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This article focuses on the care and management of patients living with a urostomy. Improved surgical techniques and shortened hospital stays result in more patients receiving home care in the immediate postoperative period after surgical creation of a urostomy. It is important that home care clinicians have the knowledge and skills to manage the care of patients with a urostomy from hospital discharge to self-care. This article reviews the anatomy and physiology of the urinary tract, the formation of a stoma, and indications for the creation of a urostomy. Stent management, peristomal skin care, stomal complications as well as pouching options and accessories are discussed. Knowledge of care of patients with a urostomy can reduce the risk of complications and hospital readmissions, and assist patients to adjust to life with a urostomy.

UROSTOMY CARE

A GUIDE FOR HOME CARE CLINICIANS

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A urostomy is a surgical opening in the abdomen that drains urine from the ureters and kidneys into a specifically created stoma. Patients living with a urostomy face physical changes that influence every aspect of their daily lives. The ability and motivation to care for oneself after surgical creation of any type of ostomy vary from patient to patient and can be influenced by a number of factors including patient education, social support, cognitive and psychomotor abilities, and access to care. With new ostomy patients being discharged home at earlier stages in the postoperative period, home care clinicians can have a positive impact on patient outcomes. This article focuses on the care needs of a patient with a urostomy in a home care setting.

Anatomy and Physiology

The urinary system is comprised of the kidneys, ureters, urinary bladder, and the urethra (Ermer-Seltun, 2016). The urinary tract (ureters, bladder, and urethra) is responsible for the drainage of urine from the kidney, storing it, and then excreting it from the body. Ureters, one on the left and one on the right, are about 10 to 12 in. long. They are tubular in shape and carry urine from the kidney to the bladder. Ureterovesical valves, located at the point where ureters enter the bladder, prevent the back flow of urine toward the kidney. The bladder is a hollow muscular organ with a wall composed of four layers. A normal bladder functions through a complex coordination of musculoskeletal, neurologic, and psychological functions (Ermer-Seltun). It is a hollow, elastic, sac-like organ that collects urine before it passes through a tube called the urethra, and out of the body. In males, the urethra is approximately 8 to 10 in. long and is also part of their reproductive system. In females, the urethra is only about 2 in. long and is not part of the reproductive system. Internal (smooth muscles) and external sphincter (skeletal muscles) help control the flow of urine through the urethra and out of the body.

Indications for a Urostomy

Invasive bladder cancer is the primary reason for a radical cystectomy and creation of an incontinent urinary diversion (Lee et al., 2018). Male patients will also have their prostate and lymph nodes removed, and female patients will have the uterus, fallopian tubes, ovaries, and anterior vagina removed (Patel et al., 2016). There are three types of incontinent diversions, the ileal conduit, colon conduit, and ureterostomy. The ileal conduit, or in general terms a urostomy, is the most common. It has been the permanent urinary diversion of choice for patients needing a cystectomy since the 1950s (Stott & Fairbrother, 2015). Bladder cancer is the fourth cause of cancer death in men in the United States (Patel et al.).

