

Good Practice in Health Care

Incontinent Urostomy

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Good Practice in Health Care

Incontinent Urostomy

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Introduction

The European Association of Urology Nurses (EAUN) was created in April 2000 to represent European urological nurses. The EAUN's underlying goal is to foster the highest standards of urological nursing care throughout Europe. With administrative, financial and advisory support from the European Association of Urology (EAU), the EAUN also encourages research and aspires to develop European standards for education and accreditation of urology nurses.

We believe that excellent healthcare goes beyond geographical boundaries. Improving current standards of urological nursing care has been top of our agenda, with the aim of directly helping our members develop or update their expertise. To fulfil this essential goal, we are publishing the latest addition to our Good Practice in Health Care series, a comprehensive compilation of theoretical knowledge and practical guidelines on incontinent urostomy. Although there is considerable literature on incontinent urinary diversion (ileal conduit or urostomy), to our knowledge prior to this publication there was only limited evidence-based guidance for nurses available on this topic. The EAUN Guidelines Group believes there is a need to provide guidelines clearly stating the level of evidence of each procedure and recommendation with the aim of improving current practices and delivering a standard and reliable protocol.

In this booklet, we have included clear illustrations, case report summaries, extensive references and annotated procedures to help nurses to identify potential problem areas and efficiently carry out possible options for effective patient care. The working group decided to also include topics such as pre-and post-operative assessment (nutrition, fluid balance, pain management, etc.) which have a profound influence on both the outcome of the surgery and the urostomy patient's quality of life and to highlight the psychological and social aspects unique to the experience of patients with a urostomy.

With our emphasis on delivering these guidelines based on a consensus process, we intend to support practitioners who are already assessed as competent in this procedure. Although these guidelines aim to be comprehensive, effective practice can only be achieved if the practitioner has a clear and thorough knowledge of the anatomy under discussion and the necessary grasp and understanding of basic nursing principles.

This publication focuses on incontinent urinary diversion, leaving the topic of continent urinary diversion for a future publication in this series. The guidelines contain only material on adults and not children. Furthermore, these guidelines are intended to complement, or provide support to, established clinical practice and should be used within the context of local policies and existing protocols.

This text is made available to all individual EAUN members, both electronically and in print. The full text can be accessed on the EAU website: <http://www.uroweb.org/professional-resources/guidelines/>

Hard copies can be ordered through the EAU website via the publication order form.

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Part 1

Cystectomy:

Indications and pre- and post-operative care

1. Role of the nurse in different countries

The EAUN is a professional organisation of European nurses who have specialised in urological care. In Europe, there is a great variation in the education and competency of nurses in urology, with urological nurses having different activities and roles in various countries. It is therefore difficult for any guideline to fulfil all requirements. However, the EAUN Guidelines Group has tried to ensure that every nurse may gain some benefit from using these guidelines.

2. Methodology

The EAUN Guidelines Group for Urostomy have prepared this guideline document to help urology nurses assess the evidence-based management of urostomy care and to incorporate the guidelines' recommendations into their clinical practice. These guidelines are not meant to be proscriptive, nor will adherence to these guidelines guarantee a successful outcome in all cases. Ultimately, decisions regarding care must be made on a case-by-case basis by healthcare professionals after consultation with their patients using their clinical judgement, knowledge and expertise.

The expert panel consists of a multi-disciplinary team of nurse specialists, including Hanny Cobussen-Boekhorst, Berit Kiesbye, Sharon Fillingham, Sharon Holroyd, Susanne Vahr and Veronika Geng (see 'About the authors', page 76). Obviously in different countries, even in different areas, titles will differ within the speciality. For the purpose of this document we will refer to the specialised nurse (e.g. stoma care nurse, wound-continance-stoma care nurse) as the 'nurse specialist' (NS).

Literature search

The data underpinning this document were gathered through a systematic literature search. The focus of this search was to ensure identification of the available high-level data (meta-analyses, randomised controlled trials, Cochrane reviews and other high-quality guidelines documents). A critical assessment of the findings was made, not involving a formal appraisal of the data. Articles were selected from Medline, Cinahl, Scopus, Scencedirect, PubMed and the Cochrane database, as well as from relevant textbooks and other guidance documents. Whenever possible, the Guidelines Working Group have graded treatment recommendations using a three-grade recommendation system (A to C) and inserted levels of evidence to help readers assess the validity of the statements made. The aim of this practice is to ensure a clear transparency between the underlying evidence and a recommendation given. This system is described further in Tables 1 and 2.

Search keywords

The Working Group first tried to find randomised, controlled trials, reviews or meta-analyses. If these references did not provide enough information, the Working Group continued their search by looking for studies with lower levels of evidence. The evidence found on each topic is shown in the recommendations of each chapter or subchapter. The choice of literature is guided by the expertise and knowledge of the Guidelines Working Group. The question for which the references were searched was: Is there any evidence for

incontinent urinary diversion for nursing interventions in different care situations such as preoperative, operative and post operative, acute as well as long term?

The references for these Guidelines were searched using the keywords listed below. Several databases (Medline, PubMed, Embase, Cinahl and Cochrane) were searched as well as private libraries, databases and books of the authors, using the keywords in different combinations. The references were searched by different experts in the field of urostomy. The same reference was often used repeatedly to build up the Guidelines.

Keywords (alphabetical order)

- Activity of daily living
- Bricker
- Colon conduit
- Coping
- Cranberry
- Cystectomy (Mesh)
- Education
- Fluid balance
- Ileal conduit
- Incontinent urostomy
- Nursing assessment (Mesh)
- Nutrition
- Pain management
- Patient care planning (Mesh)
- Patient education
- Post-operative care
- Pre-operative care
- Psychological impact
- Stoma
- Stoma care
- Stoma care nursing
- Stoma care pouching system
- Skin care (Mesh)
- Skin irritation
- Social issues
- Stent
- Stoma
- Teaching
- Urethral cutaneous stomy (Cutaneous stoma)
- Urinary diversion (Mesh)
- Urinary tract infection
- Urological nursing
- Urostomy
- Wet urostomy

Disclosure statement

The EAUN Guidelines Working Group members have provided disclosure statements of all relationships that might be a potential source of conflict of interest. The information has been stored in the EAU database. This Guidelines document was developed with the financial support of the EAU and Hollister Incorporated. The EAUN is a non-profit organisation and funding is limited to administrative assistance and travel and meeting expenses. No honoraria or other reimbursements have been provided.

Limitations of document

The EAUN acknowledge and accept the limitations of this document. It has to be emphasised that the current guidelines provide information about the treatment of an individual patient according to a standardised approach. The information should be considered as providing recommendations without legal implications. The intended readership is the pan-European practising urology nurse and nurses working in a related field. This guidelines document is of limited use to, for example, urologists, other healthcare providers or third-party payers. Cost-effectiveness considerations and non-clinical questions are best addressed locally and therefore fall outside the remit of these guidelines. Other stakeholders, including patient representatives, have not been involved in producing this document.

Review process

The Working Group included an extensive number of topics, which are not always only applicable to urostomies, but decided to include them because they make the guideline more complete. A draft for review was sent to the European national urological nurses societies, specialised nurses in various European countries, a few urologists, the EAU Guidelines Office and the EAU executive responsible for EAUN activities. We revised the document based on the comments received. A final version was presented and approved by the EAUN Board.

Rating system

The recommendations provided in these documents are based on a rating system modified from that produced by the Oxford Centre for Evidence-based Medicine. [106]
Some of the literature was not easy to grade. If, however, the EAUN Working Group thought the information would be useful in practice, it is ranked as level of evidence 4 and grade of recommendation C.

Table 1: Level of evidence (LE)

Level	Type of evidence
1a	Evidence obtained from meta-analysis of randomised trials
1b	Evidence obtained from at least one randomised trial
2a	Evidence obtained from one well-designed controlled study without randomisation
2b	Evidence obtained from at least one other type of well-designed quasi-experimental study
3	Evidence obtained from well-designed non-experimental studies, such as comparative studies, correlation studies and case reports
4	Evidence obtained from expert committee reports or opinions or clinical experience of respected authorities

Table 2: Grade of recommendation (GR)

Grade	Nature of recommendations
A	Based on clinical studies of good quality and consistency addressing the specific recommendations and including at least one randomised trial
B	Based on well-conducted clinical studies, but without randomised clinical trials
C	Made despite the absence of directly applicable clinical studies of good quality

3. Terminology (definitions)

3.1 Cystectomy

Cystectomy is a resection of the bladder.

4. Principles of management: Nursing interventions

4.1 Pre-operative assessment

4.1.1 Standardising forms, documents, tools

Several studies show that a peri-operative care plan is important to reduce morbidity and to improve recovery. [116, 85] Care plans are a way of documenting and communicating patient care. Without a specific document delineating the plan of care, important issues are likely to be neglected. There are different rules and experiences [103] of documentation in different countries.

Recommendation	LE	GR
• Implement care plans for all patients with an ileal conduit following local documentation recommendations	4	C

LE = level of evidence; GR = grade of recommendation.

4.1.2 Nutrition

Not all patients undergoing a urinary diversion will have a cystectomy, but for those who do, an early institution of an oral diet is crucial in helping a patient to return to normal everyday living.

Radical cystectomy results in catabolic metabolism and tissue breakdown, leading to a prolonged period of negative nitrogen balance. Patients who are already malnourished prior to surgery have a higher morbidity after cystectomy, with studies showing that 17% of patients undergoing cystectomy are malnourished. [4] In addition, patients undergoing cystectomy and an ileal conduit are usually elderly (mean 71 years). [116] These patients may have multiple co-morbidities and often a serum albumin in the low normal range. [84, 85] A pre-operative nutritional assessment is therefore important to ensure a goal-directed nutrition therapy.

There is evidence that pre-operative total parenteral nutrition (TPN) should be recommended in malnourished patients because TPN can reduce morbidity in this group. However, TPN has been shown to increase morbidity in well-nourished subjects [4], so careful patient selection is important. Isolated pre-operative oral nutritional supplementation does not appear to have clinical benefit in a patient with a minimum intake of 1900 calories/per day. [128]

Recommendation	LE	GR
• Pre-operative nutritional assessment of the patient is necessary	1b	A

4.2 Patient preparation

4.2.1 Nutrition, hydration and bowel preparation

4.2.1.1 Nutrition and hydration

Fasting before surgery is necessary because general anaesthesia reduces the efficiency of laryngeal reflexes and increases the risk of tracheobronchial and pulmonary aspiration. [84] However, resulting abnormalities of fluid and electrolyte balance may affect organ function. The goal of pre-operative fluid therapy is to maintain an effective circulatory volume while avoiding interstitial fluid overload. [80] This involves minimising the period of pre-operative fasting. In response to fasting, insulin resistance also develops. As clear fluids transit the gut extremely fast, it is recommended the patient drinks a glass of clear fluid 2 hours before surgery. Patients undergoing bowel preparation can be moderately dehydrated. Randomised controlled trials have shown that careful concurrent administration of either intravenous or oral hydration solutions may help restore normal fluid balance. [80]

Recommendations	LE	GR
<ul style="list-style-type: none">• The patient should receive verbal and written instructions to ensure compliance with no food intake 8 hours, and no fluid 2 hours, before surgery [108, 84]	1a	A
<ul style="list-style-type: none">• Assess the fluid balance of the patient to identify dehydration and start fluid therapy pre-operatively	1a	B

4.2.1.2 Bowel preparation and bowel function

Bowel preparation, prior to formation of ileal conduit, varies between centres and individual surgeons. If bowel preparation is used, it usually consists of a purgative laxative, e.g. sodium picosulphate, on the day before surgery. Intravenous infusion should be started prior to surgery to maintain hydration. [44]

Recent studies have questioned the necessity of bowel preparation. [131] Many studies have shown that bowel preparation provides no benefit for surgical outcome. Purgative laxatives, however, increase the length of hospital stay due to prolonged ileus. [126]

Patients undertaking the enhanced recovery programme, who received no pre-operative bowel preparation, had a significantly reduced hospital stay with no adverse effect on morbidity or mortality.[2]

Post-operative ileus is common in both open and laparoscopic procedures. [84] In the long term, patients often complain of intermittent periods of diarrhoea. [63] Vitamin B12 deficiency, due to the use of terminal ileum, requires monitoring and replacement therapy may be necessary using intramuscular injection.

