

Ostomy Management

A Model of Interdisciplinary Care



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KEYWORDS

• Ostomy • Stoma • Colostomy • Ileostomy • Palliative care • QoL

KEY POINTS

- Ostomies are indicated for a variety of intestinal conditions, and a basic understanding of their management is appropriate for clinicians of all disciplines.
- The impact of ostomies on quality of life is complex, with both positive and negative effects.
- Close collaboration with wound ostomy and continence (WOC) nursing professionals leads to optimal ostomy outcomes.

There are an estimated 1 million patients living with a stoma in North America, and approximately 120,000 stomas are created in the United States annually.¹ Stomas are indicated in several disease processes including malignancy, inflammatory bowel disease, neurologic problems, urologic disease, traumatic injury, and diverticulitis. Stomas are classified as either ileostomies or colostomies depending on whether they are created from the small or large intestine, respectively (**Figs. 1** and **2**). The term ileal conduit is reserved to describe a stoma formed for the passage of urine (**Fig. 3**). Ostomy anatomy is further characterized by how proximally they are formed and whether they are configured as an end, loop (**Figs. 4** and **5**), or end-loop. There are also more complex stoma configurations that are sometimes used in the context of technical challenges. Ostomy anatomy affects the viscosity and composition of the output, likelihood of parastomal herniation or prolapse, ease of appliance management, and quality of life (QoL). It is important to be cognizant that patients with stomas have varied perspectives on their experience and, for many, living with an ostomy significantly improves QoL. Palliative care specialists interacting with patients with ostomies should understand best practices in ostomy management, common complications, and when to refer to an enterostomal nursing specialist. Furthermore, it is important to be able to counsel patients considering ostomy formation for the treatment of serious illness, especially advanced malignancy.

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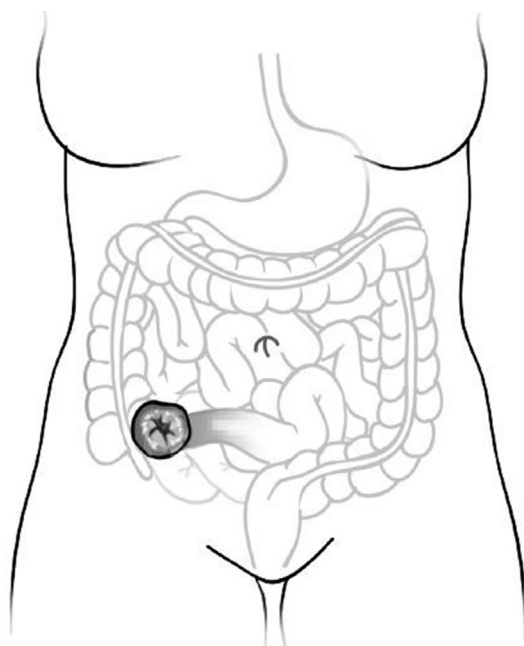


Fig. 1. Ileostomy. (Printed with permission from Lohitha Kethu.)

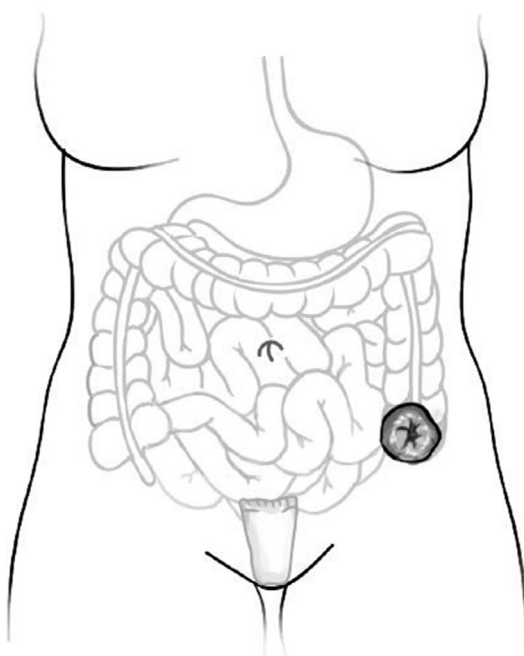


Fig. 2. Colostomy. (Printed with permission from Lohitha Kethu.)

