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Understanding the basics of stoma care and how to recognise complications

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Abstract A stoma is an opening in the abdominal wall that is used to remove body waste. There are many reasons why patients may need a stoma, including those resulting from trauma or congenital issues, colorectal or bladder cancer, and inflammatory bowel disease. Nurses in different settings will commonly encounter patients with a stoma so they should have the knowledge and expertise to offer appropriate care and advice and, where necessary, know when to refer patients to the appropriate professional.

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A stoma is a small surgical opening on the abdominal wall where faeces and flatus or urine are diverted out of the body from the bowel or bladder and collected in a stoma appliance. Stomas are formed as part of surgery for reasons resulting from colorectal or bladder cancer, inflammatory bowel disease, trauma and congenital issues (Marinova and Marinova, 2023). A stoma can be temporary or permanent

With an estimated 205,000 people in the UK living with a stoma (Aibibula et al, 2022), it is important for nurses to understand the basics of stoma care. Knowing the different types of stomas, what are normal and abnormal outputs and which appliances to use can increase nurses' confidence and improve patient care.

Stoma types

Stomas consist of three main output types:

- Ileostomy – faecal output stoma formed from the small bowel;
- Colostomy – faecal output stoma formed from the large bowel;
- Urostomy or ileal conduit – urine output stoma (Davis, 2023).

These are illustrated in Fig 1.

An ileostomy can be formed in any part of the ileum but is often formed in the terminal ileum. Other small bowel stomas are the rare stoma formed from the jejunum (jejunostomy) or even the duodenum (duodenostomy).

A colostomy is usually formed from the distal colon, such as the sigmoid or descending colon. However, it can also be formed from the more proximal colon, such as the transverse colon or, less commonly, from the ascending colon.

Reasons for stoma formation

Colorectal cancer is the most common reason for the formation of a stoma in adults (Francesk and Lotfollahzadeh, 2023). For a person with a cancer in their colon or rectum, it may be necessary to remove the area of the bowel that contains the cancer. The surgeon then needs to consider whether to rejoin the bowel by creating an anastomosis (surgical connection). This decision is based on factors such as where the join is, whether there were any issues during the surgical procedure that might complicate the healing of the anastomosis, or any personal factors about the patient that might compromise wound healing

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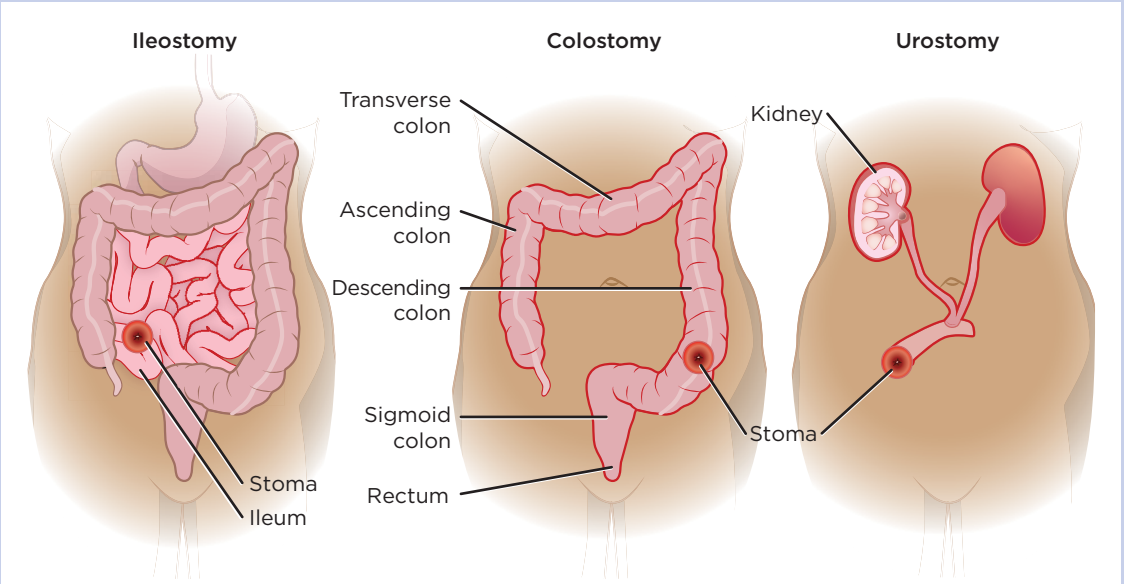
Fig 1. **Three main types of ostomies**



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(for example, pre-operative medication, such as steroids). If a join is not possible, or there are factors such as those detailed above, a stoma is often formed.

