approximately 725,000 to 1 million people in the United States live with an ostomy, a surgically created opening in the abdominal wall that allows for the elimination of waste matter, with about 100,000 ostomy surgeries performed annually. Surgically created bowel diversions may be performed to treat various diseases and pathologies affecting the bowel, including cancer (colorectal, cervical, or ovarian, for example), diverticular disease, birth defects such as imperforate anus, irritable bowel disease such as Crohn’s disease or ulcerative colitis, and bowel obstruction or perforation.

The benefits of ostomy surgery notwithstanding, patients with ostomies face significant challenges. Nurses can play a vital role in helping to care for and educate patients, enabling them to better adapt to the new conditions they will face in their daily lives. Many health care institutions employ a certified wound, ostomy, and continence (WOC) nurse who is trained to provide preoperative and postoperative care and teaching. However, not all institutions employ a WOC nurse, and those that do may engage a specialist on a limited basis only. When a WOC nurse is not available, bedside nurses must assume responsibility for providing necessary care and meeting patients’ educational needs. This article details the basics of ostomy care for nurses who encounter patients with the most common types of ostomy surgery of the bowel, namely colostomy and ileostomy.

Case scenario. JN is an active 72-year-old retired police officer, who enjoys golf, travel, and spending time with his grandchildren. (This case is a composite based on my experience.) He recently received a diagnosis of rectal cancer. An abdominoperineal resection, which is surgery to remove the anus, the rectum, and a portion of the sigmoid colon resulting in a permanent end colostomy, is recommended. He has agreed to the surgery and has a very supportive wife and family. He undergoes the operation and is a patient on a unit in a small rural hospital without a certified or trained ostomy care nurse. His nurse will therefore need to know how to care for and educate him.

If you were his nurse, would you know how to properly assess and care for him, and adequately teach ostomy care to enable him to resume his former activities with a good quality of life?

PREOPERATIVE CONSIDERATIONS
Before surgery, nurses should be prepared to meet with the patient and family, including the person who will assume the role of postoperative caregiver, to provide information about the type of surgery the patient will undergo, the position of the stoma, and what to expect, including the postoperative diet and pain management. Nurses can show support by giving patients an opportunity to express their concerns and ask questions. In some cases, the stigma attached to ostomies and fear of “the bag” may have caused the patient to
hesitate and delay surgery. Even those who feel confident in their decision to undergo surgery will have concerns about how an ostomy will impact their lives.

**Ostomy surgery of the bowel.** An ostomy is a surgical procedure to create an opening in the abdominal wall, used to divert bodily output or waste from the normal excretory pathway. A portion of the bowel is brought through the front of the abdomen to the skin surface to create a stoma—the small portion of bowel inverted on itself (“budded”), exposing the lining, or mucosa (see Figure 1). An ostomy pouching system fits over the stoma and the pouch itself collects the waste. An ostomy may be temporary, diverting the fecal output and protecting a distal anastomosis to give the affected section of the bowel time to heal, or when J-pouch surgery is performed on patients with ulcerative colitis. Extensive disease such as rectal cancer requiring the removal of the rectal sphincter and the anus results in a permanent ostomy. The surgery can be performed with laparoscopy or as an open abdominal procedure. A loop stoma is created when a loop of the bowel is brought to the surface of the abdominal wall, essentially maintaining continuity of the bowel but diverting the stool through the stoma. An end stoma, on the other hand, is created by dividing the intestine and bringing the proximal end to the abdominal wall.

**Types of ostomies.** The type of bowel diversion created depends on the underlying reason for the surgery. Ostomies are classified based on the section of the intestine brought to the abdominal surface. A *colostomy* can be created anywhere along the large intestine, but the most common site is over the sigmoid portion, the part of the colon directly above the rectum, resulting in a stoma on the lower left side of the abdomen (see Figure 2). Common reasons for a colostomy include colon cancer, diverticulitis, Crohn’s disease, bowel obstruction, birth defects, and injury. The expected output is generally pasty to more formed. An *ileostomy* diverts stool from the small intestine, usually at the terminal ileum, resulting in a stoma on the lower right side (see Figure 3). Common reasons for an ileostomy include inflammatory bowel disease, especially ulcerative colitis, birth defects, cancers, and familial adenomatous polyposis. Output is less formed, usually ranging from semiliquid to pasty in consistency.

