourodynamics

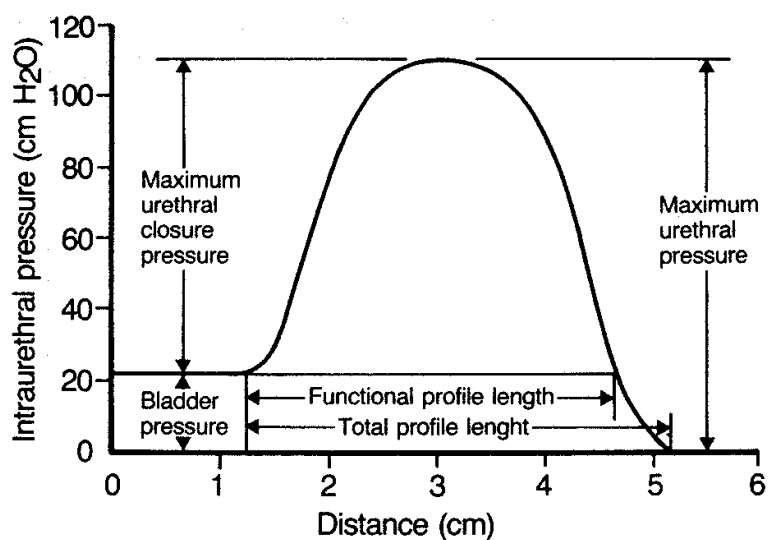
d. Ambulatory urodynamics

Ambulatory urodynamics are used when conventional urodynamics fail to achieve the prime aim of urodynamic study. Ambulatory urodynamics could be used to confirm the patient's history of incontinence where conventional urodynamics has been normal and to determine whether detrusor instability or sphincter weakness is the main cause of incontinence if the patient desires further treatment. However, the use of videourodynamics is still experimental and should be limited to centers with expertise in advanced urodynamics study.

e. Urethral pressure profile

Urethral pressure profile indicates the intraluminal pressure along the length of the urethra with the bladder at rest. In view of the poor specificity of stress urethral pressure profile, its use has declined significantly. The measurement of static urethral pressure profile is mainly on postprostatectomy incontinence.

Static Urethral Pressure Profile in Female



f. Neurophysiological testing

Neurophysiological testing including electromyography, nerve conduction studies, reflex latencies, evoked responses and sensory testing could be used in conjunction with urodynamics study. Since the interpretation of the findings need detail understanding of the complex neuropathology of the bladder current practice of neurophysiological testing has been limited to very advanced centers in the world. In general, detailed neurological examination with urodynamic studies will already yield appropriate answer to the condition.

2.3. REFERENCES

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3. MANAGEMENT

3.1. ETIOLOGY OF URINARY INCONTINENCE

Etiology of urinary incontinence in the elderly is complex and a number of associated factors are contributing to incontinence in this age group. An intact micturition pathway is vital for normal micturition but it also depends on patient and environmental factors.

3.2. TYPES OF URINARY INCONTINENCE

3.2.1. Transient incontinence

- a. Transient incontinence has an abrupt onset, which is usually associated with administration of medications or onset of acute illness
- b. The mnemonic **DIAPPERS** (Resnick 1984) is useful in helping physicians to rule out and manage possible reversible causes of transient incontinence accordingly

D: Delirium

I: Infection of urinary tract or other infection

A: Atrophic urethritis and vaginitis

P: Pharmaceutical (diuretics, anticholinergic, antihistamine, Ca channel blocker)

P: Psychological problems, especially depression

E: Excess urine output (eg. congestive heart failure, hyperglycaemia)

R: Restricted mobility

S: Stool impaction

3.2.2. Established incontinence

- a. Urge Incontinence
- b. Stress Incontinence
- c. Overflow Incontinence
- d. Mixed Incontinence
- e. Functional Incontinence

Incontinence Type	Etiology	Character	Classification	Management
URGE	<p>Detrusor overactivity</p> <p>Secondary to aging, impaired central nervous system inhibition (e.g. cerebral vascular accident, cervical stenosis) or local bladder irritation (e.g. infection, stones, neoplasm)</p>	<p>Commonest type</p> <p>Abrupt precipitant urgency with moderate/large leakage</p> <p>Often complain of urinary frequency and nocturia</p>	<p>1. Detrusor Hyperreflexia -overactivity associated with central nervous system lesion</p> <p>2. Detrusor Instability -overactivity idopathic/ due to other causes</p> <p>3. Overactive Detrusor with Contractile function preserved Vs impaired i.e. Detrusor hyperactivity with impaired contractility (DHIC)</p>	<p>Correct reversible medical causes, e.g. infection, bladder stones, neoplasm</p> <p>Behavioural therapy</p> <p>Pharmacological treatment: Anticholinergics to diminish unstable bladder contractions</p>
STRESS	<p>Impaired urethral closure due to insufficient support from pelvic endofascia & muscles (e.g. menopause, aging, difficult childbirth, transurethral/radical prostatectomy)</p>	<p>Leakage secondary to maneuvers that increase abdominal pressure</p>	<p>Other rare forms:</p> <p>1. Continuous leaks secondary to complete failure of urethral closure</p> <p>2. Episodic leaks in which sphincter abruptly & paradoxically relaxes</p>	<p>Pelvic floor exercise</p> <p>Pharmacological Rx</p> <p>Surgical Correction</p>
OVERFLOW	<p>Detrusor underactivity (e.g. peripheral neuropathy, disc herniation, spinal stenosis)</p>	<p>Leakage typically is small volume and continual in nature</p> <p>Postvoid residual</p>	<p>Other rare forms:</p> <p>Detrusor sphincter dyssynergia due to spinal cord lesion which interrupt signals from pontine micturition center leading to detrusor</p>	<p><u>For underactivity:</u></p> <p>Intermittent clean catheterization, continuous foley catheterization</p> <p>Cholinergic drugs increase detrusor contraction</p>

	Bladder outlet obstruction (BOO) (e.g. benign prostatic hypertrophy (BPH), carcinoma of prostate, urethral stricture, cystocele, prior surgery)	volume (PVRU) is elevated	sphincter incoordination	For BOO: Medical Rx: BPH-alpha blocker, antiandrogen Surgical Rx: Urethrolisis for old vaginal/urethral operation, Transurethral resection of prostate for BPH
MIXED	Urge + Stress incontinence	Second common type of incontinence	Urge or Stress predominant	Respective treatment for urge and stress incontinence
FUNCTIONAL	Functional causes e.g. immobility or impaired cognition that prevent patients from getting to bathroom	Associated with neurological or musculoskeletal disorder		Behavioural therapy Incontinence pads Indwelling catheters

(Reference: 2nd Edition Oxford Textbook of Geriatric Medicine)

3.3. PHARMACOLOGICAL TREATMENT OF URINARY INCONTINENCE

3.3.1. Overactive bladder

Studies have documented a 33-61% prevalence of an overactive bladder in the elderly over the age of 65 years ^{1,2}. Its management is generally similar to the approach taken in younger individuals, except that greater caution should be taken when pharmacological intervention is being considered because of the susceptibility of older people to adverse drug reactions. An abundance of drugs has been used for the treatment of the overactive detrusor. However, for many of them, clinical use is based on the results of preliminary, open studies rather than randomized, controlled clinical trials. It should be stressed that in many trials on both detrusor instability and detrusor hyperreflexia, there has been such a high placebo

response that meaningful differences between placebo and active drug cannot be demonstrated.

Table 1: Drugs used in the treatment of bladder overactivity

Drugs	Pharmacological and / or Physiological Evidence	Clinical Evidence	Assessment	Recommended Dosage
Anticholinergic drugs				
Propantheline ^{5,6}	E	A	R	7.5-30mg 3-5 times daily
Tolterodine ⁷⁻¹⁸	E	A	R	1-2mg 2 times daily
Drugs with mixed actions				
Oxybutynin ¹⁹⁻²¹	E	A	R	2.5-5mg 3 times daily
Antidepressants ^{22,23}				
Imipramine ³⁶	E	A	R	10 – 50mg daily
Vasopressin analogues				
Desmopressin ³⁷	E	A	R	200-400mcg nocte* ⁴¹

E = Efficacious; U = Unproven; A = Good Quality RCT ; B= Clinical Studies ; C = Expert Opinion ;
R = Recommended

*for adult under 65 years

a. Antimuscarinic (Anticholinergic) drugs

Antimuscarinics are still the most widely used treatment for urge incontinence ³. However, currently used drugs lack selectivity for the bladder ⁴, and effects on other organ systems may result in side effects, which limit their usefulness.

(i) Propantheline

Propantheline bromide is a quaternary ammonium compound, non-selective for muscarinic receptor subtypes, which has a low (5 to 10%) and individually varying biological availability ⁵. It is usually given in a dose of 15 to 30mg 4 times daily, but to obtain an optimal effect, individual titration of the dose is necessary, and often higher dosage. Using this approach in 26 patients with involuntary detrusor contractions, Blaivas et al. ⁶ in an open study obtained a complete clinical response in all patients but one, who did not tolerate more than propantheline

15 mg 4 times daily. The range of dosages varied from 7.5 to 60 mg 4 times daily.

(ii) Tolterodine

Tolterodine is a potent and competitive antagonist at muscarinic receptors, intended for treatment of urinary urgency and urge incontinence⁷⁻⁹. The drug has no selectivity for muscarinic receptor subtypes, but shows selectivity for the bladder over the salivary glands in an animal model⁷, and possibly in man¹⁰. Tolterodine has a major active metabolite with similar pharmacological profile¹¹. This metabolite significantly contributes to the therapeutic effect of tolterodine^{12,13}.

Several randomized, double blind, placebo-controlled studies, both on patients with idiopathic detrusor instability and detrusor hyperreflexia, have documented a significant reduction in micturition frequency and number of incontinence episodes^{9,14-16}. Tolterodine seems to be well tolerated when used in the dosage range 1 to 4 mg a day. In a placebo controlled study, comparing tolterodine (2mg x 2) and oxybutynin (5mg x 3) in 293 patients with detrusor instability, both drugs were found to be equally effective in reducing frequency of micturition and number of incontinence episodes. However, tolterodine appeared to have a better efficacy/tolerability profile¹⁷. These findings were largely confirmed in another study on 240 patients with bladder overactivity¹⁸.

b. Drugs with “Mixed” actions

Some drugs used to block bladder overactivity have been shown to have more than one mechanism of action. They all have a more or less pronounced antimuscarinic effect and, in addition, an often poorly defined “direct” action on bladder muscle.

(i) Oxybutynin

Oxybutynin has several pharmacological effects, some of which seem difficult to relate to its effectiveness in the treatment of detrusor overactivity. It has both an antimuscarinic and a direct muscle relaxant effect.

Several studies, both open and controlled, have shown that oxybutynin is effective in controlling detrusor overactivity¹⁹. In a randomized, double-blind, crossover trial of 30 patients with detrusor instability, Moisey et al.²⁰ compared oxybutynin 5 mg 3 times daily with placebo. 23 patients completed the study; 5 withdrew because of severe side effects. Of the patients who completed the trial, 17 (69%) had symptomatic improvement and nine had improvement on urodynamic assessment. The effect of oxybutynin in the management of idiopathic detrusor instability in women was studied by Tapp et al²¹ in a double-blind, fixed dose (5 mg x 3) placebo-controlled trial. Oxybutynin was significantly better than placebo in improving lower urinary tract symptoms and urodynamic parameters. However, 8 of 20 women receiving oxybutynin stopped medication because of side effects and of those completing active therapy, 80% suffered significant side effects, such as dry mouth or dry skin. This highlights the difficulty of conducting double blind studies with this drug because of the severe side effects obtained with active treatment, which makes it difficult to blind the study.