Recommendation	LE	GR
<ul style="list-style-type: none">• Follow local guidelines	4	C

4.2.2 Shaving

European guidelines in this respect vary.

Recommendation	LE	GR
<ul style="list-style-type: none">To prevent site infection, it is recommended that hair should not be removed from the operative site unless it is to assist surgery. If hair is removed, removal should be immediately before surgery, preferably with electric clippers [100, 97]	1a	A

4.3 Post-operative care

4.3.1 Stents

During surgery, surgeons stent the anastomosis between the ureters and the ileal conduit to prevent upper urinary tract obstruction due to mechanical compression caused by post-operative oedema. The ureteral stents originate in the renal pelvis, extend down the ureters, and exit through the stoma. Urinary output via the ureteral stents is closely monitored. The urine output should be preferably be > 50-100 ml/hour and at least 30 ml/h. [112]



Fig. 1 Stoma with stents shortly after operation to protect the uretero ileal anastomosis

Studies show that stenting reduces the risk of post-operative nausea and vomiting, while flatulence, as a sign of intestinal transit, occurred significantly earlier in patients with ureteral stents. [112, 89] Furthermore, the risk of metabolic disorders is decreased by avoiding reabsorption of significant amounts of urinary metabolites by the intestinal mucosa.

Recommendations	LE	GR
<ul style="list-style-type: none">The nurse should assess stent function. Stents should drain urine all the time	4	C
<ul style="list-style-type: none">Decreased urine output should be investigated. It can be caused by mucus plugs or dehydration	4	C
<ul style="list-style-type: none">Assessment of fluid input and urine output and measuring recent serum creatinine levels are recommended [108]	4	C
<ul style="list-style-type: none">If stents are producing no urine, they should be flushed with 5-7 ml NaCl 0.9% using a sterile technique, because mucus plugs could lead to undue tension on a surgical anastomosis	4	C

4.3.2 Fluid balance

The metabolic reaction to surgery involves not only the well-known metabolic response, but also important changes in fluid and electrolyte physiology. Patients are therefore extremely susceptible to errors in fluid prescription early after surgery. [80] In health, the average human requires 25-35 ml/kg/day of fluid and 400 calories per day to prevent starvation ketosis.

Research shows that peri-operative fluid therapy has a direct bearing on outcome. The goal of fluid therapy in the elective setting is to maintain the effective circulatory volume, while avoiding interstitial fluid overload, which may cause nausea and post-operative ileus. [80, 60, 18] These studies recommend an individualised goal-directed fluid management plan. Fluid therapy should be procedure-specific and take into account individual patient characteristics.

Weight gain in elective surgical patients should be minimised to aim for 'zero fluid balance'. However, fluid balance charts have inherent inaccuracies and reliance upon them alone can lead to inaccuracies in fluid prescription. Daily weighing is the best measure of fluid gain or loss. [60]

Recommendations	LE	GR
• Daily weighing in the post-operative period	1b	C
• Fluid balance documented on charts daily	4	C
• Clinical observation of the patient to identify fluid overload or dehydration	4	C

4.3.3 Nutrition

Nutritional support is an important area of post-operative care, which is known to improve recovery from cystectomy. Despite this, there is limited evidence to support specific nutritional strategies.

Resting the bowel and feeding orally after bowel recovery is still a common post-operative strategy [4], so that patients are often left without adequate nutrition for a prolonged time. This approach may be a result of research that has shown post-operative paralytic ileus to be the most common minor complication after radical cystectomy. [24, 84, 101]

Post-operative observations of bowel function should be part of a goal-directed nutritional therapy. There is little evidence that early TPN affects the return of bowel function and improves the outcome of cystectomy. [4, 84, 139] Another study found that peri-operative oral nutritional supplementation started before hospital admission for lower gastrointestinal tract surgery significantly reduced the extent of weight loss and the incidence of minor complications. [130] These results were supported by Barrass et al. (2006) [4], which concluded that enteral nutrition may improve recovery.

One study has investigated the effect of removing the nasogastric tube to reduce time to oral diet. [116] The median time to tolerate a regular diet was 4.2 days and median time to

hospital discharge was 5.2 days. These results are similar to those of Maffezzini et al. (2006) [85], who evaluated the effect of early parenteral and enteral post-operative nutritional support on the restoration of normal bowel function. Early post-operative artificial nutrition had no effect upon bowel function or post-operative protein depletion and the median time to normal diet resumption was post-operative day 4.

Recommendations	LE	GR
• Daily observation of the bowel function	4	C
• Daily screening of the patient's oral intake with a view to supplying with artificial nutrition	1a	A
• Counselling of the patient to involve the patient in the post-operative nutritional strategy	4	C

4.3.4 Post-operative wound management

Generally, post-operative care follows the standard protocol for any major abdominal surgery. However, post-operative infections of the surgical site are a major source of illness [100, 86] and several recommendations can be made to minimise the risk of infection.

Recommendations	LE	GR
• Protect the incision with a sterile dressing for 24-48 hours post-operatively	1b	B
• Wash hands before and after dressing changes and any contact with the surgical site	1b	B
• When changing an incision dressing, use sterile technique	1b	C
• Educate the patient and family regarding proper incision care, symptoms of Surgical Site Infection (SSI) and the need to report such symptoms	1b	C

4.3.5 Post-operative pain management

Even though clinical practice guidelines are widely available for post-operative pain assessment and management, many patients still suffer from moderate to severe post-operative pain. This is because post-operative pain management continues to be based upon local nursing traditions and nurse judgement rather than a systematic, goal-directed, evidence-based clinical intervention.

Pre-operative information has positive effects on pain intensity and patient satisfaction. [39, 70] Poorly managed pain may interfere with wound healing, cause patient suffering and prolong recovery. Both patients and nurses accept pain as a normal component of the post-operative experience. [39] A visual analog scale can be used to assess pain and to manage the post-operative

pain. Pain management should be procedure-specific and reduce the use of opioids, because opioids delay normal organ functioning. [69] Well-managed pain helps the patient to learn more easily about stoma management, to become mobile and to re-establish bowel function.

Recommendations	LE	GR
• Provide pre-operative information about the pain strategy, including the patient and nurse role	4	C
• Carry out pain assessment using a visual analog scale both at rest and during activity	4	C
• Evaluate the effects of prescribed analgesics	4	C

4.3.6 Post-operative physical activity

In fast-track surgery, early post-operative activity is important for faster recovery.

Prior to surgery, the patient should be given a nursing care plan for use following surgery. It is important to motivate the patient towards achieving an early, high level of post-operative activity. Thus, the care plan should include daily aims of activity that increase day by day. The plan should start on the day of surgery, when the patient should be helped out of bed at least once. [2, 71]

4.3.7 Special care: Laparoscopic cystectomy and ileal conduit

Laparoscopic cystectomy uses a 5-port access, which allows the surgeon to dissect the bladder and extract it through the hand port (incision). The ureters and loop of small intestine are withdrawn through the same port. The ureters are anastomosed to one end and re-introduced into the abdomen. The stoma is constructed through the right-sided port at the marked stoma site.

Laparoscopic surgery offers a less invasive approach than open radical cystectomy. However, it is technically demanding because of imperfect hand-eye co-ordination, lack of depth perception, restriction of the instrument's degree of freedom, and non-ergonomic positioning of the surgeon. [61]

The advantages of laparoscopic cystectomy include decreased surgical morbidity, good visualisation of the pelvic structures, decreased blood loss, reduced post-operative ileus, shorter hospital stay and increased cosmesis (body appearance). [23] Limitations included a significant learning curve, increased operative time and therefore increased financial costs. There is also a risk of metastases at the site of the port.

A surgeon using a robotic system will work a metre or so away from the operating table, seated at a computer console with a three-dimensional view of the operating field. The robot-assisted approach appears to have a shorter learning curve and is associated with less blood loss, fewer post-operative complications, and an earlier return of bowel function than laparoscopic radical cystectomy. [1] In a recent small case series (Kane, 2008) [67], robotic-

assisted laparoscopic radical cystectomy showed acceptable operative, pathological and short-term clinical outcomes. As experience increases, surgeons expect to refine their surgical technique and decrease operative time.

Laparoscopic radical cystoprostatectomy with formation of ileal conduit is considered a safe operation for bladder carcinoma. The procedure is technically demanding and has a steep learning curve. It should be performed in centres experienced in laparoscopic surgery. [72, 130]

Benefits of a laparoscopic approach include reduced blood loss, less blood transfusion requirements. [55]

Pruthi et al. (2003) [116] looked at improving care pathways through the pre-, peri- and post-operative stages of patients undergoing radical cystectomy to allow for early institution of an oral diet and early hospital discharge, and thereby overall improvements in patient recovery and outcomes after this procedure. Improvements such as limiting pre-operative bowel preparation, changes in surgical technique (i.e. reduced incision length), use of internal surgical stapling devices and, post-operatively, early nasogastric tube removal, use of non-narcotic analgesics and early resumption of diet.



Fig. 2 Laparoscopic cystectomy and ileal conduit formation

Today three issues will mainly dictate whether to use the laparoscopic or robotic approach: surgeon training, surgeon preference, and access to a robotic surgical system.

Recommendation	LE	GR
• Pre-operative bowel preparation is decreased in patients undergoing laparoscopic surgery	4	C

Part 2

Incontinent urostomy:

Community care, follow-up and complications

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1. Methodology

The used methodology is described in Part 1, Chapter 2 of this guideline.

2. Terminology (definitions)

2.1 Urinary diversion

A urinary diversion is defined as the surgical creation of an alternate route of flow for urine to replace an absent or diseased portion of the lower urinary tract in order to preserve renal function. [37]

2.2 Ureterostomy

A cutaneous ureterostomy (also known as an ureterocutaneostomy) is a surgical procedure that detaches one or both ureters from the bladder, and brings them to the surface of the abdomen with the formation of an opening (stoma) to allow passage of urine. There are four common types of ureterostomies (Table 3).

Table 3. Common types of ureterostomies

• Single ureterostomy	This procedure brings only one ureter to the surface of the abdomen
• Bilateral ureterostomy	In this procedure, both ureters are brought to the surface of the abdomen, one on each side
• Double-barrel ureterostomy	In this approach, both ureters are brought to the same stoma on the abdominal surface
• Transuretero ureterostomy (TUU)	This is an anastomosis of one ureter to the other ureter

2.3 Ileal conduit (ureteroileal conduit, ureteroileal anastomosis)

The ureters are disconnected from the native bladder and anastomosed to the proximal end of a 15 cm (approximately) isolated ileal segment (Bricker 1950). They are then attached so that they empty through a piece of the ileum. One end of the ileum piece is sealed off, while the other end is brought to the surface of the abdomen to form the stoma. It is the most common technique used for urinary diversion.

