Good Practice in Health Care

Continent Urinary Diversion

2010

European Association of Urology Nurses

Good Practice in Health Care Section 2

Continent Urinary Diversion

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Recommendation	LE	GR
• Patients should be encouraged to complete a diary of their experience.	4	C

6.4.2 Reimbursement of appliances

The care for a continent urinary diversion does not require any specific appliance.
Nor does the patient need any specific material for the management of the diversion itself once the continent stoma is established.

However, for intermittent self catheterisation the patient will need catheters.

Reimbursement differs in European countries as each country has its own healthcare insurance system and the personal insurance schemes also vary.
Nurses should be aware of the national rules for reimbursement.

Notwithstanding the differences in national reimbursement systems, a good standard for reimbursement could be: 'as many catheters as the patient needs per day, with a maximum of 8 per day'. If the patient needs to catheterise more than 8 times a day, the patient should contact their urologist or NS.

Recommendation	LE	GR
• Patients should be informed about the reimbursement for appliances	4	C

6.4.3 Information about possible complications

At discharge, oral and written information about possible complications should be provided to the patient.
The patient has to be aware that when serious problems occur, he/she should contact the NS, the urologist or the urology department.

Table 10. Common complications

- Skin irritations due to leakage of urine or infection
- Incontinence and leakage
- Urinary tract infections
- Fever for several days without cause
- Excessive mucus production
- Metabolic problems
- Persisting lumbar pain
- Painful catheterisation or urinating
- Sexual dysfunction
- Low urine production although sufficient fluid intake
- Bleeding in or around the stoma
- Persisting difficulties when introducing the catheter
- Obstructed access to the neobladder
- Persisting fatigue or weakness

- Losing weight without possible explanation
- Nausea and vomiting

Extensive information about this topic: see Chapter 8 'Nursing management of complications'

Van der Aa 2009, Gharajeh 2008. [107,108]

6.5 Proactive and preventive care

6.5.1 Travelling with a pouch/neobladder

Travelling should not cause any major problems for the patient who has undergone surgery for a continent urostomy/neobladder. However the following advice should be discussed with the healthcare professional:

- If using appliances such as catheters always take extra items and pack them in hand and other luggage in case of any missing luggage;
- Ensure information is readily available on where and how to obtain extra supplies;
- Save space in luggage by arranging for catheters to be delivered to the destination address by the company supplying them, or remove products from boxes;

Extra luggage allowance is available on some carriers on provision of a medical letter.

6.5.2 Medic alert bracelet, 'Can't Wait' card, disability card

Patients may feel more confident if they can carry aids such as a Medic Alert bracelet. This is an item that is worn at all times by the patient and contains a brief medical history in case a patient requires emergency care. Many companies who supply urology products produce a "Can't Wait" card to use in the community. This allows the user rapid access to toilet facilities without the need for lengthy explanations or queuing.

6.5.3 Insurance/travel

Travel certificates are available from most manufacturers of catheters and are a useful aid to the patient who travels abroad. It explains to customs and airport staff about the patient's need to carry medical devices/products and relieves the patient of the obligation to provide public explanations that may be embarrassing. The certificates are available in a variety of languages.

Conditions of travel insurance are variable depending on the insurance provider. Patients should be advised to check with their individual provider for any specific concerns. Insurers often request a medical report prior to agreeing cover.

Recommendations	LE	GR
• The NS should give advice on travelling	4	C
• The NS should provide patients with travel certificate and 'Can't Wait' Card on discharge for future use	4	C

6.5.4 Treatment for UTIs, fluid intake and effect of food and medication on urine

Urine from any type of urinary diversion is usually bacteriuric. [90, 109] It is important that patients are aware of the signs and symptoms of urinary tract infections. These include:

- Cloudy urine
- Offensive odour
- Visible blood
- Raised temperature
- Influenza like symptoms
- Pain and tenderness in the kidney area
- Nausea and vomiting

Treatment is not recommended in asymptomatic patients [109] even with a positive urinary culture. Studies identify that UTI occur in 50% of patients with enterocystoplasty. [110] Escherichia coli (E. coli) is the infecting organism in 50% of cases. Symptomatic patients with high levels of colonisation of E. coli should be treated with the appropriate antibiotic.