Selection between Tolterodine and oxybutynin should be individualized and taking into account the cost and the tolerability and side effect profiles.

(ii) Antidepressants

Several antidepressants have been reported to have beneficial effects in patients with detrusor overactivity^{22,23}. Imipramine is the drug that has been widely used clinically to treat this disorder. However, it is also well established that therapeutic doses of tricyclic antidepressants may cause serious toxic effects on the cardiovascular system (orthostatic hypotension, ventricular arrhythmias). The risks and benefits of imipramine

in the treatment of voiding disorders do not seem to have been assessed.

Side effects of anti-cholinergic agents include dry mouth, constipation, blurred vision, confusion and urinary retention.

Contraindications to anti-cholinergic agents include gastrointestinal obstruction, glaucoma, tachyarrhythmia, myasthenia gravis, bladder outlet obstruction, acontractile detrusor and significant residual urine.

3.3.2. Overflow incontinence

According to the definition of ICS, overflow incontinence is “leakage of urine at greater than normal bladder capacity. It is associated with incomplete bladder emptying due to either impaired detrusor contractility or bladder outlet obstruction”. If bladder outlet obstruction is suspected, reversible causes like constipation should be excluded before considering pharmacological treatment.

Pharmacological treatment should be based on previous urodynamic evaluation. The aim of treatment is to prevent damage to the upper urinary tract by normalizing voiding and urethral pressures. Drugs used for increasing intravesical pressure, i.e., “parasympathomimetics” (acetylcholine analogues such as bethanechol), or α -adrenoceptor antagonists, have not been documented to have beneficial effects²⁴. Stimulation of detrusor activity by intravesical instillation of prostaglandins has been reported to be successful; however, the effect is controversial²⁵.

Other means of reducing outflow resistance in these patients, particularly if associated with spasticity are baclofen, benzodiazepines and dantrolene sodium (Wein, et al., 1994).

Table 2: Drugs used in the treatment of overflow incontinence

Drugs	Pharmacological and / or Physiological Evidence	Clinical Evidence	Assessment	Recommended Dosage
(For bladder outlet obstruction)				
Alpha-Adrenoceptor agonists				
Alfuziosin	E	B	-	2.5-5mg 2 times daily
Doxazosin	E	B	-	1-8mg daily
Prazosin	E	B	-	0.5-2mg 2 times daily
Terazosin	E	B	-	1-10mg daily
Tamsulosin	E	B	-	400mcg daily
(For impaired detrusor contractility)				
Muscarinic receptor agonists				
Bethanechol	E	B/C	-	10-25mg 3-4 times daily
Carbachol	E	B/C	-	2mg 3 times daily
Anticholinesterase inhibitors				
Distigmine	E	B/C	-	5mg alternate day - daily

E = Efficacious; U = Unproven; A = Good Quality RCT ; B= Clinical Studies ; C = Expert Opinion ; R = Recommended

3.3.3. Stress incontinence

Many factors seem to be involved in the pathogenesis of stress urinary incontinence: urethral support, vesical neck function, and function of the urethral muscles²⁶. Anatomical factors cannot be treated pharmacologically. Since women with stress incontinence have lower resting urethral pressures than age-matched continent women^{27,28}, it seems logical to increase urethral pressure to improve the condition.

The pharmacological treatment of stress incontinence aims at increasing tone in the urethral smooth muscle. Although several drugs may contribute to such an increase, including α -adrenoceptor antagonists and imipramine^{3,25}, only α -adrenoceptor agonists and estrogens, alone or together, have been more widely used. Estrogen (vaginal) may also be considered in postmenopausal women with stress incontinence.

a. α -Adrenoceptor agonists

Even if several drugs with agonistic effects on α -adrenoceptors have been tried as a treatment of stress incontinence, ephedrine and norephedrine seem to be the most widely used drugs^{3,25}. They have both been reported to be effective in stress incontinence²⁹⁻³², ephedrine at a dose of 25 to 50 mg 3 to 4 times daily, and norephedrine at a dose of 50 to 100 mg 2 to 3 times daily. These drugs lack selectivity for urethral α -adrenoceptors, and may increase blood pressure. They also can cause sleep disturbances, headache, tremor and palpitations^{3,25}.

The drugs may be used on a demand basis in certain situations known to provoke leakage. Long-term experiences with the drugs are lacking.

b. α -Adrenoceptor antagonists

The theoretical basis for the use of α -adrenoceptor antagonists in the treatment of stress incontinence is that blockade of urethral α -adrenoceptor antagonists may enhance the effects of noradrenaline on urethral α -adrenoceptors. Even if propranolol has been reported to have beneficial effects in the treatment of stress incontinence^{33,34}, there are no controlled clinical studies supporting such an action.

c. Imipramine

Imipramine, among several other pharmacological effects, inhibits the re-take of noradrenaline in adrenergic nerve ending. In the urethra, this can be expected to enhance the contractile effects of noradrenaline on urethral smooth muscle. Gilja et al³⁵ reported in an open study on 30 women with stress incontinence that imipramine, 75 mg daily, produced subjective continence in patients and increased mean maximal urethral closure pressure (MUCP) from 34 to 48 mm Hg. No controlled clinical trials on the effects of imipramine seem to be available.

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3.4. BEHAVIORAL MANAGEMENT

Behavioral management is considered as the first line management of UI. It is the least invasive treatment with minimal potential adverse complications and does not limit future treatment options. Many published results indicated that most UI patient treated with behavioral techniques show improvement ranging from complete dryness to decreased UI episodes. Even cognitively impaired elderly can achieve dependent, social or sometimes independent continence when treated with appropriate behavioral techniques (Fonda, 1990). Behavioral management can also be used in combination with other therapies in the treatment of UI (AHCPR, 1996).

Behavioral management can be mainly divided into three areas that include toileting regimes, bladder training, and pelvic floor muscle exercise. Most of these areas involve an educational program, scheduled voiding, and positive reinforcement for successful toileting.

3.4.1. Toileting regimes

It is a regular toileting programme which aims to ensure bladder emptying before incontinence occurs. This will be different for each patient, and the optimum time between void should be identified using a voiding record. Patient who demonstrates cognitive and physical impairment especially the elderly patients in the long-term care facilities may benefit from the toileting regime (Cochrane Library, 2001). Outcome

measure for toileting programme is documented as the percentage of decrease wet frequency from baseline to treatment and increase appropriate toileting behaviour such as appropriate toileting rate (Ouslander, et al., 1995).

a. Prompted voiding:

Patient is contacted at regular intervals (every 2 hours) and asked whether they are wet or dry, and whether they need to toilet. Patients are socially reinforced for positive responses to prompts and appropriate toileting. Prompted voiding is recommended for patients who can discern wet or dry status and the ability to request toileting. Patient with consistent prompts and toileting assistance will promote a certain degree of continence. Elements of prompted voiding include:

- **Check and Talk:** Patient is checked by caregivers on a regular basis and asked to report verbally if wet or dry
- **Prompt:** Patient is asked to try to void or to use of toilet
- **Praise:** Patient is praised for maintaining continence and for trying to toilet
- **Correction:** Give corrective feedback and expect patient to stay dry in case where she/he is wet (Petrilli et al,1988)

b. Timed voiding (routine or schedule toileting):

The caregiver offers toileting assistance on a fixed schedule at regular intervals, i.e. every 2-4 hours. The goal is to keep the patient dry or decreases UI episode during the day. There are no specific communication steps that are followed in simple scheduled-toileting protocols and patient plays a passive role. Patient fails to initiate toileting and fails to discern of wet or dry status is suitable for regularly scheduled toileting (AHCPR, 1996).

c. Habit training:

Patient is scheduled to toilet according to his/her natural voiding pattern. The caregiver needs to work up a program of toileting time that based on individual voiding patterns through evaluation of the frequency and volume chart. Toileting times are therefore different to each individual, rather than treating all patients the same (Norton,

1996). Patient & carer's compliance is essential for the success of the program. However, caregiver compliance is a problem especially in the long-term care facilities, but it is an excellent technique for patients in the home living with a caregiver (AHCPR, 1996).

3.4.2. Bladder training

Bladder training has been shown to be effective in managing urge incontinence (AHCPR,1996). It involves a strict schedule for toilet visit and requires patient to resist or inhibit the sensation of urgency (the strong desire to urinate), to postpone voiding and to urinate according to a timetable rather than the urge to void (Button, et al., 1999). It aims to increase the interval between urination gradually until normal voiding interval is reached, i.e. every 3 to 4 hours. Consistent charting of voiding pattern is vital in assessing progress, and can give patient useful feedback that results are positive (Norton, 1996). Bladder training involves patient's motivation for starting and maintaining a schedule for voids and it usually takes 6 to 8 weeks for success.

Way to do bladder training:

- start with bladder diary to determine the amount of urine that the bladder can hold
- review the bladder diary and set toileting schedule according to the time interval of each voiding
- strictly follow the toileting schedule for the first week. Use ***'Deferment Technique'*** (below) to resist urge sensation and wait until the next scheduled time to void. Use toilet only if urge sensation cannot be suppressed, but then resume the toileting schedule
- gradually increase the time interval by 15 or 30 minutes on each week as tolerated. The schedule can be further increased if UI decreases week by week

Deferment technique (DuBean, 2002):

- stand quietly or sit still to prevent over stimulation of the bladder
- relax and take deep breaths slowly
- repeated to contract PFM to keep the urethral closed to prevent urine loss

- use mental distraction to suppress the urge sensation, e.g. by mathematical calculations
- when urge sensation subsides, do not go to void until the next schedule

3.4.3. Fluid management

- maintain fluid intake $>1.5\text{L/day}$ at a regular intervals; do not restrict fluid unless medically ordered
- patients with nocturia may benefit from fluid restriction 2 hours before bed, or no soup or drink at dinner and thereafter except sips for medication. However, they should maintain an adequate fluid intake before the evening
- eliminate intake of bladder irritants such as alcohol, caffeine. Caffeine is found in coffee, tea, common soft drinks like Pepsi and Coca Cola. Foods that contain chocolate also contain caffeine

3.4.4. Other advices

- patients with oedema of lower extremities should be advised to elevate their legs during the day to stimulate a daytime natural diuresis, thus limiting the amount of oedema and voiding during the night
- avoid going to toilet for 'just in case'. Follow the set up toileting schedule as far as possible
- maintain good bowel habits to avoid constipation as this can increase bladder sensitivity
- identify medications with your doctor that could aggravate UI

Table for behavioral techniques for managing different types of UI (AHCPR, 1996):

Target group	Behavioural management					Strength of Evidence
	<i>Timed voiding</i>	<i>Prompted voiding</i>	<i>Habit training</i>	<i>Bladder training</i>	<i>PFM exercise</i>	
Chronic UI. High dependence patient with ability to discern wet & dry status and request for toileting		√				B
Chronic UI. High dependence patient but unable either to discern wet & dry status or request for toileting	√					C
Chronic UI. Patient for whom a natural voiding can be determined with a supportive caregiver.			√			B
Urge & stress UI. Motivated patient with good cognition				√	√	A

3.4.5. Voiding diary

Voiding diary provides essential information on the voiding patterns, which help in the interpretation of patient symptoms and use as an aid in diagnosis and treatment planning. It can also use as a record of monitoring treatment progress and outcomes. Information obtained from voiding diary can include (1) total voided volume, (2) frequency of micturition, (3) mean voided volume, (4) largest and smallest single voided volume, (5) diurnal and nocturnal distribution, (6) nature and severity of urinary incontinence episodes (Romanzin & Blaivas, 1997).