Temporary and permanent stomas

A temporary stoma might be needed to enable a high-risk anastomosis – for example, a rectal join, which is a technically complex operation – to heal. Alternatively, a permanent stoma might be formed if effective anal function would not be possible and an abdominoperineal resection of the rectum (surgical removal of the rectum, anus and part of the sigmoid colon) is performed (Gavrila et al, 2021).

A urostomy is almost certainly going to be a permanent stoma formation.

Fig 2. **Loop ileostomy**

Loop and end stomas

There are two main ways to form or configure a stoma:

- Loop stoma – this is usually a temporary stoma, for which a loop of bowel is brought through a surgical opening on the abdominal surface. The bowel is partially divided, and both ends are stitched onto the abdominal wall to form the stoma (Rudoni et al, 2023) (Fig 2);
- End stoma – the surgeon removes the problem area of the bowel and brings the proximal end through the opening in the abdominal skin, before stitching it onto the abdominal wall to form the stoma (Fig 3 shows an end colostomy, a type of end stoma formed from the large bowel).

In addition to the end stoma, a mucous fistula may be formed to allow any mucus in the distal, defunctioned bowel segment to be drained. A mucous fistula is uncommon but might be formed if the colon is removed but the rectum is retained. The mucous fistula could be formed from the distal colon (such as the sigmoid colon) or the top of the rectum to allow any mucus in the rectum to be easily passed from the body. An alternative passage for the mucus would be via the anus.

Another uncommon stoma formation is a double barrel stoma. This is when two bowel ends are exteriorised but not joined to each other. A stoma is formed so both bowel ends pass out of the body through the same opening on the abdominal wall. This might be used if there is a bowel infarction, where insufficient blood flow has caused a portion of the bowel to die (gangrenous bowel), so it is important to see both ends to make sure there is a good blood supply.

Stoma position

Before the operation, it is usual practice in the UK for the person planning to have a possible or definitive stoma to attend a pre-operative appointment with a stoma care clinical nurse specialist (CNS). One of the discussion points is where to position the stoma.

It is common for a colostomy to be formed in the left iliac fossa, below the umbilicus, although a transverse colostomy is likely to be formed above the umbilicus. An ileostomy or urostomy is most often formed in the right iliac fossa, below the umbilicus (Vernon, 2023). It is not always possible for the surgeon to use the position the nurse and the patient choose, due to factors such as difficulties mobilising the bowel.

Fig 3. **End colostomy**

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Stoma appearance

The stoma should be pink or red (Stelton, 2019) due to the vascular segment of bowel that is used to form it. Due to the blood vessels in the stoma, it is possible to make it bleed (if, for example, it is cleaned too roughly), especially in the first few weeks after it is formed.

If the stoma is pale, the patient may be anaemic and should be advised to contact their doctor or CNS in stoma care. If the stoma is dark and cool (compared with the rest of the abdominal skin), this needs urgent attention. A cool, dark-coloured stoma could be due to ischaemia (lack of blood flow) and mean the blood supply to the bowel used to form the stoma is compromised (Perrin et al, 2023). Alternatively, it could be that the stoma is necrotic (the cells in the bowel have died). Necrosis and ischaemia both need surgical review and only usually occur in the immediate post-operative period in hospital.

The skin around the stoma should be the same colour and integrity as the rest of the abdominal skin; if skin damage or changes are noted, the patient should contact their CNS in stoma care for advice (White et al, 2023).

Fig 4. **Man with ileostomy appliance in situ**

Fig 5. **Man with a colostomy appliance in situ**

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The stoma should be warm to the touch, as well as moist due to the bowel mucosa. A colostomy will ideally be raised ~5-10mm above the abdominal surface; an ileostomy or urostomy will ideally have a 20-25mm spout (Davis et al, 2022).

Stomal outputs

The output from each type of stoma is different. Stoma output is also often different in the first few days and weeks after it is formed compared with in the longer term, such as 6-8 weeks or more after surgery. A faecal output stoma in the first 24 hours after being formed might pass nothing except for a small amount of haemoserous fluid. It is then likely to pass flatus, liquid or loose faeces and this faecal consistency will gradually thicken over time.