Studies identify that UTI occur in 50% of enterocystoplasty patients. [110] E. coli is the infecting organism in 50% of cases. There is some evidence that UTI in patients with ileal bladder may cause urinary incontinence. [111]

Patients with diabetes mellitus and reconstructed bladders have a greater risk of contracting a UTI. [112]

Recommendation	LE	GR
• Patients should be educated before discharge regarding signs and symptoms of urinary tract infection	4	C

Fluid intake

An individual's ideal daily fluid intake depends on various factors including body size and weight, age, exercise schedule and dietary intake. [113] Maintaining an adequate fluid intake is essential to minimise the risk of urinary tract infection. Ideally fluid intake for individuals with enterocystoplasty should be between 2.5 – 3 litres. [114, 115]

Inadequate oral intake is associated with increased incidence of bacteriuria [110], stone formation [116] and bladder cancer. [117, 118]

Recommendation	LE	GR
• Daily fluid intake of 2.5 - 3 litres	3	B

Colour and odour changes in urine

Individuals with an augmented bladder often have a heightened awareness of changes in their urine output. Normal urine is clear, straw coloured with almost no odour. [119] Certain food products, fluids and medication can affect the colour and odour of urine, however these changes do not necessarily occur in everyone.

Table 11. Examples of colour and odour changes in urine

Medication	Colour or odour
Amitriptyline	Blue-green
Anthraquinones	Red-brown (in alkaline urine)
Antibiotics (not all)	Offensive smell
Chloroquine	Rusty brown, yellow
Danthron	Orange
Ferrous salts	Black
Ibuprofen	Red
Indomethacin	Green
Levodopa	Darkens
Methyldopa	Darkens (red-black on standing)
Metronidazole	Red to brown
Nitrofurantoin	Brown or rust yellow
Phenolphthalein	Pink (alkaline)
Phenothiazines	Pink to red-brown
Rifampicin	Red to brown
Senna	Yellow-brown (acid urine); yellow-pink (alkaline urine); darkens on standing
Sulphonamides	Greenish blue
Triamterene	Blue
Vitamin B complex	Dark yellow
Warfarin	Orange
Food and drink	
Alcohol	Lightens colour
Asparagus	Green colour and offensive smell
Beetroot	Pink to dark red
Red fruit drinks	Pink to dark red
Oily fish	Fishy
Total parenteral nutrition	Offensive

Certain food smells appear to pass through into the urine, e.g. onions, garlic, some spices.

Adapted from Landowski (2008), Mason (2004), Wallach (1992) and Watsons (1987) [120, 119, 121, 122]

6.5.5 Urine testing from a continent urinary diversion

All dipstick (Multistix) testing should be carried out on a freshly produced urine sample. Older samples become alkaline due to ammonia formation caused by bacterial breakdown.

E. coli is a natural inhabitant of the gut and will therefore be present in small amounts in stomal urine samples. Dipstick tests showing positive results for leukocytes and nitrites [123] may not be indicative of a urinary tract infection. Specimens should therefore be sent for

culture and sensitivity. If the causative organism is found to be E. coli, with high levels of colonisation, and the patient is symptomatic, this should be treated with antibiotics. Urine samples have no value in patients with rectal bladders. [124]

Recommendation	LE	GR
• Patients should be educated regarding the changes in their urine as a result of the procedure	4	C

6.5.5.1 Glucose levels in patients with diabetes

Urine testing in the patient with diabetes may be inaccurate due to glucose absorption by gastrointestinal segments. [125] A blood test should therefore be used to determine glucose levels.

6.5.5.2 Pregnancy testing

The accuracy of "over the counter" pregnancy testing has been questioned in women who have had bladder reconstructed from bowel. [126, 127] Urine that has had exposure to segments of intestine has been identified as creating false positives. It is therefore recommended that pregnancy in women with reconstructive bladders is confirmed by blood test.

Recommendation	LE	GR
• A blood test should be done to confirm pregnancy in women with reconstructed bladders	3	B

7. Products

7.1 Catheters

There is a large array of catheters available and the choice of which size to use is dependent
on the type of continent urinary diversion.

The choice for the patient with an orthotopic urinary diversion will be similar to the choice for patients performing regular CISC.

For patients with cutaneous continent diversions the choice will vary according to the specific surgical technique used.