Whenever possible, such as in outpatient clinic, patient-centred responsibility in filling the chart is important for keeping its accuracy. Many different charts are available. For example, a bladder record (Appendix 1) can be used to obtain either detail or simplest information. Health care profession should choose the appropriate charts for patient according to one's ability and clinical need. For cognitive able and motivated patient, nursing staff may teach him/her to measure the voided volume. For cognitive impaired patient, carer may require to make the appropriate signs on the chart to indicate patient's incontinence or continence episodes.

Recording by frontline-staff in hospitals or institutions helps to focus staff's attention to geriatric incontinence. Incontinence chart (Appendix 2) is specifically designed for assessing and managing individual's toileting

program. The primary objective is to obtain information not only voiding frequency, volume and UI episodes; but also patient's ability to answer simple questions related to incontinence, and attempt to initiate voiding when offering toileting assistance (Schnelle, 1991). Use of this chart can give a comprehensive picture on patient's progress and response on toileting training program.

For patient requiring intermittent catheterization, a voiding and intermittent catheterization chart (Appendix 3) is used to plan and readjust individual catheterization schedule. It aims to suit patient's daily activities and to protect the upper urinary tract without over-stretching the bladder.

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3.5. PELVIC FLOOR MUSCLE RE-EDUCATION

Pelvic Muscle Exercise (PMEs), PME and bladder inhibition augmented by biofeedback therapy, vaginal weight training and pelvic floor electrical stimulation.

Pelvic muscle rehabilitation can improve control of detrusor and pelvic muscle function¹.

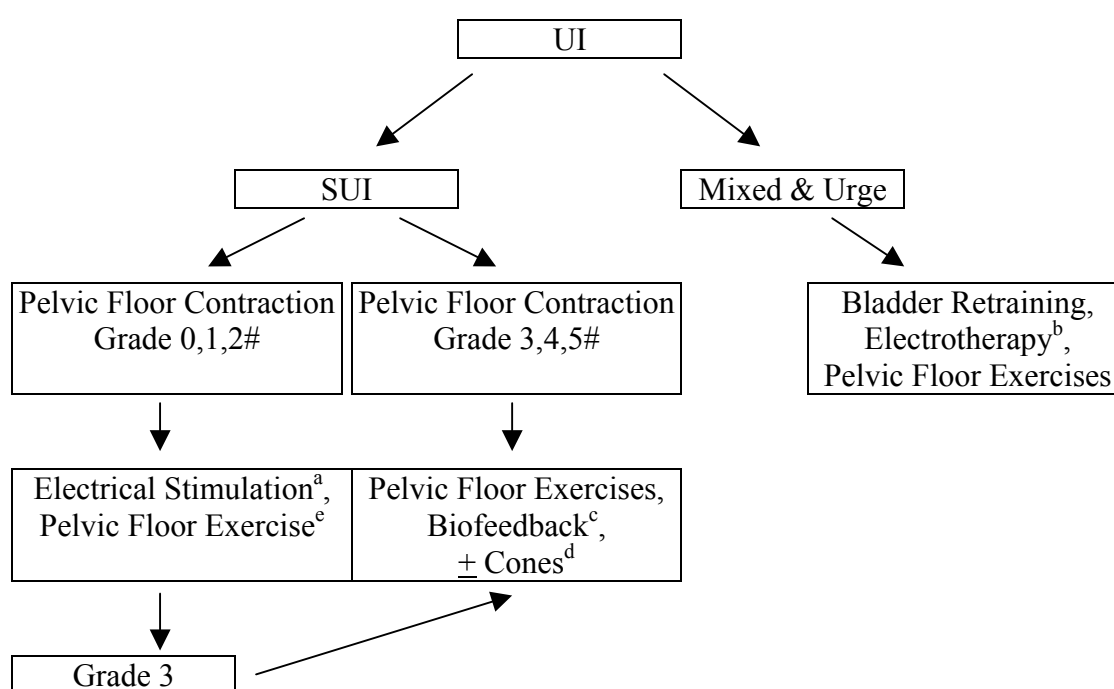


Fig1. Algorithm for physiotherapy management of urinary incontinence

- a. Electrical stimulation activates spinal cord reflex mechanisms of the autonomic nervous system. The pelvic floor muscle contractions occur through a pudendal nerve reflex. (1,2,3)
- b. In treating urge incontinence, through stimulation of the pudendal nerve to activate the pelvic nerve reflex, the uninhibited bladder contractions are depressed or eliminated to establish normal reflex patterns. (3,4)
- c. The biofeedback reinforces pelvic floor contraction directly with moment-to-moment feedback, which characterizes for the patient the quality and intensity of the contraction. (1,5,6)
- d. Specially designed vaginal weights for strengthening the pelvic muscles can augment PME's. There is limited evidence that weighted vaginal cones are beneficial in women with stress urinary incontinence. (1,7)
- e. Pelvic floor exercises are performed to strengthen the voluntary periurethral and perivaginal muscles. Patients are instructed to contract the pelvic floor in a 'squeeze / lift' movement with relaxed breathing, minimal contraction of buttock, or inner thigh muscles. The movement is a inward and squeeze sensation together with a lifting inward sensation. Contraction, in general, should not hold more than 10 seconds. Sufficient rest time in between contractions should also be advised. An individualized program of exercises and repetitions should be tailored made. (1,8,9,10,11)

Pelvic floor muscle strength is graded by modified Oxford Grading (12)

- Grade 0 = nil contraction
- Grade 1 = a flicker contraction
- Grade 2 = a weak contraction which is not fluttering
- Grade 3 = a moderate contraction resulting in a "lift" that is externally visible
- Grade 4 = good contraction resulting in a "lift and inwards drawing" to the pubic bone
- Grade 5 = a strong contraction (a positive movement in a cranial direction)

3.5.1. References

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3.6. ENVIRONMENTAL MEASURES

There are various treatment programs and training activities to help patient regain continence. The efficacy of these continence programs is affected by different factors, such as patients' motivation to comply with treatment programs, relatives' support, patients' cognitive function and learning ability. Another factor which will be the focus of this section is environmental factor. Improvement of environmental condition, for example, access to toilets is apparently helpful to incontinent patients under bladder training program. Better environmental condition may prevent urinary incontinence in some cases. For older persons in particular, continence requires mobility, manual dexterity, cognitive ability to recognize and react to bladder filling, and motivation to stay dry.¹ It is rather common among the elderly that some of these functions are impaired. Such impairment may be compensated or alleviated by adapting and / or modifying the environment, e.g., by using suitable assistive devices. For example, minor environmental modifications such as a bedside commode for women with frequent nocturia may decrease falls and subsequent fractures.² Another objective of environmental modification is to improve home safety.

3.6.1. Classifications of environmental modification

Environmental modifications³ have been categorized as follows:

Types	Examples
1. Major architectural alteration	<ul style="list-style-type: none"> - installation of ceiling hoist - building platform or large ramp - change of habits and diet of clients - change position of water closet and removal of bathtub
2. Minor home modification	<ul style="list-style-type: none"> - installation of handrails - removal of kerb or threshold - demolishing toilet door frame and door to ease entry / redesign of door entrance - re-arrangement of rooms and beds / furniture
3. On-site alteration or simple modification	<ul style="list-style-type: none"> - adaptation of clothing for client - posting of daily routine especially toileting timetable or warning sign - positioning or repairing simple toileting aids - improving the lighting and signage of toilet

3.6.2. Assessment – functional assessment

Before drafting plans for environmental modifications, an assessment will be conducted, that is the functional assessment to assess the physical conditions, cognitive functions and psycho-social conditions of clients.

The assessment includes the following:

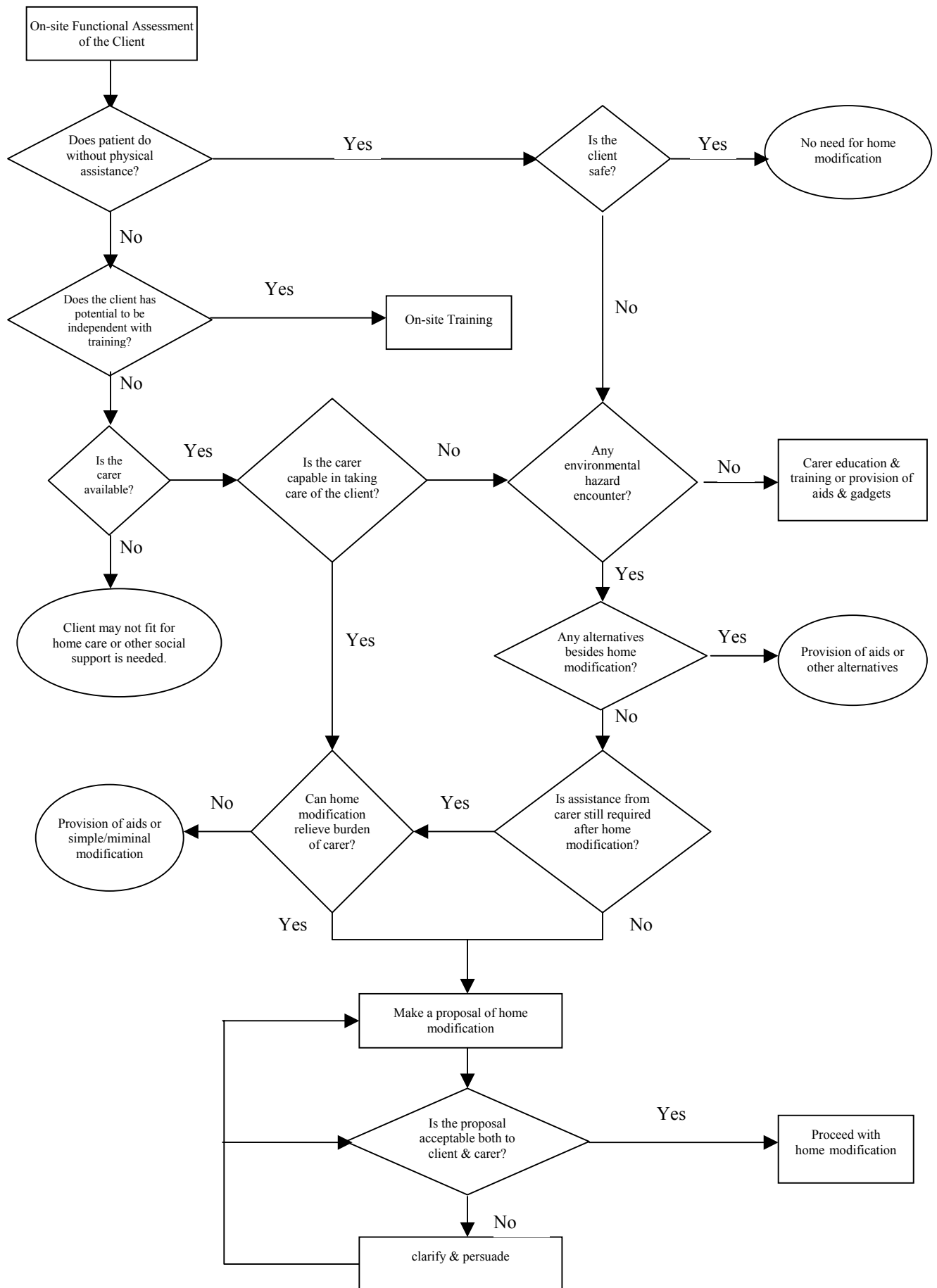
Functional Assessment for Urinary Incontinence	
<i>Functional Ability</i>	<ul style="list-style-type: none"> - mobility status - use of walking aids - difficulties in toilet transfer - position safely on the toilet facilities - hand function - cognitive function
<i>Assessment on Environment & Aids</i> <i>(1) Obstacles to using toilet</i>	<ul style="list-style-type: none"> - doorway - door design - railing system - distance to be traveled - signage - kerb / threshold - use of related assistive devices
<i>(2) Toilet facilities</i>	<ul style="list-style-type: none"> - railing system - dimensions of toilet facilities - space available vs space demanded - types of toilet facilities available - use of related Assistive Devices
<i>(3) Washing and cleaning facilities</i>	<ul style="list-style-type: none"> - types of water faucet - dimensions of the flushing system and sink - hand function sufficient for cleansing tasks - manipulation of tissue paper - use of related assistive devices
<i>Assessment on Clothing</i>	<ul style="list-style-type: none"> - preference & habits of our clients - level of hand function
<i>Identification of Secondary problems</i>	<ul style="list-style-type: none"> - skin condition / skin problem related to incontinence - care-giver ability and attitude in managing incontinence