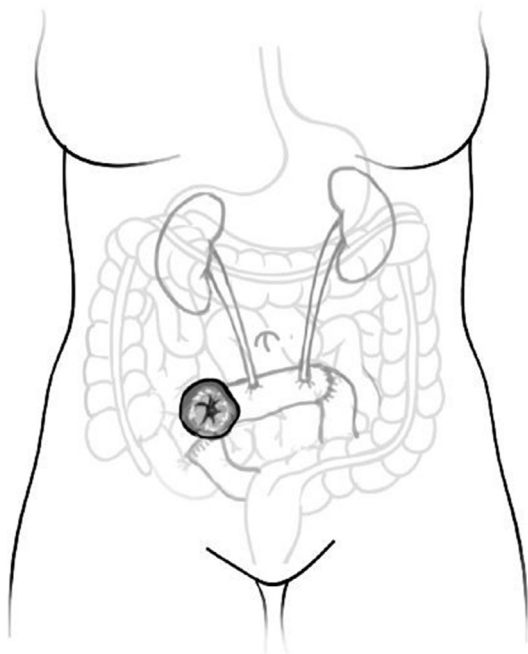


Fig. 3. Ileal conduit. (Printed with permission from Lohitha Kethu.)

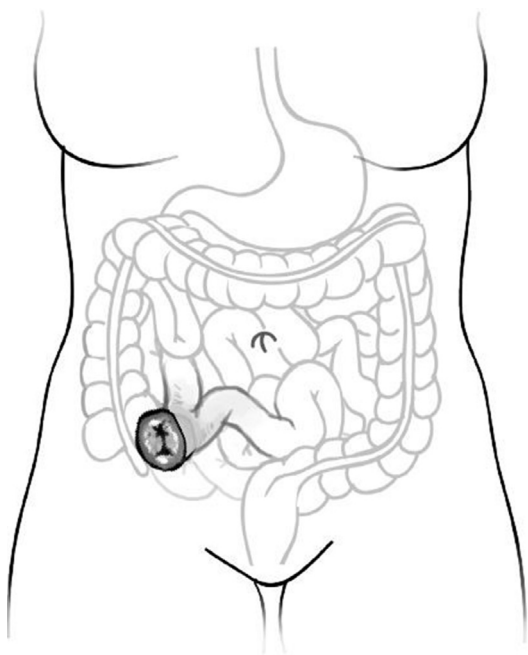


Fig. 4. Loop ileostomy. (Printed with permission from Lohitha Kethu.)

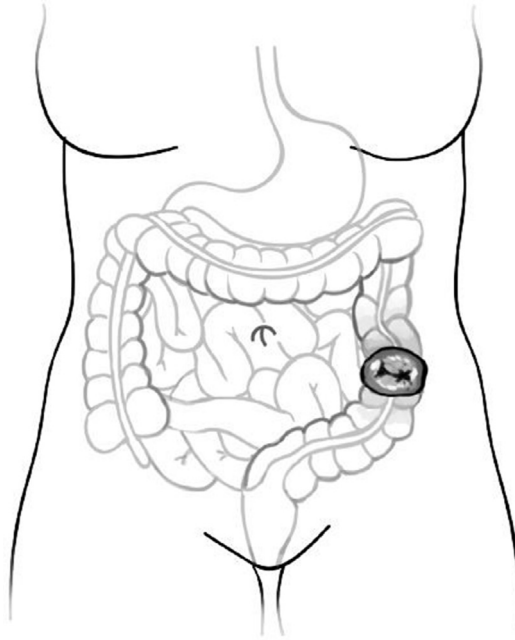


Fig. 5. Loop colostomy. (Printed with permission from Lohitha Kethu.)

Regardless of the indication or permanency of the stoma, early and continued involvement of wound ostomy and continence (WOC) nursing professionals is strongly advised. Ideally, a preoperative appointment should be used for stoma site marking in the supine (Fig. 6), seated (Fig. 7), and standing positions. In addition, preoperative appointments are important for patient and caregiver education on the medical and psychosocial sequelae of ostomy surgery. In emergent cases, education for patients and caregivers should begin early postoperatively; however, even in these circumstances, preoperative stoma site marking deserves attention. The stoma should be placed in the rectus abdominis on a 5-cm flat surface, and, in ambulatory patients, the preoperative mark should be evaluated in multiple positions. The stoma site marking should be made considering the expected type of ostomy (ileostomy vs colostomy and end vs loop), body habitus, abdominal contour (avoiding skin folds, the expected surgical incision, the umbilicus, previous surgical sites, and belt line), visual acuity, and dexterity.² In an analysis of over 1000 patients with end and loop ileostomies and colostomies, 364 experienced a major stoma-related complication including parastomal hernia, prolapse, retraction, fistula, stricture, bleeding, and ischemia. Of these 364 patients, 70% were not preoperatively marked, and in multivariate analysis preoperative marking was independently associated with reduced complication rates (odds ratio = 0.64; 95% CI, 0.48–0.84; $P = .001$).³ Similarly, observational studies have consistently demonstrated that preoperative stoma site marking is associated with significantly fewer postoperative complications.^{4–7} To reiterate the role of preoperative marking, the WOC Nurses Society, the American Society of Colon and Rectal Surgeons, and the American Urological Society have published a joint position statement detailing the process and emphasizing the importance of stoma site marking.² This position statement, which can be accessed at https://www.ostomy.org/wp-content/uploads/2018/01/wocn_ascrs_stoma_site_marking_fecal_2014.pdf