The two main types of catheters are the ones who need to be lubricated with water-soluble gel and the ones with a hydrophilic coating. [128] They can have a straight or bent tip. Some catheters have 'bigger eyes', this can sometimes be helpful when there is a problem with mucus blocking the catheter.

Choosing a catheter can be a very individual process and considerations regarding the patient's manual dexterity and lifestyle are important. [128] For wheelchair users using a catheter with integrated bag or a catheter with a urinary bag placed before catheterisation can be helpful.

Catheterising channel post-operatively

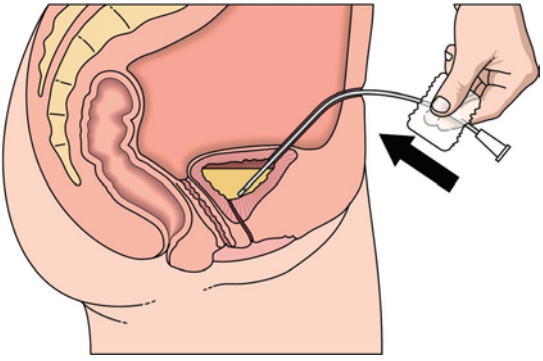

Fig. 6 Schematic drawing of intermittent self catheterisation of an access channel (Mitrofanoff)

Fig. 7 Intermittent self catheterisation of a Mitrofanoff channel

Many prefer disposable catheters. Rolstad and Hoyman in Hampton and Bryant [129] though describe and advise the use of a rubber catheter, which is washed with water and soap and dried after catheterisation and stored in a clean plastic bag between catheterisations. Some urological departments still use this procedure.

Recommendations	LE	GR
• A large variety of catheters should be available for the patient with a continent urinary diversion	4	C
• The NS should guide the patient in the use of an appropriate catheter	4	C

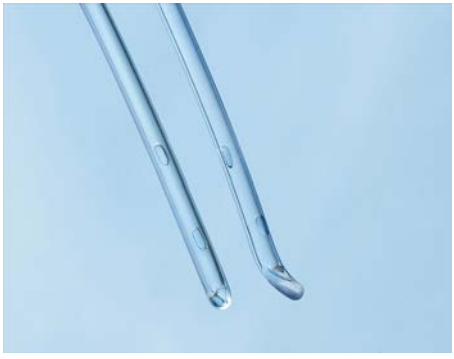

Fig 8a Various catheter tips

Fig. 8b For an access channel a standard length catheter is used (40 cm)

7.2 Covers and activity pouches

Patients with a cutaneous continent urinary diversion often need a cover to protect the stoma, protect clothes from being soiled with intestinal mucus and for discretion. The cover could be an adhesive, absorbing cover similar to the ones used for wounds. Covers with a hydrocolloid adhesive with an absorbing centre similar to covers used by patients irrigating their colostomy, but without a filter, are available.

Patients who experience leakage might have to use a pouching system similar to what patients with an incontinent urinary diversion use. However, they should use a two-piece bag in order to be able to disconnect the bag from the wafer and catheterise and afterwards put the bag back on again.

The choice of a suitable cover or pouch is individual and should be carefully assessed together with the patient.

Recommendations	LE	GR
• A wide range of covers and pouches should be available for the patient to choose from	4	C
• The NS should guide the patient in the use of an appropriate appliance	4	C

7.3 Pads

Due to the risk of incontinence (see 5.2) patients with a neobladder will need pads to collect urine.

Pads are available in many different sizes and shapes with different ability to absorb urine, and the grade of incontinence will determine which pads are most suitable.

Patients may need different sizes as daytime incontinence commonly is less severe than night time incontinence.

Recommendation	LE	GR
• Patients should receive individual advice regarding their need for pads	4	C

8. Nursing management of complications

8.1 Physical aspects

8.1.1 Skin irritation

Skin disorders in connection with a continent urostomy is often caused by leakage of urine pooling on to the skin. The enzymes and the moist may irritate the skin and cause fungus infection or contact dermatitis. A skin barrier that resists urine erosion could be used in the case of very small amounts of urine getting in contact with the skin.
The adhesive cover can also contain material that has an impact on the skin resulting in skin damage. In that case a different product to cover the skin should be found.
Patients may also suffer from underlying skin diseases such as psoriasis and eczema. These
should be assessed pre-operatively.

