Janet Barylski Essay Fecal & Urinary Diversions

1. **Identify the sections of the intestine along with the main function of each** (6 points)

The intestines consist of the small intestine and large intestine. Each portion of the intestine consists of their respective sections and/or functions. In this discussion, I will descend through the sections of the intestine beginning at the small intestine where it connects to the stomach and ending at the anus.

The small intestine consists of the duodenum, jejunum, and ileum. The function of the small intestine is to further digest food and absorb nutrients. The small intestine plays an important role in maintaining the body's fluid and electrolyte balance. Food enters the small intestine from the stomach. The first section of the small intestine is a "C" shaped section called the duodenum. It is the shortest section of the small intestine, approximately ten inches in length. The common bile duct and pancreatic duct empty into the duodenum. The major function of the duodenum is to neutralize acidic chyme. The second function of the duodenum is to emulsify fats, making them more susceptible to breakdown. Thirdly, the duodenum absorbs carbohydrates and minerals such as iron, calcium, and magnesium. The duodenum connects to the jejunum by the ligament of Trietz. This ligament suspends the duodenum at an angle that facilities passage of contents along the GI tract. From the duodenum, we move into the jejunum, which is approximately nine feet in length and functions to absorb most fats, proteins, vitamins, and any remaining carbohydrates. Prominent villi and plicae circulares are located on the mucosal surface of the jejunum creating more surface area for absorption. The large intestine does not have these villi. Stomas from a jejunum will be located in the left upper quadrant. The ileum is the most distal and longest section of the small intestine, extending from the ligament of Treitz to the ileocecal valve and measuring approximately twelve feet in length. The ileum has the highest proportion of goblet cells in the small intestine and increased amounts of lymphoid tissue known as GALTs (gut-associated lymphoid tissue). GALTs consist of tonsils, appendix, and diffuse lymphoid tissue. GALTs and Peyer patches absorb water and digest food not previously absorbed in the small intestine. The terminal portion of the ileum contains the only receptors to absorb vitamin B12 and bile salts (Netsch, 2022). Stomas from an ileostomy are located in the right lower quadrant. The ileocecal valve is the junction where the small intestine connects to the large intestine. It is a one-way valve that separates the ileum from the cecum and prevents backflow of colonic material and bacteria into the small intestine. The ileocecal valve is the area of the intestine used as a continent mechanism for certain urinary diversions.

The large intestine (colon), is approximately 4-5 feet long. The colon contains several tissue layers unique to the colon; the serosa, three muscular bands of taenia, and rugae between the taenia. The colon collects, concentrates, transports, stores, and eliminates waste. The proximal colon primarily absorbs waste and the distal colon primarily stores waste. From proximal to distal location, the colon consists of the cecum, appendix, ascending colon, transverse colon, descending colon, sigmoid colon, rectum, and anal canal. Contents of the small intestine enter the large intestine at the ileocecal junction, emptying into the cecum. Water, electrolytes (sodium, chloride), glucose, and urea are absorbed from this material. Paneth cells, which are specialized secretory epithelial cells, are scattered in the cecum and ascending colon, but are absent in the remainder of the colon. Paneth cells secrete dense granules of antimicrobial peptides and immunomodulating proteins to help regulate intestinal flora. The vermiform appendix is an appendage of the cecum. Vermiform simply means worm-like. "The function of the vermiform appendix in the human body is not fully established yet. Scientists believe that it is a vestigial remnant, that is, it was once useful to humans in the digestion of food, but as we have evolved, it has lost its function and become redundant. Some research studies show that the appendix is rich in lymphoid cells, which help the body fight

