stoma

Surgical techniques and complications

Dr Alankar Gupta
MS, DNB GI Surgery resident

PREOPERATIVE PREPARATIONS

- **Education** , preoperative counseling by an enterostomal therapist improves the quality of life by helping patients psychologically adapt to the significant lifestyle changes associated with living with a stoma

- **Site selection** — Proper site selection is important for minimizing postoperative complications and for achieving a good quality of life
  - The ostomy should lie on either side of the abdominal midline, just lateral and inferior to the umbilicus. Often, a site is selected that overlays the rectus abdominis muscle, which can provide additional support and stability for the stoma.
  - The patient must be able to visualize the stoma and access it without difficulty
  - The ostomy placement must be at least 5 cm from all folds, creases, previous incisions, belt line, umbilicus, and bony.

TECHNICAL INSIGHTS

- **Bowel loop** : healthy, well-vascularized bowel
- adequately mobilized to ensure a tension-free approximation to the abdominal wall.

- **Aperture size** — The appropriate size of the aperture in the abdominal wall can be difficult to judge. Large apertures are a risk factor for parastomal hernias, while small apertures can result in ischemia, stricture, stomal outlet obstruction strictures, or stomal necrosis.

- **Stomal fixation to the fascia**
- place absorbable sutures transabdominally from the posterior fascia or peritoneum to the seromuscular layer of the bowel, effectively fixing the limb to the abdominal wall.

- However, this technique does not reduce the risk of stomal herniation or prolapse compared to stomas that were not fixed to the fascia.

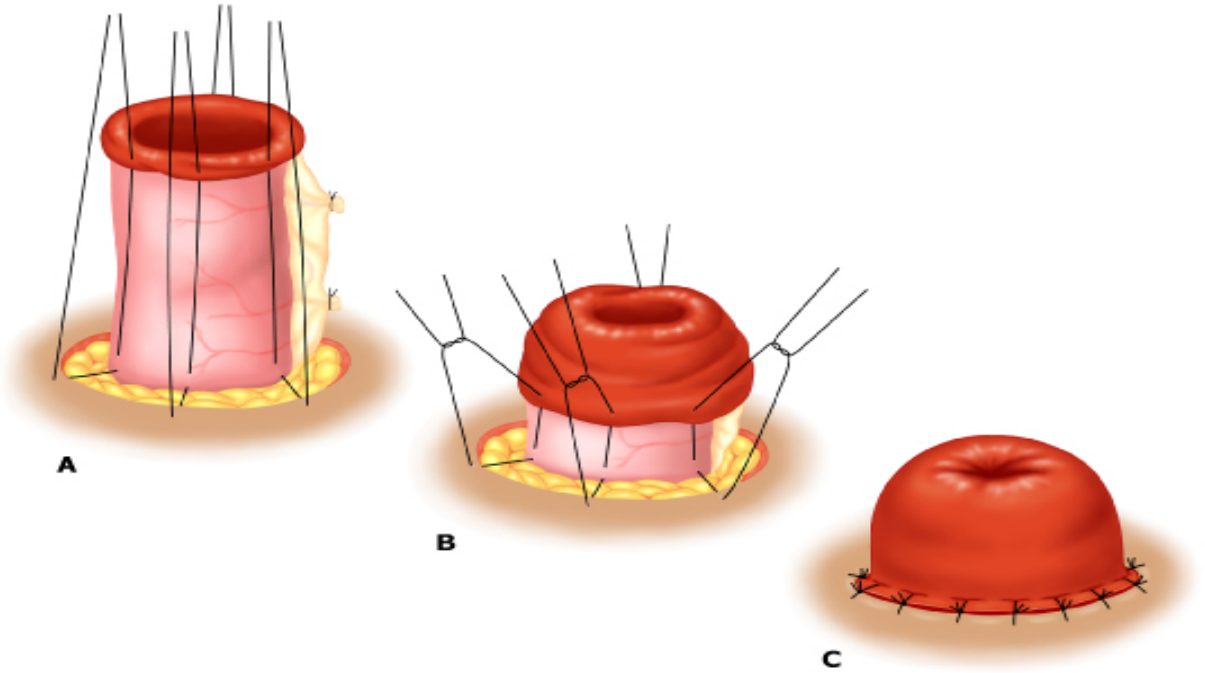
- **Closure of the lateral space**
- Fixation of the ileal or colonic mesentery to the abdominal lateral sidewall in order to close the lateral sulcus has been suggested as a means for preventing the rare complication of a volvulus around the stoma limb .

Maturing the ostomy

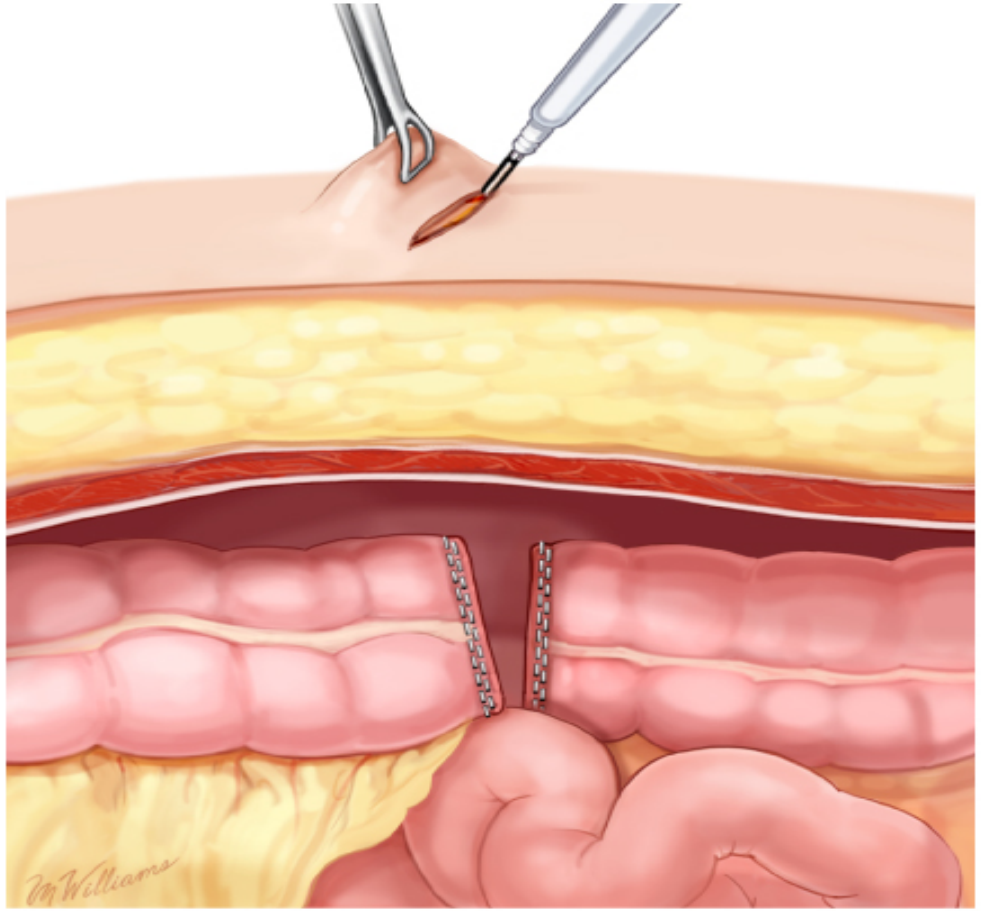
- **End ostomy** — The segment of intestine to be used for an end ostomy is advanced through the abdominal wall. The abdominal incision is closed and protected from possible spillage while maturing the ostomy.