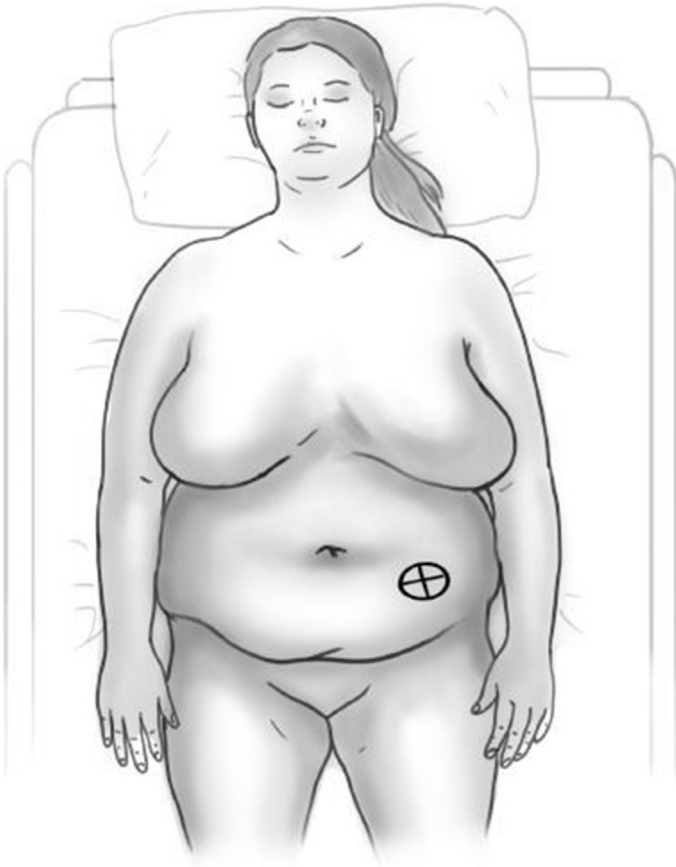


Fig. 6. Stoma marking supine. (Printed with permission from Lohitha Kethu.)

is an extremely valuable resource for best practice principles for stoma marking and should be referenced when circumstances create the need for stoma formation without an available WOC nurse to mark the site.

When considering ostomy output, generally the more proximal the stoma is formed the less viscous or formed the effluent. When the output is more liquid, there is an increased likelihood of nutritional and pharmacologic malabsorption and, therefore, the preferred location for the formation of ileostomies is often the distal ileum, just proximal to the cecum. However there are situations in which more proximal ileostomies or jejunostomies may be appropriate. In these cases, the need for antimotility agents, along with the risk of both nutritional and pharmacologic malabsorption, should be anticipated. Although there is no universal definition of excessive ostomy output, often when the volume exceeds 1200 mL/24 h, infectious causes should be ruled out, water and electrolyte balance assessed, and rehydration with intravenous fluid considered. The type of fluid should be tailored to the patient's electrolyte and volume status. In some patients, restricting hyper- or hypotonic fluids may reduce the volume of ostomy output; however, many require antimotility medications to prevent dehydration and acute kidney injury ([Table 1](#)). Patients with high-output stomas, particularly jejunostomies and ileostomies, are vulnerable to hyponatremia,