infections, and hence it could have a role in the body's immune functions" (Cheriyedath, 2022). The ascending colon extends vertically from the cecum to the right hepatic flexure and functions to absorb water and any key nutrients from undigested material, solidifying intestinal contents. The middle, or next portion of the colon is the transverse colon. It lies beneath other abdominal organs, and is suspended across the abdominal cavity starting at the right hepatic flexure and ending at the left splenic flexure. The splenic flexure sits higher in the abdomen than the hepatic flexure. The transverse colon is the longest, most mobile segment of the colon, and may sag down a bit. It absorbs water and salts from undigested material and makes it easier for waste products to move through the digestion process. The descending colon is next. It descends vertically down the left side of the body between the splenic flexure and the sigmoid colon. The descending colon is approximately 4-6 inches long. It moves materials down the left side of the abdomen, storing contents until they enter the sigmoid colon. Once the descending colon passes over the psoas muscle, or the muscle that allows you to run, the sigmoid colon starts. The sigmoid colon is an "S" shaped section of the colon that functions to store fecal matter and connect the colon to the rectum. It's anatomical location and function are the reason patients are positioned on their left side during endoscopic exams and enemas. The rectum is approximately eight inches long, is a straight chamber, and has three transverse folds, two on the left and one on the right, known as the valves of Houston. These valves support the weight of fecal matter and prevent strong urges to defecate. The function of the rectum is to hold the stool that is received from the colon until evacuation can occur. The compliance and capacity of the rectum contribute to fecal continence. The rectum connects the colon to the anal canal, which is approximately 1.18 to 1.57 inches long. The anal canal is held closed by the anus, the opening through which contents exit the body. The opening and closing of the anus is maintained by the muscles of the pelvic floor and two sphincter, the internal and external anal sphincters.

2. **You are consulted to see a 45 y/o patient with an ileostomy for pouch leakage. When you enter the room, you see a towel over the stoma. The patient indicates staff has been using the towel since yesterday. Peristomal skin is sore, tender to touch, irritated, and weeping. Stoma is red, moist, and at skin level. When he sits up, the stoma retracts below skin level. Effluence is liquid to slightly pasty stool.**

    a. How would you address the peristomal skin? (3 points)

    Using a towel over the stoma is contraindicated. The towel will become moist/saturated with effluent and continue to expose the skin to that same moisture and effluent that is causing the irritation. The enzymes and proteins in the effluent cause tissue destruction. For skin care, I would clean the skin with warm water, allowed to dry, and then I would dust the skin with powder and apply the appropriately size the pouching system.

    b. What type of pouch will you use? (2 points)

    The appropriate degree of convexity is important to this patient. With the stoma retracting below skin level, the effluent is not properly draining into the pouch. This will cause moisture-associated skin damage (MASD). Convexity is indicated for a stoma opening below the level of the skin (Colwell & Hudson, 2022). A deep convex pouching system with a skin barrier washer will be used. A convex one-piece pouch will be more accommodating to the low-profile stoma and provide a more consistent seal. The pouch needs to allow for the effluent to drain over the edge of the barrier/seal and into the pouch where it is away from the skin without leaking under the barrier. Water resistant one-piece pouching systems are available, which will help keep this

patient's skin dry. Soft convexity is flexible and conforms to the body as one moves. Firm convexity is rigid, providing firm support around the stoma to help it protrude. Typically, soft convex skin barriers are used on firmer abdomens, and firm convex skin barriers are used on softer abdomens.

c. What accessories will you use? (2 points)
Convex barrier rings can be used to enhance convexity with a flat pouching system or to increase convexity on a convex pouch. A belt can also be used. The belt will stabilize and enhance the convex pressure and seal.

3. **Continent diversions require intubation through the stoma with a catheter. Identify and explain the purpose of such and when one would contact their surgeon.** (2 points)

At the end of the surgical procedure to create a continent urinary diversion, ureteral catheters, or stents, are placed to protect the ureterointestinal anastomoses, maintain patency, and aid in proper healing (Packiam, et al., 2022). The stents exit the body through the skin and drain urine to gravity from the low-pressure high-volume urinary reservoir. Irrigation for continent diversions is important to prevent infection and ensure efficient drainage. As the reservoir is exposed to urine, the villi begin to slough off and create mucous. Mucous production is substantial during the first 30 days after surgery creating a need for frequent irrigation that tapers down in occurrence. During this time, the ureteral catheter is used for frequent irrigation to allow mucous to be removed from the reservoir/channel. This prevents infections and ensures efficient drainage through the diversion. The stents are typically left in place for 1-2 weeks. If there is no indication of urinary leakage, the stents are pulled and a Foley is placed into the catheterizable channel and capped off so the patient can be taught intermittent self-catheterization to the provider.