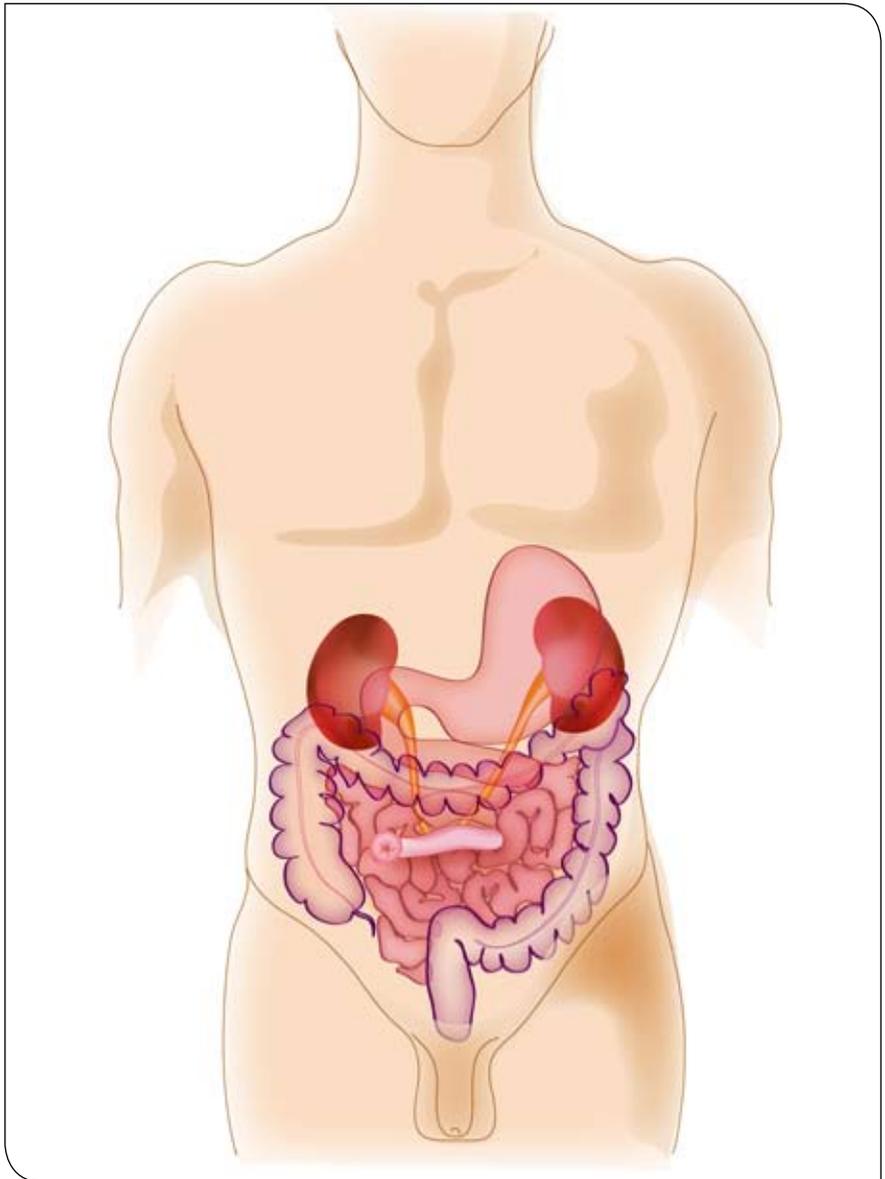


Fig. 3 Ileal conduit

2.4 Colon conduit

In this type of urinary diversion, a segment of colon is used as a conduit to divert urine from the ureters and out through a stoma.

3. Indications for urostomies

Indications for urostomies are given in Table 4.

Table 4. Indications for urostomies

- Bladder cancer [26, 30, 38, 95]
- Cystectomy [140]
- Trauma
- Surgery
- Incontinence [95]
- Painful bladder
- Overactive bladder
- Congenital abnormalities, e.g. ectopia vesicae [26, 30, 38]
- Conversion of continent urinary diversion to incontinent stoma
- Neurological conditions and diseases [94]
- Spinal cord injury [26, 30, 38]
- Chronic inflammation of bladder [26]
- Interstitial cystitis [38]
- Radiation damage [29, 30, 95, 130]
- Inability to manage a continent urinary diversion or a neobladder

4. Complications of ileal conduit urinary diversion

There are several, common, long-term, follow-up complications of ileal conduit diversion (Table 5). In addition, there are complications specifically associated with the use of ileum. (Table 6) [53]

Table 5. Common long-term follow-up complications of ileal conduit urinary diversion

- Stomal or peristomal problems
- Parastomal hernia
- Conduit stenosis
- Upper tract deterioration
- Stomal stenosis and subsequent UTI
- Stricture
- Renal dysfunction due to recurrent UTI and calculus formation

Adapted from Hautmann et al. (2007) [53].

Table 6. Complications associated with the use of ileum

- Hyperchloraemic metabolic acidosis
- Hypokalaemia and other electrolyte abnormalities
- Altered sensorium
- Disorders of hepatic metabolism
- Abnormal drug metabolism
- Vitamin B12 deficiency
- Decreased linear growth
- Bone demineralisation
- Mucus production

Adapted from Hautmann et al. (2007) [53].

5. Principles of management: Nursing interventions

5.1 Pre-operative assessment

5.1.1 Activities of daily living (ADL)

Activities of daily living (ADLs) are the activities we normally carry out in daily living, including any daily activities we perform for self-care, work, homemaking, and leisure. [91]

Health professionals routinely refer to the ability or inability to perform ADLs as a measurement of an individual's functional status. The formation of a stoma can be traumatic and life-changing for patients. It is a challenge for patients to live successfully with their stoma and continue in their employment and with other activities. [20] ADLs provide a useful measurement for assessing the ostomate and the impact of the stoma upon daily living. Pre-operative counselling from NS about the ostomy, self-care activities and resumption of activities outside the home results in better long-term adjustment to an incontinent ostomy. [52]

Recommendation	LE	GR
• Pre-operative assessment of the functional status of the patient, including data about work, sport activities and home-making.	4	C

5.1.2 Social context and support

Following urostomy formation, some patients may have a temporary or permanent reduction in their income because of their illness and/or surgery. There is also the cost of transport to and from hospital both for surgery and follow-up appointments. Some individuals may require adaptations to their homes and bathrooms. Some countries provide financial assistance in some or all of these scenarios. [104, 105, 115, 125]

It is important to start talking about a patient's concerns at the pre-operative assessment stage as there are still social taboos surrounding bodily excretion. Many patients will experience negative thoughts and feelings about the impact of a stoma on their lives. [15] Family and friends are a vital source of comfort and support to the patient in the post-operative stage. It should be remembered that they too may have fears and anxieties regarding their loved one and may benefit from talking to the stoma nurse. [142] It is important to begin these discussions prior to surgery, not least because there has recently been a drastic reduction in the post-operative length of hospital stay. [105] Information is best given in small fragments to allow patients to absorb it and prevent overloading them with information. [31]

Recommendations	LE	GR
• Pre-operative assessment of social circumstances to identify any requirement for physical alterations to home	3	C
• Pre-operative assessment of eligibility for financial support	3	C
• Inclusion of family member at pre-operative assessment to establish support mechanism	3	C
• Provision of written information at pre-operative stage to clarify and support discussions	3	C

5.1.3 Psychological aspects, compliance and cognition

Undergoing surgery resulting in the formation of a urostomy is very distressing for most patients. [141] The threat of helplessness, loss of control and normal bodily function, alteration in body image and impact on future sexual function contribute to anxiety and fear of the future. [135] Patients undergoing surgery because of cancer also have a life-threatening disease to cope with.

Special attention should be paid to patients with a history of mental illness, as they are at higher risk of psychological problems post-operatively. [141] Pre-operative psychological support can allow patients to express and work through any emotional concerns, feelings and anxiety about their surgery and the urostomy. [135] After surgery, counselling can provide information to help the patient understand and gain control of the situation. [135]

It is important to create an environment in which the patient and his/her relatives feel free to express themselves and ask any questions. This helps to reduce stress and anxiety and increases trust and co-operation between the patient and staff. [123]

Patients should be informed about, and motivated, to take on the important role they themselves have in maximising their early post-operative recovery, especially in nutrition, resuming physical activity and stoma care.

Giving patients information both before and after surgery will help them to gain control of their situation and to cope better physically and mentally. [92] Information should be about the surgery itself, the urostomy and its function, stoma care and appliances. There should be discussion of the impact the stoma will have on their life. [92] Written information and photos about the surgery and urostomy should be available to support orally provided information.

Patients can benefit from being taught prior to surgery practical skills regarding stoma care and change of appliance. [124] At this point, patients are not yet affected by the sequela of surgery, such as nausea, bowel obstruction, fatigue and pain. If the patients can gain confidence in being able to develop stoma care skills pre-operatively, it can influence their psychological adjustment post-operatively and reduce feelings of stress and anxiety. [92, 141]

A training kit can be used. An adhesive with a model of a stoma made out of foam-like material (provided by several companies) is placed where the stoma is sited. The patients

are then guided to cut and apply the appliance and afterwards to remove it again, using the principles of stoma care and change of appliance. During the training session, the nurse explains the principles of stoma care and change of appliance, answers questions, and discusses the effects of the stoma on the patient's life.

Recommendations	LE	GR
• Pay special attention to patients with a history of mental illness	4	C
• Pre-operative assessment of psychological capability essential	4	C
• Audio or visual information should be provided	4	C

5.1.4 Cultural and religious issues

Modern multi-cultural society requires a healthcare system that reflects and respects an individual's colour, culture, religion and customs. In addition, many practices relevant to ostomates with bowel stomas may not be applicable to the urostomate.

Being aware and responsive to cultural difference is an essential component of care. An example of this is knowledge of the 'ingredients' or components of a stoma product. Pastes or powders may contain certain animal products unacceptable to certain cultures and religions and to those following a vegetarian or vegan diet.

There are several examples where religious or cultural practices need to be taken into consideration. Ramadan, for example, requires a period of fasting from dawn until dusk. In warmer weather, this may mean a period of 12 hours without fluid, which can cause serious dehydration in a patient with a urostomy. During Ramadan, the patient may be predisposed to urinary tract infection (UTI) and even renal damage. It may therefore be advisable for the NS and the patient to seek advice from the patient's iman (learned religious man). [14]

Recommendations	LE	GR
• Be aware of the patient's country of origin and religion	4	C
• Note their individual 'feast, festival and fasting calendar'	4	C
• Maintain the patient's dignity at all times	4	C
• Understand cultural dietary/product usage considerations, e.g. gelatine (animal product)	4	C
• Provide translators when necessary	4	C
• Promote cultural awareness among team members	4	C

From Black et al. (2000) [13].

5.2 Patient preparation

5.2.1 Siting (site marking) (Table 7)

Different procedures of stoma site marking are described in the literature [119, 122, 133] (Level of evidence: 2b).

In daily practice, it has been known for a long time that the procedure of pre-operative site marking positively affects the clinical and financial outcome of stoma care. [133]

A wrongly placed stoma can lead to:

- Failure of the appliance system
- Skin and leakage problems
- Local revision or displacement of the stoma
- Psychological disturbance. [59]

In turn, these complications can lead to increased use of stoma appliances and therefore higher costs. It can also have a negative influence on the patient's quality of life.

Several studies have shown the importance of pre-operative site marking:

- In a retrospective study [5], data extracted from a stoma registration system found that 32.5% of patients who received pre-operative site marking developed complications versus 43.5% of patients who did not receive pre-operative site marking, such as stoma location in relation to skin complications, e.g. stoma placed near a crease, scar, incision or bony prominence, and stoma location in relation to stoma complications, e.g. necrosis, stenosis, retraction, etc.
- Crooks (1994) [32] describes a survey in which patients not given pre-operative site marking, as well as patients in which the surgeon deviated from the site marking, experienced more difficulties in self-care.

There has also been discussion about the preferred procedure for pre-operative site marking. Several procedures of pre-operative site-marking are described (Level of evidence: 2b):

- Turnbull (2002) [133] explains the preferred procedure for pre-operative site marking, as described by Turnbull and Weakley in 1964.
- Reading (2003) [119] presumes that site marking should be a joint decision of the patient and (stoma care) nurse.
- Rozen (1997) [122] describes some concerns, such as wheelchair-dependent patients, corpulent patients, patient's profession and use of orthopaedic aids.

It is important to consider poor eyesight or other physical disability (e.g. missing limbs or digits, Parkinson's tremor, arthritis) when preparing a patient for stoma surgery. [8]

The stoma should be sited on a patient with a physical disability with any mobility aids used in place (e.g. in a wheelchair user while he or she is sitting in their wheelchair). It is important to discuss prior to surgery the normal working posture of patients and the level of physical activity of their job and/or hobbies.