3.6.3. Checklist for environmental design and modification

Item	Recommendation
Poor lighting	<ul style="list-style-type: none"> - light for distance vision should be 200-210 lux (a well-directed 60 Watt bulb) - avoid working in shadows - light switches should be easily accessible or easy to operate (e.g. use of easy touch switches)
Well polished or wet surfaces may cause slipping	<ul style="list-style-type: none"> - avoid tiles made of marble - use tiles with non-slip surface - non-slip adhesive strips, non-slip mat can be stuck on floor next to tub, sink & toilet - use slip-resistant floor wax with minimal buffing
Electric / Telephone cords on path	<ul style="list-style-type: none"> - avoid loose cords on path - use portable telephone if necessary
Thick carpet borders may cause stripping	<ul style="list-style-type: none"> - use carpets of low pile
Rugs on floor may slide out	<ul style="list-style-type: none"> - use rugs with non-slip backing - throw loose rugs away
Rapidly closing doors	<ul style="list-style-type: none"> - use safety release locks
Kerb / threshold	<ul style="list-style-type: none"> - remove kerb if kerb height more than 1 inch - use contrasting background
Difficulty in bedside commode transfer	<ul style="list-style-type: none"> - appropriate bed height: hips & knees flexed at about 90° with both feet rest on ground - avoid soft and sagging mattress - firm support provided at the the back of commode - position of the commode should facilitate the good side approach of transfer
Identification of Circulation Path (e.g., from living area to toilet, or from bedroom to toilet)	<ul style="list-style-type: none"> - remove obstacles from the circulation paths - ensure sufficient space for ambulation, turning and for transfer, especially for clients using wheelchairs
Inadequate handrails / improper supporting devices at side of toilet seat for toilet transfer	<ul style="list-style-type: none"> - handrails should be cylindrical (with diameter of approximately 1.5 inches) - rails at 1 to 2 inches (clearance) away from wall on both sides - grab bars on wall next to toilet - towel bars should be avoided for support - toilet frame can be used
Toilet seat of inappropriate height	<ul style="list-style-type: none"> - appropriate height: hips & knees flexed at about 90° with both

	<ul style="list-style-type: none"> feet rest on ground - raised toilet seat recommended if height is too low
Poor hand function for managing the water faucet	<ul style="list-style-type: none"> - lever type water tap preferable
Sink at appropriate height for reaching	<ul style="list-style-type: none"> - provide knee space under the wash basin

3.6.4. Flowchart showing the critical pathway of environmental modification



3.6.5. Reference

1. Urinary Incontinence in Adults: Acute and Chronic Management, Clinical Practice Guideline. Number 2 (1996 Update) AHCPR Publication No. 96 – 0682 (1996, March).
2. Brown, J.S. (2000).Urinary Incontinence: Does it increase Risk of Fall and Fractures? Journal of the American Geriatrics Society, 48 (7), 721-725.
3. Working Group on Community Occupational Therapy, Coordination Committee for Occupational Therapy Hong Kong. (1999). Guide to Environmental Modification – Occupational Therapy in Practice. Hong Kong Occupational Therapy Association.

3.7. ACUPUNCTURE

Effectiveness of acupuncture was evaluated and reported in many studies. Improvement of urge- and mixed- type incontinence after acupuncture treatment among elderly women noted even at 3 months follow-up¹. Electro-acupuncture having positive influence on the closure mechanism of the female urethra in patients with stress incontinence². Recent study also shows acupuncture in chronic spinal cord injury patients relieve detrusor hyperreflexia incontinence³.

3.7.1. References

1. Bergstrom, K., Carlsson, C.P., Lindholm, C., & Widengren, R. (2000). Improvement of urge-and mixed-type incontinence after acupuncture treatment among elderly women- pilot study. Journal of the Autonomic Nervous System, 79 (2-3): 173-80.
2. Kubista, E., Altmann, P., Kuceral, H., Rudelstorfer, B. (1976). Electro-acupuncture's influence on the closure mechanism of the female urethra in incontinence. American Journal of Chinese Medicine, 4(2): 177-81.
3. Honjo, H., Naya, Y., Ukimura, O., Kojima, M., & Miki, T. (2000). Acupuncture on clinical symptoms and urodynamic measurements in spinal cord injured patients with detrusor hyperreflexia. Urologia Interantionalis, 65 (4): 190-5.

3.8. REFERRAL

The majority of patients suffering from urinary incontinence are first in contact with primary care physicians and front-line nurses so the management should start with the primary care team and nurses. In fact, for majority of cases with

urinary incontinence should be amenable by simple investigations and management mentioned in the present guideline. The referral to other disciplines would usually means more complicated cases requiring the expert investigation or management.

3.8.1. Role of continence nurse specialists / geriatric nurse specialists

Continence Nurse Specialists and Geriatric Nurse Specialists possess the skills and knowledge in promoting continence through proper assessment and treatment of patients with urinary incontinence. They possess the following expertise in continence management

- promotion of continence care
- proper assessment and treatment of incontinence
- assessing the need and assist in urodynamic study
- education and training on continence care including pelvic floor exercise
- advice on the use of specialized continence aids
- assessment and training on using intermittent catheterization
- advice on bowel management
- conducting community education

3.8.2. Role of geriatricians

Elderly patients with urinary incontinence who failed to respond to treatment from primary care physicians or nurses for more than 3 months should be referred to Geriatrician with interest in care of incontinence patients. The following conditions should be referred to Geriatrician for early assessment: retention of urine, neurological diseases, recurrent urinary tract infection. They possess the following expertise in continence management

- comprehensive geriatric assessment
- accurate diagnosis of medical conditions in elderly patients
- treatment of reversible conditions
- providing medical treatment
- rehabilitation for patients with neurological conditions and functional limitations
- detail assessment including the use of urodynamic study
- provision of community support and education

3.8.3. Role of physiotherapist

Patients with urinary incontinence will benefit from referral to physiotherapists if they require rehabilitation on mobility, pelvic floor training and acupuncture. They possess the following expertise in continence management

- pelvic floor rehabilitation (pelvic floor exercise biofeedback, electrotherapy, vaginal cones)
- mobility training
- bladder training
- acupuncture

3.8.4. Role of occupational therapist

Patients with urinary incontinence may be referred to occupational therapist for further management:

- prescription of aids and appliances to enhance continence ability
- provision of advice on environmental modification
- provision of functional transfer training and manual dexterity training

3.8.5. Role of urologist

Patients with the following conditions should be referred to urologist for assessment and management:

- suspected of suffering from prostatic enlargement causing bladder outlet obstruction
- suspected bladder abnormalities which would benefit from cystoscopy
- patients suffered from intractable urge incontinence who failed to both medical and behavioral treatment

3.8.6. Role of gynaecologist

Patients with the following conditions should be referred to gynaecologist for assessment and management:

- uterine prolapse or cystocele induced outlet obstruction
- operation for stress incontinence when conservative management failed

3.9. SKIN CARE FOR THE INCONTINENT

- a. Individuals with severe intractable incontinence are often immobile and at major risk for skin breakdown. Good hygiene and skin care can prevent skin breakdown and maintain skin integrity.
- b. Perineal skin condition and integrity should be assessed regularly.
- c. Thorough cleansing of the entire genital area should be done at least twice a day. Gentle cleansing of the skin after each soiling is recommended.
- d. Avoid force and friction during cleansing.
- e. Ideally a bath or shower should be taken daily especially in hot season. Water and mild un-perfumed soap can be used. Avoid soap if dry skin, dermatitis or pruritus. Strong soap may destroy sebum, provoke skin reaction and cause discomfort if the skin is already sore. Avoid bubble bath as it is virtually impossible to rinse the skin completely.
- f. After cleansing, the skin should be gently but thoroughly patted dry with a soft towel.
- g. A moisturizing lotion or cream may be applied for dry skin.
- h. If skin irritation is present or at risk, a moisture barrier product (e.g. Zinc or castor oil) should be used. The moisture barrier should be re-applied after each incontinent episode and every 12-24 hours.
- i. Avoid using talcum powder as it can irritate and tend to form lumps when dampened by urine causing encrustations in the groin skin folds.
- j. Absorbent incontinent product should be replaced frequently to keep skin dry. Avoid using plastic pants.
- k. If the skin is becoming sore, factors other than the incontinence should be investigated:
 - sensitive to the materials of incontinent pad or appliance, e.g. latex of a penile sheath
 - the pad may be too rough
 - appliance may be too tight
 - plastic in contact with wet skin
 - candida infection
- l. Minimizing skin injury caused by friction or shearing forces through proper positioning, turning and transfer techniques.

3.9.1. References

Norton, C. (1996). Nursing for Continence (2nd ed.). U.K. Beaconsfield.

Wyman, J.F. (1999). Urinary Incontinence in Clinical Gerontological Nursing: A guide to Advanced Practice, 2nd ed. J.T. Stone, J.F. Wyman & S.A. Salisbury. W.B. Saunders Company, Philadelphia, 203-231.

Urinary Incontinence in Adults: Acute and Chronic Management, Clinical Practice Guideline Number 2. (1996 Update) AHCPR Publication No.96-0682 (1996 March).

LeLievre, S. (2000). Skin Care for Older People with Incontinence. Elderly Care, 11 (10), 36-38.

4. CHRONIC INTRACTABLE URINARY INCONTINENCE

4.1. URETHRAL CATHETERIZATION

4.1.1. Types

- indwelling (urethral or suprapubic) catheterization
- intermittent catheterization (urethral or through urinary diversion)
- catheterize bladder once

4.1.2. Reasons for bladder catheterization

1. acute & chronic urinary retention
2. incomplete bladder emptying
3. monitoring urine output in severe acute illness
4. bladder irrigation for heavy haematuria
5. checking residual urine
6. urodynamic study
7. immediate pre- and post-operative management
8. intra-vesical instillation of drugs
9. urinary incontinence (in exceptional case or as last resort):
 - to prevent contamination of surrounding wound, e.g. stage III or IV pressure ulcers (Evidence B, AHCPR, 1996¹⁹)
 - collecting urine specimen (e.g. 24 hrs-urine) for investigations.
 - terminal ill or severely impaired persons for whom diapers, bed & clothing changes are painful or disruptive (Evidence B, AHCPR, 1996¹⁹)
 - severely impaired individuals in whom alternative interventions are not an option and when a patient lives alone and a caregiver is unavailable to provide other supportive measures (Evidence C, AHCPR, 1996¹⁹)

4.1.3. Duration of bladder catheterization

- Catheterize once
- Short-term (within 2 week)
- Medium-term (2-12 weeks)
- Long-term (>12weeks)

Remarks:

- avoid catheterization if possible. Review indication regularly and try to wean off Foley as soon as possible. Use alternative methods of urine drainage when possible
- it should not be used solely for the convenience of carers