Complications of continent urinary diversions include ileus, bowel leak, parastomal hernia, urine leak, infection/pouchitis, urinary stone formation, metabolic alterations such as metabolic acidosis and vitamin B12 deficiency, and ureteral stricture. Patients should report lethargy, fatigue, dehydration, weight loss, pain/flank pain, fever, malaise, hematuria, and change in appearance or odor of urine (Packiam, et al., 2022; R.B. Turnbull Jr. MD School of Nursing Education, 2022).

Continent ileostomy is used for patients who've undergone total proctocolectomy. The continent ileostomy is permanent and involves the creation of a reservoir with a nipple valve that prevents the stool from draining through the stoma. The early form of this continent diversion was the Kock pouch, but there was a high occurrence of re-operation due to complications. In 1978, the IPAA was introduced and is currently the procedure of choice for UC patients. During surgery, a Medina straight catheter is placed in the pouch and left to drain to gravity continuously for at least two to three weeks to allow the pouch to heal (Rubin, 2022). Once the Medina catheter is removed, patients are taught to self-catheterize the pouch through the stoma/valve. Catheters in functional ileostomies are also used for functionally complete bowel obstructions. It is inserted into the stoma and pouch, gas and contents are suctioned temporarily decompressing the functional obstruction. Catheters can also be placed to allow for continual drainage of the pouch until surgical revision. Continuous catheter drainage also prevents stasis of effluent.

During the immediate post-op period, there should be no pressure beneath the pouch, absence of stool drainage from the catheter, or stool leakage around the catheter. If a catheter is placed for other reasons

noted above, report increased volume of effluent that is watery, foul smelling, or bloody. Also report abdominal pain, distention, fever, and nausea.

4. **Identify and explain teaching points specific to the ileal pouch (not the ostomy) for a patient who undergoes an IPAA.** (4 points)

These patients need pre-op education and post-op education. It is important to use the repeat/teach back method. The ileal pouch is a reservoir that functions as a "new rectum" for fecal matter that is formed from loops of the small intestine to form either a "J" pouch or an "S" pouch. The IPAA preserves sphincter function and is performed in one, two, or three surgical phases (R.B. Turnbull Jr. MD School of Nursing Education, 2022). The internal "J" pouch is stapled to the anal transition zone (ATZ). Cells in the ATZ area can become cancerous. These factors make educating patients to maintain regular follow up with biopsy every 3-5 years, or sooner if indicated, critical.

Immediately post-op, one will have a 28-32Fr catheter in place. Two important things to remember are the catheter must always be stabilized, and it must always be free-flowing. Flow is maintained through irrigation with 20-30cc of normal saline returned by gravity. Irrigation is initially done every 2 hours for the first 48 hours to avoid over distention of the internal pouch and disruption of the anastomosis. Time between irrigation increases in a step-up fashion after that time to the routine of 3-4 times per day with potable water, and then daily and as needed for mucous. During intubation, use a water soluble lubricant and a catheter made for ileostomies. Upon inserting the catheter, it is normal to feel a pop as the catheter passes the rectus abdominis muscle. When the effluent stops flowing, insert the catheter another inch until drainage ceases. Remove, wash, and air dry the catheter. Then store the catheter in a plastic bag. Cleanse the peristomal skin, if needed, and apply the dressing. Small amounts of mucous may be secreted from the stoma. The filling of the pouch is similar to the filling of the bladder, signaling the need for intubation. Patients need to carry a catheter at all times. Discharge instructions for patients going home will include irrigation, skin care, application of a leg bag and a nighttime bag, and extubation of the catheter. This routine will be maintained for approximately 4 weeks.