**Patient concerns.** In addition to concerns involving practical issues, such as managing stoma care and the pouch system, patients may also have questions about the impact of surgery on their physical, emotional, professional, and social lives. Nurses should address these concerns while also sharing that stoma creation often improves quality of life. For example, in their study of the factors contributing to a good or impaired quality of life in patients with inflammatory bowel diseases, Keller and colleagues found that patients with Crohn’s disease who had a stoma had an improved quality of life compared to those with no stoma or whose stoma had been reversed. In patients with ulcerative colitis who had a stoma, there was a trend toward improved quality of life. While patients often fear stoma creation, many experience better disease control after surgery. In patients with spinal cord injury who had neurogenic bowel dysfunction, the presence of a stoma significantly reduced time spent on bowel management and resulted in improved patient satisfaction and ability to cope. According to Iqbal and colleagues, more than 70% of patients who had ostomy surgery for severe and chronic constipation were satisfied with their quality of life compared with their presurgical condition, although some adverse effects on health-related quality of life regarding physical and social well-being were reported.

**INITIAL POSTOPERATIVE CONSIDERATIONS**

Following ostomy surgery, patients will need to remain in the hospital for several days. In addition to monitoring patients’ overall health, nurses should ensure proper healing. If there is an open wound on the abdomen, dressing changes may be necessary. Temporary small rubber surgical drains or Penrose drains may be required to remove any fluids that might collect at the surgical site.
to prevent abscess formation. In addition, patients may require IV fluids for hydration and a Foley catheter to drain urine. The condition of both the stoma and the peristomal skin warrant close attention. In some cases, nurses will need to liaise with other members of the care team. For example, should complications develop involving insufficient blood flow to the stoma, resulting in a darkened or even necrotic stoma, the nurse will need to immediately inform the surgical team and operating surgeon and continue to monitor the patient. Registered dietitians should be consulted to evaluate a patient’s nutritional needs and provide dietary advice. It is also important to keep the following in mind:

**The importance of activity.** Nurses should encourage ambulatory patients to get up and walk as soon as possible after surgery, premedicating for pain if needed. Early mobilization is a key element of Enhanced Recovery After Surgery (ERAS) protocols, reducing the risk of postoperative pneumonia and venous thromboembolism. In some situations, involving physical and occupational therapists in the patient’s care can help achieve this goal.

**Resumption of oral intake.** ERAS protocols also include the resumption of oral feedings, if possible, within a few hours after surgery, by physician order. Traditionally, oral feedings were suspended until signs of bowel activity, such as bowel sounds, flatus, and bowel movements, were apparent. However, recent research has found no association between these signs and tolerance of oral intake.

Nurses should monitor the patient for nausea and promptly report it to the physician. First foods may be a liquid or low-fiber/low-residue diet, followed by a regular diet if this is well tolerated. Patients with an ileostomy should be monitored for high output (greater than 1,200 mL per day), which can lead to dehydration and electrolyte imbalance. High output should be promptly reported to the physician.

**Pain management.** Properly controlling pain will facilitate early mobilization and enhance patients’ ability to recover and learn how to manage stoma care on their own. The usual postoperative analgesics can be administered, although nurses should caution colostomy patients about constipation if opioids are used.

**Rods.** Loop stomas may temporarily have a rod or support bridge placed, based on the surgeon’s preference, which will later be removed.

**Appearance.** The ideal stoma is red, moist, and protrudes approximately 2 cm (0.78 in). Following surgery, the stoma may appear edematous but it will shrink to a more permanent size in about six to eight weeks. If the stoma becomes dark red or purple, even progressing to black with an odor, there may be an ischemic condition or necrosis and the surgical team must be notified immediately. This is likely due to tension on the stoma during creation and will probably result in a retracted stoma, depending on the severity.

**Basic Ostomy Care Prior to Discharge**

The basics of ostomy care, consisting of emptying and changing the pouch and addressing skin problems and leakage, are essential for patients to know prior to discharge.