Table 7. Siting (site marking) procedure

1.	Inform the patient about the aim and procedure and be aware that site marking should be a joint decision of the patient and (stoma care) nurse. This is because consent promotes acceptance
2.	Collect all relevant information about the disorder and the planned surgery. This is because different stomas have different preferences for site marking
3.	Collect patient-specific information about lifestyle, profession, body, skin, religion, orthopaedic aids, hobbies and sports. This because wheelchair-bound patients, or patients who wear orthopaedic aids, should not be hindered by the stoma. Always carry out the site marking with patients in their wheelchair or using their aid
4.	Let the patient lie down on the bed and let him/her hitch up the abdomen. This is because stomas will be placed within the rectus abdominus
5.	Make an imaginary line between the umbilicus, the pelvic crest and the os pubis. Mark the place as an orientation point marking where the stoma can possibly come out. Within this triangle, the stoma will preferably be placed, leaving enough room for the flange
6.	Let the patient bend and sit so that possible folds and dips can be registered. This will help to prevent leakage by folds and pits and enable the device to be adequately fitted
7.	Discuss clothing in relation to the site marking. This can prevent patient disappointment and limitation of ADLs and daily habits and prevent complications
8.	Check that the site is visible in different positions and is accessible for the patient, so that the patient can take care of his/her stoma
9.	Eventually, place a test pouch over the marked point and evaluate this with the patient. In this way, you can see how the device behaves during motion and how the device relates to scars, the umbilicus, and body structures. The device should be observed when filled with water. Allergic reactions to the device should be observed
10.	Discuss with the patient the chosen site, so that the patient can agree with it and understands the choice
11.	Mark the site definitely. Take care that the surgeon will still be able to see the marked place after disinfection has taken place
12.	Do not use tattoo ink. Tattoo is a permanent marking
13.	Inform the surgeon if the site is different to what would be expected. In this way, you can stop the surgeon from using the usual site and make sure the surgeon uses the correct site for the patient

Adapted with permission from the evidence-based Stoma Care Guideline: Pre-operative site-marking, Dutch Stoma Care Nurses Society, 2006. [49]

Recommendations	LE	GR
<ul style="list-style-type: none"> Pre-operative site marking should be a standard procedure when a patient is due to undergo surgery that includes stoma formation, but also when a patient is due to undergo surgery and there is a possibility that a stoma could be performed 	4	C
<ul style="list-style-type: none"> Pre-operative stoma site marking must be done under the responsibility of a NS, whose level of education is acceptable and who works as a NS 	4	C
<ul style="list-style-type: none"> The procedure described in Table 7 provides the basic document for all protocols to be written in institutions 	4	C
<ul style="list-style-type: none"> Pre-operative assessment of the patient's manual dexterity and use of mechanical aids 	4	C

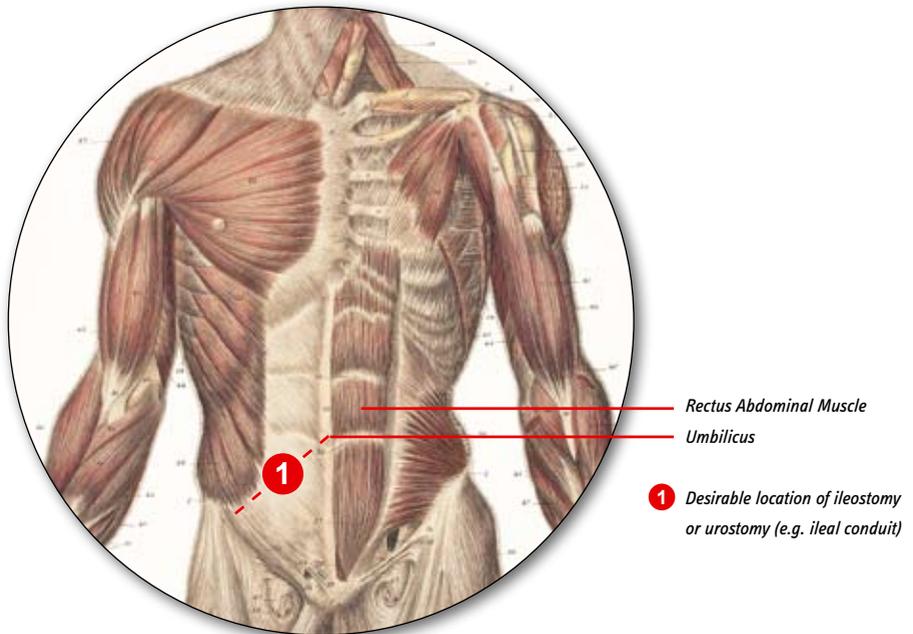


Fig. 4 Preferred siting spot



Fig. 5 Evaluate potential site in lying, sitting, bending and standing positions

5.2.2 Products

Not all products and materials are available in every country (see also Part 2, Chapter 6 Products). Patients must have the opportunity to choose an optimal stoma pouch from the many available, though it is often wise for patients to wait until they are really familiar with their stoma care so that they can make an informed choice. Stoma care nurses can help the patient in making decisions. [92]

How to obtain products

It is not possible to give standard advice because the rules for obtaining products differ in every country. For nurses who take care of urostomy patients it is important to know the national rules. A hospital NS can also provide expert advice. It is important that a patient has products when discharged, so delivery of products must be arranged either before, or on, the day of discharge.

Recommendations	LE	GR
• Patients must have an adequate supply of products on discharge	4	C

The National Institute for Health & Clinical Excellence (NICE) UK, www.nice.org.uk, is an independent body providing national guidance on promoting good health and preventing and treating ill health. Within the UK they produce national clinical guidelines such as: Urinary incontinence: the management of urinary incontinence in women. [96]

5.2.3 Patient education

5.2.3.1 Patient organisations and brochures

Most countries have national ostomy patient organisations. Their main goals are to safeguard the quality of stoma care, to represent patient interests at a political level, to provide adequate and up-to-date education material and to put ostomates in contact with each other.

There is also a European ostomy patient organisation: www.nice.org.uk. Its main goals are to provide an association for the benefit of ostomates, run by ostomates and in the interest of all ostomates, with the co-operation of outside help as required, and to represent the viewpoint of all ostomates at a European level.

An international organisation also exists: <http://www.ostomyinternational.org>

Its main goal is to improve the quality of life of ostomates and those with related surgeries worldwide.

Recommendations	LE	GR
• The nurse should be aware of national patient organisations and the availability of brochures	4	C

5.2.3.2 *Optimal timing for learning and practising skills*

Metcalf (1999) [92] describes how practical skills can be taught. She uses the definition of Bloom et al. (1956) [16], i.e. learning is the acquisition of skill (psychomotor), knowledge (cognitive) or attitude (affective), which can be achieved through study, experience or teaching. These three elements are inter-related, yet independent. Metcalf (1999) [92] also states that psychomotor skills are best learned by repetition of steps enhancing learning (Slavin 1991, in Metcalf 1999) [92].

Principles of social learning theory (Bandura 1982, in Metcalf, 1999) [92] underpin the strategy used to teach a patient how to change a stoma appliance. There are two main concepts that try to explain how learning occurs in a practical situation. The first is providing reward by giving praise. The operant conditioning used deliberately as positive reinforcement provides encouragement. Once a person has started to acquire some skills, even negative feedback can be useful, if given tactfully, as it helps the learner to establish what has and has not been mastered (Slavin 1991, in Metcalf, 1999) [92]. Cognitive learning is also important. At discharge, patients may be competent at pouch changes, but not necessarily confident, because they are only at the 'organising phase' of learning. This confirms how vital it is for patients to have ongoing support at home from the stoma care nurse to help them move to the 'perfecting phase'.

Patients must be physically ready to learn, as all types of learning require energy. Patient motivation and previous learning experiences are important. The nurse needs to be sensitive to the patient's difficulties and be prepared to use a variety of educational strategies. O'Connor (2005) [105] suggests that stoma self-care may be defined as the patient's ability to carry out stoma-management skills. Ostomy teaching should begin pre-operatively and continue in the post-operative phase (Hampton and Bryant 1992, in O'Connor 2005) [105]. A holistic assessment of stoma patients must include a discussion of potential psychological, sexual and cultural issues (Black, 2004, in O'Connor, 2005) [105].

Stoma patients may suffer psychological distress for up to a year post-operatively. [105] Stoma patients should therefore be formally reviewed during this time, with ongoing support thereafter as necessary, and should always have access to a stoma care NS. Specialist nurses should recognise that they may not be able to meet all their patients' needs and should refer patients to other specialist staff if available. [104]

A randomised controlled trial of 218 urostomy patients and 88 patients with a reservoir versus 310 controls showed that the number of long-term symptoms after radical surgery with a urostomy for urinary bladder cancer affected the risk of anxiety, depression and low or moderate well-being. [56] (Level of evidence: 1b). Hautmann states, 'It is likely that a patient's satisfaction is dependent on the anticipated results. This in turn will be largely a function of informed consent and a realistic preparation by the clinician and specialist nurse in explaining, before surgery, the physical and lifestyle changes involved' (Hautmann's comment, in Henningsohn 2003) [56] (Level of evidence: 4).

Recommendations	LE	GR
• Motivation and previous educational experiences are important	3	C
• A nurse needs to be sensitive to educational difficulties and be prepared to use a variety of strategies	3	C
• An NS must remember that he/she may not be able to meet all of a patient's needs and should refer on to other specialist staff where these services are available	3	C
• Patients should always have access to an NS	4	C

5.2.4 Procedure before and after surgery and at discharge

5.2.4.1 Pre-operative information

Pre-operative information on stoma management should be supplemented by booklets and demonstrations of relevant stoma appliances. Some patients may wish to see pictures of a typical stoma.

Patients should be offered a contact number for a person living with a stoma, matched as closely as possible for age, gender and lifestyle, and given details of local and national support groups.

Patients are usually admitted to hospital 1-2 days before surgery. During this time, pre-operative information should be reviewed, allowing time to answer questions and discuss any fears and anxieties. Pre-operative stoma site marking should take place. Persson (2005) [111] advises offering patients a whole day at the hospital a week before surgery when they can meet the staff involved in their care. She recommends that patients should bring a relative to the pre-operative meeting so that relatives have the opportunity to ask questions and discuss treatment.

Recommendation	LE	GR
• Patients should be offered a contact number for a person living with a stoma	4	C
• Pre-operative information on stoma management should be offered, supplemented by booklets and demonstrations of relevant stoma appliances	4	C

5.2.4.2 Post-operative teaching

The NS should use a teaching plan as soon as the patient is ready to learn the practical skills of pouch emptying and changing (see Part 2, Section 5.3.3 Stoma management by patients and family/carers).

Many factors can hinder learning in the early post-operative phase. Fear, anxiety, pain, fatigue and nausea significantly affect a patient's motivation and ability to learn. Motivation is crucial in creating a readiness to learn within the individual.

In many countries, nursing and bed shortages have resulted in shorter post-operative stays in hospital. In turn, this reduces time available for teaching and counselling. Under these circumstances, teaching during the post-operative phase must focus on the skills of pouch emptying and pouch changing. [105]

It is important not to bombard patients with too much information leaving them feeling confused, frightened and overwhelmed (Stuchfield 2000, in O'Connor, 2005) [105]. A checklist of instructions on how to change a stoma appliance may be given to the patient (see Part 2, Section 5.3.3 Stoma management by patient and family/carers). Many patients find it very reassuring if a partner, family member or informal carer is also instructed in basic stoma-management skills.

Recommendation	LE	GR
<ul style="list-style-type: none"> • Give a checklist of instructions how to change a stoma appliance to the patient 	4	C

5.2.4.3 Discharge and follow-up

Stoma patients can suffer emotional distress because of their lack of knowledge about practical aspects of stoma management (Kelly, 1992 in O'Connor 2005) [105]. Although most patients in the early post-operative phase require practical information rather than psychological counselling, patients still remain at risk of emotional difficulties following surgery.