Often within a few days, a person with a colostomy is likely to be passing flatus and small amounts of faecal matter. Over time, the output from a colostomy will usually become soft, formed faeces with flatus. Normal function varies but, on average, the faecal output is commonly passed once per day.

"The aim of a stoma appliance is to collect and contain the stomal output, so no odour or leaks occur."

Usually within a few days, a person with an ileostomy will be passing some flatus and loose faecal matter. Nightingale (2022) stated that normal output was 600-1,200ml each day, although opinions on this vary.

Volumes depend on dietary and fluid intake, as well as other factors, such as medication; for example, laxatives may increase the faecal output of a colostomy, whereas loperamide, used for treating diarrhoea, might reduce the ileostomy output (Nightingale, 2022). The latter is not commonly prescribed in the immediate post-operative period but can be used to manage faecal outputs that are above normal range.

A person with a newly formed urostomy will pass urine immediately and constantly. Initially, the urine might be slightly blood stained and contain large amounts of mucus, which also collects on the stents that are inserted into the urostomy when it is formed. Once the stents are removed, the mucus production will usually decrease. Mucus is formed in the conduit used to form the urostomy, and will often continue but in limited amounts.

The colour of the urine should be straw coloured, but it will vary in colour and volume depending on the amount of fluid drunk. It can also be affected by other factors – for example, potentially reducing in hot weather due to increased sweating.

Stoma appliances

A stoma appliance is often called a stoma bag or stoma pouch by patients. The aim of a stoma appliance is to collect and contain the stomal output, so no odour or leaks occur. This is achieved by having two main parts to the appliance:

- Collection part, made of a plastic type material;
- Adhesive part, which is applied to the skin around the stoma.

The adhesive part of the appliance has many names, such as flange, base plate and face plate. Most flanges are made from hydrocolloid, a skin-friendly adhesive used in wound healing. Stoma appliances are available as:

- One-piece systems – all parts are pre-joined;
- Two-piece systems – two separate parts that are joined as part of the stoma appliance change routine (Burch and Collins, 2021).

There are three main types of stoma appliance for collecting the stomal output, one for each of the three main types of output stoma:

- Drainable appliance that can be emptied and re-fastened – worn by patients with an ileostomy, who will have loose faeces (Harris, 2021) (Fig 4);
- Drainable appliance with a tap or bung type fastening – worn by a person with a urostomy, allowing urine to be emptied;
- Closed appliance – worn by a person with a colostomy, who will usually have formed faeces (Fig 5).

Faecal output stoma appliances usually have a filter, which is designed to release the flatus, keeping any odours in the appliance. To prevent urine from flowing back up the bag (for example, when in bed), a urostomy often has several layers in the stoma appliance.

In addition to the stoma appliance are products known as accessories. Accessories are generally used to prevent problems occurring or to treat problems that have already occurred. Common examples of stoma accessories include, but are not limited to, seals, powder, barrier film, flange extenders and paste (Harris, 2023).

Changing stoma appliances

In UK hospitals, patients are usually taught to change stoma appliances themselves

(Steinhagen et al, 2017), with each appliance change presenting a potential training opportunity. Before discharge, most people can self-manage their own stoma appliance; if this is not possible, family or healthcare support will be necessary. Self-care learned in hospital has been shown to reduce nursing interventions after discharge home (van Loon et al, 2020).

Appliances should be changed routinely rather than waiting for them to leak, which can be embarrassing for patients. Usual recommendations for emptying or changing appliances are:

- Colostomy – replace between three times a day and three times per week;
- Ileostomy – empty between four to six times a day into the toilet when the applicance is between a third full and half full. Change the appliance every one to three days;
- Urostomy - empty this between four and six times a day when it is a third to half full. At night, connect to a drainage bag to enable more urine collection and fewer trips to the toilet. Change the urostomy appliance every one to two days (White, 2018).

The procedure for changing a stoma appliance is similar for all three stoma types and for one-piece or two-piece appliances. The steps are as follows:

1. Collect all necessary equipment. This will include a new appliance, cleaning cloths (which can include kitchen towels), water in a small container and a rubbish bag. It might also include a measuring guide, pen, scissors and something to protect the patient's clothes from any spillages.