There are several types of pouching systems, among them one- and two-piece ostomy systems. Both include a pouch and a skin barrier that adheres to the skin around the stoma, protecting the skin from effluent. In the one-piece system, the skin barrier and the pouch are connected; whereas in the two-piece system they are separate, and the pouch can be removed and a new pouch connected while the skin barrier remains in place (see Figure 4). For proper fit, the center opening of some skin barriers will need to be cut one-eighth of an inch larger than the stoma. There are also moldable or stretchable skin barriers on the market that do not need to be cut. The type of pouching system selected depends on patient preference and need, as well as availability. There are also several accessory products available to help manage the pouching system and/or create a more secure seal and ensure a longer wear time. These include flexible barrier rings to protect the skin and improve the fit of the skin barrier, stoma powder to absorb moisture, ostomy paste, pouch deodorants, and lubricants to ease pouch emptying.

**Emptying the pouch.** Patients should be taught to empty their pouch when it is no more than one-third full; otherwise, it may get too heavy and pull away
from the abdomen, causing leakage. The pouch should be emptied directly into the toilet, with patients positioning themselves a little further back on the seat or standing and facing the toilet. If backsplash is a concern, toilet paper can be layered on the water in the toilet bowl. Each pouching system has its own unique closure mechanism. Fecal pouches may still include a removable clip, although most have an integrated closing mechanism, such as a roll-down type closure. After emptying, the inside of the tail should be cleaned with toilet paper or a moist paper towel, and the pouch closed. Patients should double-check that it is securely closed by gently tugging on the end. It is best not to rinse the pouch with water, as this may weaken the seal and cause leakage. With colostomies, if stool is too formed and difficult to squeeze out, it may help to use a commercial pouch lubricant, which is often available in combination with a deodorizer for odor control from pouch manufacturers. This can be applied directly into the pouch when the pouch is changed or each time it is emptied.

**Changing the pouch.** The pouch system should be changed on average twice a week, or whenever there is evidence of leakage or skin irritation. Pouching systems should provide a seal that is secure and predictable, generally lasting at least three days. Ostomy patients may occasionally experience leakage, but this should be the exception and not the rule; otherwise, quality of life will be negatively affected. If leakage persists, a different ostomy system or changing technique should be explored. Patients may need to consult a WOC nurse; the Wound, Ostomy, and Continence Nurses Society (www.wocn.org) may be able to help find one in the patient’s local area.

Nurses can demonstrate pouch changes while gradually encouraging the patient and/or caregiver to participate. The best time of day to change the pouching system is different for every patient. Changing it at a time when there is less stool production can make changing easier and quicker. That can be early in the morning before having anything to eat or drink, or at least two hours after a meal. Another good time is following a shower. The following is a step-by-step guide:

1. Gather supplies; preferably keep them organized in one area on a shelf or in a box or bag.
2. Gently remove the pouching system using an adhesive remover or warm wet washcloth, pushing on the skin to support and protect it while removing the skin barrier from the top down.
3. Measure the stoma and cut or mold the new skin barrier to fit the stoma’s size and shape. Remeasure the stoma periodically for the first six to eight weeks after surgery because its size may change as swelling subsides (see Figure 5).
4. Cleanse the skin around the stoma with water and dry thoroughly. Avoid use of products that contain a moisturizing agent, such as premoistened cleansing cloths like baby wipes, as they may interfere with adherence of the pouching system. The use of soap is not recommended. If used, the skin should be well rinsed afterward.
5. Inspect the stoma and peristomal skin for irritation, wounds, rashes, or changes. Treat any skin breakdown with a light dusting of stoma powder sealed with a skin barrier wipe. Consult a certified WOC nurse if skin problems around the stoma persist.
6. Remove the backing from the skin barrier after checking for proper sizing and making any adjustments. Apply stoma paste or barrier rings, if needed, to protect the skin or improve the pouch seal and increase the pouch wear time.
7. Center the pouching system over the stoma, stretching the skin around the stoma as you do so. Gently press it into place to ensure a good seal. Apply the pouch to the skin barrier if using a two-piece system.

**Tips for skin problems and leakage.** Regardless of the type of pouching system used, peristomal skin problems and leakage may occur. The patient should be taught to observe the stoma and the peristomal skin for any abnormalities, including irritation and skin breakdown (see Figure 6). Peristomal skin breakdown can be treated by applying a thin layer of stoma powder onto the damaged skin, then tamping it down with a no-sting barrier.
skin breakdown.17 If seepage has occurred, the entire system must be sealed by applying tape around the skin barrier. Once the pouch is changed to prevent further seepage and consequent leakage. To obtain a better seal, ostomy paste should be applied from the tube like a line or “bead” of caulk around the stoma opening of the skin barrier. Paste may be used, especially in the case of an ileostomy, which can trigger gas, can be added one at a time to determine if they are tolerated.11 There are also pouches with gas filters that may be helpful in keeping the pouch from overfilling with gas.