Recommendations	LE	GR
• Patients with skin irritation should consult their NS for help	4	C
• It is important to assess the aetiology in order to provide proper treatment	4	C

Geng 2009. [67]

8.1.2 Leakage

Some patients with a cutaneous continent diversion may experience leakage (see 5.5).
Leaking may make it difficult to live a normal life and may cause skin problems.
They should always consult their urologist in order to determine the cause and get possible treatment.
The NS can help solve the immediate problem by finding a solution to collect the leaking urine and prevent skin irritation.
If a urostomy appliance is used it should be a two-piece bag in order to let the patient take off the pouch and catheterise the cutaneous continent diversion according to the usual schedule and apply the pouch back on the wafer again afterwards. The pouch allow leaking urine to be released through a tap at the bottom.

Recommendation	LE	GR
• Patients should consult a urological specialist if they experience leakage	4	C

8.1.3 Bladder stone formation

Bladder stone formation has been found to be the most common complication in patients with bladder augmented with bowel. [110, 130, 131]

The most common urea splitting organisms cultured from individuals with reservoir stones are proteus mirabilis [132], providencia and klebsiella [110] which may lead to struvite stones. [133] These stones develop when urine is alkaline and bacteria are present. [134] The composition of struvite stones is usually triple phosphate. Patients who catheterise via an abdominal stoma have a higher risk (66%) than those who pass urine via their native urethra (15%). [132] The presence of stones increases the incidence of urinary tract infection.

Fig. 9 X-ray showing bladder stones

The incidence of stone formation is recognised to be higher in the immobile patient and those who catheterise via an abdominal stoma. The use of staples in the formation of the reservoir also presents an increased risk. [132]

Stones smaller than 5 cm may be able to be removed endoscopically. However open stone removal may be required for those over 5 cm. [116]

Study data suggests that following a bladder reconstruction a bladder irrigation regime reduces the incidence of reservoir calculi from 43% to 7% [132], with saline irrigation recommended twice weekly. However recurrent stones form in some patients despite mucus management. [135]

8.1.4 Use of cranberry in reduction of UTI, mucus and stone formation

Mucus production can be a problem causing blockage of catheters both in the immediate post-operative period and when intermittent self-catheterisation is necessary.

To date the most effective treatment in mucosal adherence is the cranberry. [82]
The cranberry, in both juice and capsule format, has become widely used in urology for the control of:

- urinary tract infection [136]
- mucus formation [137]
- formation of urinary stones. [138]

A native North American wetland fruit, cranberry (unlike most citrus fruits) does actually acidify the urine [139]. Early studies [140] identified the production of hippuric acid which had a bacteriostatic effect on the urinary pH (i.e. pH 5.5), although the concentrations required to achieve this was argued. Later studies advocated the use of cranberry juice in combination with oral medication, e.g. ascorbic acid and methenamine hippurate. [141]
E. coli are natural inhabitants of the gut and are therefore present in small amounts in the urine of patients with reconstructed bladders. If large amounts of mucus are produced and urine remains static it becomes an ideal medium in which to colonise E. coli and the patient may become symptomatic with fever, malaise and offensive urine. Under these circumstances the patient would be given antibiotics.

A meta analysis of studies into the effectiveness of cranberry concluded that there is some evidence that the juice may decrease the number of symptomatic UTI. [142] This may be achieved by decreasing bacterial adherence. [143]

Fig. 10 Mucus in a jar

A review on cranberry to prevent recurrent UTIs (2008 updated from 2004) included 10 randomized or quasi-randomized clinical trials. Most (7) studied cranberry in the form of juice, and 4 studied tablets (1,049 participants in total). The review found "some evidence" that cranberry juice may decrease the number of symptomatic UTIs over a 12-month period compared with placebo/control, especially in women with recurrent UTIs. The effect on UTIs may be achieved by decreasing bacterial adherence. [143]
A 2009 review on cranberry to treat UTIs concluded that there is no good-quality evidence on this question. [142]

Recommendations	LE	GR
• Bladder washout should be undertaken to reduce catheter blockage, UTI and stone formation in high risk patients	4	C
• Advise cranberry products to reduce the risk of UTI	3	B

8.1.5 Metabolic complications in patients following urinary diversion

Any metabolic complications in patients following urinary diversion depend mainly on the type of diversion used. In patients having an orthotopic neobladder or a urinary pouch, the urine remains in contact with the bowel segment for a longer period of time than in patients having a urinary conduite. The specific type of urinary diversion including the length of used bowel in the creation of the diversion may influence the severity of the metabolic alterations. [144]

In the continent type of diversions metabolic alterations can be recorded in up to 50% of the patients. [144]

The increased acid load in these patients originate mainly from reabsorption of ammonium chloride from the urine. Consequently, a low urine pH will lead to an increased reabsorbtion of acid.