2. Carefully remove the old appliance from the abdominal skin, taking care not to cause trauma to the skin (Ratliff et al, 2021). Some people might need an adhesive remover – if, for example, they have fragile skin. If the appliance is drainable, it is sensible to empty it first to reduce the risk of the contents spilling. It can be useful to stick the two adhesive edges together to reduce the risk of any content spilling into the rubbish bag.

3. Gently, but thoroughly, clean the skin around the stoma (peristomal skin) with warm tap water. The stomal output is usually removed during the skin cleaning process. Take care when touching the stoma, as it can bleed, particularly in the immediate post-operative period; this is normal in the first few weeks after stoma formation, but you should make sure you minimise this with gentle cleaning. Carefully dry the peristomal skin. Place all cloths in the rubbish bag.

4. Quickly assess the stoma and the peristomal skin for any signs of skin damage or change. If any problems are noticed, take action, such as contacting the CNS in stoma care.

5. Ensure that the appliance's aperture is about 2mm larger than the stoma, while being the same shape, to reduce the risk of skin damage (Burch et al, 2023). This might mean you have to measure the stoma, particularly in the first eight weeks after its formation. Carefully adhere the new stoma appliance to the skin around the stoma, making sure that the appliance does not adhere to the actual stoma. Hold the appliance to the skin for about 30 seconds to help with adhesion.

6. Dispose of all rubbish as per local policy. Take time to ensure that the stoma appliance is placed carefully around the stoma to reduce the risks of leaks and skin damage. In addition, advise the patient to avoid excessive bending soon after the appliance has been replaced, as the stoma appliance can take a little while to fully adhere to the abdominal wall. Fig 6 shows a two-piece closed appliance change.

Fig 6. **Two-piece closed appliance change**

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"Faecal output stoma appliances usually have a filter, which is designed to release the flatus, keeping any odours within the appliance"

Dietary advice

A question people with a newly formed stoma frequently ask is what they can eat, although there is little evidence to support advice on dietary management (Mitchell et al, 2021). General advice is for patients to be particularly careful in the first few days after the stoma is formed, although less caution is needed once the post-operative oedema has reduced (after about six to eight weeks). In the first few days, it can be sensible to chew food more carefully for all three stoma types. All people with a stoma should be advised to eat a balanced diet and try not to exclude any food types from their diet. For people with a stoma and another dietary consideration (such as having diabetes or being vegan) seeing a dietitian may be useful. Other dietary advice will be considered separately for each stoma type.

Colostomy

To prevent constipation, patients should be advised to include plenty of fibre in their diet and drink about six to eight cups of fluid a day (Colostomy UK, 2021), unless contraindicated. If people are bothered with flatus, it can help to avoid flatus-inducing food and drink (such as beans or carbonated drinks) as well as smoking. However, if the person is in an environment where flatus is not bothersome, it is not necessary to consistently avoid such foods.

Ileostomy

A person with an ileostomy will usually have to make the most changes to their diet. It is usually considered sensible to reduce fibre intake, as this may cause the faeces to be loose and greater in volume. Small, hard-to-digest foods (such as sweet corn and fruit and vegetable skins) can be avoided or chewed very carefully to reduce the risk of a food bolus blockage. Due to the potential loss of salt in the loose faeces,

advise patients to take a little extra salt each day (around half to one teaspoon) unless contraindicated for other reasons. As the faecal output is loose, it is advisable to drink about around 1.5-2L of fluids each day to prevent dehydration (Liu et al, 2021).

Urostomy

A person with a urostomy can usually eat normal foods in the longer term once their bowel anastomosis has healed. However, to ensure the urine output is clear, it is advisable to drink about 1.5-2L daily (Davis, 2023).

Complications and interventions

Nurses should ask patients with a stoma if there are any issues. For patients with skin problems (peristomal skin damage), nurses need to undertake an assessment of the peristomal skin and the stoma. Part of the assessment will include asking questions, such as when did the problem occur, did anything happen before the problem occurred, what treatment has been tried and what was the effect of that treatment.

One of most common problems associated with having a stoma, particularly an ileostomy, is the presence of skin damage from appliance leakage (Krogsgaard et al, 2022). This might present visibly as superficial skin damage, through to blisters, bleeding and ulceration. Patients may report discomfort, itching or pain in their peristomal skin area.