**Ileostomy.** Ninety percent of absorption and digestion of nutrients is completed within the first 100 cm of the small intestine.19 Therefore, unless a major portion of their ileum is resected, ileostomy patients are not at risk for malnutrition as long as they follow a well-balanced diet and thoroughly chew their food. With resection of the distal ileum, long-term ileostomy patients may be at risk for B12 deficiency.19 Because the large bowel, which is being circumvented, is largely responsible for water and electrolyte absorption (particularly sodium and potassium), ileostomy patients are at risk for dehydration and electrolyte deficiencies.11 Patients should be cautioned to increase their water intake and include foods with sodium and potassium in their diet, as long as medically appropriate.

Normal ileostomy output should be about 1,200 mL (40 oz or 5 cups) per day14 and should have a somewhat thickened liquid consistency. A consistently higher output can lead to fluid and electrolyte imbalances. Patients should be aware of signs of dehydration, such as fatigue, light-headedness, and abdominal cramping, and report them to the health care provider. There are nutritional measures that can help to slow and thicken output, such as avoiding sweets and simple carbohydrates, and eating foods such as bananas, rice, applesauce, peanut butter, soda crackers, pasta, bread, and cheese. Sports drinks and most nutritional supplement drinks are not appropriate due to their high sugar content, which only increases output.20 Further discussion about high output ileostomies is beyond the scope of this article.

A blockage in the small intestine is also possible with an ileostomy. Foods known to cause blockage include corn, celery, popcorn, nuts, coleslaw, and grapefruit.19 Chewing food well helps to avoid a blockage, as does staying well hydrated. Signs of a blockage include no or drastically reduced output over 24 hours, progressing to abdominal pain and a swollen abdomen.

**Nutrition and Fluid Guidelines**

Following surgery, the eating plan will usually consist of clear liquids and a low-residue diet to avoid irritating the edematous bowel in the early postoperative period, avoiding high-fiber foods such as popcorn, nuts, raw cabbage, apple peels, and celery. Go to the United Ostomy Associations of America (UOAA) website for lists of foods to avoid following surgery: [www.ostomy.org/wp-content/uploads/2022/02/Food_Reference_Chart_2022-02.pdf](http://www.ostomy.org/wp-content/uploads/2022/02/Food_Reference_Chart_2022-02.pdf). As patients recover and edema resolves, patients can resume a regular diet.15 Small frequent meals and adequate fluid intake are important, as is chewing food well to optimize digestion and absorption. The patient should follow any specific diet recommendations from their health care provider and consider a nutritional evaluation with a registered dietitian as needed. Specific dietary recommendations generally depend on the type of ostomy.**
Should this occur, patients need to stop solids, sip on warm liquids, and seek medical help if the blockage does not resolve.

**EARLY STOMA COMPLICATIONS TO REPORT**

In addition to stomal necrosis, nurses and patients should be aware of other possible early complications and report them to the physician immediately.

**Mucocutaneous separation**, which is the detachment of the stoma from the peristomal skin, can be partial or complete. A complete separation involves the entire circumference of the stoma, with the stoma looking like it is in the middle of a moat. Separation may be the result of excessive bowel tension during surgery and poor healing, and occur more often in patients with malnutrition or who have used steroids in the past.\(^2\)\(^1\)\(^2\)\(^1\) Treatment will depend on the severity of the separation, but a minor separation can be treated by filling the defect with a stoma powder, hydrofiber, or calcium alginate.\(^2\)\(^1\)

**Stomal retraction**, which is the “disappearance” of stoma tissue protrusion in line with or below the skin level, may have various causes, including obesity.\(^2\)\(^1\) In overweight patients, larger adipose layers may cause inadequate mobilization of the bowel during surgery. Treatment is usually conservative and often involves the use of a convex ostomy system to bring the stoma above skin level. Severe cases of retraction may require surgical revision.\(^2\)\(^1\)

**Other postoperative concerns** include uncontrolled pain, nausea, abdominal distention, and developing signs of depression. Excessive bleeding from the stoma should be reported immediately, although small amounts of blood, especially during changing and washing, is normal.