Much additional teaching and counselling are needed to help patients to integrate their stoma into their lifestyles. An organised exchange of information between hospital and community regarding the patient's medical condition, his or her post-operative progress and stoma education, is essential to make sure education and support are continued after discharge. In some countries (e.g. the Netherlands), it is standard for stoma patients to be referred to a district nurse. This ensures the patient and family receive educational and emotional support during the early discharge period.

A checklist can be useful to ensure that important aspects of the patient's education are not overlooked (see Section 5.4.1 Patient control visits/calls). (Level of evidence: 3)

Recommendation	LE	GR
<ul style="list-style-type: none"> • A checklist could be useful to ensure that aspects of patients education are not overlooked 	4	C

5.3 Post-operative care

5.3.1 Post-operative observation of stoma

Immediately after surgery, the stoma should be covered with a clear appliance to allow easy and regular visual checks. These should be done as often as post-operative cardiovascular observations. [19] (Level of evidence: 3) The appliance should be drained regularly to promote patient comfort and to reduce pressure on the newly formed stoma. There should be immediate urine production.

Careful observation for signs of ischaemia or necrosis should be an integral part of post-operative observations. A healthy stoma will look pink or red with a good blood supply, similar in appearance to the oral mucosa. [90] The stoma will be oedematous initially and mucus will be visible in the urine and around the stoma site. [73] (Level of evidence: 3) The swelling/size of a stoma will reduce over a period of 2 to 6 months post-operatively. [27] (Level of evidence: 2b)

It is important to check the temperature of the stoma through the appliance. It should be the same temperature as the abdomen. [34]

Recommendation	LE	GR
Post-operative visual check of stoma to be recorded at the same time and frequency as cardiovascular observations	2b	B
Check the temperature of the stoma through the appliance	4	C



Fig. 6 Post-operative observation of stoma

5.3.2 Colour and odour changes in urine

The presence of an appliance for collecting urine increases patients' awareness of both odour and colour changes affecting the urine caused by some medications and food products (Table 8). These changes do not necessarily occur in all patients. Normal urine is clear, straw-coloured, with almost no odour. [88]

Table 8. Possible colour and odour changes in urine caused by medication, food or drink

• 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
• Methylodopa	Darkens (red-black on standing)
• Metronidazole	Red to brown
• Nitrofurantoin	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 (not in all patients)
• Beetroot	Pink to dark red
• Red fruit drinks	Pint 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) [75], Mason (2004) [88], Wallach (1992) [136] and Watson (1987) [138].

5.3.3 Stoma management by patient and family/carers

5.3.3.1 Role of family and carers

In a study of 29 patients with all types of ostomies (four patients with urostomy) versus 30 control patients the investigators look at the relationship between family dynamics and health locus of control in family who had a member with an ostomy. They concluded that a patient's family was an important factor in helping the patient learn to live successfully with an ostomy. [143] Nurses play a crucial role in providing enough accurate information and also need to appreciate the effects of having a urostomy on family life. With good support from family or carers and nurses, patients will be able to regain their sense of wholeness and self-image despite having an ostomy.

A study of colostomy and ileostomy patients and their families showed there was a discrepancy between the information and education provided and what was understood or received by the patients' relatives. [111] This finding can be applied to urostomy patients and their families. The participation of relatives in patient consultations should be considered as it may help to reduce or even eliminate any misunderstanding by the patient of the issues discussed. The study recommended telling patients to bring a relative to the pre-operative meeting, thereby giving the relative opportunities to ask questions and to discuss issues regarding treatment.

Recommendations	LE	GR
• Inform patients they can bring a relative to the pre-operative meeting, thereby giving the relative opportunities to ask questions and to discuss issues regarding treatment	2b	B
• Understanding of family dynamics is essential. Obtain a quick assessment of family dynamics when meeting with the client and family. Watch how the client and his or her family interact	2b	B
• Provide ostomy teaching prior to surgery. If this is not possible, begin teaching as soon as the client is alert, awake, and says their pain is under control	2b	B
• Encourage patients to participate in ostomy care as much as possible	2b	B
• Introduce new ostomy products slowly and easily. Present the patient with choices and allow him or her to decide whether any changes should be made	2b	B

Adapted from Wong and White (2002). [143]

5.3.3.2 Procedure for discharge care

Stoma management is best learned by repetition of steps enhancing learning (Slavin 1991 in Metcalf 1999). [92] The (specialist) nurse should begin teaching how to change a pouch when the patient is physically ready to learn. A teaching plan will increase learning by the patient. A procedure for pouch changing must include the following:

- First, the complete pouch-changing procedure is demonstrated by the nurse, enabling the patient to form a mental image of how it is performed
- The demonstration enables the nurse to point out relevant cues that logically guide the patient through future successful performances
- Before starting a pouch change, the patient must collect together and prepare all the equipment with the nurse explaining each item
- Then, the pouch-changing procedure is broken down into its separate parts (i.e. steps enhancing learning). [92]
- Table 9 suggests a pouch-changing procedure; the steps involved may follow a different order.

Table 9. Suggestion for pouch-changing procedure

- Remove the pouch
- Inspect stoma and skin
- Wash around the stoma
- Dry around the stoma
- Eventually apply skin care products
- Competently apply a new pouch and check that is correctly sealed
- Prepare the night bag to the pouch
- Empty the pouch during the day

At discharge, the nurse should discuss with the patient and family or carers the topics listed in Table 10. Any discussion should be supported by written information to be taken away with them by the patient and family or carers.

Table 10. Topics to be discussed at discharge with the patient and carers

- Explain the process of follow-up by the surgeon and stoma care nurse
- Provide a contact telephone number for acute problems or questions
- Explain what to do when problems occur, such as odour, UTI, leakage, etc
- Explain that mucus is normal and what to do when there is more mucus than normal
- Explain that the stoma is oedematous and swollen in the initial post-operative period and that its size will gradually reduce over 6-8 weeks
- Explain that the stoma can bleed easily on contact
- Explain the colour of normal urine, red or cloudy urine, offensive odour and the action to take
- Explain about bathing, clothing, travelling, work, hobby, sexuality, etc

See the Tables of Contents on pages 4 and 20 of this booklet if you would like to know which sections offer more information on these topics.

Recommendations	LE	GR
• Stoma management is best learned by steps of enhancing learning	3	C
• A teaching plan will increase learning by the patient	3	C
• At discharge the nurse discuss topics from Table 10 and support this with written information	3	C

5.4 Discharge care

5.4.1 Patient control visits/calls

Bekkers researched stoma care amongst members of a Dutch patient organisation [6]. He concluded the stoma care to be of a high level, but also identified threats to the care, such as closure of outpatient stoma care clinics and follow-up care, and potential threats such as new health care insurance systems. These threats seem to apply to other countries in Europe. Following the survey, Bekkers has drawn up a set of quality criteria for stoma care in the Netherlands. [7] The criteria included hospital provision of continuous specialised stoma care by a stoma care nurse in the pre-operative, peri-operative and post-operative stages, as well as long term. Because stoma care in hospital is independent, NS are free to choose the best choice for appliances for a patient. During the peri- and post-operative periods, ward nurses who also have a basic understanding of stoma care and potential stoma-related complications, can provide basic nursing care to the patient.

Bekkers (2004) [6] also found that in the first 2 years following stoma formation, patients have lots of questions and have many psychosocial problems. A low threshold for consulting an NS is therefore important. Stoma care after discharge does not end with good functioning of the stoma patient and/or the stoma. If the patient is having problems adjusting to the stoma and the stoma is causing psychosocial problems, sexual problems and/or relationship problems, the NS and urologist can offer help to the patient or refer the patient to a specialist.

Discharge should be based on the patient's ability or the availability of home care support by the community nurse or stoma care nurse. The NS (or nurse on the ward) should carry out an evaluation by phone a few days after discharge. Recurrent visits by medical and nursing personnel in the first 2 years are recommended. It is therefore important that the nurse on the ward responsible for the patient makes sure an appointment with the NS at discharge. At 2 years after surgery, urostomy patients can then be seen annually in the urological department for a check of blood, kidney ultrasound and urine culture). Long-term follow-up in a urological department is needed because of the high rate of urostomy-related complications. 66% of patients will develop complications long term, with almost 40% requiring surgical re-intervention. [83] The patient needs to appreciate that he/she can have specialised long-term care.

Patients should receive regular stoma nurse support for at least 3 months after hospital discharge. [92] It is important that patients know when their nurse is going to visit them and the date when they will finally be discharged from the regular care of their nurse. By equipping patients with the necessary skills and knowledge, patients can eventually take complete control over all aspects of their stoma care, including decisions on when to contact the NS.

As previously mentioned, stoma patients may suffer psychological distress for up to a year post-operatively. Ideally, stoma patients should be offered formal review during this time with ongoing support thereafter as needed. Patients should always have access to a NS. [105] Referral to other specialist staff if available may be necessary for problems or needs the nurse cannot help with.

Recommendations	LE	GR
<ul style="list-style-type: none"> • Patient's visits to or calls by the NS start prior to surgery and for at least 3 months after hospital discharge, but preferably until 2 years after discharge 	3	C
<ul style="list-style-type: none"> • Patients should know that specialised stoma care from a NS is available to them long term 	3	C
<ul style="list-style-type: none"> • Patients should have a contact telephone number, together with details of their local community stoma care clinic or hospital 	3	C
<ul style="list-style-type: none"> • Patients with specific problems should be referred to other specialist staff if these services are available 	3	C
<ul style="list-style-type: none"> • Long-term (annual) follow up in a urological department is needed because of the high rate of urostomy-related complications 	2b	B



Fig. 7 a



Fig. 7 b

The stoma on discharge with and without drainage bag

5.4.2 Patient diary

At discharge, it may be helpful to supply patients with their own patient diary, including a brief account of their surgery and appliances. Patients are then able to take the discharge record with them when visiting healthcare institutions so that details of their surgery are easily available. The stoma care specialist can add comments to the diary when reviewing the patient.

Recommendations	LE	GR
• The NS should provide the patient with a brief written history of surgery, reason for surgery, type of stoma and appliances used	4	C

5.4.3 Reimbursement of appliances

There are no standard rules for reimbursement of appliances. Reimbursement rules differ greatly between countries as each country has its own healthcare insurance system. Patient insurance schemes also vary. Nurses caring for urostomy patients should be aware of the national rules for reimbursement and may need to consult with their local NS.

5.4.4 Information about possible complications

As well as teaching practical skills, information should be provided about possible complications. As Metcalf (1999) [92] describes, information is learned by repetition of steps enhancing learning (Slavin 1991, in Metcalf 1999) [92]. Thus, patients should first be told about possible complications during the pre-operative stage.

When a patient is discharged information must be given (oral and written) about common complications and what to do when they occur (see Part 2, Chapter 7 about UTI, skin problems, leakage, etc.).

Recommendations	LE	GR
• Discharge information must be given about the common complications	4	C

5.5 Proactive and preventive care

5.5.1 Travelling with a stoma

Travelling should be no problem for the patient with an urostomy, but the following advice should be given (Table 11).

Table 11. Patient advice for travelling with a stoma

- Always take extra appliances, as a change of climate may need more frequent changes of appliance
- Patients can obtain information on where to buy additional supplies at a travel destination from the urostomy manufacturer
- Appliances should be kept out of the heat to prevent the adhesive melting
- To save space, appliances can be taken out of their boxes and packed into clean plastic bags
- Always carry appliances in the hand luggage, when travelling by air, in case checked-in luggage arrives later or disappears
- Scissors cannot be taken through security in airports, so all appliances should be cut to fit on beforehand
- Extra luggage (5 kg) when travelling by plane is possible. A medical letter must be provided.