There are multiple reasons why skin damage can occur. Skin that is damaged due to touching the output from the stoma is known as peristomal moisture associated skin damage (P-MASD). P-MASD might occur due to seepage of the faecal output under the stoma flange. To resolve and prevent seepage, it is necessary to obtain a secure seal between the skin and the stoma adhesive in the flange. Stelton (2019) considers this might involve checking that the aperture in the stoma flange is the correct size (2-3mm larger and the same shape as the stoma). Another alternative is to use stoma accessories to improve adhesion.

Skin damage may occur due to the stoma having a small spout or being retracted below the surface of the abdominal wall. In this situation, it might be useful to consider a convex appliance. This product has a dome-shaped flange that pushes into the abdominal wall, compared to the usual flat flange. As a result of pushing into the skin around the stoma, the convex flange can help smooth the peristomal skin or push the stoma slightly further out from the skin. This action will often assist the stomal output to drain into the appliance instead of seeping under the stoma flange.

Things to consider when using convexity include the need to observe for pressure damage, seen as bruising around the stoma (Roveron et al, 2021), although this is uncommon (Colwell et al, 2022). Thus, it is important for a CNS in stoma care to assess the patient and educate them on the potential issues that might occur.

Another issue that can occur with the peristomal skin is skin stripping, also known as peristomal medical adhesive related skin injury. The skin can be stripped when the appliance adhesive is removed from the abdominal wall (Harris, 2023). Damage is more likely to occur with fragile skin, such as in people who are young or old. Another risk factor is taking medications such as steroids.

Exercise care when removing the stoma appliance by removing it slowly and supporting the peristomal skin during the process. Alternatively, an adhesive remover in the form of a wipe or spray can be useful, exercising caution in the very young, such as neonates. It is common to see a slight pinkness on pale skin tones when the stoma appliance is first removed. However, such subtle changes are not always visible on darker skin tones. Skin damage on dark skin tones can appear as dark, grey or purple rather than red, although redness may also be seen.

Some patients may be sensitive to the stoma flange, stoma bag, cleaning products or accessories used on the peristomal skin, although a true allergy is rare. If an allergy is suspected the patient will need see the CNS in stoma care. One way to resolve it is to try switching to an appliance by another manufacturer, who uses different compounds in the formulation of the stoma products.

Sweating during sport or menopause can reduce the stoma appliance adhesion. In this situation, it can be useful to add additional adhesion to the edges of the stoma flange. These products have different names, such as flange extenders or edging tape.

For people with a faecal output stoma (most commonly a colostomy), flatus collecting in the stoma appliance can balloon and become visible under clothing. If the filter is functioning well, ballooning should not occur. However, if the filter becomes blocked with faeces or gets wet during bathing or swimming it might become less effective. To prevent external water damage, small adhesive filter covers are usually provided with appliances for use over the filter when in water, which are removed afterwards.

Emotional support

Having a stoma formation is life changing. For some people it will improve their lives, but it often requires life adjustments. Patients commonly need emotional support in the first few months of adjustment to their stoma (Lim et al, 2015); this can be from health professionals, such as the CNS in stoma care and the patient's GP, as well as from friends and family.

A literature review of psychosocial health following ostomy surgery identified psychosocial problems that can occur such as "poor body image perception and self-respect, depression, sexual problems, and lower psychosocial adaptation" (Ayaz-Alkaya, 2019). The authors proposed that health professionals, particularly nurses, should consider interventions such as relaxation and cognitive behavioural techniques, emotional and social support, as well as general interactional skills like supportive communication, listening and counselling to solve and prevent psychosocial problems. Although referral to specialist mental health services will not usually be necessary, this should be available for patients who might need it.

Patient education

Every healthcare encounter is an opportunity for patient education. For example, this might be a reminder about diet or encouragement on how to become independent with stoma appliance management. It can be useful to signpost patients to other forms of education, such as websites from the stoma appliance manufacturers, stoma support group websites, written patient information booklets or the CNS in stoma care in the local hospital.

Conclusion

Often patients will have acquired the skills and confidence to manage their own stoma care without the need for nursing intervention. However, all nurses need a basic knowledge of stoma care and how to recognise and manage common stoma complications, as well as understanding when to refer on to the CNS in stoma care for additional support in managing complex stoma-related issues. Nurses should be proactive in checking with the patient whether they have any stoma-related issues, so they can offer knowledgeable support as necessary. **NT**

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Professional responsibilities

This procedure should be undertaken only after approved training, supervised practice and competency assessment, and carried out in accordance with local policies and protocols.