The common symptoms of metabolic acidosis following urinary diversion are fatique, muscular weakness and lethargy, anorexia as well as nausea and vomiting. There may also be symptoms like abdominal pain, epigastric burning, dehydration, weight loss and an increased respiration in order to compensate the acidosis. [70, 144, 145]
It is likely that many patients may have alterations in bone mineral density due to the long lasting acidosis. Women in the post climacterium phase or children seem to be at greatest risk of developing low bone mineral density. [144]
In order to reduce the reabsorption of acid it is important to ensure regular emptying of the orthotopic neobladder or drainage of the pouch.

Apart from metabolic complications, malabsorption of vitamin B12 and bile acid can be seen. Vitamin B12 deficiency may lead to severe non-reversible neurological damage. Malabsorption of bile acid may lead to cholegenic diarrhea. [146]

Table 12. Metabolic consequences of continent urinary diversion

- Acidosis
- Electrolyte disturbances
- Vitamin B12 malabsorption
- Bone demineralisation
- Stone formation
- Periodic stool frequency
- Hypomagnesemia

Recommendations	LE	GR
• All patients should be monitored regularly for B12 deficiency	2b	B
• Patients should be informed to contact the hospital when non-specific illness occurs	2b	C
• Patients must be advised to consume 2-3 litres of fluids daily	4	C
• Patients must be advised to void regularly/catheterise their pouch to completion	2b	B

8.1.6 Pain

Once the patient is fully recovered and rehabilitated, the management of the continent urinary diversion is mostly painless. However, some patients continue to experience pain.

In case of pain when inserting the catheter in the pouch it can be helpful to re-evaluate the kind of pre-lubricated catheter the patient uses. Sometimes a catheter with another tip can be useful or prescribe the use of an extra gel to insert the catheter.

Persisting lumbar pain can sometimes occur, in which case a referral to the urological specialist and a renal check-up will be indicated.

Recommendation	LE	GR
• In case of persisting pain patients should be referred to the urological specialist for a renal check-up		4 C

8.1.7 Stomal stenosis

Sometimes in cutaneous urinary diversion channels stomal stenosis occurs. This can sometimes already be within the few hours between the catheterisations, in which case an ACE-stopper can be helpful. This stopper can be used for one months and can be placed between the catheterisations [147] Or an I-stent (knotted catheter) can be used.

Fig. 11 ACE-stopper

Fig.12 Knotted catheter

Recommendation	LE	GR
• Patency of the cutaneous channel can be maintained at surface level by use of an ACE stopper	4	C

8.2 Psychological and social issues

8.2.1 Post-operative social considerations

Early promotion of self care and management skills can significantly help patients adapt psychologically following their surgery. [148]

Many patients will return to work following their surgery but may need to adapt their activities to follow a less strenuous or physically demanding lifestyle. This in turn may lead to a reduction in their income and alter their circumstances. There may be additional costs incurred through the necessity of attending follow-up appointments and visits to hospital. Patients may also experience a change in their role or status within their family maybe even becoming dependant. This can lead to increased stress, anxiety and depression. [149]

identified that patients need to feel a part of a community. Patients need to be involved with family and friends on a social level as well as in the role of care assistants. [52]

Patients requiring catheters may need to consider bathroom facilities within their workplace or social environment. Advice on how to adapt inadequate facilities must be offered by the healthcare professional in the post-operative phase prior to discharge. [150, 151]