Recommendation	LE	GR
• The NS should give advice on travelling with a stoma	4	C

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

Patients may feel more confident if they carry aids, such as a Medic alert bracelet, which the patient wears at all times and contains a brief medical history in case a patient requires emergency care. Many urostomy companies supply a 'Can't Wait' card to use in the community to gain rapid access to toilet facilities, without the need for queuing or lengthy explanations.

Travel certificates are available from all major manufacturers of stoma products for patients to use when travelling. It explains to airports and customs staff about the patient's need for medical devices/products so the patient does not have to explain in a public place.

Recommendation	LE	GR
• The NS should provide patient with a travel certificate and 'Can't Wait' card on discharge for future use	4	C

5.5.3 Insurance/travel insurance

It is important to declare the urostomy, as well as other pre-existing illness, to make sure that the patient has full health insurance cover. The patient should consult his insurance company when in doubt.

Countries within the European Community have a mutual agreement to provide all citizens with free emergency health treatment when needed. Patients should check with the local authorities what documents are needed prior to travel.

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

As conduit urine is usually bacteriuric, [24, 41, 101] patients must learn what to do about specific symptoms of upper or lower UTIs. Treatment is not recommended in asymptomatic patients with a positive urinary culture result unless they are affected by recurrent UTIs. [41]

Adequate fluid intake is crucial to minimise the risk of UTIs.

Patients with a urostomy don't need to avoid eating any foods. However, some foods can give a certain smell or colour to the urine e.g. asparagus will make urine smell for a short period, while beetroot can give a reddish tinge to urine. [47] See Table 8 in section 5.3.2.

Recommendation	LE	GR
• Patient education before discharge about UTI symptoms and adequate fluid intake	4	C

5.5.5 Skin care

Reassurance should be given to the patient that most ostomy products are skin-friendly and allergy is rare. Water and cotton gauze are sufficient for cleaning urine from the peristomal skin.

Patients may be tempted to use ordinary moist wipes, but skin allergies may be caused by the presence of perfume and other potential allergens. If available, specific wipes for ostomy should be used by patients who want to use wipes. Patients who use washable cloths for cleaning their peristomal skin are advised to wash the cloths in a non-biological washing powder, but not in bleach (sodium hypochlorite) or disinfectant, to help reduce the potential for skin irritation. Patients who bath or shower with no pouch on should use a non-oily, unperfumed bath or shower gel and should make sure their skin is thoroughly rinsed. Inappropriate recommendation of creams and lotions can contribute to more skin problems. Creams or lotions should only be recommended if supported by evidence of their efficacy and safety.

The pouch should be cut to the exact size and shape of the stoma to protect the peristomal skin and prevent leakage. The size can be gauged using a measuring guide that comes with most appliances. Some appliances are already pre-cut in different sizes. This can be helpful, but only if the appliance fits properly.

Hair around the peristomal skin may hinder pouch adhesion or the patient may experience pain on removing the flange. Most patients choose to shave. However, they should be encouraged to shave no more than once a week and with a clean razor. Hair follicles can become infected if shaving is done more often and if careful attention is not paid to hygiene. In general, stoma care routines, including washing, appliances and accessory use, should be kept as simple as practical to minimise the potential for skin problems. [82]
When skin problems appear, despite good care of the stoma, it is recommended that a NS is consulted.

Further information on skin care can be found in a book by Lyon (2001) [82], a specialist registrar in dermatology and a stoma care nurse. The book entitled Abdominal stoma and their skin disorders describes skin disorders and treatment, including skin care. Skin care tools are available from various companies.

Recommendation	LE	GR
• Regular observation of peristomal skin to identify potential complications	4	C
• Use skin care tools for correct identification	4	C

5.5.6 Urine testing from an ileal conduit

The correct technique for obtaining an uncontaminated specimen of urine from a urostomy is to catheterise the ileal loop. [42, 44]

Recommendation	LE	GR
• To collect urine for analyses catheterise the ileal loop	4	C

5.5.6.1 Glucose levels in diabetic patients

A blood test should be used to determine glucose levels.

5.5.6.2 UTI testing

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. Escherichia coli (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 [10] may not be indicative of a UTI. Specimens should therefore be sent for culture and sensitivity. Antibiotics should be given if the causative organism is found to be E. coli with high levels of colonisation and the patient is symptomatic. Table 12 lists the symptoms of UTIs.

Table 12. Symptoms of UTIs

- Cloudy urine
- Offensive odour
- Visible blood

- Raised temperature
- Influenza-like symptoms
- Pain/tenderness in the kidney area
- Nausea and vomiting

5.5.6.3 Pregnancy testing

The accuracy of ‘over the counter’ pregnancy testing has been questioned in women who have had bladder reconstructed from bowel. [46, 99] False positives have been associated with urine that has had increased exposure to the bowel loop. Blood tests are recommended to confirm pregnancy in the urostomate.

5.5.7 Parastomal hernia (PSH)

A PSH may occur months or years after the original surgery, usually as a bulge around the stomal area. The patient may be asymptomatic, but if the segment of loop becomes strangulated, severe pain and cessation of urinary output may require emergency surgery.

Several studies have focused on the occurrence of PSH in patients with bowel stomas. [74, 110] Siting within the rectus abdominis does not seem to prevent PSH. [76, 106] Contributory factors are given in Table 13. [93]



Fig. 8 Parastomal hernia

Table 13. Contributory factors to PSH

- Overweight at time of operation
- Significant increase in body mass post surgery
- Multiple surgical procedures
- Loss of muscle tone
- Inappropriate lifting
- Infection around stoma in immediate post-operative period
- Raised intra-abdominal pressure in early post-operative period

5.5.7.1 Prevention of PSH

Thompson and Trainer (2005) [132] compared the incidence of PSH before and after a prevention programme involving a non-invasive series of abdominal exercises, increased patient education regarding hazards, and advising patients to wear support belts or girdles during lifting and any work that increased the intra-abdominal pressure. There was a significant reduction in PSH formation. A similar regime should be advocated by stoma nurses for patients for up to 1 year post-operatively.

Recommendation	LE	GR
• Support garments should be recommended post surgery	4	C

5.5.8 Latex hypersensitivity

Children with spina bifida have the highest prevalence of sensitisation to latex in the general population. Other risk groups, such as healthcare workers and other multi-operated patients, do not have the same risk. (Level of evidence: 2a)

The high prevalence of latex sensitisation in patients with spina bifida has been correlated with a genetic tendency to develop a latex IgE response. However, pathogenesis is multifactorial involving both genetic and environmental factors.

In a study of 80 spina bifida patients, factors associated with latex allergy and sensitisation were early exposure, number of surgical procedures and atopy. [3] About 40% showed latex hypersensitivity, while 15% had clinical manifestations.

Serious systemic reactions have included anaphylaxis, usually as a result of mucosal exposure to latex devices or during surgical procedures. However, latex exposure can also occur in a variety of everyday situations.

A recent article discusses groups at risk of latex hypersensitivity and gives guidelines for the management of latex allergic patients on hospital wards, particularly on how to provide a latex-safe environment (e.g. non-latex gloves). [68]

Recommendation	LE	GR
• All devices used by urostomy patients should preferably be latex-free to reduce their risk of developing latex allergy because of their lifelong use of appliances	4	C
• Patients must also know that if they have an allergic reaction, it could be an allergic reaction to latex	4	C

6. Products

6.1 Types of urostomy appliances (bags)

The patient with a urostomy and the NS have a wide range of solutions to pick from. Appliances are divided into one-piece and two-piece products. The wafers are made out of hydrocolloid material, with some also made with a piece of microporese adhesive. Appliances are available in different shapes and forms. Most appliances are available with pre-cut holes. The pouch consists of several layers of plastic film. They can be clear, opaque or white and some are covered with a soft dressing. The pouch incorporates a non-return valve to prevent urine from running back onto the urostomy. All pouches have a tap on the bottom to release urine when full. Pouches can contain from 150 ml to 330 ml depending on the size chosen.



6.1.1 One-piece bag

The one-piece appliance incorporates the pouch and the adhesive wafer. It is flexible and has a low profile. [50]

Fig. 9 Example of a one-piece bag with night drainage connector and drip cap



6.1.2 Two-piece bag

The two-piece system is divided into:

1. A wafer with flange, which the pouch is applied onto. The flange can be stationary or floating. The urostomy pouch is applied directly onto the stationary flange where the floating flange allows the fingers to slide underneath the flange for application. Because of the flange this system is considered more rigid than the one-piece system and it has a higher profile. [50]
2. The adhesive coupling system where the pouch has an adhesive device that is applied on a thin soft plastic platform on the wafer. The absence of the flange makes this system more flexible, less rigid and with a profile in between the one-piece appliance and the two-piece with a flange.

Fig. 10 Example of a two-piece flange and bag system



Fig. 11 Easiflex system



6.1.3 Night drainage bag

A night drainage bag can be attached to the urostomy pouch to increase the urine storage capacity during sleep. The night drainage bag is connected to the urostomy pouch using an adapter constructed to fit the individual urostomy pouch.

A tiny pouch designed for being used at night connected with the night drainage bag is available. It is part of a two-piece system and the patient wearing a pouch of normal size during daytime has to change pouches at night and again in the morning.

Fig. 12 Example of a night drainage bag



6.1.4 Leg bag

All pouches can be connected with a leg bag. Some patients, especially wheelchair users, prefer to wear a leg bag connected with the pouch as it can hold a larger amount of urine before emptying. For a wheelchair user it is easier to empty the content of a leg bag into the toilet than the urostomy pouch.

The leg bag is fastened either to the thigh or under the knee with straps or a leg bag holder.

Fig. 13 Example of a leg bag

6.2 Other products

6.2.1 Barrier strips/rings

Barrier strips/rings are flexible items that can be moulded to the skin surrounding the stoma, providing increased adherence and security from leakage. They are alcohol-free so there is no irritation or stinging on application. They mould to body contours and fill gaps where a patient's skin may be uneven. Rings or strips absorb excess moisture and provide added skin protection. The strips can be cut to the correct size, while the rings are available in varying sizes.



Fig. 14 Example of a hydrocolloid mouldable ring



Fig. 15 Example of hydrocolloid paste strips

6.2.2 Pastes

This product is specifically designed to effectively fill skin contours, where scar tissue or gaps around the stoma may lead to leakage and poorly-fitting appliances. It is easy to apply and can be spread into position. It has a drying time of about 30 seconds.

6.2.3 Belts and binders

Ostomists who are physically active may want the extra support for their appliance provided by a belt and a belt plate system. This system provides extra appliance security and prolongs the appliance's wearing time. The belt is elastic and easily adjusted to an individual's size. The belt and belt plate can usually withstand water temperatures up to 90°C during washing and are re-usable several times.

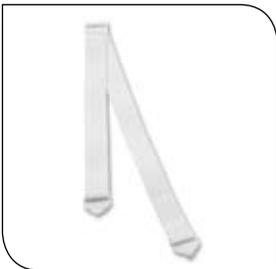


Fig. 16 Example of a belt

6.3 Skin care products

It is important to protect the peristomal skin from the effects of urine exposure and repetitive skin stripping, caused by the removal of adhesive during appliance changes. [114] Studies have shown that choosing the correct products increases patient compliance and provides a better quality of life by reducing peristomal skin complications [9, 12, 33]

6.3.1 Skin barriers (second skin)

Skin barriers using silicone polymers as a film-forming agent are a valuable addition to the stomatists' collection of consumables. Skin barriers are aqueous-based creams or lotions applied directly to the skin prior to pouch application. Silicone-based skin barriers are preferable to alcohol-based products as they have less side-effects and cause less discomfort. [9] Silicone-based products do not sting and dry without leaving a residue. [33] Cavilon, Comfeel & Skinprep are a few examples of the many products on offer, with availability varying between different European countries. The efficacy of these products has been proven in several international studies. [58, 62, 102]

Recommendation	LE	GR
• Use a silicone based product in all patients who require a skin barrier	4	C

6.3.2 Adhesive removers

Removing appliances daily will undoubtedly lead to skin stripping around the stoma site, leaving the skin susceptible to damage from bacteria, urine and the adhesive components. [82] There are three categories of adhesive removers currently available:

- alcohol/organic-based solvents
- oil-based solvents
- silicone-based removers.