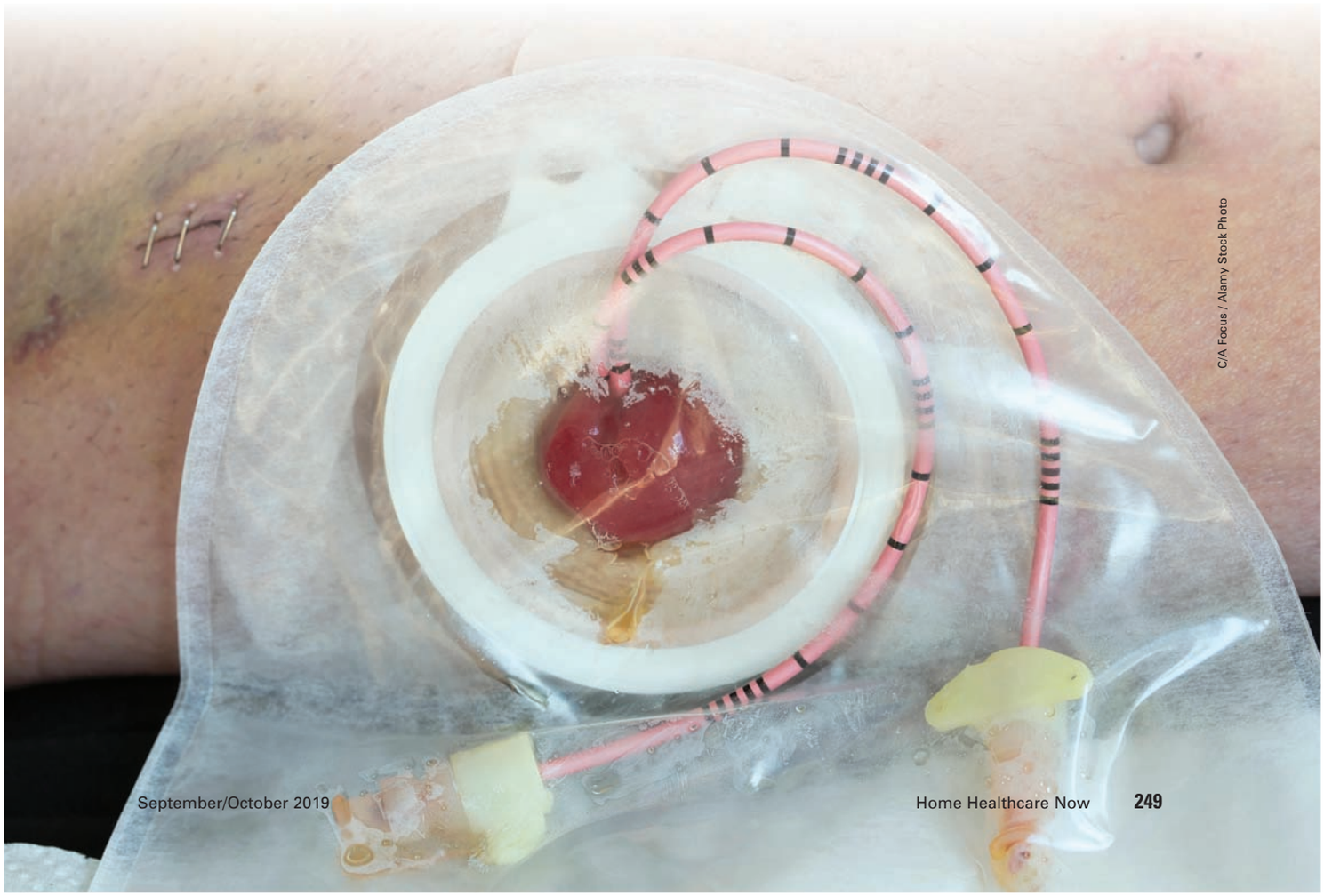
It occurs three times more frequently in men than women. The most common cause of bladder cancer is smoking, but environmental exposures to substances such as ink and paint have also been implicated (Patel et al.).

There are other rare conditions that may warrant a cystectomy. They include neurogenic bladder, radiation enteritis, and interstitial cystitis (Patel et al., 2016). A neurogenic bladder is a dysfunction of the bladder due to neurological impairment such as multiple sclerosis or spinal cord injury. If conservative or surgical management is not effective, a urinary diversion is used as a last resort. Radiation cystitis is a result of previous radiation treatment to the prostate, rectum, or uterus that causes damage to the bladder and sphincter (Patel et al.). It can result in incontinence, bleeding, a noncompliant bladder, or severe pain with bladder filling. A urinary diversion will be performed if these conditions do not respond to medical management. Lastly, interstitial cystitis is a painful disorder of the bladder that presents with urgency, frequency, and nocturia. Etiology is unknown, and cystectomy and urinary diversion are done only in the most severe cases (Patel et al.).

Up to 80% of patients with ileal conduit may experience asymptomatic bacteriuria and are at high risk for pyelonephritis.

Anatomy of the Stoma

The urostomy is created from a segment of the ileum or colon. The ileal conduit, which is more common, is constructed by implanting the ureters into a segment of the ileum that is isolated from the remainder of the bowel and fecal matter. The distal end of the ileum (the segment closest to the ileocecal valve) is spared due to the importance of bile and B-12 absorption (Patel et al., 2016). A 10 to 12 cm segment proximal to this is used to create the conduit. The proximal end of the conduit is sutured and closed and the distal end is brought through the abdomen to form the stoma. The ureters are then placed at two separate locations on the proximal end of the conduit. Postoperatively, stents will exit the stoma and are left in place 7 to



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Moisture-associated skin damage is the most common peristomal skin complication that results from urine or mucous in constant contact with the surrounding skin due to urine pooling in abdominal creases or an ill-fitting skin barrier exposing too much peristomal skin.