4.1.4. Choices of Indwelling Foley Catheter^{1-9, 18}

Length	Standard length ('male length', ~42cm)	<ul style="list-style-type: none"> • suitable for most conditions in male & female patients
	Female length (~24cm)	<ul style="list-style-type: none"> • to avoid kinks especially when using leg bag in female patients
Size	Optimal size: Ch 12, 14, 16 (Size > Ch 16 for surgical conditions; Size < Ch 12 for children)	<ul style="list-style-type: none"> • use the smallest size that can drain urine adequately • catheter life span shorter for smaller size • use larger size if lots of debris or haematuria leading to frequent blockage
Balloon size	5-10ml	<ul style="list-style-type: none"> • 30ml size only for controlling post-TURP bleeding, not for preventing expulsion of catheter
Material	Plain latex coated with or without a thin outer layer of silicone	<ul style="list-style-type: none"> • cheapest • prone to encrustation • material prone to swell due to absorption of fluid through its surface • life span: 7-14 days (short-term use)
	Silicone elastomer coated latex (coated both inner & outer surfaces)	<ul style="list-style-type: none"> • reduce encrustation • reduce absorption of fluid • life span: 4-12 weeks (medium to long-term use)
	100% Silicone	<ul style="list-style-type: none"> • more expensive • latex-free (indicated for patients with latex allergy) • catheter wall is thinner and so lumen larger for an equal Ch size catheter • life span: up to 12 weeks (long-term use)
	Polytetrafluoroethylene (PTFE) (Teflon-coated latex)	<ul style="list-style-type: none"> • smoother and easier to insert • reduce absorption of body fluids • life span: up to 4 weeks (medium-term use)
	Hydrogel coated latex	<ul style="list-style-type: none"> • expensive • more compatible with body tissues • reduce bacterial colonization and encrustation • life span: up to 12 weeks (long-term use)
Special designs	Roberts' catheter	<ul style="list-style-type: none"> • one more eye below balloon to drain the residue urine below the balloon
	Double balloon	<ul style="list-style-type: none"> • one more balloon at external meatus to prevent catheter movement (female only)
	3-channel catheter	<ul style="list-style-type: none"> • for continuous bladder irrigation

4.1.5. Choices of drainage system¹⁻⁹

<p>Standard bag (2L size) 'Bed-Side-Bag'</p>	<ul style="list-style-type: none"> • hooks for hanging on bed rail, walking frame or by hands • new design has one-way valve to prevent backflow of urine
<p>Leg bag (350, 500, 750ml size)</p>	<ul style="list-style-type: none"> • indicated for ambulatory patients to enhance independence • also cosmetically more acceptable • wear onto thigh or calf by velcro straps or a holster suspended from a waistbelt or a knicker pant with a pocket to hold the bag • usually have one-way valve to prevent backflow of urine • emptying outlet can be handled by single-hand technique • emptying outlet can be connected to a 2L bag at night if necessary & appropriate
<p>Catheter valve⁶ (patient's own bladder as reservoir)</p>	<ul style="list-style-type: none"> • suitable for patients with sufficient large bladder capacity (with or without anti-cholinergic drugs) and a continent sphincter. • increase independence and self-esteem • catheter valve can be handled by single-hand technique • emptying bladder at regular intervals or when feeling of urgency • catheter valve can be connected to a 2L bag at night if necessary & appropriate

4.1.6. Techniques

- Catheter insertion
- Removing catheter
- Emptying drainage bag
- Changing drainage bag
- Obtaining CSU specimen

Remarks:

- follow Nursing Standards for Patient Care (2nd Edition) by Working Group on Nursing Standards, Nursing Section, Hospital Authority Head Office, March 2000²⁸ and practical guidelines of individual hospital

4.1.7. General advices^{1, 3, 6-8, 18}

1. Good fluid intake (1.5-2L daily) to maintain high urine output to flush the bladder and catheter.
2. Avoid and treat constipation.
3. Good personal hygiene and handwashing before and after every procedure.
4. Strict aseptic technique when inserting catheter.
5. Avoid kinks or twists in the tubings.
6. Avoid clamping of catheter which may damage the inflation channel.
7. Strap catheter onto the thigh, not abdomen.
8. Keep drainage bag below level of bladder but outlet must not touch the floor.
9. Always maintain the closed drainage system.
10. Wash perineal region thoroughly with soap and water after each bowel movement and at least daily. Rinse and dry thoroughly.
11. Clean away any encrustation or mucus from the urethral meatus and around the prepuce with soap and water daily.
12. Use of shower is recommenced for bathing.
13. Avoid using talcum powder or lotions as these trap organisms in the area.
14. Adaptive methods to accommodate sexual need if required⁷:
 - male: fold the catheter back along the penis and cover it with a condom.
 - female: repositioning the drainage bag to enable sexual intercourse
 - remove the catheter and replace it with a new one following sexual activity
 - better consider intermittent or suprapubic catheterization

4.1.8. Documentation in patients with catheter

- keep a good documentation for every patient on catheter, at least on patient discharge summary. Information includes: indication, date of 1st insertion, choice of catheter & drainage system, date of changing catheter & drainage system, CSU result, occurrence of complications, date of review of indication and trial of removing catheter, etc

4.1.9. Frequency of changing catheter ^{2,4,8}

- life span of catheters depends on catheter materials, fluid intake, urine concentration & contents, and presence of UTI
- routine changing of catheters at fixed time intervals wastes valuable resources and should be discouraged
- intervals for changing catheter should be individualized for each patient. Catheter management record card or diary will be helpful in determining the optimal intervals for changing catheter
- catheters should be changed proactively according to the individual's usual pattern of catheter life rather than being replaced after they become blocked
- condition requiring immediate change of catheter: intra-luminal blockage, expelled catheter, damaged catheter

4.1.10. Frequency of changing drainage bag ^{2,4,8}

- the changing of drainage bag routinely incurs unnecessary expense and entails disconnection of the system more often than is necessary
- change bag when changing catheter or when it becomes very dirty and smelly

4.1.11. Problems and complications of indwelling catheters

Problem	Check for Causes	Management
Discomfort or pain ^{3,9}	<ul style="list-style-type: none"> • too large catheter or balloon • traction on the catheter • blocked catheter • UTI • urethral trauma or lesions 	<ul style="list-style-type: none"> • check for the cause and treat accordingly • high fluid intake • change position or walk around
Urethral trauma, perforation, urethritis, peri-urethral abscess, epididymitis, stricture ⁹	<ul style="list-style-type: none"> • traction on catheter • use of too thick catheter • too rough insertion of catheter 	<ul style="list-style-type: none"> • consult surgeon • may need temporary suprapubic catheter
Haematuria ⁹	<ul style="list-style-type: none"> • urethral trauma • UTI • bladder stone or tumour • bleeding tendency • BPH 	<ul style="list-style-type: none"> • find out the cause and treat accordingly • transamin • use 3-channel catheter for bladder irrigation if heavy haematuria • consult surgeon
Catheter-associated UTI & colonization ^{6, 26-27}	<ul style="list-style-type: none"> • bacteriuria (colonization) is inevitable after 2-4 weeks ²²⁻²⁵ • balloon size too large • insufficient fluid intake • aseptic technique not satisfactory • handwashing not done properly • closed drainage system broken 	<ul style="list-style-type: none"> • encourage fluid intake • antibiotic is indicated only when symptomatic • prophylactic antibiotic is useless and only produce resistant strain • catheter may need to be changed or removed if UTI • bladder washout does not prevent catheter-associated UTI ^{11, 26-27}
Blocked catheter ^{3, 6, 9, 10}	<ul style="list-style-type: none"> • kinks or twists in tubing • encrustation (esp. when urine pH >7.2 and presence of UTI) • displacement of catheter into the urethra • bladder stone pass into the catheter lumen • blood clot inside lumen 	<ul style="list-style-type: none"> • remove kinks or twists • change blocked catheter • consider catheter of a larger size if frequently blocked • consider catheter of materials with longer life span • increase fluid intake • bladder washout with diluted acid solution is still controversial ^{3, 11}
Bypassing of urine ^{2, 3, 9}	<ul style="list-style-type: none"> • blocked catheter • drainage bag above level of bladder • unstable bladder contraction (esp. large catheter or big balloon) • faecal impaction 	<ul style="list-style-type: none"> • remove kinks or twists • change blocked catheter • check position of bag • change to smaller catheter with 5-10ml balloon • avoid drugs with cholinergic effects

		<ul style="list-style-type: none"> • use anti-cholinergic drugs • treat constipation
Expulsion of catheter	<ul style="list-style-type: none"> • pulled out accidentally • unstable bladder contraction (e.g. large catheter or big balloon) • during straining to defaecate in constipated patients 	<ul style="list-style-type: none"> • secure catheter and drainage bag properly • explanation. Physical restraint as last resort • avoid drugs with cholinergic effects • use anti-cholinergic drugs • treat constipation
Non-deflating balloon ^{2,9-10}	<ul style="list-style-type: none"> • catheter material swells up causing the valve to stick • syringe nozzle being pushed too hard into the valve • blocked inflation channel by particle introduced during inflation • catheter shaft being clamped causing collapse of inflation channel • urease-producing organisms cause phosphate and oxalate salts to be precipitated, effectively coating the balloon and catheter-tip • using wrong solution (not sterile water) for inflating the balloon 	<ul style="list-style-type: none"> • blocked valve: try aspirate with syringe and needle directly through the inflation channel just proximal to the valve • blocked inflation channel: gently pass a stylet (from a ureteric catheter) down the inflation channel to dislodge blockage through a cut open hole in the inflation channel • consult surgeon • avoid cutting of the catheter (leave it to surgeon)
Bladder stone	<ul style="list-style-type: none"> • foreign bodies (e.g. pubic hairs) introduced during catheterization • urease-producing organisms 	<ul style="list-style-type: none"> • consult surgeon for removal • careful catheterization • increase fluid intake
<p>Others:</p> <ul style="list-style-type: none"> • chronic renal inflammatory changes • CA bladder 		

4.1.12. Removing catheter

- review reason of catheterization and patient's condition regularly and remove catheter as soon as possible
- be aware of the high incidence of recurrent retention of urine, incomplete bladder emptying, recurrent UTI and urinary incontinence after removing catheter in the elderlies
- after removing catheter, check post-voided residual volume to assess ability to empty bladder effectively
- maintain high fluid intake and avoid constipation

4.2. SUPRAPUBIC CATHETERIZATION

(References: 2, 6, 18, 19)

- a. Indications of suprapubic catheterization:
 - unable to insert catheter via urethra (e.g. urethral trauma or lesions, severe outflow obstruction or severe diplegia)
 - chronic retention of urine - as an alternative to urethral catheterization with the following advantage:
 - lower risk of UTI
 - eliminate urethral complications
 - less complaint of pain and discomfort
 - not interfere with sexual activity
 - changing of catheter is easier especially in disabled women
- b. Complications of suprapubic catheter:
 - uncontrolled urine leakage
 - skin erosion, haematoma
 - problems with catheter re-insertion
- c. Strict aseptic technique during insertion and removal of catheter.
- d. Daily wound care (~surgical wound).
- e. Avoid movement of catheter in and out of the wound by careful fixation.
- f. Traction on the catheter should be avoided at all times by regularly emptying the urine drainage bag and proper use of supporting straps or bag hangers.

4.3. INTERMITTENT CATHETERIZATION (IC)

4.3.1. Types of IC ¹⁸⁻²⁰

- sterile vs. clean technique
- self-catheterization vs. nurse or carer-assisted intermittent catheterization
- in hospital: sterile technique and catheter for single use only
- in community: clean technique is sufficient in selected cases and catheter can be used for up to 5-7days

4.3.2. Advantage of IC ^{15-16, 18-20}

1. Controlled voiding time greatly increase independence, improving quality of life and boosting self-esteem.
2. Lower incidence of UTI compared with indwelling catheter.
3. Relieve symptoms of incomplete bladder emptying such as frequent small amount of urine, urgency, urge incontinence, nocturia, etc.
4. Prevent reflux of urine into the upper urinary tract.
5. Normal sexual relationship is preserved.