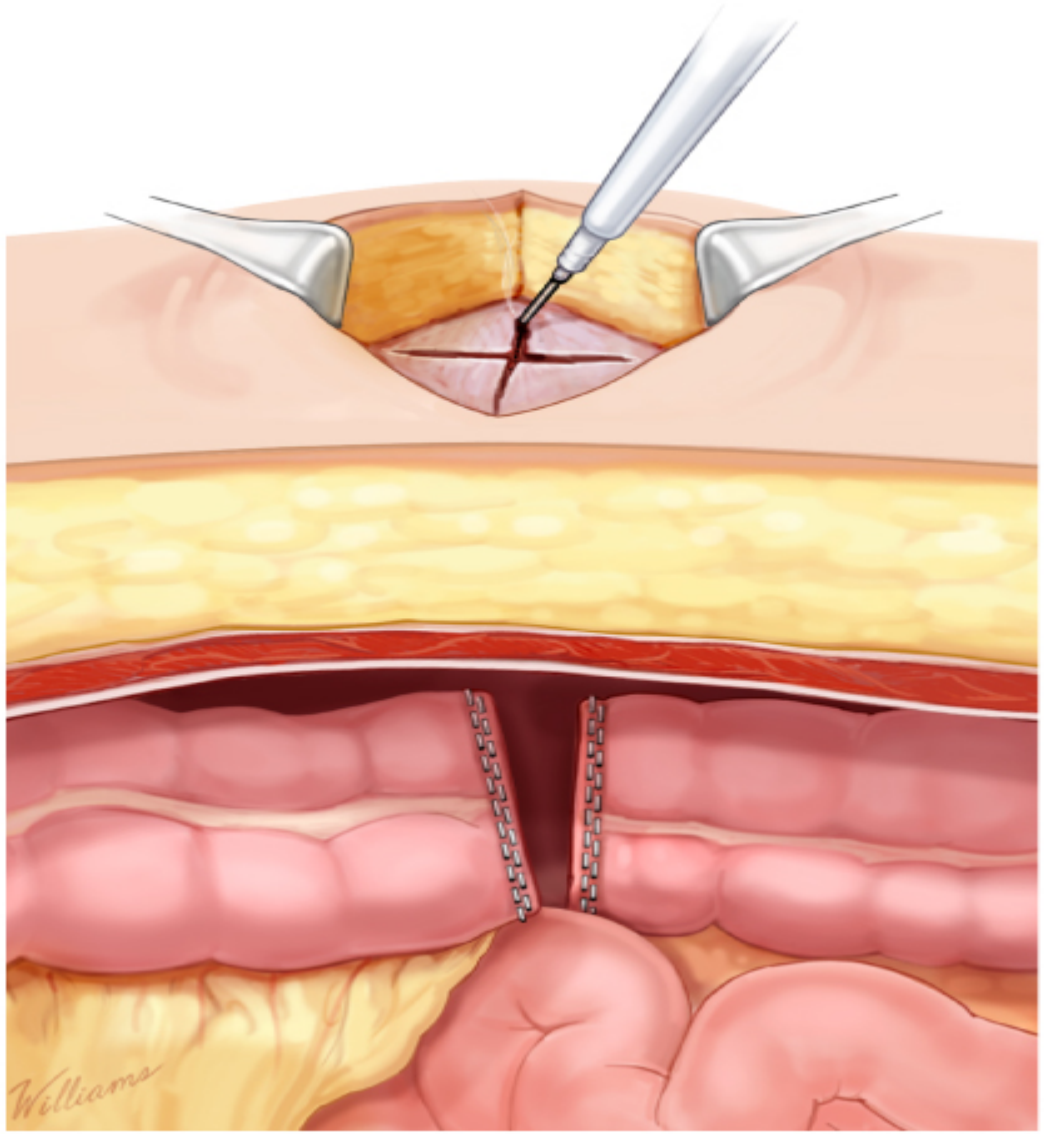
- An ileostomy should protrude at least 2 to 3 cm above the abdominal wall after eversion to allow adequate output of its contents into the appliance .

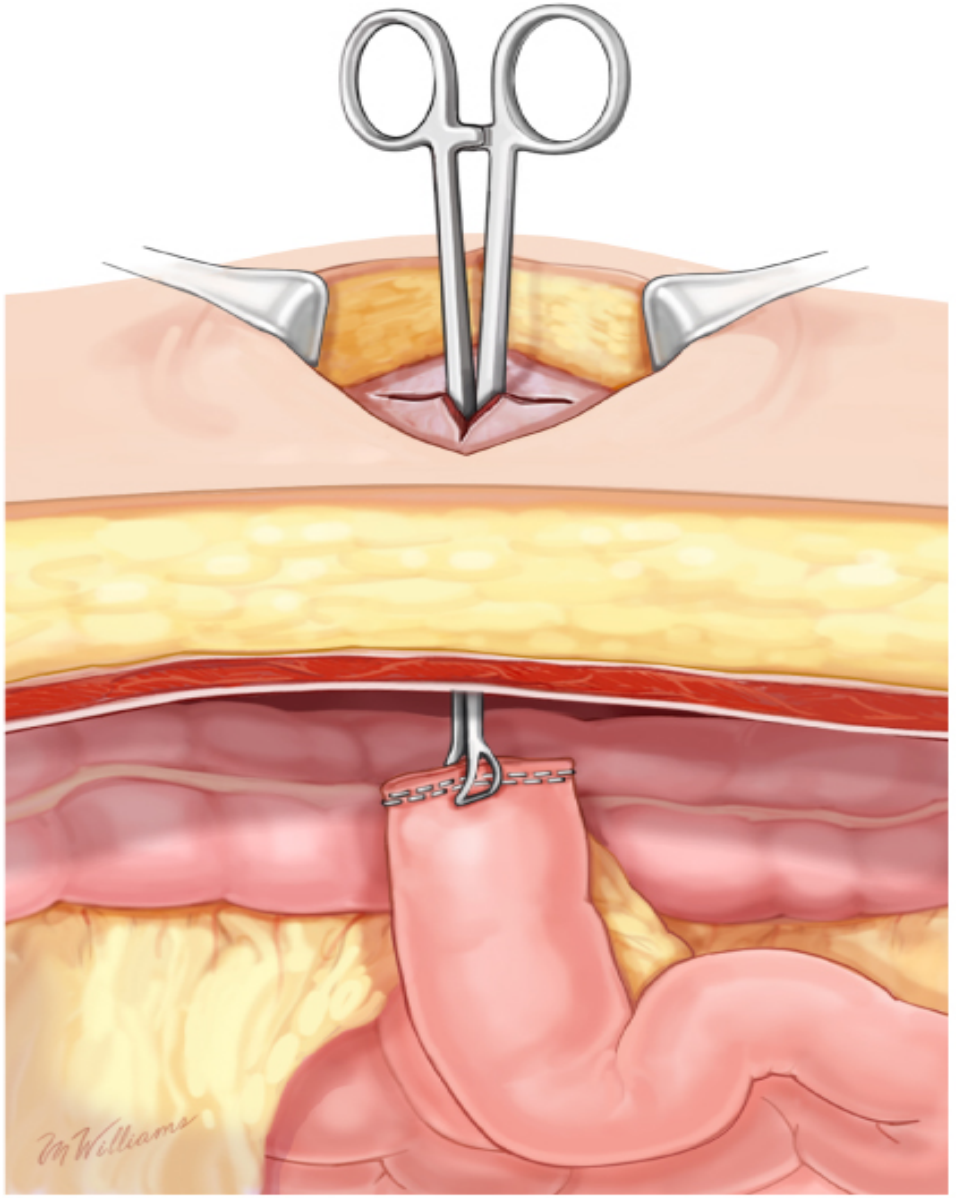
- In contrast, because of a more solid output, colostomies require only a 1 to 2 cm protrusion above the abdominal wall