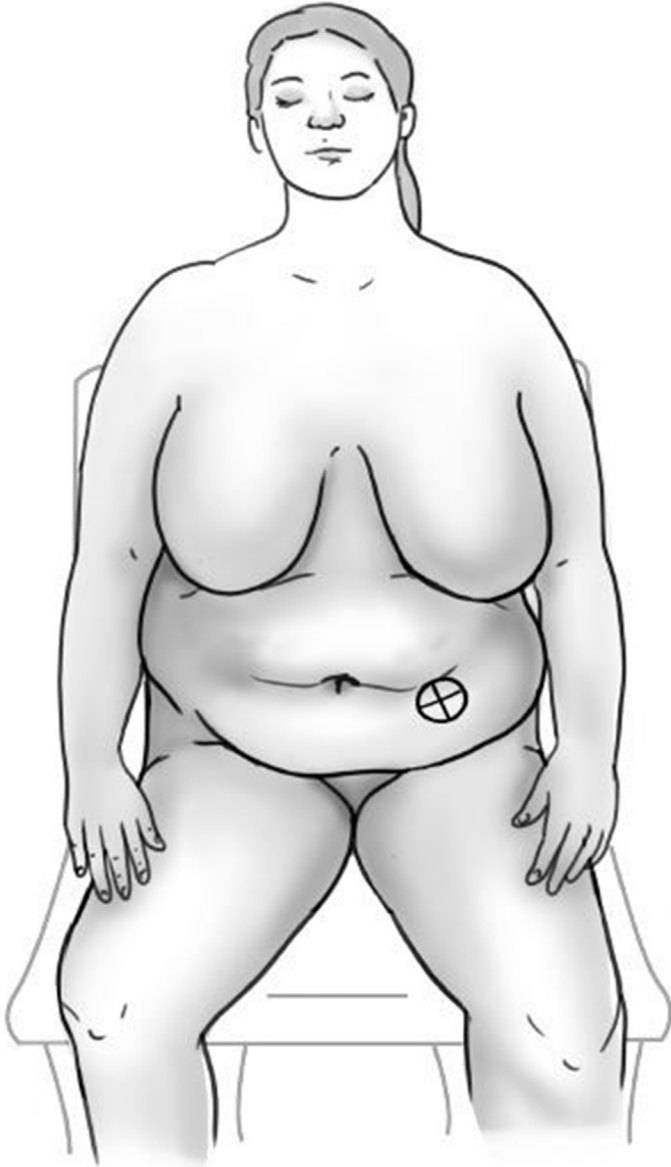


Fig. 7. Stoma marking sitting. (Printed with permission from Lohitha Kethu.)

hypomagnesemia, and vitamin (B12, A, D, E, and K) or micronutrient deficiencies. When assessing a patient's hydration status, urinary sodium or urine urea if the patient is taking diuretics, can be considered as a source of objective information.

Colostomies generally are fashioned from the distal colon and typically produce formed output similar to feces (see [Fig. 2](#)). Colostomies formed in the ascending or transverse colon are generally avoided unless intended to be temporary because the output is more difficult to manage, and transverse colostomies ([Fig. 8](#)) are more likely to develop prolapse and parastomal hernia. [Fig. 9](#) shows a colostomy with

Table 1 High-output ostomy management		
Stepwise Management of High-Output Ostomy (>1200 mL/24 h)		
	Intervention	Options & Maximum Dosing
First line	A. Rule out infectious causes B. Restrict (<1000 mL/d) fluids: <ul style="list-style-type: none">• Hypotonic: water, tea, coffee, fruit juice, ETOH, dilute salt solutions• Hypertonic: coca cola, many sip feeds	—
Second line	Antimotility medications	Loperamide 4 mg QID
Thirrd line		Codeine 15–60 mg QID
Fourth line		Atropine/diphenoxylate (Lomotil) 2.5–5 mg TID
Fifth line		Tincture of opium (not with codeine)
Sixth line	Antisecretory drugs	Octreotide, omeprazole, cholestyramine

prolapse. Lastly, loop ostomies are configured so that the end of both the proximal and distal bowel are contiguous with the skin. This is typically done to facilitate future ostomy reversal or when there is concern for distal obstruction in an effort to avoid creation of a closed intra-abdominal bowel segment at risk for perforation. For surgeons, it is important to remember that even intestinal segments in discontinuity will

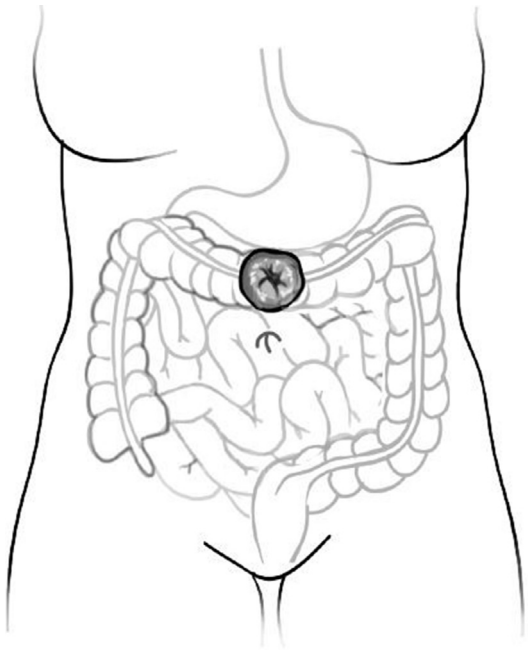


Fig. 8. Transverse colostomy. (Printed with permission from Lohitha Kethu.)