6. Can be used to treat recurrent urethral stricture by sequential larger catheter for urethral dilatation.

4.3.3. Assessment for suitability for IC ^{13, 15-16, 18-20}

1. Retention of urine or incomplete bladder emptying (PVRU >100ml).
2. Sufficient large bladder capacity (with or without anti-cholinergic drugs) and a continent sphincter.
3. Intact urethra that is free from stricture (or presence of a urinary diversion).
4. Good manual dexterity.
5. Ability to learn the task effectively.
6. Motivated to learn the technique & continue the procedure for long period of time.
7. Awareness of the problems associated with IC and how to avoid them.
8. If a relative or carer is to perform the catheterization procedure, there must be total agreement among all parties concerned.
9. Disabilities such as blindness, lack of perineal sensation, tremor, mental handicap and paraplegia will not necessarily prevent the individual from mastering the technique of ISC.

4.3.4. Training, procedures and precautions ^{14-16, 18, 20}

- refer to continence nurse or geriatric nurse for specialist care

4.3.5. General advices ¹⁴⁻¹⁶

- maintain optimal fluid intake (~1.5L daily). Avoid taking fluid late in the evening
- avoid constipation as an overloaded rectum makes catheterization difficult or prevents complete drainage
- make sure the bladder is completely emptied during catheterization by rotating the catheter, changing position and occasionally checking with ultrasound scan
- routine use of long-term antibiotic prophylaxis in patients with chronic clean IC is not recommended (Evidence B, AHCPR, 1996¹⁹) except patients with an internal prosthesis or immunocompromised because of age or disease where the use should be individually reviewed (Evidence C, AHCPR, 1996¹⁹)

4.3.6. Complications^{16, 18-20}

- UTI : more commonly due to infrequent catheterization or incomplete emptying during catheterization
- repeated haematuria during IC - change to indwelling catheter until traumatic source (e.g. urethral mucosa trauma or urethral false passage) is resolved
- urethral trauma (esp. in male), urethritis, urethral stricture.
- false passage
- renal and bladder stone : hair or lint introduced during catheterization
- epididymo-orchitis

4.4. AIDS & APPLIANCES : ADAPTED CLOTHING

General consideration for making adaptation to clothing²⁹

- a. Satisfaction with the personal preferences of the client. Clothing does more than merely cover the body. It can provide a method of self-expression and promote confidence and acceptance in society;
- b. Clothing should be strong enough to take abrasion caused by orthotic devices or sliding transfer techniques to a wheelchair;
- c. The opening of the clothing should be easily accessible and fasteners are operable by individuals with limited arm movement or poor hand coordination;
- d. Clothing should be attractive as well as functional after the adaptation;
- e. Adaptation of clothing provides for ease of movement in a wheelchair or with assistive devices for ambulation.

The following samples are quoted for the illustration of the above ideas:

a. Adaptation of fasteners to enhance easy manipulation;



Use of velcro instead of zipper

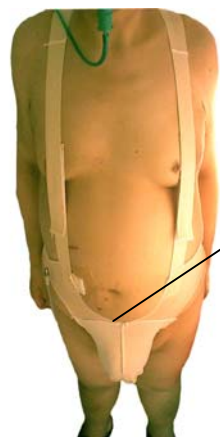
Operable by individuals with limited hand functions

b. Use of scrotal sling to replace the under-pant for clients with scrotal edema:

- more comfortable as it provides constant and reliable support;
- avoid catheterization as it is easy to apply and remove with minimal application time;
- encourage early ambulation;



Full view of the scrotal sling



- comfortable
- provide constant & reliable support
- minimal application time
- easy to clean
- allow ambulation
- custom fitting allow for variations

c. Use of corset and pant-holder by paraplegic client for self catheterization:

- corset provides extra support to enhance better stabilization of trunk during self catheterization
- pant-holder allows client to free his/her bilateral hands for catheterization procedures



Normal appearance of adapted pant enhances better self image of the client



Soft corset improves trunk control that client can free his hands for functional use.



Pant-holder allows individuals to free their hands for functional tasks.

d. Adapted pant allows easy handling of leg-bag



Side-opening zipper easily accessible by the client



Emptying of leg bag will be much more manageable with the aid of side opening zipper.

4.5. AIDS AND APPLICANCES FOR THE MANAGEMENT OF INCONTINENCE

(References: 30-32)

4.5.1. Selection principles

- can maintain patient's dignity and enable her/him to achieve "social continence"
- can contain the excreta completely to prevent any leakage and disguise any odour
- can protect vulnerable skin from soreness or pressure sores and be comfortable to wear
- can be easily managed by patient and easily available

4.5.2. Types of incontinence aids

i. Absorbent products

a. Pads and pants

- different sizes, shapes and thickness are available
- both available in disposable and washable version
- pads' absorbency rate

<i>Size</i>	<i>Absorbency rate</i>	<i>Suitable for</i>
Small	50-100ml per void	Light incontinence
Medium	100ml+ per void	Moderate incontinence
Large	>200ml per void	Heavy incontinence

- pants such as stretch pant or waterproof pant can hold absorbent pad securely in place

b. Diaper system (All-in-ones)

- disposable garments with a plastic wrap around and integral pad
- use for the management of heavy incontinence such as elderly people in long-term care
- some diapers include super-absorbents, and wetness indicators

c. Male drip collector

- suitable for men with a slight or dribbling incontinence

- absorbency rate: 50-100ml
 - can be worn inside stretch pant or patient's own close-fitting pant
- ii. Collecting devices
- a. Hand-held urinals (male and female)
- allow both men and women with restricted mobility to be continence
 - can be used in bed, when seated or standing position
 - U-shape cut-out urinal may be useful for female patient sitting on the wheelchair
 - female bottle-types urinal can be used in a standing or sitting position or side lying position
 - choice of urinal depends upon manual dexterity, posture when using it and physical abilities
 - non-spill adapter urinal is suitable for male patient with a poor grip or shaky hand who easily spill or drop the urinal
- b. Bedpans
- use for patient with restricted mobility
 - choice of bedpan depends upon manual dexterity, posture and physical abilities
 - fracture bedpan is suitable for spinal injury and obese patient who cannot raise their buttocks to position
- c. Commodes
- recommend for patient with difficulty in reaching lavatory
 - choice of commodes must be considered its stability, height, comfort of the seat, and its compatible container which fits the aperture closely
- d. Washable bedpads
- "feel-dry" surface of the pad allows urine to pass in the soaked layer of pad for absorption, leaving the skin relatively dry and reduce the risk of pressure sores
 - washable and allow an undisturbed and comfortable night's sleep

- wear no nightclothes below the waist is required that some patient do not find it acceptable
- e. Penile sheaths
- penile sheaths (Paul's tubes) for male are adults devices made from latex rubber, polyvinyl, or silicone that applied to the sheath of penis and connected to urine drainage bags
 - Patients who would be benefit for the use of penile sheath
Urinary incontinent patients who have/require:
 1. Sacral/buttock sores : Stage III
 2. Collection of clean urine specimen for investigation.
 3. Failure to improve incontinence status after behavioral management such as toilet training, bladder training, pelvic floor exercise.
 - Patients who should not use penile sheath
 1. Urinary retention – patients who have post void residual urine : 100 ml.
 2. Upper urinary tract damage
 3. Penile skin irritation or skin breakdown
 - Adverse effects of penile sheaths
 1. Abrasions, ischaemia, necrosis, edema or maceration of penis
 2. Dermatitis of penile areas or around perineal areas
 3. Urinary tract infection
 - Application and observation
 1. Select appropriate size of penile sheath.
 2. Clean the penis and foreskin with antiseptics and dry properly.
 3. Secure penile sheath firmly with the adhesive tape supplied by manufacturer, make sure it is not too tight to cause penile constriction.
 4. Assess patient for any discomfort and suitability of tightness of the penile sheath.

5. Assess on each shift of duty for any twisting of penile sheath, penile pain, penile swelling, ischaemia, report and document for any abnormalities.
6. Monitor and document the color, nature and amount of urine output
7. Renew the penile sheath daily and assess patient's need before each application of penile sheath.

4.6. REFERENCES

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5. EDUCATION IN CONTINENCE CARE

Training and education in continence care could be divided into public education and professional education.

5.1. PUBLIC EDUCATION

Public education and resources material on continence care include:

- promotion of public awareness of continence problem and the availability of treatment options for sufferers of incontinence
- continence hotline e.g. Continence Hotline by Hong Kong Continence Society (Tel: 28157390)
- internet access to the homepage of International Continence Society (www.icsoffice.org), Continet, Hong Kong Continence Society Homepage will give ready access to Internet resources on continence care
- public seminars and workshops are organized regularly by Hong Kong Continence Society for the general public (www.fmshk.com.hk/hkcs)

5.2. PROFESSIONALS

Professionals including doctors, nurses and allied health professionals need to be trained on the management of Continence Care in primary and tertiary settings.

- general training and education need to be developed for all health care professionals to promote the awareness of the importance of continence care in the population. Regular professional seminars were organized by Hong Kong Continence Society. Newsletters were also published regularly by Hong Kong Continence Society for the general education of health care professionals and provide the update on advances on continence care
- specialized training courses for nurses have been developed throughout the world. A certificate course on continence care for health care professionals are conducted annually by United Christian Hospital
- short courses on continence care were conducted by Hong Kong Continence Society regularly
- advanced training courses like Urodynamic training workshop were organized by Hong Kong Continence Society for doctors and nurses from time to time

- an annual scientific meeting organized by the Hong Kong Continence Society at the end of September each year offered excellent opportunity to share the knowledge on management of urinary incontinence
- professional societies have provided training courses for their members like Pelvic Floor Training Courses from the Hong Kong Physiotherapy Association (www.hongkongpa.com.hk)

6. OUTCOME MEASURES AND CLINICAL AUDIT FOR THE MANAGEMENT OF LOWER URINARY TRACT DYSFUNCTION IN FRAIL AND OLDER PEOPLE

The ICS Working Party on Outcome Measures has indicated that outcome measurements for elderly people could be included: 1) Patient observations and symptoms; 2) Quantification of the symptoms; 3) Anatomical and functional measures; 4) Quality of life; 5) Socio-economic measures. The selection of an outcome variable should depend on the nature of the intervention being studied e.g. pharmacological, surgical, behavioural management.^{1,2,3} Please refer to Appendix 4 for references regarding the use of specific types of outcome measurement in the published literatures.

Annual clinical audit by each local setting is also recommended for improving standards of continence care⁴. Audit tool includes clinical indicators of⁵:

- a. Appropriate structures for care:
 - number of trained personnel for conducting initial assessment and management for patient with incontinence;
 - implementation of bladder/ toileting training regimes, faecal impaction management;
 - easy access to toilet facilities;
- b. Appropriate processes for high-quality care:
 - screening rate for UI;
 - incidence and prevalence of incontinence;
 - use of indwelling catheters and containment products;
- c. Recommended outcome measurements:

ICS recommendations for outcome measurements for older people²:

Measure	Recommendations
1. Patient observations and symptoms	<ul style="list-style-type: none"> • purely subjective • data could be obtained from care-givers
2. Quantification of the symptoms	<ul style="list-style-type: none"> • voiding diaries • pad weighing tests • wet check
3. Anatomical and functional measures	<ul style="list-style-type: none"> • ultrasound for PVRU • urodynamic Study

	<ul style="list-style-type: none"> • pelvic muscle strength
4. Quality of life measurements	<ul style="list-style-type: none"> • QOL questionnaires specific with UI problem
5. Socio-economic measures	<ul style="list-style-type: none"> • instruments to evaluate cost, cost-benefit and cost effectiveness

6.1. REFERENCES

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3. Lose, G. et al (2001). Outcome measure for research in adult women with symptoms of lower urinary tract dysfunction. Acta Obstetrica et Gynecologica Scandinavica. 80(11, 981-985.
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Appendices





Appendix 1
Example of a bladder record

(Ouslander, 1995)

INCONTINENCE MONITORING RECORD

INSTRUCTIONS: EACH TIME THE PATIENT IS CHECKED:

- 1) Mark one of the circles in the BLADDER section at the hour closest to the time the patient is checked.
- 2) Make an X in the BOWEL section if the patient has had an incontinent or normal bowel movement.