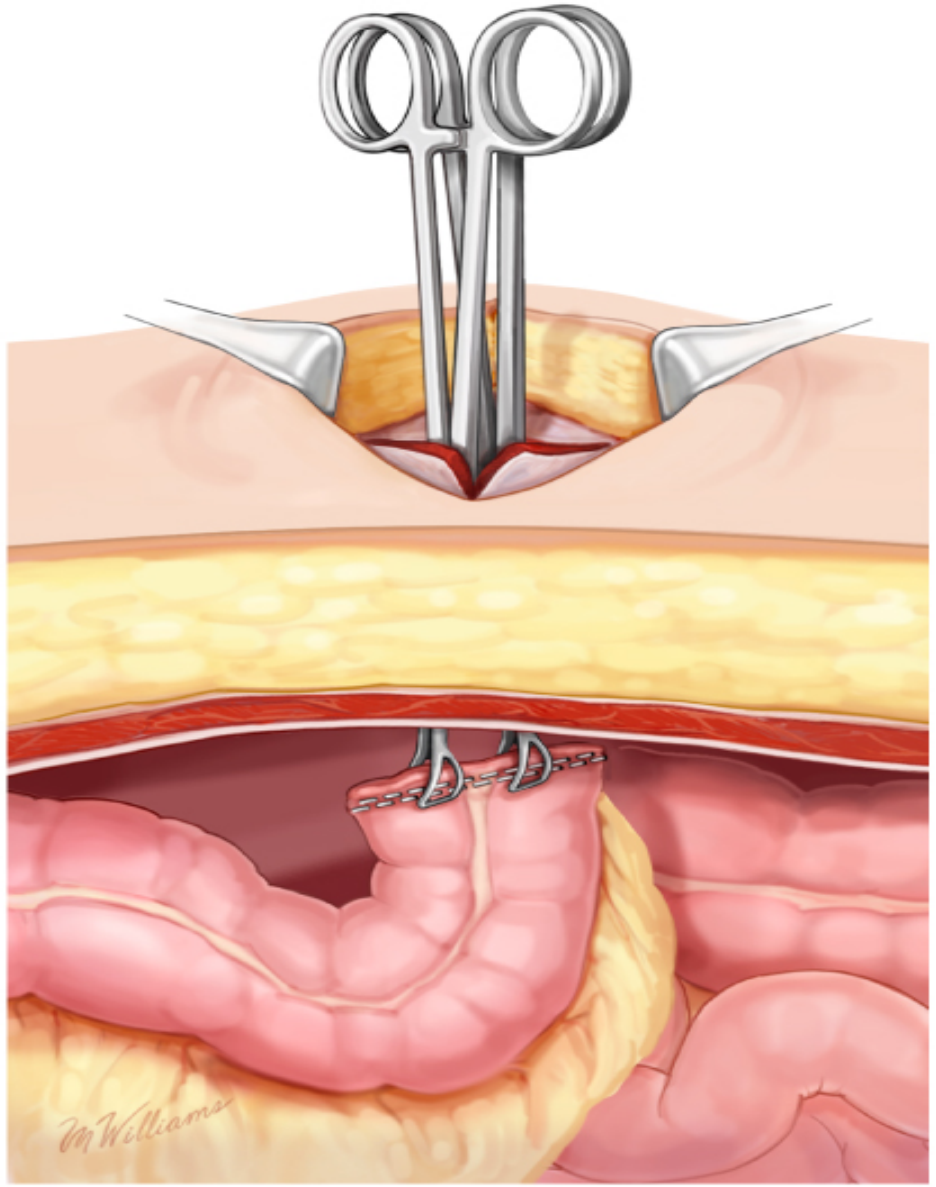


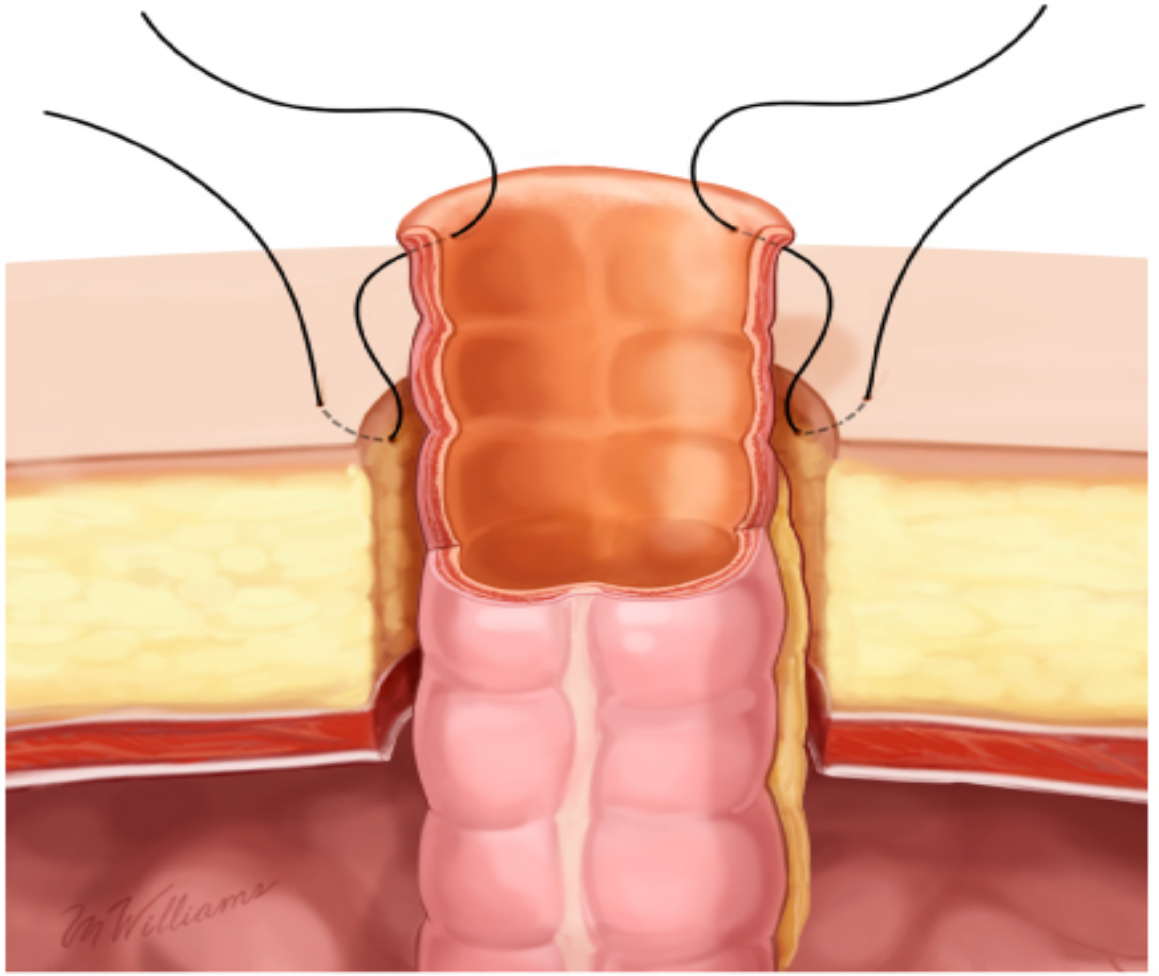
•Deliver the end of the small bowel or colon through the abdominal wall.
•Place four absorbable stay sutures equidistant at 12, 3, 6, and 9 o'clock to evert the intestine and secure it to the abdominal wall trephine.
•When constructing an ileostomy, the suture includes the full thickness end of bowel, seromuscular layer of the bowel wall approximately 3 cm proximal to the end, and the dermis of the abdominal wall .
•Tag the sutures with small clamps. Evert the intestine by gently pulling on the sutures, then tie in place.
•Place one to two additional sutures in between the originally placed stay sutures, approximating the full thickness distal bowel with the dermis.