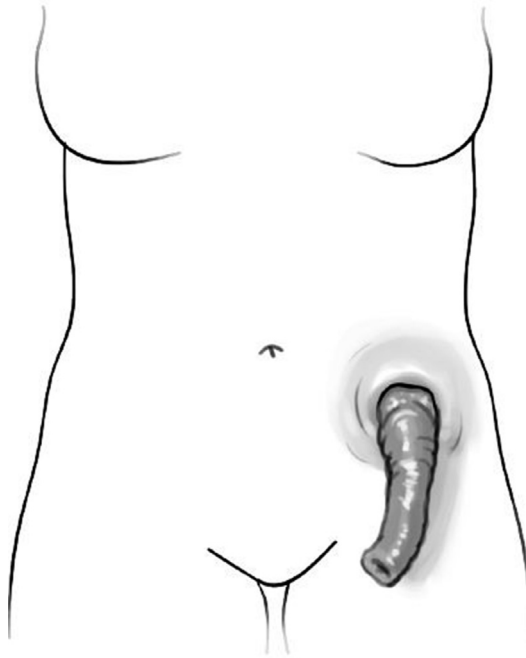


Fig. 9. Colostomy prolapse. (Printed with permission from Lohitha Kethu.)

produce fluid and mucus and thus will build up material that needs an outflow mechanism.

The rate of postoperative complications for patients receiving ostomies is high. Historically, up to 70% of patients receiving an ostomy were reported to experience a complication; however, even recent risk-adjusted data suggest that at certain centers complications occur in nearly 60% of patients.^{8,9} Ostomy-specific complications can be classified as early (within 30 days of surgery) or late (greater than 30 days from surgery) and major (retraction, prolapse, stenosis, parastomal hernia, and necrosis) or minor (peristomal skin breakdown [PSB], mucocutaneous separation, and cutaneous infections). The complication rates vary widely owing to the follow-up duration and whether PSB is considered a complication. PSB is common and arguably should be considered a postoperative complication as it is influenced by the type of stoma,^{6,10} the selected stoma site,⁵ and the height of protrusion above the skin.^{10,11} **Figs. 10** and **11** show a normal ileostomy and colostomy, whereas **Fig. 12** depicts a flush ileostomy. In addition, this common problem increases health care use.¹² For patients with appliance wear times under 48 hours or experiencing PSB, skin preparations or changing the type of appliance can be considered. In general, patients with soft, flaccid abdomens may benefit from a firm wafer, whereas patients with firm abdominal wall tissue would benefit from more flexible wafers. Convex rings are useful for patients with retracted or flush stomas because they can funnel the effluent and reduce the frequency of leaks. Other common peristomal skin issues that can be easily identified and treated empirically include allergic contact dermatitis and candidiasis. For contact dermatitis, an alternative appliance and/or adhesive is often required, and for candidiasis, topical antifungal powder (prescription Nystatin or 2% miconazole over the counter) is useful. If PSB persists, evaluation and treatment by a WOC nurse has been shown to improve skin condition and decrease appliance leaks and accessory product use.¹³

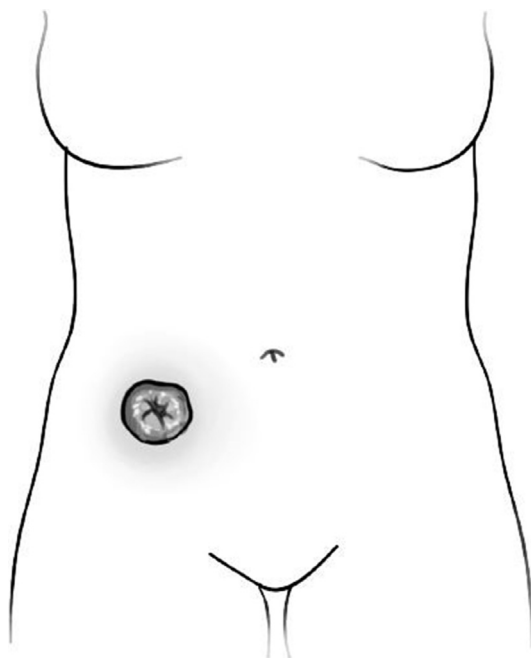


Fig. 10. Normal ileostomy height. (Printed with permission from Lohitha Kethu.)

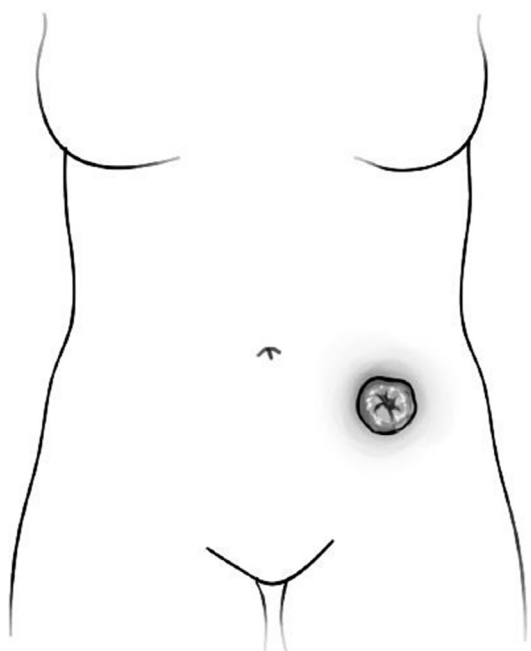


Fig. 11. Normal colostomy height. (Printed with permission from Lohitha Kethu.)