 = Incontinent, small amount
  = Dry
 X = Incontinent BOWEL
 = Incontinent, large amount
  = Voided correctly
 X = Normal BOWEL

PATIENT NAME _____ ROOM # _____ DATE _____

	BLADDER			BOWEL		INITIALS	COMMENTS
	INCONTINENT OF URINE	DRY	VOIDED CORRECTLY	INCONTINENT X	NORMAL X		
12 am	● ●	○	△ CC _____				
1	● ●	○	△ CC _____				
2	● ●	○	△ CC _____				
3	● ●	○	△ CC _____				
4	● ●	○	△ CC _____				
5	● ●	○	△ CC _____				
6	● ●	○	△ CC _____				
7	● ●	○	△ CC _____				
8	● ●	○	△ CC _____				
9	● ●	○	△ CC _____				
10	● ●	○	△ CC _____				
11	● ●	○	△ CC _____				
12 pm	● ●	○	△ CC _____				
1	● ●	○	△ CC _____				
2	● ●	○	△ CC _____				
3	● ●	○	△ CC _____				
4	● ●	○	△ CC _____				
5	● ●	○	△ CC _____				
6	● ●	○	△ CC _____				
7	● ●	○	△ CC _____				
8	● ●	○	△ CC _____				
9	● ●	○	△ CC _____				
10	● ●	○	△ CC _____				
11	● ●	○	△ CC _____				
TOTALS:							

INCONTINENCE CHART

Date : ____ / ____ / 20____

(circle as appropriate) Frequency of *Assessment/ Training: Q ____ H
Mode of Training: *Prompted Voiding/ Timed Voiding

Time	Intake	(ml)	Wetness		Respond to wetness		Use of toilet/ urinal		
			Dry (✓)	Wet (+)	✓ for right ✗ for wrong	No Answer	Yes (ml)	No	BO
2AM									
5AM									
7AM									
8AM									
9AM									
10AM									
11AM									
2N									
1PM									
2PM									
3PM									
4PM									
5PM									
6PM									
7PM									
8PM									
11PM									
Night : 11 pm – 7 am Day (a & b) : 8 am – 8 pm			No. of wetness Night _____ Day _____ _____ (=a)		No. of ✓ _____ No. of ✗ _____ No answer _____		No. of 'Yes' Night _____ Day _____ (=b)		No. of 'BO' _____
Grand Total Intake _____ ml			Grand Total Output _____ ml						

Appropriate Toileting Rate (%)

= Appropriate voids / Total voids

$$= \frac{b}{(a + b)} \times 100\% = \boxed{\quad \% \quad}$$

Voiding and Intermittent Catheterization Chart					Name:				Sex/Age:			
小便及導尿記錄表					ID No:				Ward/Bed:			
					HN:				Dept:			
日期												
時間	飲水	小便	導尿	尿濕	飲水	小便	導尿	尿濕	飲水	小便	導尿	尿濕
上午 6 時												
上午 7 時												
上午 8 時												
上午 9 時												
上午 10 時												
上午 11 時												
中午 12 時												
下午 1 時												
下午 2 時												
下午 3 時												
下午 4 時												
下午 5 時												
下午 6 時												
晚上 7 時												
晚上 8 時												
晚上 9 時												
晚上 10 時												
晚上 11 時												
零晨 12 時												
零晨 1 時												
零晨 2 時												
零晨 3 時												
零晨 4 時												
上午 5 時												
總和	cc	cc	cc	次	cc	cc	cc	次	cc	cc	cc	次

OUTCOME MEASURES USE IN INCONTINENCE STUDY

	Acute	Extended	Long stay	Outpatient
<i>The patient's observation (symptoms)</i>	<ul style="list-style-type: none"> subjective UI improvement^{11, 21} 	<ul style="list-style-type: none"> subjective UI improvement⁴⁶ side effect of drugs^{12, 20, 46} 		<ul style="list-style-type: none"> subjective UI improvement^{3, 6, 8, 10, 32, 33, 35, 37, 40, 48} side effect of drugs^{1, 2, 44, 49, 30} severity index^{3, 7, 19, 24, 43} patient satisfaction^{6, 40, 48}
<i>Quantification of symptoms</i>	<ul style="list-style-type: none"> pad test^{14, 21} voiding diary²¹ 	<ul style="list-style-type: none"> no. of wet episodes^{12, 15, 34} voided frequency³⁴ 	<ul style="list-style-type: none"> no. of wet episodes^{9, 25, 38} appropriate toileting rate^{25, 38} 	<ul style="list-style-type: none"> pad test^{4, 13, 26, 36, 39, 40} voiding diary^{21, 24, 39, 40} no. of wet episodes^{1, 2, 6, 13, 18-20, 26-29, 31-33, 44, 47-49} voided frequency^{1, 2, 13, 19, 35, 37, 49} nocturia² mean voided volume^{2, 49} maximum voided capacity³⁰ no. of pad used¹⁸ PVRU³⁰
<i>The clinician's observations (anatomical and functional):</i>	<ul style="list-style-type: none"> PFM strength (digital & air pressure)¹⁴ 	<ul style="list-style-type: none"> urodynamic data¹² FIM, DRS⁴¹ 	<ul style="list-style-type: none"> health status measure: ADL³⁸ 	<ul style="list-style-type: none"> urodynamic data^{12, 30} PFM strength (air pressure)^{4, 43}
<i>Quality of life:</i>			<ul style="list-style-type: none"> QOL questionnaires¹⁶ 	<ul style="list-style-type: none"> QOL questionnaires^{5, 7, 13, 17, 26, 39, 40, 41, 43, 48}
<i>Socioeconomic measure:</i>			<ul style="list-style-type: none"> cost of implementing toileting regime³⁸ 	
<i>Others:</i>		<ul style="list-style-type: none"> use of drugs²⁰ Medical Diagnosis²⁰ 		<ul style="list-style-type: none"> PFM exercise compliance^{8, 10, 28}

				• health promoting behaviour ⁴²
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No.	Title	Outcome Measure	Setting
1.	Appell RA, et al (2001) <u>Overactive Bladder: Judging Effective Control and Treatment Study Group. Prospective randomized controlled trial of extended-release oxybutynin chloride and tolterodine tartrate in the treatment of overactive bladder: results of the OBJECT Study.</u> Mayo Clinic Proceedings. Vol.76(4); p.358-63.	<ul style="list-style-type: none"> • UI episodes, frequency • drug S/E 	<ul style="list-style-type: none"> • outpatient
2.	Atan A, et al (1999) <u>Tolterodine for overactive bladder: time to onset of action, preferred dosage, and 9-month follow-up.</u> Techniques in Urology. Vol.5(2); p.67-70.	<ul style="list-style-type: none"> • urinary frequency, nocturia, leakage episodes, average urine volume per day, and average voided volume. S/E 	<ul style="list-style-type: none"> • outpatient
3.	Bergstrom K, et al (2000) <u>Improvement of urge- and mixed-type incontinence after acupuncture treatment among elderly women - a pilot study.</u> Journal of the Autonomic Nervous System. Vol.79(2-3); p.173-80.	<ul style="list-style-type: none"> • subjective scorings, 48 h Inco-test 	<ul style="list-style-type: none"> • outpatient
4.	Bo K, et al (1999) <u>Single blind, randomised controlled trial of pelvic floor exercises, electrical stimulation, vaginal cones, and no treatment in management of genuine stress incontinence in women.</u> BMJ Vol.318(7182); p.487-93.	<ul style="list-style-type: none"> • pad test, self report severity, biofeedback 	<ul style="list-style-type: none"> • outpatient
5.	Bo K, et al (2000) <u>Randomized controlled trial on the effect of pelvic floor muscle training on quality of life and sexual problems in genuine stress incontinent women.</u> Acta Obstetricia et Gynecologica Scandinavica. Vol.79(7); p.598-603.	<ul style="list-style-type: none"> • Quality of Life Scale (QoLS-N) and the Bristol Female Lower Urinary Tract Symptoms (B-FLUTS) questionnaire 	<ul style="list-style-type: none"> • outpatient
6.	Burgio KL, et al (1998) <u>Behavioral vs drug treatment for urge urinary incontinence in older women: a randomized controlled trial.</u> JAMA Vol.280(23);p.1995-2000.	<ul style="list-style-type: none"> • UI episodes, patients' perceptions of improvement and their satisfaction 	<ul style="list-style-type: none"> • outpatient
7.	Burgio KL, et al (2001) <u>Psychological improvements associated with behavioral and drug treatment of urge incontinence in older women.</u> Journals of Gerontology Series B-Psychological Sciences & Social Sciences. Vol.56(1); p46-51.	<ul style="list-style-type: none"> • Hopkins Symptom Checklist (QOL), the global severity index 	<ul style="list-style-type: none"> • outpatient

No.	Title	Outcome Measure	Setting
8.	Cammu H, et al (2000) <u>A 10-year follow-up after Kegel pelvic floor muscle exercises for genuine stress incontinence.</u> Bju International. Vol.85(6); p.655-8.	<ul style="list-style-type: none"> self-assessment of therapy outcome, the frequency of PFM exercises at home, and the demand for surgery after physiotherapy. 	<ul style="list-style-type: none"> outpatient
9.	Colling J., et al (1992) <u>The Effects of Patterned Urge-Response Toileting (PURT) on Urinary Incontinence among Nursing Home Residents.</u> The Journal of the American Geriatrics Society. Vol.40;p.135-141.	<ul style="list-style-type: none"> UI episodes 	<ul style="list-style-type: none"> nursing home
10.	Dattilo J. <u>A long-term study of patient outcomes with pelvic muscle re-education for urinary incontinence.</u> Journal of Wocn. Vol.28(4); p.199-205.	<ul style="list-style-type: none"> PFM exercise compliance rate. subjective UI symptoms 	<ul style="list-style-type: none"> outpatient
11.	Davies JA, et al (2000) <u>An evaluation of the efficacy of in-patient bladder retraining.</u> International Urogynecology Journal. Vol.11(5); p.271-5.	<ul style="list-style-type: none"> subjective UI symptoms 	<ul style="list-style-type: none"> acute
12.	Department of Urology, University of Heidelberg, Germany. <u>Dosage escalation of intravesical oxybutynin in the treatment of neurogenic bladder patients.</u> Spinal Cord. 38(4):250-4, 2000 Apr.	<ul style="list-style-type: none"> continence situation, side effects and urodynamic data 	<ul style="list-style-type: none"> extended
13.	Dougherty MC, et al (2002) <u>A randomized trial of behavioral management for continence with older rural women.</u> Research in Nursing & Health. Vol.25(1); p.3-13.	<ul style="list-style-type: none"> pad test, UI episode, frequency, QOL 	<ul style="list-style-type: none"> outpatient
14.	<u>Effect of postpartum pelvic floor muscle training in prevention and treatment of urinary incontinence: a one-year follow up.</u> Bjog. 107(8):1022-8, 2000 Aug.	<ul style="list-style-type: none"> standardised pad test, pelvic floor muscle function and strength were by vaginal palpation and vaginal squeeze pressure 	<ul style="list-style-type: none"> from inpatient to home
15.	Eldar R, et al (2001) <u>Quality of care for urinary incontinence in a rehabilitation setting for patients with stroke. Simultaneous monitoring of process and outcome.</u> International Journal for Quality in Health Care. Vol.13(1); p.57-61.	<ul style="list-style-type: none"> % of continence on discharge 	<ul style="list-style-type: none"> rehabilitation setting
16.	Francine C. (2000) <u>Nursing home residents used 6 strategies to manage urinary incontinence.</u> Evidence-Based Nursing vol.3(4) p.136	<ul style="list-style-type: none"> QOL 	<ul style="list-style-type: none"> nursing homes
17.	Fultz N.H. (2001) <u>Self-Reported Social and Emotional Impact of Urinary Incontinence.</u> The Journal of the American Geriatrics Society. Vol.49(7);p.892-899.	<ul style="list-style-type: none"> QOL 	<ul style="list-style-type: none"> outpatient