8.2.2 Cultural aspects

Modern multi-cultural society must be supported by an appropriate healthcare system that respects and reflects an individual's culture, religion, race and customs. Being aware and responding appropriately to cultural differences is an essential part of the healthcare professional's role. HCP need to recognise beliefs, values and health practices of different cultures to ensure that appropriate care and advice is provided. [58] For example; a patient observing the Sabbath in the Jewish faith may require support if they are required to use catheters during that time. A patient who fasts during Ramadan may limit their fluid intake for a 12-hour period, leading to a higher risk of UTI or renal damage in extreme cases. It is therefore recommended that the nurse specialist or patient should seek appropriate advice from the religious leader. [58]

8.2.3 Psychological aspects

Having a neobladder or stoma formation is a major event in anyone's life, patients can very easily become depressed or anxious. Counselling is vital and should begin prior to surgery and include family members. [152] Introducing the patient to another who has undergone the same procedure may be a valuable tool to enable the patient and family to adapt to the concept of surgery and prepare for the challenges ahead. Communication is integral in a nurse-patient relationship and necessary for education to be successful, thereby ensuring a patient is well-prepared to deal with the challenges of surgery and aftercare. [52]

8.2.4 Impact on quality of life (QoL)

QoL can deteriorate post-operatively for a lot of patients. The first few weeks post-operative are the most crucial. [153] Practical challenges such as catheters, stomas, access to public

toilet facilities may contribute to a low mood – support from family and friends is vital at this time. A psycho social assessment pre-operatively will identify potential challenges and allow the patient time to adapt facilities or develop coping mechanisms that will reduce the risk of post-operative depression. [154] A highly skilled nurse specialist with good communication and observation skills will play a critical role in promotion of health and well-being in patients who are undergoing urinary diversion surgery. [52]

8.3 Sexual function

Radical pelvic surgery can create difficulties with sexual function in both men and women. Sexual desire is often seriously affected even when nerve sparing techniques are used. [155] During pelvic surgery damage may be caused to:

- Nerve supply – of the superficial and deep nerves;
- Vascular supply – affecting engorgement and lubrication;
- Tissue – causing tenderness and reduced space.

8.3.1 Sexual dysfunction in males

Erectile dysfunction is defined as the persistent or recurrent inability to attain or maintain an erection sufficient for satisfactory sexual activity causing marked distress or interpersonal difficulty. [156]

Erection is a neurovascular phenomenon dependant on the flow of blood in and out of the penis. During pelvic surgery damage to the blood flow to the corpus cavernosum results in an inability to maintain satisfactory tumescence.

A significant percentage of men may present with erectile dysfunction prior to surgery. This information can be collated by pre-operative counselling, completion of sexual function questionnaires (IIEF) and nocturnal tumescence study (NPT). [157]

Radical pelvic surgery and formation of a reconstructed bladder will invariably result in some degree of erectile dysfunction. Damage is caused to several structures including the sympathetic and parasympathetic nerve supply. [158] The percentage of men with erectile dysfunction after radical cystectomy is high regardless of the type of bladder reconstruction. [155]

New nerve graph techniques after complete removal of the cavernous nerve have been developed to potentially recover lost erectile function. [159] Even after nerve sparing of the neurovascular bundles approximately 50% of men are likely to complain of erectile dysfunction. Nerve sparing laparoscopic surgery has improved the percentage of preserved function to between 43% - 97%. [160] It is now recommended that early rehabilitation in the post-operative phase is commenced to prevent irretrievable loss of erectile function. [161] Combination therapy of phosphodiesterase type 5 inhibitor and vacuum therapy have also significantly increased sexual function. [160]

Ejaculation will be affected if there is damage to the urinary sphincter. In the case of surgery to the bladder, prostate or urethra this will be inevitable.

Orgasmic ability and desire often remain intact due to circulating testosterone levels. It is important that patients are encouraged to explore alternative methods of sexual expression. [162] Psychosexual therapy, if available, should be considered so that both partners have the opportunity to discuss concerns in a supportive environment. [163]

Sperm banking

As a significant number of men survive cancer therapy, including chemotherapy, radiotherapy and surgery, cryopreservation of sperm should be considered in the pre-operative period. [164]

8.3.1.1 Treatment of erectile dysfunction

Treatments which may be suitable for men following reconstructive surgery include:

- Injection therapy
- Intra-urethral vasodilating medication (MUSE®)
- Oral medication
- Vacuum therapy
- Penile implants