6.3.2.1 Alcohol- or organic- or oil-based products

These products penetrate between the skin and adhesive of the appliance, thereby dissolving the adhesive bond. They are based on paraffin mixtures using citrus oil extracts. They can leave an oily residue to which the stoma bag will not adhere and the skin must be thoroughly washed with soap and water to remove all traces of oil. This may not be possible in all situations (e.g. if a patient is at work and requiring a bag change, or travelling). Frequent washing with soap can have a drying effect and exacerbate excoriation of the skin.

6.3.2.2 Silicone-based adhesive removers

Silicone-based adhesive removers also work by penetrating between the skin and the adhesive layer. This is widely accepted as the product of choice for patients and healthcare professionals due to minimal side-effects and efficacy. [12]

6.3.2.3 Skin cleansers

Cleaning peristomal skin should not compromise the integrity of the skin. A skin cleanser with a pH of 5.5 causes less irritation or damage. [12]

6.3.3 Karaya moisture absorber

Karaya gum powder absorbs moisture and provides a drier surface allowing for improved appliance adhesion. It can be used on sore and broken skin without any stinging or irritation. It is a natural, environmentally friendly product, easy to apply and can be used with any stoma appliance.

Recommendation	LE	GR
• Use Karaya moisture absorber or a similar powder in patients with appliance adhesion problems or follow local policy	4	C

7. Complications and problems of having a urostoma (urostomy)

7.1 Physical problems

7.1.1 Skin irritation

Healthy peristomal skin is defined as the complete absence of any visible skin change in the peristomal area.

The main reason for skin disorders in the peristomal area is urine, which contains enzymes that can be irritating to the skin. Other reasons for loss of skin integrity are listed in Table 14. [29, 57]



Fig. 17 Healthy stoma and healthy peristomal skin

Table 14. Causes of skin disorders in peristomal area

• Urine
• Mechanical injuries, e.g. stripping of skin when removing the ostomy bag
• Infections, e.g. folliculitis
• Underlying skin diseases, e.g. psoriasis or eczema
• Immunological disorders, e.g. contact dermatitis

Adapted from Colwell et al. (2001) [29], Herlufsen et al. (2006) [57].

A study of peristomal skin disorders found that 42% of participants had irritant contact dermatitis. When asked, 89% of 147 participants believed their skin disorder was caused by their ostomy appliance, though contact dermatitis only occurred in 0.7% of cases. [57]

A study by Herlufsen et al. (2006) [57] included 202 subjects who had a stoma for a mean of 8 years. Nineteen had a urostomy, 48% of whom reported a peristomal skin disorder. In contrast, the overall peristomal skin irritation rate reported in the literature for urological stomas has been 20%. [29] However, Herlufsen et al. (2006) [57] reported that 77% of the skin disorders in their study might have been due to contact with stoma effluent caused by a poorly fitting pouching system.

The opening of the skin barrier should be no more than 2 mm (1/8 inch) larger than the stoma. [113] If the opening of the skin barrier is too large, urine will irritate the peristomal skin. It is equally important that the barrier adheres well to the skin to prevent leakage, or else the skin may be exposed to urine for up to several days, depending on the wear time of

the appliance. Although cleaning the peristomal skin helps to prevent irritation, cleaning is not enough if the skin is exposed to stoma effluent. [57]

Peristomal complications were found to be most likely in people with ileal conduits. [118] A classification of peristomal skin changes in patients with urostomy can be useful in helping to decide between ordinary findings and skin lesions. Three main groups of peristomal skin findings have been described (Table 15). The Wound, Ostomy and Continence (WOC) Nurses Society (WOCN) has produced its own classification of peristomal skin complications (Table 16). This can be used to help the nurse decide suitable treatment.

Table 15. Peristomal skin findings

• No sign of irritative skin
• Erythematous-erosive skin lesions (subgroup mild and severe lesions)
• Pseudoverrucous skin lesions (subgroup mild and severe lesions)

From Borglund et al. (1988) [17].

Table 16. WOCN classification of peristomal skin complications

• Mechanical damage
• Chemical damage
• Infection
• Other

WOCN = Wound, Ostomy and Continence Nurses Society.

Recommendations	LE	GR
• A stoma nurse should collect data related to the skin, such as underlying skin diseases or immunological disorders, as part of the pre-operative assessment of the peristomal skin	4	C
• To prevent skin irritation from failure of the pouching system, due to a poorly sited stoma, the stoma site should be marked out prior to surgery by a stoma (or WOC) nurse	4	C
• To prevent skin irritation, the Guidelines Group recommends cleaning of the peristomal skin using warm water and gently drying with gauze. Men should be shown how to shave peristomal hair without damaging the skin and moving outwards away from the stoma	4	C
• To prevent skin irritation the patient should be taught to cut the barrier, so that the opening just fits the size of the stoma. This will minimise the risk of urine coming into contact with the peristomal skin. It is important to tell the patient that the stoma will decrease in size for at least 8 weeks after surgery and that the size of the opening of the barrier must also change	4	C
• When treating skin irritation, it is important to assess the aetiology. A skin barrier that resists urine erosion can be used	4	C

A few examples of skin irritation



Fig. 18 Skin grazed and irritated



Fig. 19 Fungus



Fig. 20 Skin irritated by the plaster that covered the stoma site



Fig. 21 Contact dermatitis with appliance leakage



Fig. 22 Contact dermatitis



Fig. 23 Contact dermatitis

7.1.2 Parastomal hernia (PSH)

See Section 5.5.7 Parastomal hernia (PSH).

7.1.3 Retraction

A condition where the urostomy is located at or under skin level and does not protrude above skin level.

It may be caused by difficulty in creating a tension-free urostomy in obese patients or patients treated with radiation, or by necrosis of the urostomy after surgery, scars after mucocutaneous separation, chronic peristomal skin infections or weight gain. [27, 50]

It can cause leakage because of difficulty in obtaining and maintaining a bag seal. To compensate, the patient may need to use a filler paste, seals or a convex bag. The downward pressure of the convex shape of the bag can enhance the seal around the base of the skin to promote a secure fit and inhibit undermining of the adhesive wafer of the appliance. [40]



Fig. 24 Retraction

7.1.4 Leakage

Urine undermines the adhesive wafer of the appliance causing leakage. This can be caused by retraction of the urostomy, skin folds, soft abdomen, scars or other irregular peristomal contours. [50] To obtain and maintain a secure seal between the appliance and the skin, filler paste, seals, belts or a convex solution can be used to even out the peristomal skin contours and create a secure fit of the appliance.

All patients should be encouraged to use a night drainage bag to avoid overfilling of the pouch at night causing leakage. [50] The night drainage bag and the pouch should be connected with some urine left in to prevent vacuum formation and the tube should be coiled to prevent kinks.

A leg bag for urine bags, or a catheter strap, can be used to stabilise the drainage tubing, securing a constant flow of urine during the night. The night drainage bag always has to be placed below the urostomy pouch for the same reason.

Recommendation	LE	GR
• Patients with a leakage problem should be advised to consult a stoma care nurse for solving the problem.	4	C

7.1.5 Urinary tract infections (UTIs)

Madersbacher et al. (2003) [83] conducted a prospective study on the long-term outcome of ileal conduit. Of 412 patients, 131 patients survived 5 years or more. Of these, 66% developed conduit-related complications from 1 to 7 (range 2.2) complications per patient. Almost a quarter (23%) of complications were symptomatic UTIs, including pyelonephritis. Within the first 5 years, complications developed in 45% of patients. This percentage increased to 50%, 54% and 94% in those surviving 10, 15 and longer than 15 years, respectively. In this last group 50% had upper urinary tract changes and 38% had urolithiasis.

Another study of 218 urostomy patients and 88 patients with a reservoir found that UTI was the most prevalent symptom, which occurred consistently in about a quarter of all operated patients over all intervals, compared with 9% of controls. [56]

Falagas et al. (2005) [41] reviewed the development of UTIs after urinary diversion in studies of mixed microbial flora in conduits found 10 days post-operatively after antibiotic withdrawal. Mucus and cup biopsy specimens of ileal conduit tissues were also examined for a period of up to 16 years. Electron microscopic examination showed virtually no bacteria adhering to columnar cells of the conduit. However, conduit mucus was heavily colonised with microcolonies of Gram-positive and Gram-negative bacteria. Mixed flora was found in ileal loops, whereas culture colonic conduits most often grew a single bacterial species. The reason for this difference is unknown. (Hill et al. 1983, in Falagas 2005) [41]

Of course, renal function impairment was a major concern. Recurrent pyelonephritis was associated predominantly with certain causes of postrenal obstruction, such as an anastomotic stricture, stomal stenosis or urolithiasis.

The authors concluded that more research was needed to determine the incidence of UTIs and other complications in patients with different types of urinary diversion and the preferred treatment. However, for the three main types of urinary diversion, the authors made an attempt to summarise the micro-organisms isolated and to recommend treatment.

Thus, in the ileal conduit (urostomy), the authors found Gram-positive bacteria mixed with skin flora (i.e. streptococci, *Staphylococcus epidermidis*), Gram-negative enterobacteriaceae (i.e. *E. coli*, *Proteus spp.*, *Pseudomonas spp.*), and *Enterococcus faecalis*. The authors recommended no treatment for asymptomatic bacteriuria, unless there was a history of recurrent pyelonephritis, as defined by asymptomatic bacteriuria or the presence of bacteria in urine without symptoms. (Level of evidence: 2b)

Recommendation	LE	GR
• No treatment for asymptomatic bacteriuria, unless there is a history of recurrent pyelonephritis (asymptomatic bacteriuria: presence of bacteria in urine without symptoms)	2b	B

7.1.6 Mucus production

When used in the urinary tract, intestinal segments continue to produce mucus. Despite the use of muco-regulatory medication, mucus production will not decrease in two-thirds (67%) of patients. [94]

7.1.7 Complications caused by significant variation in pH of urine

The normal range of urinary pH is 4.6-8, while the average pH is about 6 (acidic). Significant variations can cause problems, especially with a urostomy. Complications associated with alkaline urine include stomal bleeding, incrustation, odour, UTIs, urinary calculi and stenosis. [137]

Of course, other factors need to be excluded, such as dirty collection devices, foods, medication, or lack of basic hygiene (odour). A vegetarian diet and citrus fruit consumption can both result in alkaline urine. Cranberry (see Section 7.1.8) and vitamin C are widely advised.

Ascorbic acid (vitamin C) is not an innocuous drug. It can result in toxic reactions, e.g. nausea, vomiting, heartburn, diarrhoea, flushing, insomnia, and crystalluria due to high acidification. Vitamin C may also reduce the effect of some medications, e.g. amphetamines and tricyclic antidepressants. It also interferes with laboratory tests based on the oxidation-reduction reaction.

The following are recommended for acid urine [137] (Level of evidence: 2b):

- An 'acid-ish' diet – a diet high in animal protein, which includes butter, cheese, fats and lentils
- Decreased intake of citrus fruits (orange juice!)
- Ammonium chloride as the preferable urinary acidifier.

7.1.8 UTI, mucus and stones formation: Use of cranberry

The cranberry, as both juice and capsule, has become widely used in urology for control of:

- UTIs [64]
- mucus formation [22, 121]
- formation of urinary stones. [144]

Cranberry is a North American wetland fruit. Unlike most citrus fruits, cranberry acidifies the urine. [137] Early studies [43] identified the production of hippuric acid, which has a bacteriostatic effect on urinary pH (i.e. pH 5.5), although there was debate about the concentrations of cranberry juice required. Later studies advocated the use of cranberry juice with oral medication, e.g. ascorbic acid and methenamine hippurate. [109]

Escherichia coli are natural inhabitants of the gut found in small amounts in the stomal urine. The presence of large amounts of static mucus in the urostomy creates an ideal medium for *E. coli* colonisation. An affected patient may become symptomatic with fever, malaise and offensive urine and should be prescribed antibiotics. The effect of hippuric acid is to reduce mucus formation, thus inhibiting the adherence of *E. Coli*. [22]

Cranberries have been used widely for several decades for preventing and treating UTIs.