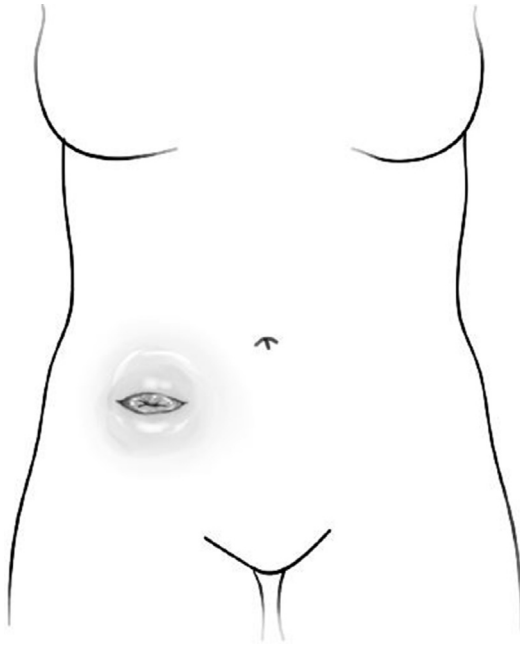


Fig. 12. Flush ileostomy. (Printed with permission from Lohitha Kethu.)

The formation of an ostomy induces significant changes in patient body image, function, and QoL. Postoperative QoL is a nuanced topic influenced by the involvement of a WOC nurse,⁴ cause of disease, patient age,^{14,15} complications,^{15,16} and the time from surgery.^{15,17,18} The overall negative impact of an ostomy on QoL is well described, and the literature suggests that avoiding a stoma is preferred.¹⁹ However, in a meta-analysis comparing self-expanding metallic stents (SEMS) with palliative surgery for malignant bowel obstruction (MBO), patients who had surgery had significantly higher rates of relief of obstruction (93.1% vs 99.8%, $P = .0009$), and among the studies that reported failure rates (299 patients over 10 studies), 12.7% of patients who received SEMS required a subsequent stoma.²⁰ Regardless, a proportion of patients with colorectal cancer (CRC) have lesions close to the anal canal or are otherwise not amenable to stent placement, and a diverting ostomy is indicated. A retrospective study on patients with CRC undergoing palliative surgery reported a median survival of nearly 3.5 months and 18% of patients lived beyond 1 year. This suggests that this cohort can be expected to develop ostomy-related complications.²¹ From a QoL perspective, there are few data on palliative surgery alone and that the data must be extrapolated from literature on therapeutic intervention or comparing stenting with ostomy creation.

Among patients with CRC, a population-based study of 2299 patients showed that older (≥ 76 years) patients with ostomies had reduced physical functioning, whereas younger patients with ostomies experienced significant impact on global health status and physical, role, and social functioning compared with similarly aged nonostomy patients and healthy controls.¹⁴ Among the elderly, the magnitude of this effect was clinically insignificant, whereas younger patients with ostomies saw the greatest impact on QoL. Lastly, a study of over 700 long-term CRC survivors showed that health-related QoL and generic QoL both improved significantly over time, and psychological

distress trended downward. In this analysis, patients with poorer optimism and low social support (single, no pet) had poorer adjustment over 5 years.¹⁷ Although these data should be interpreted cautiously in a palliative situation, younger patients with CRC without social support who are ineligible for stenting should be expected to experience the greatest negative impact on QoL. Cost-effective interventions such as preoperative education, stoma site marking, and involvement of a WOC nurse can reduce complications and improve QoL. When stenting or surgery are therapeutic options, the risks and benefits of both palliative procedures should be carefully considered and discussed with the patient.²⁰

Although patients with CRC represent most cases that palliative care specialists will interact with, other causes of disease should be considered and may require longer-term support. The fact that QoL data from CRC cannot be extrapolated to other indications becomes clear when assessing patients with spinal cord injury (SCI). In a meta-analysis and several case series of patients with SCI who received ostomies for several reasons, QoL significantly improved after surgery.^{22–27} In 1 study, after a mean of 5.5 years after surgery, most patients were satisfied with their stoma (88% with right-sided colostomies, 100% with left-sided colostomies, and 83% with ileostomies) and most would have preferred surgery sooner (63% right-sided and 77% left-sided ileostomy 63%).²⁵

Palliative care specialists often encounter 2 kinds of patients with ostomies. The first group of patients are those with an existing ostomy created for a condition unrelated to the issue that led to referral to palliative care. In this population, the goal is to maintain the ostomy care regimen and make adjustments as needed with alterations in oral intake and PSB. The second group are patients in whom ostomy formation is being considered for palliation. In general, palliative principles of empathetic and patient-centered communication, thoughtful discussions of prognosis, and a multidisciplinary approach, particularly with involvement of an enterostomal therapy nurse, is recommended (**Box 1**). Depending on resources and the clinical context, primary and specialty palliative care consultation may be both beneficial and appropriate.