10 days, or at the discretion of the surgeon. Many patients will still have stents in place upon discharge from the hospital. The purpose of the stents is to maintain patency of the conduit and allow the ureteral/conduit anastomosis site to heal (Carmel, 2016).

A stoma created from the ileum will usually be on the right side of the abdomen. The stoma is matured with sutures to form a rosebud appearance. This elevation of the stoma limits the amount of urine that comes directly in contact with the skin (Patel et al., 2016). The stoma should be deep red in color and above skin level. A colon urinary conduit is created similarly to the ileal conduit, but the sigmoid or transverse colons are the most common segments used (Patel et al.). This type of conduit would be created if the patient received previous pelvic radiation or they have an existing colostomy. A cutaneous ureterostomy is created by bringing the ureters to the surface of the skin and there will be no stoma. This type of diversion is not frequently created, but is sometimes performed for infants or the very elderly who cannot undergo a long and extensive surgery (Wound Ostomy and Continence Nurses Society [WOCN], 2017).

Complications

Most of the complications for an ileal conduit are categorized as early (within 90 days post-op) and late (greater than 90 days post-op). Early complications are related to the gastrointestinal tract and include paralytic ileus, bowel obstruction, and anastomosis leak (Lee et al., 2018). Up to 80% of patients with ileal conduit may experience asymptomatic bacteriuria and are at high risk for pyelonephritis. Progressive renal deterioration is also common, but typically not until many years after initial surgery, most likely due to infection, ureteral reflux, and bacterial colonization (Patel et al., 2016).

Stomal complications fall into the late category (greater than 90 days post-op) and are the most common reason for reoperation after a cystectomy (Szymanski et al., 2010). Stomal complications with an ileal conduit include parastomal hernia, stomal stenosis, and bowel necrosis. Parastomal hernia occurs when the intestine bulges into the area around the stoma. If a patient is symptomatic and has no issues with their pouching system, surgical intervention is not required. If the stoma darkens in color or the patient has unresolved pain, surgical intervention is needed. Stomal stenosis is the narrowing of the stoma that interferes with the drainage of urine, causing upper urinary tract infection or complaints of flank pain (Pittman, 2016). It is usually a result of stomal necrosis or stomal retraction. Surgical treatment is required in the most severe cases. Stomal necrosis is the result of poor blood flow resulting in stomal tissue death. Depending on the degree of necrosis, surgical intervention may be warranted.

Peristomal Skin Complications

Urine, unlike feces, contains no enzymes and will not cause the erosive damage to the peristomal skin. Moisture-associated skin damage is the most common peristomal skin complication that results from urine or mucous in constant contact with the surrounding skin due to urine pooling in abdominal creases or an ill-fitting skin barrier (Salvadalena, 2016). It presents as erythema around the stoma and can result in skin loss. The patient may complain of burning pain, especially when anything touches that area. Adjusting the pouching system and/or adding barrier rings or paste should correct this problem. Prior to applying the skin barrier, the area can be dusted with stoma powder before application of a skin barrier film. Macerated peristomal skin is very common with urostomy stomas and presents as moist waterlogged skin. This usually occurs if the opening in the skin barrier is cut too large and skin is exposed. Patients will report short wear time and frequent leakage. Management includes ensuring

the stoma opening is sized appropriately, possible use of a convex skin barrier and a belt, and reducing moisture where it is causing skin to macerate (Colwell, 2016).

Pseudoverrucous lesions, commonly known as hyperplasia, are a benign complication specific to patients with a urostomy (Salvadalena, 2016). White, gray, or tan lesions appear on peristomal skin chronically exposed to urine, causing bleeding and pain. Alkaline encrustation and alkaline concentrated urine appear as crystal deposits on or around the stoma. Alkaline urine is more damaging to the skin because normal urine pH is acidic. Management depends on the cause. If it is due to leakage, the skin barrier opening will need to be remeasured and sized. Correcting urine pH (average pH is 6) can be accomplished by increasing fluid intake, drinking cranberry juice, and taking Vitamin C. The lesions can be treated with vinegar soaks at each skin barrier change. A gauze pad soaked in dilute vinegar solution (30%–50%) can be applied to the lesions for 20 minutes while the skin barrier is off during pouch changes (Salvadalena). The encrustation must be resolved or a patient will have continued pouching issues.