Injection therapy – A vaso active drug (alprostadil) is injected into the corpus cavernosum with a fine gauge needle. The effect of the drug is to cause relaxation of the arterial and trabecular smooth muscle. The cavernous arteries dilate, the corpus cavernosum relaxes and is engorged with blood. [165] The erection should last approximately 1 hour. Priapism (prolonged erection) should be treated as a clinical emergency and medical advice sought. Gould et al (1992) [166] found that some patients suffered from persistent anxiety associated with self injection. Penile fibrosis may also become an issue. [167]

MUSE® – A small pellet containing alprostadil is inserted into the urethra using a disposable plastic applicator. Lubrication of the urethra can be achieved either by urination or by instillation of a water soluble gel prior to insertion of the pellet. The erection should occur 5 – 15 minutes after the insertion and can last between 30 – 60 minutes.

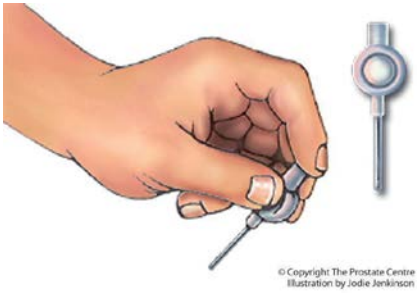

Fig. 13 MUSE® applicator

Oral medication – The suitability of oral medication for patients with reconstructed bladders has been minimally investigated. [168, 169]) Oral agents are known to be more acceptable to both the patient and the partner. [170]

- Phosphodiesterase type 5 (PDE5) inhibitor. This medication is a facilitator rather than an initiator of erection. In the presence of sexual stimulation [171] this group of drugs promotes cavernosal muscle relaxation and inhibits the release of PDE5 (initiating chemical responsible for detumescence). Erections occur approximately 20 minutes after administration. Side effects have reduced and the duration of erection increased in recent years. This treatment is not suitable for men using nitrates or with a diagnosis of

hypertension or recent myocardial infarction.

- Apomorphine hydrochloride — This sublingual medication stimulates the postsynaptic dopamine receptors in the hypothalamus. This enhances the natural erectile process. [172] However, this is only effective in those with intact sympathetic and parasympathetic nerve supply.

Vacuum therapy — External vacuum devices produce rigidity through vascular engorgement resulting in tumescence of the penis. [173] Vacuum devices are available both battery operated and as hand pumps. They consist of a plastic cylinder, constriction ring, lubrication and the pump. When the pump is activated, negative pressure (a vacuum) is created. Blood is drawn into the penis and an erection occurs. The constriction ring is rolled off onto the base of the penis and the cylinder removed. The erection can be maintained for up to half an hour. This system has been regarded as the most suitable for stoma patients as it is non-surgical and will not interfere with other treatments. Criticisms are the coldness of the penis and a lack of spontaneity.

Fig. 14a and 14b Vacuum therapy devices

Penile implants – This treatment tends to be reserved for men who have not responded to non-surgical treatments. It involves insertion of prosthesis into the corpus cavernosum. Malleable prosthesis produces a permanently erect penis which can be bent to accommodate intercourse and is flexible enough to be moved into a position of concealment. [158] Inflatable prosthesis consist of two basic designs, an integral inflatable/deflatable unit or those which involve insertion of a scrotal pump and abdominal reservoir.

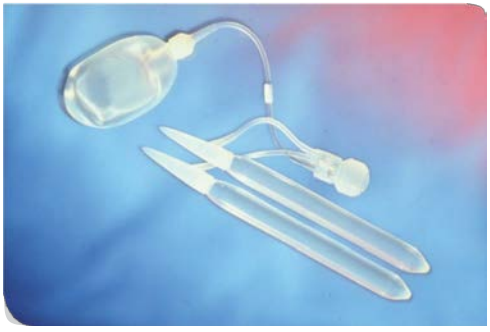

Fig. 15 Inflatable penile prosthesis

Recommendation	LE	GR
• Male patients with post-operative erectile dysfunction should be assessed for suitability for treatment if requested	4	C

8.3.2 Sexual dysfunction in females

Surgical damage in the female may include:

- Vascular supply – Reduction of lubrication to the vagina;
- Reduction in vaginal length
- Reduction in vaginal elasticity [174, 175]