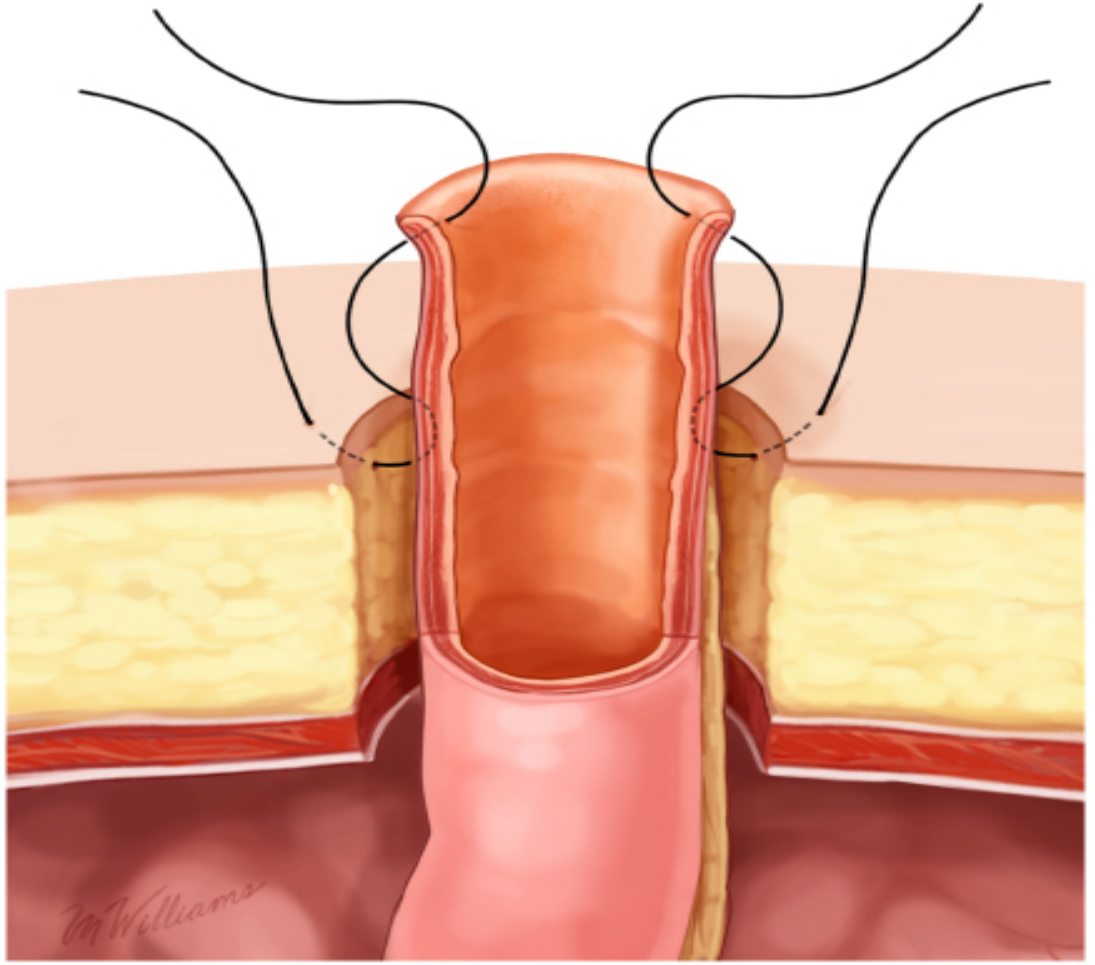






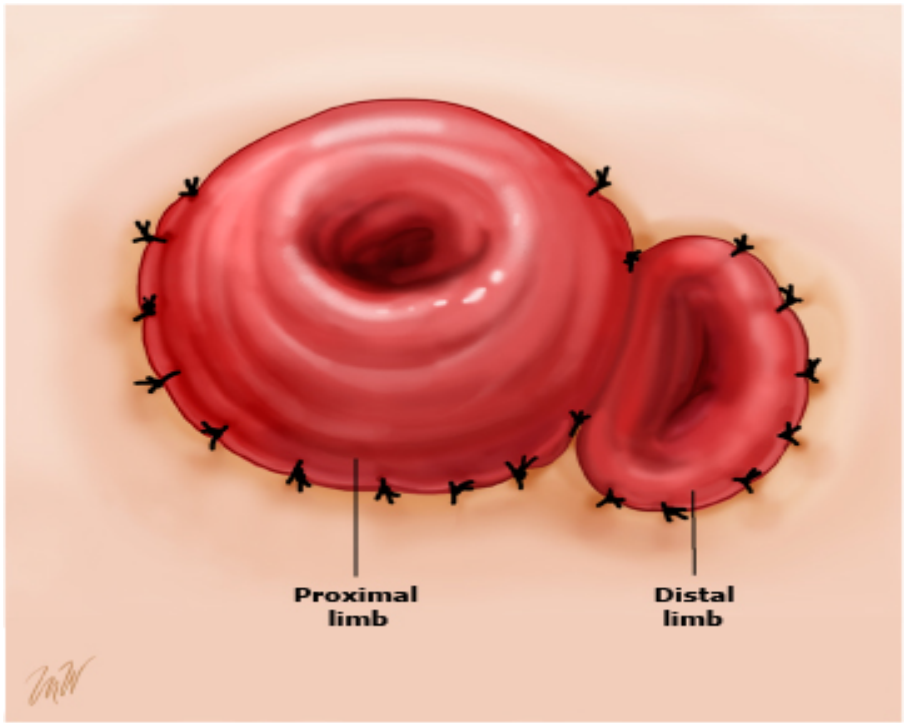


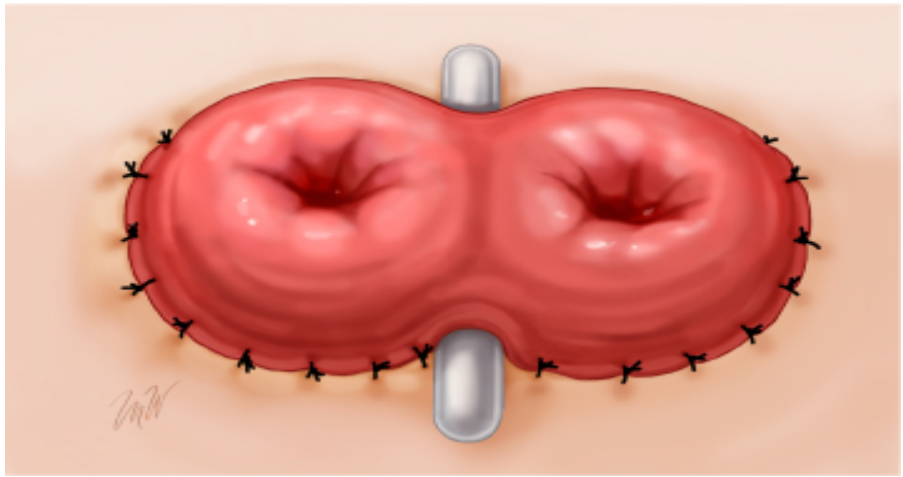


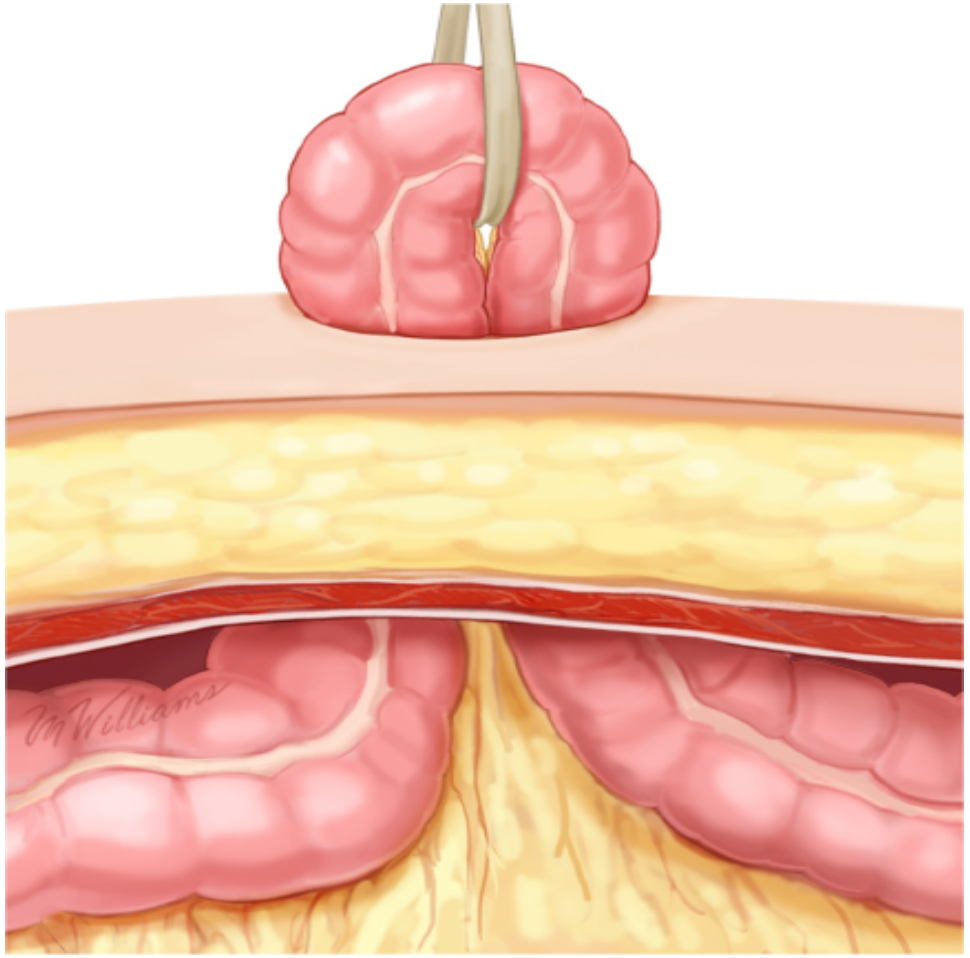


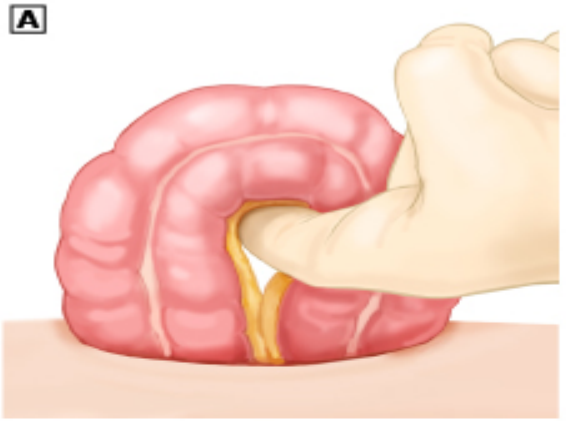
Loop ostomy with a defunctionalized distal limb

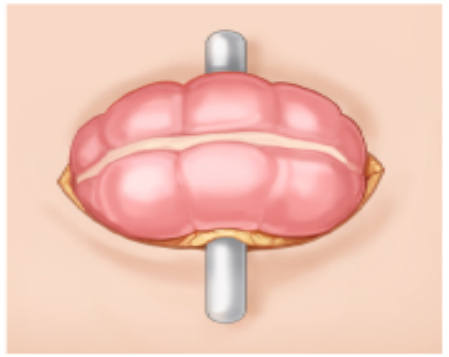
- A loop ileostomy or loop colostomy can be performed with a defunctionalized distal limb or as a double barrel ostomy .
- The defunctionalized distal limb allows for a more efficient stoma with a compressed distal limb and the proximal functioning limb occupies the majority of the abdominal wall aperture.
- The segment of intestine to be used for a loop ostomy is advanced through the abdominal wall trephine, using a penrose drain under the bowel loop to facilitate advancement through the aperture.
- The abdominal incision is closed and protected from possible spillage while maturing the ostomy.