No.	Title	Outcome Measure	Setting
18.	Gerard L. (1997) <u>Group Learning Behavior Modification and Exercise for Women with Urinary Incontinence</u> . Urologic Nursing. Vol.17(1);p.17-21.	<ul style="list-style-type: none"> • no of pad used, urine loss 	<ul style="list-style-type: none"> • outpatient
19.	Grady D, et al (2001). The HERS Research Group. <u>Postmenopausal hormones and incontinence: the Heart and Estrogen/Progestin Replacement Study</u> . Obstetrics & Gynecology. Vol.97(1); p.116-20.	<ul style="list-style-type: none"> • UI episode, frequency, severity of incontinence 	<ul style="list-style-type: none"> • outpatient
20.	Grossklaus DJ, et al (2000) <u>Treatment of elderly women with urge incontinence in middle tennessee: a single institution practice-based study</u> . Tennessee Medicine. Vol.93(12); p.457-60.	<ul style="list-style-type: none"> • use of drugs, drug S/E, Medical Dx. 	<ul style="list-style-type: none"> • extended
21.	Groutz A, et al (2000) <u>A simplified urinary incontinence score for the evaluation of treatment outcomes</u> . Neurourology & Urodynamics. Vol.19(2); p.127-35.	<ul style="list-style-type: none"> • pre- and post-operative questionnaires, 24-hour voiding diary, pad test, a new response score 	<ul style="list-style-type: none"> • in patient to outpatient after surgery
22.	Haferkamp A, et al (2000) <u>Combined behavioral and drug therapy for urge incontinence in older women</u> . Journal of the American Geriatrics Society. Vol.48(4); p.370-4.	<ul style="list-style-type: none"> • frequency of incontinent episodes 	<ul style="list-style-type: none"> • outpatient
23.	Harvey MA, et al (2001) <u>Tolterodine versus oxybutynin in the treatment of urge urinary incontinence: a meta-analysis</u> . American Journal of Obstetrics & Gynecology. Vol.185(1); p.56-61.	<ul style="list-style-type: none"> • UI episodes, frequency, and voided volume • Drug S/E 	<ul style="list-style-type: none"> • systematic review .
24.	Holtedahl K., et al (1998) <u>A population based, randomized, controlled trial of conservative treatment for urinary incontinence in women</u> . Acta Obstetrica et Gynecologica Scandinavica. Vol.77(6);p.671-7.	<ul style="list-style-type: none"> • severity index, quantify measure of UI 	<ul style="list-style-type: none"> • outpatient
25.	Ouslander, J.G. et al (2001) <u>Prompted Voiding for Nighttime Incontinence in Nursing Homes: Is it effective?</u> The Journal of the American Geriatrics Society. Vol.49(6);p.706-709.	<ul style="list-style-type: none"> • wet rate, appropriate rate 	<ul style="list-style-type: none"> • nursing home
26.	Jeyaseelan S.M., et al (2000) <u>An evaluation of a new pattern of electrical stimulation as a treatment for urinary stress incontinence: a randomized, double-blind, controlled trial</u> . Clinical Rehabilitation. Vol.14;p.631-640.	<ul style="list-style-type: none"> • UI episodes, SF 36 IIQ, pad test 	<ul style="list-style-type: none"> • outpatient
27.	Jirovec MM, et al (2001) <u>Predicting success using individualized scheduled toileting for memory-impaired elders at home</u> . Research in Nursing & Health. Vol.24(1); p.1-8.	<ul style="list-style-type: none"> • calculate the percentage of times the incontinence 	<ul style="list-style-type: none"> • outpatient

No.	Title	Outcome Measure	Setting
28.	Kim JI (2001) <u>Continence efficacy intervention program for community residing women with stress urinary incontinence in Japan</u> . Public Health Nursing. Vol.18(1); p.64-72.	<ul style="list-style-type: none"> • PFM exercise compliance rate • urine loss symptom 	<ul style="list-style-type: none"> • outpatient
29.	Lionis C, et al (2000) <u>Urinary incontinence, the hidden health problem of Cretan women: report from a primary care survey in Greece</u> . Women & Health. Vol.31(4); p.59-66.	<ul style="list-style-type: none"> • UI symptoms 	<ul style="list-style-type: none"> • outpatient
30.	Madersbacher H, et al (1999) <u>A placebo-controlled, multicentre study comparing the tolerability and efficacy of propiverine and oxybutynin in patients with urgency and urge incontinence</u> . Bju International. Vol.84(6); p.646-51.	<ul style="list-style-type: none"> • UDS, RU, Maximun voiding capacity, adverse effect 	<ul style="list-style-type: none"> • outpatient
31.	McDowell BJ, et al (1999) <u>Effectiveness of behavioral therapy to treat incontinence in homebound older adults</u> . Journal of the American Geriatrics Society. Vol.47(3);p309-18.	<ul style="list-style-type: none"> • reduction of UI episode 	<ul style="list-style-type: none"> • outpatient
32.	McFall SL, et al (2000) <u>Outcomes of a small group educational intervention for urinary incontinence: episodes of incontinence and other urinary symptoms</u> . Journal of Aging & Health. Vol.12(2); p.250-67.	<ul style="list-style-type: none"> • UI episodes, Subjective UI symptoms 	<ul style="list-style-type: none"> • outpatient
33.	McFall SL, et al (2000) <u>Outcomes of a small group educational intervention for urinary incontinence: episodes of incontinence and other urinary symptoms</u> . Journal of Aging & Health. Vol.12(2); p.250-67.	<ul style="list-style-type: none"> • UI episode, Subjective improvement. 	<ul style="list-style-type: none"> • outpatient
34.	Morre K. (1993) <u>Twenty four-hour monitoring of incontinence and bladder function in a community hospital</u> . Journal of Enterostomal Nursing. Vol.20;p.163-168.	<ul style="list-style-type: none"> • urine loss, voiding frequency 	<ul style="list-style-type: none"> • extended hospital
35.	Pages IH, et al (2001) <u>Comparative analysis of biofeedback and physical therapy for treatment of urinary stress incontinence in women</u> . American Journal of Physical Medicine & Rehabilitation. Vol.80(7); p.494-502.	<ul style="list-style-type: none"> • urinary frequency and subjective improvement of incontinence. 	<ul style="list-style-type: none"> • outpatient
36.	Paterson J., et al (1997) <u>Pelvic floor exercises as a treatment for post-micturition dribble</u> . British Journal of Urology. Vol.79(6);p.892-7.	<ul style="list-style-type: none"> • pad test , urine lost 	<ul style="list-style-type: none"> • outpatient
37.	Petros PP, et al (2001) <u>Pelvic floor rehabilitation in the female according to the integral theory of female urinary incontinence</u> . European Journal of Obstetrics, Gynecology, & Reproductive Biology. Vol.94(2); p.264-9.	<ul style="list-style-type: none"> • urinary frequency and subjective improvement of incontinence. 	<ul style="list-style-type: none"> • outpatient

No.	Title	Outcome Measure	Setting
38.	Prompted voiding for the management of urinary incontinence in adults(Review) Cochrance Library, 2001	<ul style="list-style-type: none"> • no of wet episodes, appropriate toileting behavior, self initiated of toileting , no of UI, Health status measure: ADL, • cost of implementing toileting 	<ul style="list-style-type: none"> • nursing home
39.	Sand PK, et al (1999) <u>Effect of a urinary control insert on quality of life in incontinent women.</u> International Urogynecology Journal. Vol.10(2);p.100-5.	<ul style="list-style-type: none"> • SF-36, pad test, voiding chart 	<ul style="list-style-type: none"> • outpatient
40.	Sander P, et al (2000) <u>Evaluation of a simple, non-surgical concept for management of urinary incontinence (minimal care) in an open-access, interdisciplinary incontinence clinic.</u> Neurourology & Urodynamics. Vol.19(1); p.9-17.	<ul style="list-style-type: none"> • subjective symptom, quality-of-life questions and voiding charts, pad test, Pt's satisfaction. 	<ul style="list-style-type: none"> • outpatient
41.	Seidel G.K. <u>Predicting Bowel and Bladder Continence From Cognitive Status in Geriatric Rehabilitation Patients.</u> Arch Phys Medical Rehabilitation. Vol.75;p.590-593.	<ul style="list-style-type: none"> • FIM, DRS 	<ul style="list-style-type: none"> • Geriatric Rehabilitation Patients
42.	Seim A., et al (1997) <u>Management in general practice significantly reduced psychosocial consequences of female urinary incontinence.</u> Quality of Life Research. Vol.6(3);p.257-64.	<ul style="list-style-type: none"> • QOL 	<ul style="list-style-type: none"> • outpatient
43.	Shinopulos NM, et al (1999) <u>Relationship between health promotion lifestyle profiles and patient outcomes of biofeedback therapy for urinary incontinence.</u> Urologic Nursing. Vol.19(4); p.249-53.	<ul style="list-style-type: none"> • frequency of health-promoting behaviors 	<ul style="list-style-type: none"> • outpatient
44.	Sung MS, et al (2000) <u>FES-biofeedback versus intensive pelvic floor muscle exercise for the prevention and treatment of genuine stress incontinence.</u> Journal of Korean Medical Science. Vol.15(3); p.303-8.	<ul style="list-style-type: none"> • severity of incontinence, pelvic muscle contraction force were measured using a perineometer. 	<ul style="list-style-type: none"> • outpatient
45.	Versi E, et al (2000) <u>Dry mouth with conventional and controlled-release oxybutynin in urinary incontinence.</u> The Ditropan XL Study Group. Obstetrics & Gynecology. Vol.95(5); p.718-21.	<ul style="list-style-type: none"> • incontinence episodes, drugn S/E 	<ul style="list-style-type: none"> • outpatient
46.	Winkler HA, et al (1998) <u>Treatment of detrusor instability with oxybutynin rectal suppositories.</u> International Urogynecology Journal. Vol.9(2);p.100-2.	<ul style="list-style-type: none"> • subjective improvement, S/E 	<ul style="list-style-type: none"> • extended

Appendix 4

Clinical Guidelines On Geriatric Urinary Incontinence

No.	Title	Outcome Measure	Setting
47.	Woodman PJ, et al (2001) <u>The use of short-form quality of life questionnaires to measure the impact of imipramine on women with urge incontinence.</u> International Urogynecology Journal. Vol.12(5); p.312-5.	<ul style="list-style-type: none"> • incontinent episodes, QOL scores: UDI-6 & IIQ-7 	<ul style="list-style-type: none"> • outpatient
48.	Wyman JF, et al (1998) <u>Comparative efficacy of behavioral interventions in the management of female urinary incontinence.</u> Continence Program for Women Research Group. American Journal of Obstetrics & Gynecology. Vol.179(4);999-1007.	<ul style="list-style-type: none"> • incontinent episodes, quality of life, perceived improvement, and satisfaction. 	<ul style="list-style-type: none"> • outpatient