A Cochrane review (Jepson et al. 2008) [64] was carried out of all RCTs or quasi-RCTs of cranberry products for the prevention of UTIs in all populations found. There was some evidence that cranberry juice may decrease the number of symptomatic UTIs over a 12-month period, particularly for women with recurrent UTIs. Its effectiveness for other groups is less certain. The large number of dropouts/withdrawals indicates that cranberry juice may not be acceptable over long periods of time. It is not clear what is the optimum dosage or method of administration (e.g. juice, tablets or capsules). Further properly designed studies with relevant outcome are needed (Level of evidence: 1a).

In daily practice, the EAUN Guidelines Group for Urostomy experience some benefit of cranberries in recurrent (symptomatic) UTI and/or excess mucus and/or skin problems and/or leakage problems. The use of cranberry is contraindicated in some patients for example when warfarin is used.

Recommendation	LE	GR
<ul style="list-style-type: none"> • Cranberry can be advised in daily practice when patients have complaints of (symptomatic) UTI and/or excess mucus, and/or skin problems, and/or leakage problems 	4	C



7.1.9 Granuloma

Granuloma is the term used to describe small, red, raised areas/nodules on the stoma or peristomal skin. These can be caused by local irritation, pressure or leakage onto the skin.

Treatment options include:

- Removal of pressure on the stoma
- Correctly fitting appliances
- Silver nitrate cauterly [82]
- Steroid-impregnated tape. [65, 98]

Fig. 25 Granuloma

7.1.10 Stomal bleeding and ulceration caused by oxalate crystals

Alkaline urine may produce oxalate crystals, which can lead to stomal bleeding and ulceration. Crystal formation can be prevented by restoring urine acidity.

Methods used to restore urine acidity include:

- Applying diluted vinegar [44]
- Ascorbic acid (vitamin C tablets) [78]
- Acetic acid preparations
- Cranberry juice or tablets. [22]

7.1.11 Purple bag syndrome

Purple bag syndrome is characterised by the purple discolouration found in stomal urine, appliances and various catheter tubing, including night drainage bags. [28] The precise aetiology is unknown, although chronic constipation is considered to be a key contributory factor. [130] Although studies have shown certain factors may be present, these factors are not found consistently. [134] Females appear to have a significantly higher incidence. [127] Constipation causes tryptophan, a dietary protein, to pass further along the gut into the large intestine, where it is decomposed by bacteria. During the process of decomposition, it is converted into indoxyl by the liver and combines with potassium sulphate. Indican passes through the kidney giving urine a purple/blue/grey colour. [44] Other causative factors are the presence of bacterial growth, particularly *E. coli*, *Proteus mirabilis* and *Klebsiella pneumoniae*. [130]

Although the dramatic discolouration of urine and appliances can cause anxiety to patients and carers, it is a clinically benign condition. Collins (2002) [28] considers education of patients and colleagues to be most important in managing this syndrome. The incidence is reduced by avoiding constipation, increasing the frequency of appliance change and treating symptomatic bacterial infections. [134]



Fig. 26 Purple bag syndrome

7.2 Psychological and social problems

7.2.1 Post-operative social considerations

Early promotion of self-care and stoma management skills can significantly help patients to adapt psychologically following their surgery. [87]

Many patients will return to work following stoma formation, but may need to adapt their activities to follow a less strenuous or physically demanding lifestyle. This may lead to a reduction in financial circumstances. Patients may need adaptations to their homes to enable them to carry out their bag changes, or there may be additional costs in going to hospital for follow-up care. Although products are available on prescription in most European countries, patients in some countries have to purchase their own supplies. Different European countries may have benefits or assistance available to patients and this should be investigated locally.

Workplace toilet facilities require consideration and planning. Advice on how to adapt inadequate facilities must be offered by the healthcare professional in the post-operative phase. [73, 142]

7.2.2 Cultural aspects

Healthcare professionals need to recognise beliefs, values and health practices of different cultures in order to provide culturally appropriate care and advice. [12] For example, a Jewish patient who observes the Sabbath may not be able to change their appliance for 24 hours, while a Muslim patient who prays 5 times a day has to perform a washing ritual (al-wadhu) requiring a bag change at each prayer interval. Some Muslims use the right hand to eat and greet, while the left hand will carry out intimate personal hygiene.

7.2.3 Psychological aspects

Around 20% of patients with a stoma will experience significant clinical psychological symptoms post-operatively. [141] Many of the remaining 80% will experience milder negativity and depression following stoma formation. Some cultures or religions view disease and stoma formation as a punishment – a sign that the person has sinned in a previous life.

Incontinence is still a social taboo in many societies. Many patients view a stoma as a loss of control. By the age of 2-4 years, children have usually achieved continence. Following the formation of an incontinent urostomy, many patients experience a feeling of regression and a sense of shame. Fear of appliance leakage or odour may affect their confidence and daily life.

Healthcare professionals may help to facilitate a support mechanism from other patients or national self-help associations. Availability of these groups varies between European countries.

Media presentation of the ideal body image is a universal phenomenon. The patient with a urostomy undergoes a radical change in their physical appearance that will need early recognition and psychological management.

Involvement of the family will be an important factor in how well the patient copes with the change in body image. Disguising the appliance with attractive underwear and clothing increases a patient's confidence and reduces psychological complications. [21]

7.3 Sexual function

Radical pelvic surgery can lead to problems in sexual function in both men and women. Physical problems are often made worse by the psychological impact of stoma formation on the individual.

During pelvic surgery damage may be caused to:

- The nerve supply – of the superficial and deep nerves
- The vascular supply – affecting engorgement and lubrication
- Tissue – causing tenderness and reduced space.

7.3.1 Sexual dysfunction in males

Radical pelvic surgery with cystectomy and formation of a urinary stoma always results in erectile dysfunction because of damage caused to several structures, including the sympathetic and parasympathetic nerve supplies. [45] In selected cases, nerve-sparing cystectomy can be performed, which increases the chance of preserving erectile function.

Erection is a neurovascular phenomenon. It depends on the flow of blood in and out of the penis. During pelvic surgery, damage that reduces blood flow to the corpus cavernosum results in an inability to maintain satisfactory tumescence. Surgery for the formation of bowel stomas may also cause damage, which may be temporary or permanent. Ejaculation will be affected if there is damage to the urinary sphincter, which is inevitable in surgery involving the bladder, prostate or urethra.

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. [81] If available, psychosexual counselling provides the opportunity for both partners to discuss concerns in a supportive environment. [51]

7.3.1.1 Treatment of erectile dysfunction

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. (DSM-IV, 2000) Treatments suitable for men following stoma surgery include:

- oral medication
- injection therapy
- intra-urethral vasodilating medication (MUSE)
- vacuum therapy
- penile implants.

Oral medication

The suitability of oral medication for stoma patients has been minimally investigated. [36, 65] Oral agents are known to be more acceptable to both the patient and partner. [75]

Phosphodiesterase type 5 (PDE5) inhibitor: this is a facilitator, rather than an initiator of erection. In the presence of sexual stimulation [120], PDE5 inhibitors promote cavernosal muscle relaxation and inhibit the release of PDE5, which is the initiating chemical responsible for detumescence. Erections occur approximately 20 minutes after administration. In recent years, side-effects have been reduced and the duration of erection increased. This treatment is not suitable for men using nitrates or with a diagnosis of hypertension or recent myocardial infarction.

Apomorphine hydrochloride: a sublingual medication that stimulates the postsynaptic dopamine receptors in the hypothalamus and enhances the natural erectile process. [54] It is only effective in patients with an intact sympathetic and parasympathetic nervous system. (This medication has been withdrawn in some countries.)

Injection therapy

A vasoactive 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. [117] This treatment is more suitable for men who have had bowel stomas formed. 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) [48] found that some patients suffered from persistent anxiety associated with self-injection. Penile fibrosis may occur. [25]

MUSE® (alprostadil)

A small pellet containing alprostadil is inserted into the urethra using a disposable plastic applicator. The patient must pass urine immediately prior to insertion and therefore this treatment is unsuitable for those with a urinary stoma. [44] The erection should occur 5-15 minutes after the insertion and can last between 30-60 minutes.

Vacuum therapy

External vacuum devices produce rigidity through vascular engorgement resulting in tumescence of the penis. [78] Vacuum devices are operated by either battery or hand pump. 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 30 minutes. Disadvantages are the coldness of the penis and a lack of spontaneity.

Penile implants

Penile implants tend to be reserved for men who have not responded to non-surgical treatments. It involves insertion of a prosthesis into the corpus cavernosum. A malleable prosthesis produces a permanently erect penis that can be bent to accommodate intercourse and is flexible enough to be moved into a position of concealment. Most prostheses used

are inflatable. [45] Inflatable prostheses consist of two basic designs: those with an integral inflatable/deflatable unit and those that involve insertion of a scrotal pump and abdominal reservoir.

Recommendation	LE	GR
<ul style="list-style-type: none"> Male patients with post-operative erectile dysfunction should be assessed for suitability for treatment if requested 	4	C

7.3.2 Sexual dysfunction in females

Surgical damage in the female may include:

- vascular supply damage leading to reduced vaginal lubrication
- excision of the rectum causing changes to the angle of the vagina
- perineal scarring or pelvic sepsis, which may cause adhesions across the vagina
- radical cystectomy may require the additional removal of the ovaries, fallopian tubes, uterus and cervix.

7.3.2.1 Dyspareunia

Dyspareunia is a condition in which intercourse (penetration) becomes painful. The cause may be internal scarring or lack of lubrication. Increased lubrication in the form of KY jelly or experimenting with a change of position can be helpful.

7.3.2.2 Vaginismus (spasm)

Vaginismus can be purely psychological and may be helped by relaxation methods and counselling. [11] However, it may be worse in periods of active disease and therefore an underlying cause should be considered.

7.3.2.3 Fertility and pregnancy

Debilitation may lead to the loss of ovulation and internal scarring to a decrease in tubal patency. Oocyte banking may need to be considered prior to treatment.

Pregnancy testing in the urostomate may lead to false results because samples taken from the ileal loop may have undergone reabsorption of electrolytes and hormones leading to an alteration in the concentration of human chorionic gonadotrophin. Instead, blood samples should be taken. [99] Vaginal ultrasound is more accurate than abdominal ultrasound because of the presence of the ileal loop.

Urinary tract infections should be treated seriously. They are generally treated with antibiotics immediately, as pyelonephritis can result in premature labour. [35]

Advice of the consultant urological or colorectal surgeon should be sought. Many centres advise shared care between the surgeon and obstetrician and delivery by an elective Caesarean section.

Recommendations	LE	GR
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Patients should be advised pre-operatively of potential alterations to their pre-surgical sexual function 	4	C
<ul style="list-style-type: none"> • Post-operative counselling should include discussion of treatment options and their suitability for individual patients 	4	C

8. Quality-of-Life Evaluation (form)

Hollister Incorporated has presented a Hollister Ostomy Comprehensive Health and Life Assessment form at the WCET in Slovenia (2008). More information on this tool can be obtained through the EAUN Central Office.

9. Abbreviations

ADL	activity of daily living
E. coli	Escherichia coli
IgE	Immunoglobulin E
MS	multiple sclerosis
NS	nurse specialist
PVR	post-void residual urine
PSH	parastomal hernia
RCT	randomised controlled trial
SP	spina bifida
TUU	Transuretero ureterostomy
UTI	urinary tract infection
WOCN	Wound, Ostomy and Continence Nurses Society
WOC	Wound, ostomy and continence

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