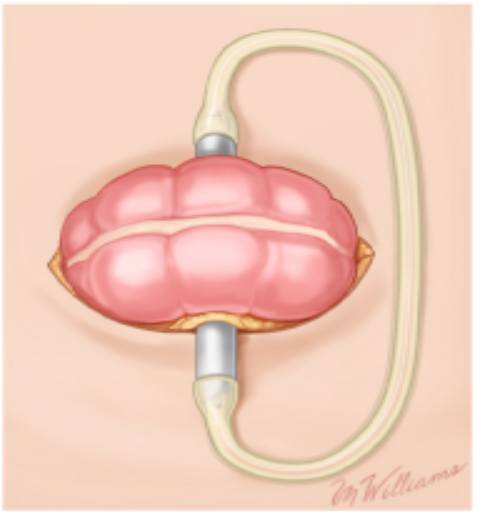




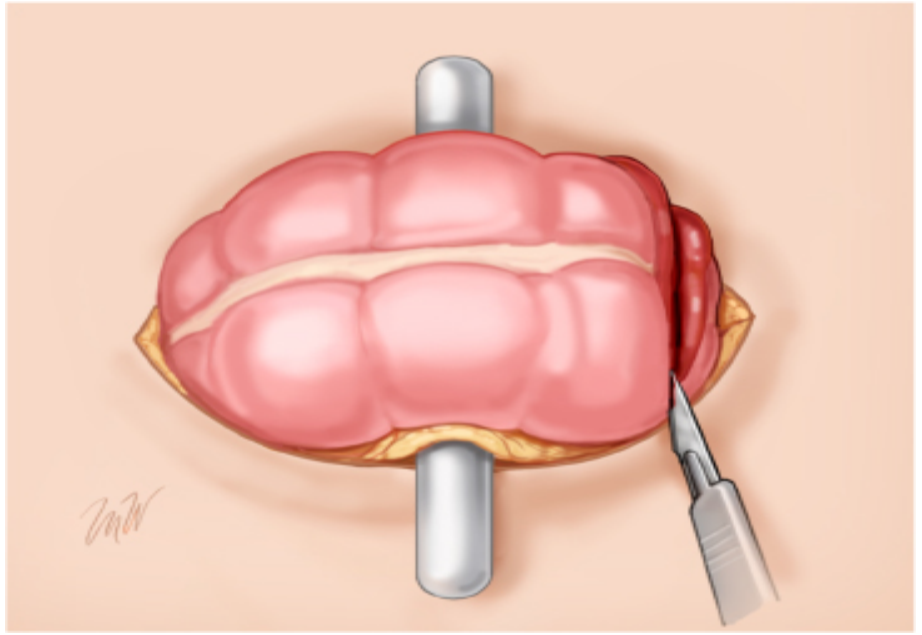


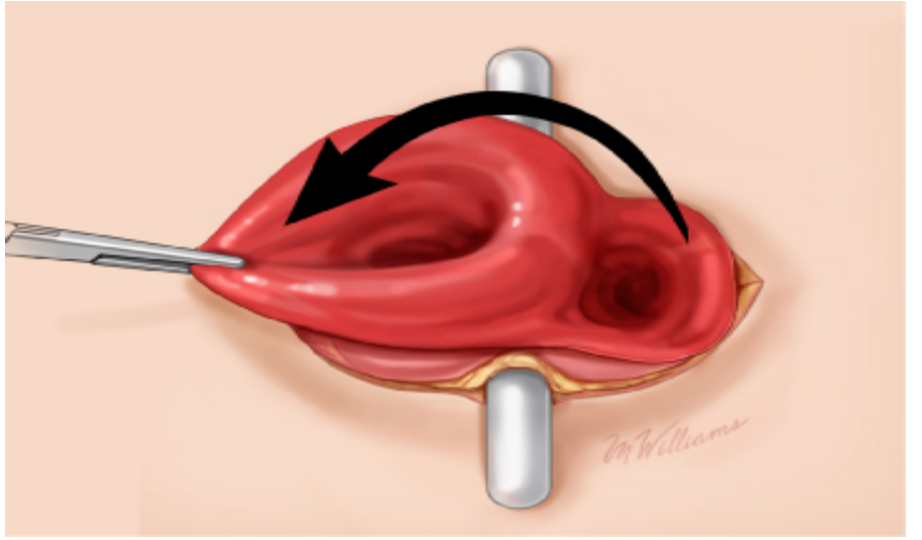




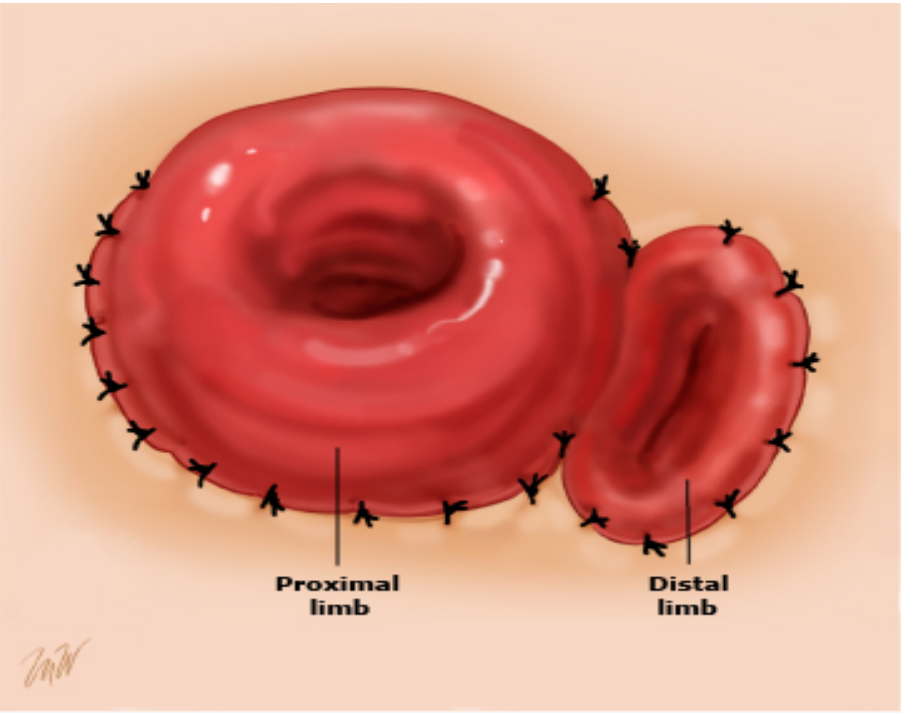


Pass a 14Fr red rubber catheter through a small opening in the mesentery of the exteriorized intestine, this will replace the Penrose drain used to exterior the loop.
The red rubber catheter is shaped in a large loop and secured to itself with 0 silk ties. An alternative to the catheter is a plastic rod





Transect 80 percent of the circumference of the bowel wall with electrocautery, beginning on the anti-mesenteric wall at the distal-most portion of the descending, or nonfunctional limb



- Secure and evert the proximal functional limb by suturing the full thickness bowel wall to the seromuscular layer 3 cm proximal to the partially transected end with the dermis of the abdominal wall opening

- Four absorbable stay sutures are placed on the antimesenteric border of the bowel at the junction of the proximal and distal limbs of the stoma and secured (not tied) with small clamps.

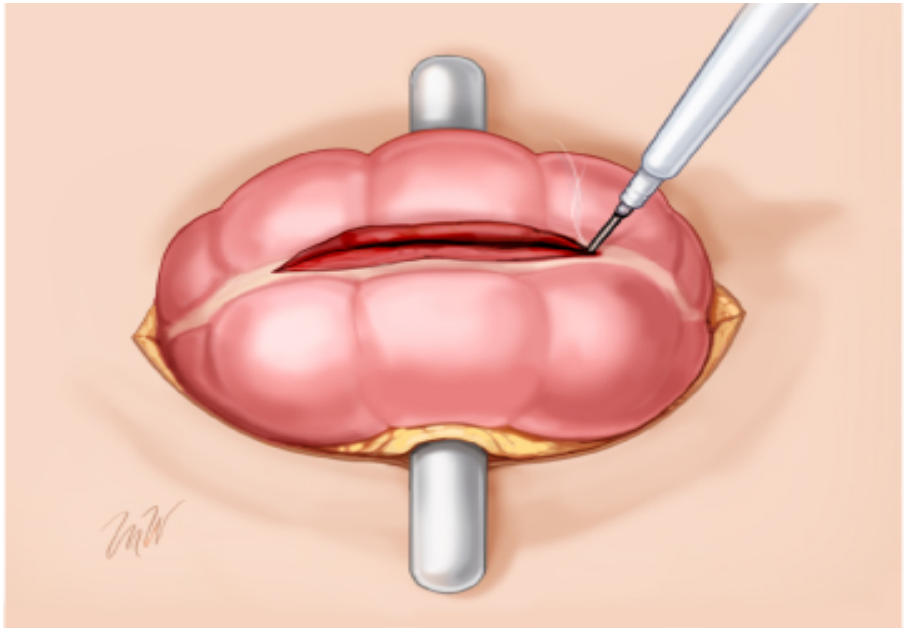
- Tie the sutures in place to evert the proximal limb.
- Place one to two additional sutures in between the originally placed stay sutures, approximating the full thickness distal bowel with the dermis.
- The catheter or rod is removed approximately 7 to 10 days after the procedure

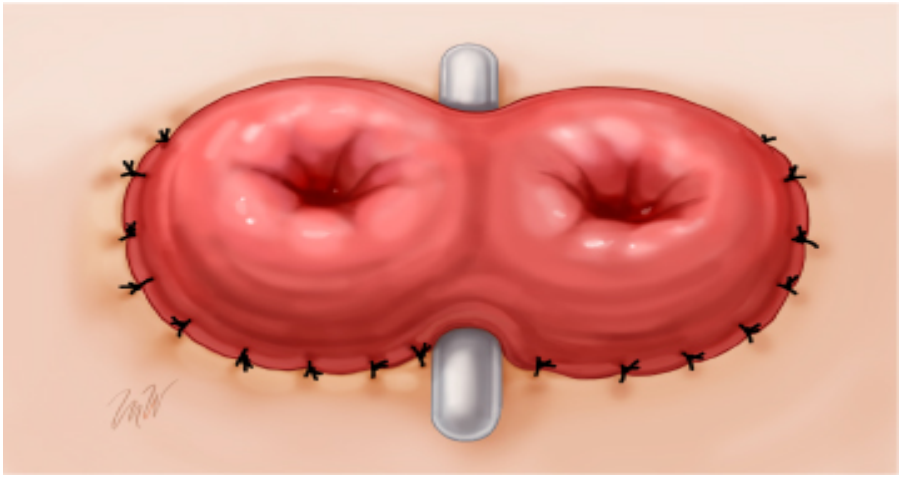
Double barrel ostomy

- A double barrel ileostomy or colostomy can be constructed as a loop ostomy with both limbs everted and the back wall intact, or as completely divided proximal and distal limbs that are brought together through the abdominal wall trephine.

- The resulting ostomies are larger and more cumbersome to manage (eg, leakage) than the loop ostomy with a compressed distal limb.

- The double barrel ostomy may be preferable in emergent settings as some surgeons find it takes less time to perform.