**LIFESTYLE CONSIDERATIONS**

Ostomy surgery can affect patients physically, mentally, and emotionally. Nurses can reassure patients that an ostomy is nothing to be embarrassed about. People with ostomies can lead active lives for years, and are able to resume their normal activities, including travel, dancing, and swimming; attend places of worship; enjoy family life; and continue sexual intimacy. Multiple studies confirm that an ostomy can improve the quality of life for many people with various conditions.\(^3\)\(^\)\(^1\)\(^0\)\(^,\)\(^1\)\(^1\)\(^2\) Patients can return to work and drive when cleared by their health care provider. Before undertaking strenuous exercise or lifting weights, patients should check with their provider, as peristomal hernias are possible.\(^2\)\(^1\) The following are helpful tips that nurses can share with patients:

- Always have a spare! Be prepared to change the ostomy system at any time. Keep a small travel kit stocked with ostomy supplies.
- When traveling, be sure to store the travel kit in an airplane’s carry-on luggage. Take at least twice the supplies you normally need.
- It is fine to get in the shower with the pouching system intact\(^4\); be prepared to gently towel it dry after the shower. Depending on a patient’s comfort level and output, it is also fine to shower without the pouch on, especially on days when patients are planning to change the ostomy system.

<table>
<thead>
<tr>
<th>Organizations</th>
<th>Focus of Support and Education</th>
<th>Services</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Ostomy Associations of America</td>
<td>Ostomy patients</td>
<td>A nonprofit organization providing free teaching materials and a listing of support groups</td>
<td><a href="http://www.ostomy.org">www.ostomy.org</a></td>
</tr>
<tr>
<td>Wound, Ostomy, and Continence Nurses Society</td>
<td>Ostomy patients and nurses</td>
<td>A professional society of specially trained ostomy care nurses. Click on Patient Resources for free access to publications, services, websites, and ostomy care nurse referrals.</td>
<td><a href="http://www.wocn.org">www.wocn.org</a></td>
</tr>
<tr>
<td>American Cancer Society</td>
<td>Cancer patients</td>
<td>Information, research, support groups</td>
<td><a href="http://www.cancer.org">www.cancer.org</a></td>
</tr>
<tr>
<td>Crohn’s and Colitis Foundation</td>
<td>Inflammatory bowel disease patients</td>
<td>Information, research, and other services</td>
<td><a href="http://www.crohnscolitisfoundation.org">www.crohnscolitisfoundation.org</a></td>
</tr>
<tr>
<td>Nurses Specialized in Wound, Ostomy and Continence Nurses Canada</td>
<td>Wound, ostomy, and continence nurses</td>
<td>Education, conferences, patient information</td>
<td><a href="http://www.nswoc.ca">www.nswoc.ca</a></td>
</tr>
<tr>
<td>World Council of Enteroostomal Therapists</td>
<td>Wound, ostomy and continence nurses (globally)</td>
<td>Education, conferences, patient information</td>
<td><a href="http://www.wcetn.org">www.wcetn.org</a></td>
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**Table 1. Ostomy Resources for Information and Support**
Table 2. Ostomy Supplies and Resources

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Website</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convatec</td>
<td><a href="http://www.convatec.com/ostomy">www.convatec.com/ostomy</a></td>
<td>(800) 422-8811</td>
</tr>
<tr>
<td>Hollister, Inc.</td>
<td><a href="http://www.hollister.com">www.hollister.com</a></td>
<td>(888) 808-7456</td>
</tr>
<tr>
<td>Coloplast</td>
<td><a href="http://www.coloplast.us">www.coloplast.us</a></td>
<td>(800) 533-0464</td>
</tr>
<tr>
<td>Nu-Hope Laboratories, Inc.</td>
<td><a href="http://www.nu-hope.com">www.nu-hope.com</a></td>
<td>(800) 899-5017</td>
</tr>
<tr>
<td>Cymed</td>
<td><a href="http://www.cymedostomy.com">www.cymedostomy.com</a></td>
<td>(800) 582-0707</td>
</tr>
</tbody>
</table>

Everything should be ready to apply upon exiting the shower.