Pouching Options

One- and two-piece pouching systems are available for patients with a urostomy. A one-piece pouch has a flat profile and will not be as visible under clothing but may be more difficult to apply if the patient cannot see through the pouch to center the skin barrier opening over the stoma. A two-piece system allows visualization of the stoma when placing the skin barrier on skin and will also be easier to manage, especially if there are stents. A skin barrier can be flat or convex depending on the characteristics of the stoma, as well as the abdomen. If the area around the stoma is flat in all positions (lying, standing, and sitting), a flat skin barrier should be adequate. If there are creases or folds in the abdomen around the stoma, a convex skin barrier should be chosen. Manufacturers suggest wear time of 3 to 7 days, but this is patient-specific (WOCN, 2017). Urinary pouches have an antireflux valve inside to prevent backflow of urine. Urinary pouches also have a tap at the end to allow easy emptying of urine. Each manufacturer will have a different type of tap. The box of pouches will have an adapter that will allow the pouch to be connected to a nighttime drainage bag.

Nighttime drainage bags can become twisted or kinked and some patients are reluctant to use them. However, they should be used nightly to ensure the urostomy pouch is never overfilled and the patient does not have to wake up during the night to empty. In addition, using the overnight drainage bag keeps the urine from lying on the stoma, and reduces the risk of urinary crystal formation and maceration (Salvadalena, 2016). A leg strap or tube holder can stabilize the drainage system, and placing the nighttime drainage system at the foot of the bed instead of the side may lessen the chances of twisting. Using extension tubing may also help. If the patient does not have easy access to a bathroom, a leg bag can be used during the day and can provide up to 500 cc capacity.

The nighttime drainage bag and leg bag should be replaced every 30 days, with a limited number covered by insurance. The drainage bags should be cleansed, especially when switching from a leg bag to night bag. Both should be rinsed with warm water after each use. Irrigate with a cleansing solution of 1 part bleach to 10 parts water or vinegar solution of 1 part vinegar to 3 parts water (Moore & Franklin, 2016). Instill into the drainage system and swish around for 30 seconds and then drain and air dry. A cleaner/decrystallizer solution can also be ordered from the equipment company, which most insurances cover.

Role of the Home Healthcare Clinician

In a study conducted by Harraz et al. (2015), the most common causes for the first hospital readmission for a sample of 895 patients included upper urinary tract obstruction (13%), pyelonephritis (12.4%), intestinal obstruction (11.9%), and metabolic acidosis (11.3%). Therefore, postoperative care of patients with a new urostomy should include interventions to reduce infection, renal complications, and metabolic acidosis. Infectious complications are common especially in the initial postoperative period and include urine or bowel leaks, abscess, pyelonephritis, or wound infection. The incision should be assessed for redness or induration. Assess for fever, flank pain, and cloudy foul-smelling urine (Goldberg, 2016). Patients with an ileal conduit will have chronic bacteriuria due to the bowel conduit. These patients will be asymptomatic but will have positive urine cultures (Patel et al., 2016). Urine cultures should only be obtained by catheterizing the stoma and should

Infectious complications are common especially in the initial postoperative period and include urine or bowel leaks, abscess, pyelonephritis, or wound infection.

be performed by a Wound, Ostomy, Incontinence (WOC) nurse or physician. Antibiotics should be reserved for patients with systemic signs of infection. Harraz et al. reported that prolonged hospital stay and hypertension were also predictors of hospital readmission. Home care clinicians should carefully monitor blood pressure at each visit and report high readings to the surgeon or primary care provider.

Stent Management

Stent management and education are critical if the patient returns home with stents still in place. The purpose of the stents is to maintain patency and allow the anastomosis site to heal. They are usually removed at the first follow-up visit with the surgeon (Carmel, 2016). There is one stent in each ureter, so two stents exit the stoma. Stents may fall out on their own, and, although this is not an emergency, the patient should be instructed to notify their surgeon. Stents may also become longer as they migrate out and will need to be coiled in the pouching system. A two-piece pouching system will be easier than a one-piece for the patient to manage the stents because they will be able to visualize the stents as they thread them through the opening in the skin barrier. Because the conduit is constructed from the intestine, there will be a large amount of mucous expelled through the stoma and around the stents. The intestinal mucosa naturally secretes mucous to lubricate the intestinal content and this will continue even if diverted. A large amount of mucous is secreted for the first few months but it will eventually decrease.