Some studies have shown that when cystectomy and neobladder construction have been carried out for benign conditions in females it does not appear to have a negative effect on sexual function. [155, 176] However, radical cystectomy may require the additional removal of the ovaries, fallopian tubes, uterus and cervix and appears to have a high risk of female sexual dysfunction. This includes decreased orgasm, decreased lubrication, lack of sexual desire and dysparenunia. [175]

8.3.2.1 Vaginismus

Vaginismus (spasm) - This condition can be purely psychological and can often be attributed to an involuntary pelvic muscle contraction caused in anticipation and fear of pain. This may be helped by relaxation methods and counselling. [176]

8.3.2.2 Dyspareunia

Dyspareunia - Is a condition where intercourse (penetration) becomes painful. The cause may be internal scarring or lack of lubrication. Increased lubrication in the form of a water based gel or experimenting with a change of position can be helpful.

8.3.3 Fertility and pregnancy

Surgery for bladder reconstruction is undertaken in women of all ages and therefore issues around conception, pregnancy and childbirth must be considered. [127]
Debilitation may lead to loss of ovulation and internal scarring to a decrease of tubal patency.

Fertility preservation

Recent advances in cancer therapy have resulted in an increase in long term cancer survivors. Techniques to preserve fertility in young women are evolving and include cryopreservation of ovarian tissue and oocytes. [177, 178] Current clinical guidelines for the collection, storage and use of tissue for use in fertility preservation varies internationally. [179, 180, 181]

Pregnancy testing in those with bladder reconstruction may lead to false results. Samples taken may have been subject to reabsorbtion of electrolytes and hormones and therefore the concentration of human chorionic gonadotrophin can be altered. Blood samples should be taken. [126, 127]

Urinary tract infections and pyelonephritis are the most commonly identified urological complication in pregnancy. [132, 182] Urinary tract infections should be treated seriously and are generally treated with antibiotics immediately as pylonephritis can result in

premature labour. [183] Data suggests that cranberry may provide a protective effect against asymptomatic bacteriuria and symptomatic urinary tract infections in pregnancy. [184] This study was carried out on non cystectomised patients.

During the latter stages of pregnancy it may become more difficult to CISC and therefore an indwelling catheter may be required. [127, 185] For those who catheterise via a Mitrofanoff channel a longer length catheter may be required (standard length single use catheter is 40 cm) to reach the augmented bladder.

Women with augmentation cystoplasty should be allowed to deliver vaginally and a caesarian section should be avoided to protect the bladder and augmenting bowel. [110, 182] Advice of a urological specialist should be sought. Many centres advise booking an elective pre term caesarean for all other types of bladder reconstruction with joint care between the urological surgeon and the obstetrician. [185]

Recommendations	LE	GR
• Radical pelvic surgery need not mean the end of an active sex life for either men or women. Restoration of sexual activity may, however, require further treatment, a certain degree of adaptability and specialist intervention	4	C
• Patients should be advised pre-operatively of potential alterations to their pre-surgical sexual function	4	C
• Post-operative counselling should include discussion of treatment options and their suitability for individual patients	4	C

9. Abbreviations

ADL	activity of daily living
CISC	clean intermittent self catheterisation
E. coli	Escherichia coli
ET	enterostomal therapist
ICS	International Continence Society
IgE	Immunoglobulin E
IUGA	International Urogynecological Association
MBP	mechanical bowel preparation
MS	multiple sclerosis
MSSU	midstream urine sample
MUSE®	Medicated Urethral System for Erection
NS	nurse specialist
NSAID	non-steroidal anti-inflammatory drugs
PCEA	patient-controlled epidural analgesia
PCIA	patient-controlled intravenous analgesia
PDE5	phosphodiesterase type 5
POD1	post-operative day 1
PSH	parastomal hernia
PVR	post-void residual urine
RCT	randomised controlled trial
RN	Registered nurse
SP	spina bifida
TPN	total parenteral nutrition
TUU	transuretero ureterostomy
UTI	urinary tract infection
VAS	visual analogue scale
VIP bladder	vescica ileale Padovana
WOC	wound, ostomy and continence
WOCN	Wound, Ostomy and Continence Nurses Society

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12. Disclosure of conflicts of interest

All members of the EAUN Guidelines working group that has written this guideline have provided disclosure statements on all relationships that they have and that might be perceived to be a potential source of conflict of interest. This information is kept on file in the European Association of Urology Central Office database.

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