- Swimming with a secured pouch is also fine, but before swimming empty the pouch and perhaps secure it in place with waterproof tape to create a “picture frame.” The choice of swimwear can provoke anxiety, but special swimwear is available. Women may find that tankinis work best, as they make it easier to empty the pouch.

- Ostomy surgery should not negatively impact a trusting sexual relationship. It is normal to feel self-conscious and sensitive about body image, and patients should be encouraged to communicate concerns and ask questions. Nurses should recommend that patients 1) empty the pouch first; 2) wear a smaller pouch, such as a closed-end pouch or stoma cap (ask for samples from pouch manufacturers); and 3) if uneasy about seeing the pouch, cover it with specially designed underwear, lingerie, or pouch covers.

SUPPLIES AND PATIENT RESOURCES

Hospitals and other health care facilities should keep a variety of ostomy supplies on hand, including ostomy paste, powder, and barrier rings, as well as one- and two-piece ostomy systems. For difficult stomas, there should be a convex option; companies now have a moldable or cut-to-fit convex system that can be customized for different stoma sizes. If it is determined that a patient needs an item that is not in stock, reasonable efforts should be made to procure it.

Nurses should take advantage of patient teaching materials available from the UOAA and from ostomy supply manufacturers. In addition, manufacturers provide a “starter service” that includes an ostomy kit and telephone counseling with ostomy care nurses once the patient is discharged. See Tables 1 and 2 for resources for nurses and patients.

When discharged, patients should be sent home with a minimum of five pouching systems and accessory items such as paste, powder, and barrier rings. Include a list of all supplies given to the patient, along with the manufacturer’s name and order numbers. If the patient is going home, case managers should offer a referral to home care services, preferably services with a certified ostomy specialist. Prescriptions are needed for patients to receive insurance coverage and reimbursement for ostomy supplies; however, supplies can be bought online or from a reliable medical equipment provider. There are ostomy supply mail-order companies that deliver directly to the patient’s home, and also provide ostomy support.

Insurance coverage and copays for supplies vary based on insurance plans and policy. Medicare Part B covers the cost of ostomy supplies with the usual copay; however, it requires a prescription and sets a limit for the type and number of supplies that are reimbursable. For uninsured patients, some manufacturers have programs for free or low-cost supplies.

Patients should be encouraged to contact a local ostomy support group if one is available. They can search local listings on the UOAA website (www.ostomy.org/support-group-finder). Evidence shows that participation in an ostomy support group decreases hospital readmissions and ED visits and positively impacts a person’s ability to cope and manage the stoma.

CASE SCENARIO CONCLUSION

JN’s nurse followed recommendations regarding pre- and postoperative care and teaching that are essential to advancing positive patient outcomes. JN’s abdomen is soft and nondistended; he is tolerating food and drink without any nausea; he has stool and flatus in the pouch and is urinating adequately. He is ambulating in the hallway and his pain is controlled.

JN is ready for discharge on day 6 following his surgery. His nurse has taught him about managing his pouch system. Assisted and encouraged by his wife, JN has successfully demonstrated that he knows how to empty and change the pouch. He has received instructions regarding dietary and lifestyle considerations, as well as addressing potential complications, and he knows how to obtain ostomy supplies and seek out additional information. He appears comfortable with the care plan that was put in place for a successful discharge. Home care nursing has been arranged to initially assist with ostomy system changes. He has a follow-up visit with his surgeon in two weeks. He was provided with enough pouches for at least five changes and teaching materials were downloaded from one of the reliable websites. He has been signed up for a starter kit from one of the manufacturers.

With appropriate support, encouragement, and education, ostomy patients like JN can successfully transition to their new life with an ostomy with a minimum of trauma and disruption and be able to continue most, if not all, of the activities they pursued previously and enjoy a high quality of life. Ideally, trained ostomy professionals such as WOC nurses should be involved to perform both preoperative and postoperative care, teaching, and follow-up, but this is not...
always possible. Staff nurses should have the necessary preparation to step in to fill this role to ensure the best possible outcomes for their ostomy patients.

For 210 additional nursing continuing professional development activities on medical–surgical topics, go to www.nursingcenter.com/ce.

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REFERENCES