Nutritional Considerations

Adequate hydration is necessary to prevent urinary complications. It is recommended that patients with a urostomy drink 2,000 to 2,500 mL/day or 30 mL/kg/day to flush the renal system, dilute bacteria and maintain an acidic pH, and keep a constant one-way flow of urine (Goldberg, 2016). The function of the ileal conduit will depend on kidney function and hydration, but minimal output should be 800 mL/24 hours (Colwell, 2016). There are no eating restrictions after urostomy surgery; however, patients should be educated about the types of foods they eat and how these foods can change the pH of their urine. When the food we eat is used by the body, all that remains is a residual mineral ash, which can be acidic or alkaline (American Cancer Society, 2018). As previously mentioned, cranberry juice and Vitamin C can aid in keeping the urine on the acid side, which is recommended in most cases. Acid-ash foods include foods such as breads and cereals, cheese, corn, eggs, pastas, nuts, prunes, fish, poultry, and most other types of meats. Most fruits, including fruit juices and most vegetables are more alkaline.

Psychosocial

In a recent qualitative study examining life with a urostomy, Villa et al. (2018) demonstrated the physical, psychological, and social stresses urostomy patients may experience after surgery. Participants in the study were concerned about body image, resuming daily activities and social activities, returning to work, sexuality, and managing their stoma. Coping strategies need to address body image, permanent loss of the bladder, and changes in urine elimination, as well as the most common indication for the ileal conduit which is bladder cancer. Alteration in body image and sexual function are of major concern due to the anatomical involvement of the surgery (Kandemir & Oskay, 2017). Patients and their spouses should be encouraged to discuss concerns and to seek help and support. Patients who are informed and receive proper education regarding living with

an ostomy, stomal, and peristomal skin care, and management of the pouching system have shown increased psychological adjustment to life with a stoma (Kristensen et al., 2013).

Long-Term Management

Metabolic complications are more common with urinary diversion than with bowel diversion (Vasdev et al., 2013). The extent of the metabolic complications will depend on the length and type of bowel used for the conduit. Other factors that may contribute are baseline renal and liver function, age, and prior chemotherapy or radiation treatment (Vasdev et al.). The portion of bowel that is removed to form the conduit will retain its absorbing and secreting properties but eventually the mucosa will atrophy. Over time, patients may exhibit signs of malabsorption, diarrhea, and electrolyte imbalances. Patients are at risk for renal calculi due to hyperchloremic metabolic acidosis, and chronic upper urinary tract infection. In addition, there is also a long-term decrease in renal function and renal failure can occur due to ureter obstruction, recurrent urinary infections, and renal calculi (Lee et al., 2018). Lifelong follow-up is essential for these patients to monitor and decrease metabolic complications.

Education

It is best to follow a standardized education plan when teaching ostomy care. The Urostomy Education Scale is a tool that evaluates urostomy self-care and differentiates self-care skills of beginners versus experienced patients (Kristensen et al., 2013). The scale includes seven essential skills the patient needs to meet: reaction to the stoma, removing the stoma appliance, measuring the stoma, adjusting the size of the opening in the skin barrier, skin care, applying a new stoma appliance, and emptying procedure. Because the ileal conduit is permanent, and there may be late complications, it is important that patients are educated on these complications and seek follow-up with their primary care provider and urologist on a regular basis.

It is important to teach patients to measure and monitor their stoma because it will change over time. After about 6 to 8 weeks, the stoma will mature and will no longer change size but it will still be necessary to measure and adjust the opening in the skin barrier. When there is no change in size, the patient may be able to order a precut skin barrier. It is also important to instruct patients to monitor their peristomal skin at each change for any skin complications that may need attention.