Box 1

Discussing ostomy as a therapeutic option

Protocol for discussions regarding ostomies

1. Set the scene. It is a serious discussion and should be given appropriate time and space. Find out who the patient does (and does NOT) want to be present for the discussion
2. Assess the patient's *perception*. Many patients with conditions that can result in the need for an ostomy have already heard things about ostomies, had friends or family members with ostomies, or independently researched this option. Find out what they know and think before you tell them your opinion. For example, "Have you ever thought about an ileostomy as an option?"
3. Obtain the patient's *invitation*. Ask, "Would it be OK to talk about an ileostomy as a treatment option?"
4. Provide *knowledge*. Give this information in small chunks and use nontechnical words appropriate for the health literacy of the patient. "A colostomy involves bringing the end of the large intestine to the skin, so the poop can come out into a special bag."
5. Address emotions with *empathy*. Consideration of an ostomy can prompt a large spectrum of reactions including relief, anger, and grief at the loss of perceived normalcy. Be prepared to support all of these emotions.
6. Strategy and *summary*. Assess the patient's understanding of the discussion, answer questions, and formulate next steps.

Data from Baile WF1, Buckman R, Lenzi R, et al. SPIKES—A six-step protocol for delivering bad news: application to the patient with cancer. *Oncologist*. 2000;5(4):302-11.

Table 2 Points to consider for palliative ostomy formation for malignant bowel obstruction	
Patient factors	Family, caregiver support/ability to manage ostomy Prognosis (recovery time vs expect life span)
Disease factors	Anatomy of obstructing process (proximal vs distal, focal vs diffuse) Anticipated efficacy of treatment alternatives (stent, gastric decompression, medical management)

The most common condition for consideration of palliative ostomy formation is MBO. For MBO, there are several possible interventions including decompressive gastric tube placement, ostomy formation, medical management, SEMS placement, surgical bypass, and surgical resection without ostomy formation, among others, which vary by clinical context. The benefits of ostomy formation should be considered in the context of patient prognosis and anticipated complexity of the surgical technique. Surgical intervention should be avoided when the recovery will take up much of a patient's life expectancy. For example, patients with MBO due to stage IV ovarian or pancreatic cancer, have a median survival after their first admission of less than 3 months.²⁸ Similarly, a systematic review showed that mortality was high (6%–32%) after palliative surgery for peritoneal carcinomatosis, and that hospitalization alone took up a significant portion of the patient's remaining life.²⁹ Patient and disease factors are both important considerations when discussing palliative surgery in the context of MBO, **Table 2**. When a multidisciplinary approach to patient care is adopted to include the disciplines of surgery and palliative care, coupled with the preferences of the patient, one is able to achieve outcomes that are acceptable to all involved.

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REFERENCES

1. McGee MF. JAMA PATIENT PAGE. Stomas. JAMA 2016;315(18):2032.
2. Salvadalena G, Hendren S, McKenna L, et al. WOCN Society and ASCRS position statement on preoperative stoma site marking for patients undergoing colostomy or ileostomy surgery. J Wound Ostomy Continence Nurs 2015;42(3):249–52.
3. Arolfo S, Borgiotto C, Bosio G, et al. Preoperative stoma site marking: a simple practice to reduce stoma-related complications. Tech Coloproctol 2018;22(9): 683–7.
4. Person B, Ifargan R, Lachter J, et al. The impact of preoperative stoma site marking on the incidence of complications, quality of life, and patient's independence. Dis Colon Rectum 2012;55(7):783–7.
5. Bass EM, Del Pino A, Tan A, et al. Does preoperative stoma marking and education by the enterostomal therapist affect outcome? Dis Colon Rectum 1997;40(4): 440–2.
6. Pittman J, Rawl SM, Schmidt CM, et al. Demographic and clinical factors related to ostomy complications and quality of life in veterans with an ostomy. J Wound Ostomy Continence Nurs 2008;35(5):493–503.