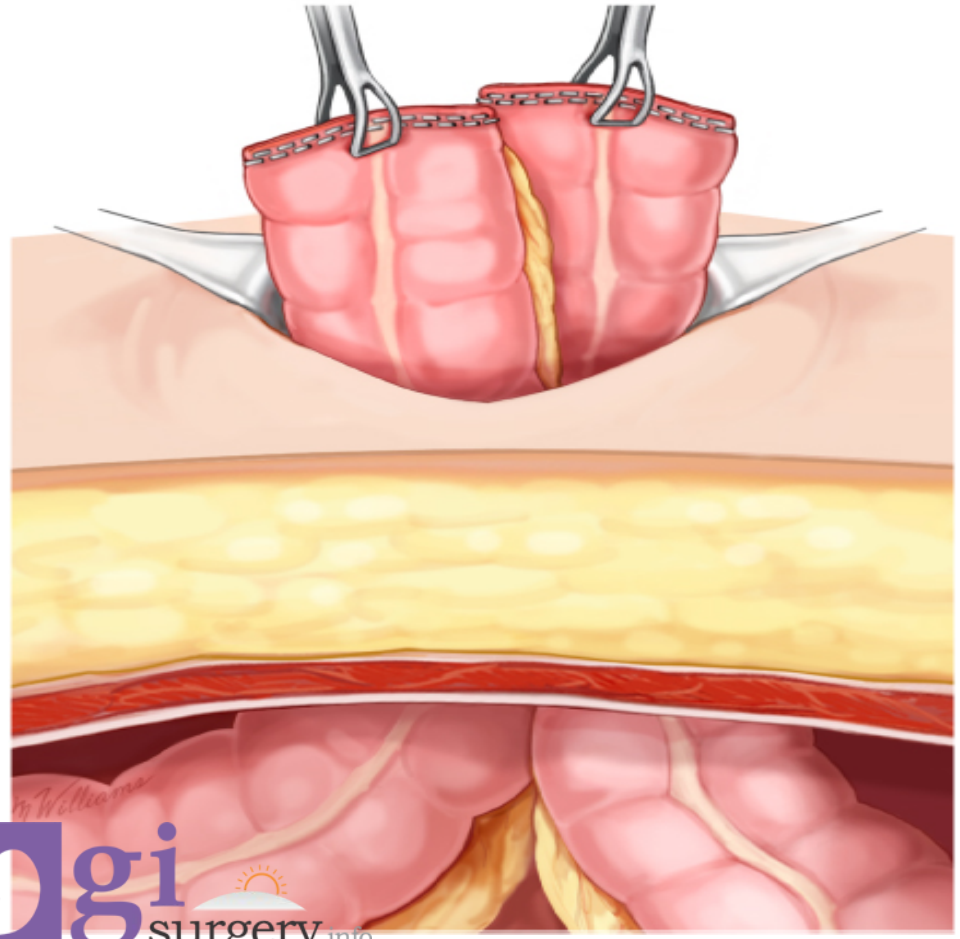




A longitudinal or circumferential incision can be used to create the opening in the stoma at the apex of the selected limb, with the back wall remaining intact .

Both the proximal and distal limbs are everted

Double barrel end colostomy



The bowel is divided with a stapler and the functioning proximal limb and decompressed distal limb are brought through the abdominal wall .

One abdominal wall aperture is created for the stoma when no bowel is resected (eg, emergency decompression of an obstruction).

The proximal and distal limbs are brought through separate apertures if bowel is resecting between the two ends.

Technical challenges in obese patients

- Obesity is an independent risk factor for stomal complications.

- The ileostomy or colostomy is placed in the upper abdomen, above the umbilicus, where the abdominal wall is less thick.

- Peritoneal attachments should be adequately mobilized:
- Completely mobilize the splenic flexure when creating a descending colostomy
- Transect the medial peritoneal attachments at the base of the colon mesentery
- Transect the inferior mesenteric artery proximal to the left colonic arterial origin to decrease tethering effect

- Create peritoneal windows over the colonic mesentery just below the stoma

- Trim the thickened colonic mesentery to ease the passage of the intestine through the abdominal wall, while preserving the marginal artery.

- Enlarge the trephine aperture in the abdominal wall to ease passage of the intestine, decrease tension, and minimize venous congestion.

- If these steps are unsuccessful, a loop-end stoma can be created. The distal end of the colon is stapled and left in the peritoneal cavity. The anti-mesenteric border of the colon is extracted through an oversized aperture and matured without eversion. Although less than ideal, the patient is provided with a functioning stoma that can be later revised.

LAPAROSCOPIC APPROACH

- The laparoscopic approach is a safe and effective alternative to a laparotomy for identifying the segment of bowel to be used for an ileostomy or colostomy .

- it provides excellent anatomic visualization of the abdominal cavity and minimizes the risks and complications of an open procedure.

- Creation of loop ileostomy or loop sigmoid colostomy are preferred since they do not routinely require significant mobilization.

- The following general principles are used in the laparoscopic approach:

- Initial access to the peritoneal cavity is achieved via a 12 mm port placed at the pre-selected stoma site.

- The entire abdominal cavity is examined visually. If adhesions limit visibility and accessibility to the segment of bowel to be used for the ostomy, the procedure is converted to a laparotomy.

- If feasibility is confirmed, two additional 5 mm ports are placed in the suprapubic and left iliac fossa, two fingerbreadths above and two fingerbreadths medial to the anterior superior iliac spine.

- When creating an end or loop sigmoid ostomy, the bowel is mobilized in the lateral to medial direction, extending from the recto-sigmoid to the mid-descending colon.
- When creating an end or loop ileostomy, bowel is not routinely mobilized, except in the presence abdominal or pelvic adhesions.
- The surgeon must verify the correct orientation of the proximal and distal orientation of the intestine by re-establishing the pneumoperitoneum.
- An adequate abdominal wall aperture must be created for a loop and end ostomy to avoid stoma outlet obstruction.
- The stoma is matured using the same approaches as previously described

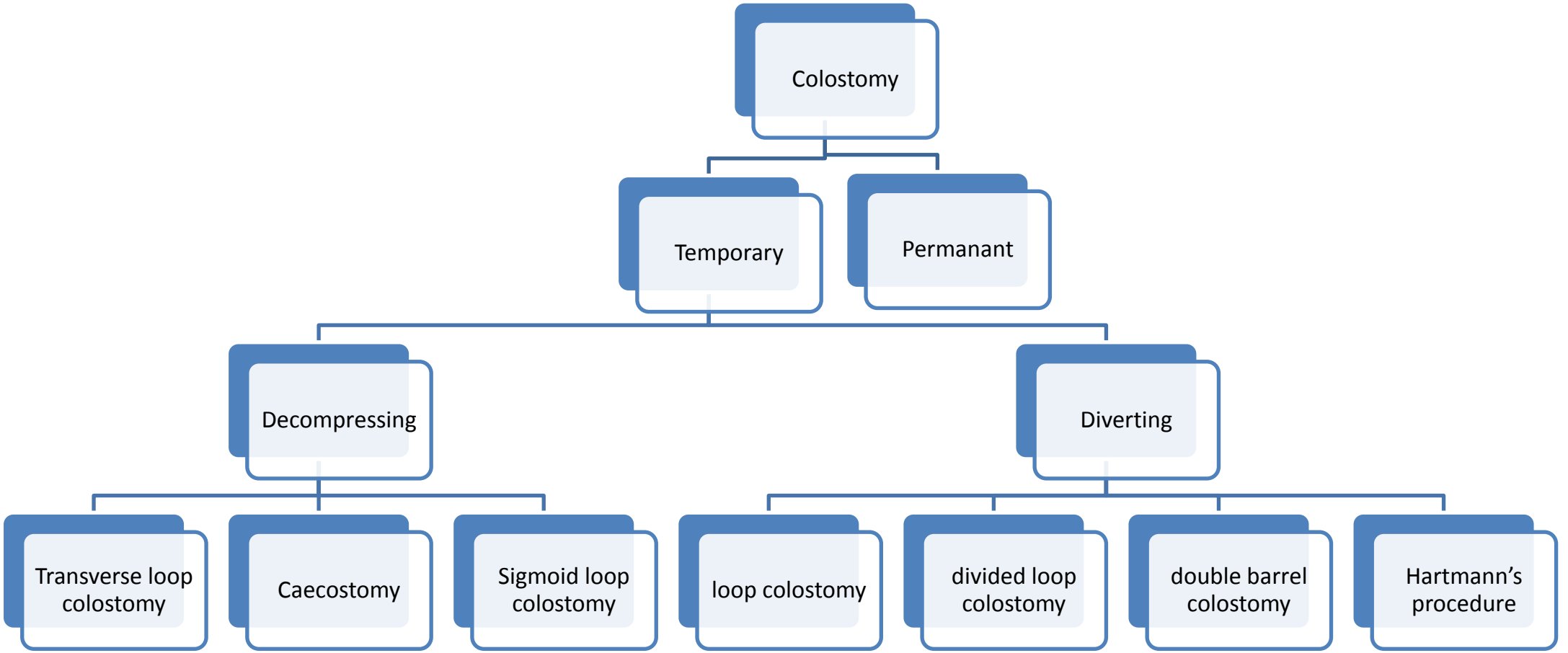
Surgical principles of ostomy construction

INDICATIONS

- Clinical settings appropriate for a temporary ostomy include:
  - Large bowel obstruction
  - Colonic stricture
  - Rectovaginal fistula
  - Fecal incontinence
  - Penetrating rectal injuries
  - Penetrating colon injuries
  - Complex perianal fistulas
  - Fecal peritonitis
  - Necrotizing enterocolitis
  - Severe/destructive injury of the colon or rectum following penetrating trauma
  - High risk of anastomotic leak
  - Hemodynamic instability

- Clinical settings that warrant construction of a permanent ostomy include:
  - Abdominal perineal resection for rectal cancer
  - Total abdominal proctocolectomy for severe Crohn's colitis
  - Total abdominal proctocolectomy for severe ulcerative colitis

Colostomy



COLOSTOMY

A colostomy is performed when it is necessary to bypass or remove the distal colon, rectum, or anus, and it is either inadvisable or not feasible to maintain integrity of the bowel.