Instruct patients to empty the pouch when it is 1/3 to 1/2 full because a heavy pouch will exert weight on the skin barrier and may cause leakage or a decrease in wear time. To drain the pouch, have the patient sit on the toilet as far back on the seat as possible and empty between their legs. Because a urostomy needs to be emptied more frequently than a colostomy or ileostomy, some patients may wish to attach the pouch to a leg bag. The leg bag will act as a second receptacle, decreasing the need to go to bathroom and empty as frequently. This is a good practice if the patient is at work or traveling.

Practical Tips for Transitioning Patient to Self-Care

Patients with a urostomy will never have the option for a reversal like many patients with a colostomy or ileostomy. They will need support and encouragement and careful instruction on how to care for and live with their urostomy. Preparing the patient for resuming a normal life is important to their recovery. Review or role play with the patient regarding activities such as bathing, swimming, returning to physical activities and exercise, or returning to work (Berti-Hearn & Elliott, 2019a, 2019b). Patients can bathe daily and the water will not affect the wear time of the skin barrier or pouch. Barrier strips or waterproof tape can be used to picture frame skin barrier to reinforce and protect.

Reassure patients there are many ways to conceal the pouch under clothing. Certain products can be used including belly bands, bandeaus, underwear with spandex, high-waist underwear, biker shorts, and some manufactured products called stealth belts or stoma guards. Specialty underwear can be purchased from online sites such as Ostomy secrets (https://www.ostomysecrets.com/), Vanilla Blush (http://www.vblush.com/), and Awestomy (http://www.awestomy.com/). Clothing with patterns and florals, as well as dark colors conceal better than solids and lighter colors. Loose blouses, shirts, and tee shirts as well as pleated pants are another way to conceal the pouch. Men can also wear suspenders and vests and women wear loose sweaters and scarfs.

Patients with a urostomy should be able to return to whatever type of work and travel they did

before their surgery. They should always have a second pouching system with them at all times in case they do experience a leak. Encourage them to carry everything they need for the change in a purse or backpack and if they go back to work to keep a change at work. For travel, everything needed for their stoma should be packed in a carryon, including hand sanitizer, skin barriers that are already cut, pouches, hand towels, and extra clothing. A notification card can be found on the Transportation Security Administration (TSA) website (www.tsa.gov) and should be printed before traveling through airports.

Patients are ready for discharge to self-care when they are able to complete the essential skills. There are a number of resources to offer to patients (Table 1). Most essential is ensuring patients know how to order supplies and have resources and phone numbers should they have any issues after discharge (Berti-Hearn & Elliott, 2018).

Several interventions have been published that focus on patient education or bundle programs to help improve outcomes for the patient with a urostomy. Broughton et al. (2017) developed and tested a cystectomy-enhanced recovery program and outlined best practices for patient care that extended from the preoperative period and continued to hospital discharge. Early outcomes of the project have decreased length of hospital stay and improved patient self-awareness concerning surgery. Mohamed and Mohamed (2014) also found positive results by implementing a urostomy patient education program that consisted of five 2-hour classes. Lastly, Rojanasarot (2018) examined the effects of a postoperative support group program and found this intervention to reduce healthcare utilization over an 18-month period of time.

Table 1. Resources for Patients With a Urostomy

United Ostomy Associations of America, Inc.	Urostomy Guide—free download at https://www.ostomy.org/wp-content/uploads/2018/01/UrostomyGuideedits.pdf
Urostomy Association	https://urostomyassociation.org.uk/information/living-with-urostomy/
ConvaTec—Urostomy Tips & Insights	https://www.convatec.com/ostomy/right-after-surgery/urostomy-tips-and-insights/
Kidney & Urology Foundation of America, Inc.	http://www.kidneyurology.org/Library/Urologic_Health.php/Urostomy_and_Continent_Urinary_Diversion.php
American Cancer Society—Urostomy Guide	https://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/urostomy.html
Hollister—Ostomy Care Learning Center	http://www.hollister.com/en/ostomycare/ostomycarelearningcenter
Coloplast—Ostomy Care: Everything You Need to Know	https://www.coloplast.us/ostomy/people-with-an-ostomy/

Conclusion

Improved surgical techniques and shortened hospital stays result in more patients receiving home care in the immediate postoperative period after creation of a urostomy. Patients with a urostomy require a great deal of care and education as well as significant psychosocial support, both short-term and long-term, as they adjust to daily living. Home care clinicians can be vital to patients' acquisition of the knowledge and skills necessary for self-care and prevention of complications and readmission.

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