Complications of the continent ileostomy include ileus, bleeding, pouchitis, slippage of the nipple valve, prolapsed valve, valve stenosis, peristomal hernia, and fistula. Pressure beneath the stoma that may or may not accompanied by bloating or nausea, lack of effluent into the bag, or effluent leaking around the catheter are indications to irrigate the catheter or remove, flush, and reinsert the catheter. If these interventions do not correct the problem, notify the surgeon. One may be experiencing a delayed ileus or a band of adhesions. Being incontinent of effluent (fluid or gas) or being unable to intubate the pouch are indications of slippage of the nipple valve. If changes in position, relaxation of the abdominal muscles, or using a stiffer catheter do not facilitate intubation, this is a medical emergency. If these actions to facilitate intubation, the catheter needs to remain in place and an appointment with the surgeon needs to be made.

At 3-4 weeks post-op, a follow up visit with the surgeon occurs. The pouch is rinsed until the fluid returns clear. This is done to determine the capacity of the pouch. At this time the capacity is usually approximately 150cc. At maturity, pouch capacity is approximately 500cc. Valve competency is also checked. If valve leakage occurs, the surgeon is informed. If no leakage occurs, the patient is started on an intubation schedule. Patients with continent diversions must wear a medical alert identification in case they are unable to speak for themselves.

Expected IPAA outcomes include 4-8 bowel movements daily and one during the nighttime, you can eat most foods, stool is usually a pudding consistency, and stool evacuation can usually be delayed by one hour without any urgency. There is usually no incontinence. If incontinence occurs, it is usually a small amount of liquid effluent that occurs at night during a very deep sleep when one is not aware of the urge to defecate, and nighttime leakage of stool is a potential risk with the "S" pouch for up to nine months post-op (R.B. Turnbull Jr. MD School of Nursing Education, 2022). Eating large meals at night can increase nighttime bowel movements. Patients will have to re-learn how foods affect them. For example, spicy foods, roughage, caffeine, and carbonation may increase bowel activity. Eventually, patients do not usually have to avoid foods. Patients should resume kegel exercises four weeks post-op. These exercises should be taught pre-operatively.

Complications of the IPAA may be inflammatory, mechanical, metabolic, functional, or neoplastic, as well as early or late. They include bowel obstruction, anastomotic dehiscence, pelvic abscess, wound infection, anastomotic stenosis requiring mechanical dilation, UTIs, impotence, retrograde ejaculation, and transient dyspareunia. More significant complications are recurrent pelvic sepsis, CD of the pouch with fistulas, chronic recurring pouchitis, and pouch failure possibly leading to removal of the pouch. Dehydration is a complication with the diverting loop ostomy which tends to have high output of than 1200cc. Patients will need to measure their ostomy and urine output for the first two weeks after hospital discharge and notify the physician if the output exceeds 1200cc in 24 hours. Signs and symptoms of dehydration include fatigue, decreased energy, dark colored urine, dizziness when standing, thirst, and decreased urine output. Dehydration can be managed with foods that help soak up liquids such as bread, pasta, crackers, bananas, applesauce, white rice, and pretzels. Sip fluids throughout the day. Patients can make their own oral rehydration solution at home by mixing one liter of water with 2/3tsp. of salt and 2TBS. of sugar plus sugar-free Kool Aid, Crystal Light, or something similar for taste. Do not add ice because it will dilute the solution. Sorbitol, mannitol, and zylotol are present in some sugar-free foods and can have a laxative effect. Alcohol and caffeine increase output. Eat foods and then drink so foods will sponge up liquids. Anti-diarrheal medications such as Imodium or Lomotil taken 30 minutes before meals and at bedtime as needed helps to thicken output. High roughage food, popcorn, nuts, and high acid foods such as tomato sauce and fruit juice may increase the number of stools and burning at the anal opening. After bowel continuity is restored, it is not uncommon to have 8-10 loose bowel movements daily, increasing the risk of skin irritation and breakdown secondary to frequent wiping irritating digestive enzymes. Using moisturized cleansing pads, making sure the skin is dry, and then applying a moisture barrier skin ointment is recommended. Using fecal incontinent pads or butterfly absorbing pads will wick away wetness/seepage to protect the skin. Wet skin can become denuded and infected with candidiasis. If this happens, using antifungal powder or ointment until the rash resolves is recommended. It does take 3-12 months for the pouch to accommodate increase fluids and develop a capacity to absorb liquids. With regard to sexual dysfunction, as healing occurs and swelling goes down, those symptoms resolve.