7. Baykara ZG, Demir SG, Karadag A, et al. A multicenter, retrospective study to evaluate the effect of preoperative stoma site marking on stomal and peristomal complications. *Ostomy Wound Manage* 2014;60(5):16–26.
8. Robertson I, Leung E, Hughes D, et al. Prospective analysis of stoma-related complications. *Colorectal Dis* 2005;7(3):279–85.
9. Sheetz KH, Waits SA, Krell RW, et al. Complication rates of ostomy surgery are high and vary significantly between hospitals. *Dis Colon Rectum* 2014;57(5):632–7.
10. Parmar KL, Zammit M, Smith A, et al, Greater Manchester and Cheshire Colorectal Cancer Network. A prospective audit of early stoma complications in colorectal cancer treatment throughout the Greater Manchester and Cheshire colorectal cancer network. *Colorectal Dis* 2011;13(8):935–8.
11. Persson E, Berndtsson I, Carlsson E, et al. Stoma-related complications and stoma size - a 2-year follow up. *Colorectal Dis* 2010;12(10):971–6.
12. Meisner S, Lehur P-A, Moran B, et al. Peristomal skin complications are common, expensive, and difficult to manage: a population based cost modeling study. *PLoS One* 2012;7(5):e37813.
13. Erwin-Toth P, Thompson SJ, Davis JS. Factors impacting the quality of life of people with an ostomy in North America: results from the Dialogue Study. *J Wound Ostomy Continence Nurs* 2012;39(4):417–22 [quiz: 423–4].
14. Verweij NM, Bonhof CS, Schiphorst AHW, et al. Quality of life in elderly patients with an ostomy - a study from the population-based PROFILES registry. *Colorectal Dis* 2018;20(4):O92–102.
15. Arndt V, Merx H, Stegmaier C, et al. Restrictions in quality of life in colorectal cancer patients over three years after diagnosis: a population based study. *Eur J Cancer* 2006;42(12):1848–57.
16. Vonk-Klaassen SM, de Vocht HM, den Ouden MEM, et al. Ostomy-related problems and their impact on quality of life of colorectal cancer ostomates: a systematic review. *Qual Life Res* 2016;25(1):125–33.
17. Chambers SK, Meng X, Youl P, et al. A five-year prospective study of quality of life after colorectal cancer. *Qual Life Res* 2012;21(9):1551–64.
18. Bekkers MJ, van Knippenberg FC, van Dulmen AM, et al. Survival and psychosocial adjustment to stoma surgery and nonstoma bowel resection: a 4-year follow-up. *J Psychosom Res* 1997;42(3):235–44.
19. Young CJ, De-Loyde KJ, Young JM, et al. Improving quality of life for people with incurable large-bowel obstruction: randomized control trial of colonic stent insertion. *Dis Colon Rectum* 2015;58(9):838–49.
20. Zhao X-D, Cai B-B, Cao R-S, et al. Palliative treatment for incurable malignant colorectal obstructions: a meta-analysis. *World J Gastroenterol* 2013;19(33):5565–74.
21. Pickard C, Thomas R, Robertson I, et al. Ostomy creation for palliative care of patients with nonresectable colorectal cancer and bowel obstruction. *J Wound Ostomy Continence Nurs* 2018;45(3):239–41.
22. Hocevar B, Gray M. Intestinal diversion (colostomy or ileostomy) in patients with severe bowel dysfunction following spinal cord injury. *J Wound Ostomy Continence Nurs* 2008;35(2):159–66.
23. Bølling Hansen R, Staun M, Kalhauge A, et al. Bowel function and quality of life after colostomy in individuals with spinal cord injury. *J Spinal Cord Med* 2016;39(3):281–9.
24. Branagan G, Tromans A, Finnis D. Effect of stoma formation on bowel care and quality of life in patients with spinal cord injury. *Spinal Cord* 2003;41(12):680–3.

25. Safadi BY, Rosito O, Nino-Murcia M, et al. Which stoma works better for colonic dysmotility in the spinal cord injured patient? *Am J Surg* 2003;186(5):437–42.
26. Munck J, Simoens C, Thill V, et al. Intestinal stoma in patients with spinal cord injury: a retrospective study of 23 patients. *Hepatogastroenterology* 2008; 55(88):2125–9.
27. Rosito O, Nino-Murcia M, Wolfe VA, et al. The effects of colostomy on the quality of life in patients with spinal cord injury: a retrospective analysis. *J Spinal Cord Med* 2002;25(3):174–83.
28. Lilley EJ, Scott JW, Goldberg JE, et al. Survival, healthcare utilization, and end-of-life care among older adults with malignancy-associated bowel obstruction: comparative study of surgery, venting gastrostomy, or medical management. *Ann Surg* 2018;267(4):692–9.
29. Paul Olson TJ, Pinkerton C, Brasel KJ, et al. Palliative surgery for malignant bowel obstruction from carcinomatosis: a systematic review. *JAMA Surg* 2014;149(4): 383–92.