5. **What are the mechanisms of action & possible uses for the following medications for a patient post-intestinal surgery?** (2 points each)

   a. Octreotide acetate (Sandostatin)

      Sandostatin is a growth hormone classified as a synthetic octapeptide that mimics our own naturally occurring growth hormone somatostatin. Sandostatin binds to somatostatin receptors to regulate growth hormone secretion and cell growth. Sandostatin acts primarily by only binding to somatostatin receptor 2, reducing the enzyme content with regard to the volume of biliary, pancreatic and gastric

secretions and increasing absorption by prolonging GI transit. Because of its ability to inhibit the release of gastric secretions, Sandostatin would be used in an attempt to lower the output of a patient with a high-output ECF resulting in a quicker fistula healing rate. Reducing fistula output also reduces the loss of fluids and electrolytes (Nix & Bryant, 2022).

b. Dicyclomine (Bentyl)

Bentyl is an anticholinergic/antimuscarinic/antispasmodic. Anticholinergic medications block acetylcholine, the neurotransmitter for muscle contraction. Bentyl decreases acid production in the stomach, inhibiting involuntary muscle movements in the GI and urinary tracts, resulting in relaxation of muscles in the stomach, kidney, bladder, and intestines, therefore decreasing GI motility.
Bentyl is used for IBS, functional bowel disorders, and sometimes for people who have bouts of diarrhea. Bentyl would not be one of my choices for any post-intestinal surgery. I would consider it for management of IBS, which is not treated with surgery, but rather with medications and diet and/of lifestyle changes (Black & Ford, 2021).

c. Metoclopramide (Reglan)

Reglan is an antiemetic that blocks dopamine receptors, stimulates motility of the upper GI tract, and increases lower esophageal sphincter tone. Reglan is indicated for prevention/reduction of: nausea and vomiting from chemotherapy; postoperative nausea and vomiting; or gastroparesis. I would use Reglan within the first 24 hours after colorectal resection. The use of Reglan during this time has shown to potentially accelerate GI function and speed recovery without adverse affects (Al-Mazro, et al., 2017).

6. **Once a patient with a neobladder has the Foley catheter removed, the patient must relearn to void by passive emptying. Explain what is meant by passive voiding.** (1 point)

In order to empty the neobladder, one must relax the urethral sphincter and pelvic floor while increasing intra-abdominal pressure. To do this, one needs to learn how to perform the Valsalva or Crede maneuver (Packiam, et al., 2022). The American Urological Association describes passive voiding as natural filling of the bladder with urine after catheter removal.

7. **Your patient is having a gastrojejunal tube placed for enteral feeding. Identify two reasons a gastrojejunal tube might be used instead of a PEG, the method of insertion that is used for placement of this tube, & the nursing implications for skin care.** (4 points)

The gastrojejunostomy tube (GJ-tube) is two different tubes combined into one; the gastro tube (G-tube) which goes from outside your body into your stomach and the jejunal tube (J-tube) which goes into your intestine. The G-tube is used to decompress the stomach by venting air, draining fluid, and give liquid/crushed medications if needed directly into the stomach and can be connected to suction. G-tubes are used when there are head and neck obstructions from cancer for example, esophageal disease, neurologic

dysfunction, trauma, and respiratory failure (Fellows & Rice, 2022). The J-tube is used to give liquid nutrition more distally than the G-tube by placing it directly into the jejunum. The J-tube is very small, should only be used for liquid nutrition. The J-tube is never used for suction. Crushed medications can clog the J-tube and are typically not given via the J-tube. The GJ-tube is a way for the body to get the food and water it needs when gastroesophageal reflux or delayed emptying is a problem (Fellows & Rice, 2022). The distal feeding of the J-tube is more appropriate for aspiration risks.

Implications for skin care include hyperplasia, tube leakage, increased redness of the skin, thick yellow or green drainage from around the tube, malodorous drainage around the tube, and increasing tenderness or soreness. There are several skin complications associated with enteral tubes such as irritant dermatitis, medical device related pressure injuries, fungal infections, cellulitis, and hypertrophic granulation tissue (Fellows & Rice, 2022).

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