If the distal rectum and anorectal sphincter mechanism are removed, the colostomy is permanent; if the sphincter mechanism is retained, there is the potential for restoration of continuity.

- **Temporary colostomy** —
  - performed on an emergency basis to decompress an obstructed or perforated distal colon.
  - electively to permit healing of a fistulous tract or acute inflammatory process distal to the colostomy.
  - protection of a distal anastomosis when delayed healing is anticipated

- **Decompressing colostomy**
- **Diverting colostomy**

Decompressing colostomies

- The transverse loop colostomy – the entire loop of bowel is brought out through the abdominal wall and sutured to the dermis or stabilized with a rod or bridge until the bowel granulates to the abdominal wall.
- Cecostomy – the anterior wall of the cecum is opened and sutured to an opening in the abdominal wall.
- The loop sigmoid colostomy – similar to the loop transverse colostomy and useful for patients with a redundant sigmoid colon and an obstructive rectal or anal cancer.

- **Advantages**
- Fecal diversion without transecting the bowel and risking major contamination of the abdominal cavity
- the ability to provide definitive management of the underlying disease process on an elective basis following a thorough work-up and a bowel prep if indicated .

- **Disadvantages**
- Requirement for additional surgery
- Transverse loop colostomies are typically large stomas in the upper quadrants that are difficult to conceal, increased rate of prolapse.
- Cecostomies are typically skin-level stomas located adjacent to the groin crease, which compromises pouch adherence.

Diverting colostomy

- Divert the fecal stream proximal to a fistulous tract, an area of inflammation, or a distal anastomosis.
- Until recently, diverting colostomy has been the standard of care in cases involving acute intraabdominal sepsis following perforation or traumatic disruption of the bowel because primary anastomosis was thought to be unsafe.
- However, other studies consistently reveal lower morbidity and mortality rates when such patients are managed with primary anastomosis .
- In addition, loop ileostomy has been shown to be a safer diversion with lower morbidity rates in situations where diversion is required, so the diverting colostomy is being used less frequently

- A **loop colostomy** is created by bringing a loop of colon up to the abdominal wall. The ostomy is created with an afferent or proximal end that allows fecal diversion and a distal end that allows venting of the distal efferent limb/length of bowel.

- A **divided loop colostomy** is created by exteriorizing a loop of colon, dividing the colon with a linear stapler, reducing the distal end into the subcutaneous space, removing the proximal staple line and suturing it to the dermis.

- A **double barrel stoma** is created by bringing both ends of the transected bowel to the abdominal wall as stomas (eg, a proximal functional colostomy and a distal mucous fistula).

- A **Hartmann's procedure** includes bringing the proximal end of the transected bowel to the abdominal wall as an end colostomy, and the distal end is oversewn and left in the abdominal cavity as a defunctional stump. The distal end may also be secured in place in the subcutaneous tissue as a mucous fistula, but not matured out to the skin.

Closure of a temporary colostomy

- Takedown of a temporary colostomy is delayed for weeks to months to assure complete resolution of the underlying condition and to permit softening of the adhesions.

- However, closure of the colostomy may be performed within three to six weeks if studies indicate that the need for diversion no longer exists (eg, if the distal anastomosis is well healed).

- Closure of the colostomy can be done laparoscopically or by an open procedure.

Permanent colostomy

- Permanent colostomy is most commonly performed for cancer involving the distal rectum or anus.
- Reduced the number of patients with rectal cancer requiring a permanent colostomy.

- 1 cm negative distal margin of resection
- Endoanal stapling devices
- intersphincteric resection

ILEOSTOMY

- An ileostomy is performed when it is necessary to remove or bypass the entire colon and rectum, or to protect a distal colorectal, coloanal, or ileoanal anastomosis.

- If the anorectal sphincter mechanism is removed with the entire colorectum, a permanent end ileostomy is required (either a standard ileostomy or a continent ileal reservoir).

- If the anorectal sphincter mechanism is retained, there is the potential for reversal.

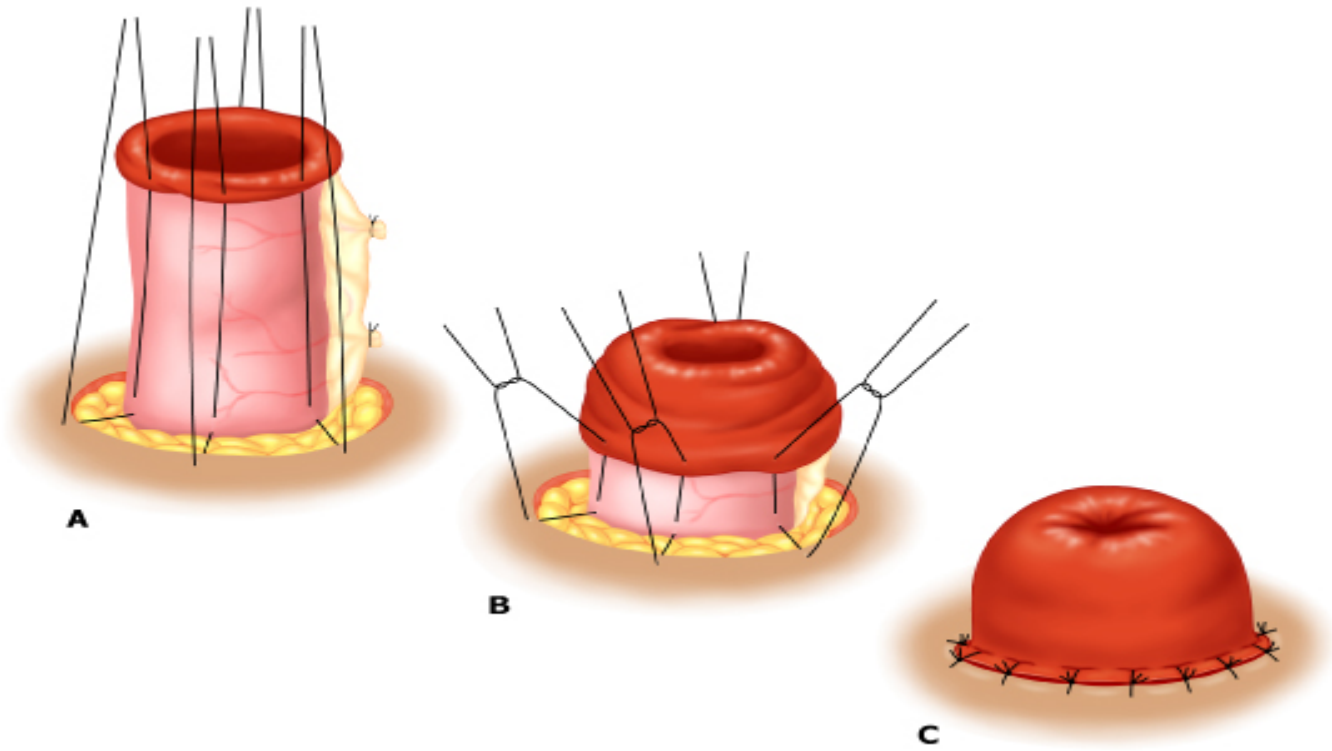
End ileostomy (Brooke ileostomy)

- End ileostomy using Brooke's technique (eg, eversion of the bowel to expose the mucosa followed by mucocutaneous suturing to create an end stoma) is the standard method

- prevents the development of serositis and resultant stricture formation and allows for secure application of the stoma appliance.

- Crohn's disease who require panproctocolectomy

- stoma that protrudes 2 to 3 cm above skin level; a sufficiently "budded" stoma supports drainage of the effluent into the pouch and reduces the risk that the enzymatic drainage will leak onto the skin underneath the pouching system.



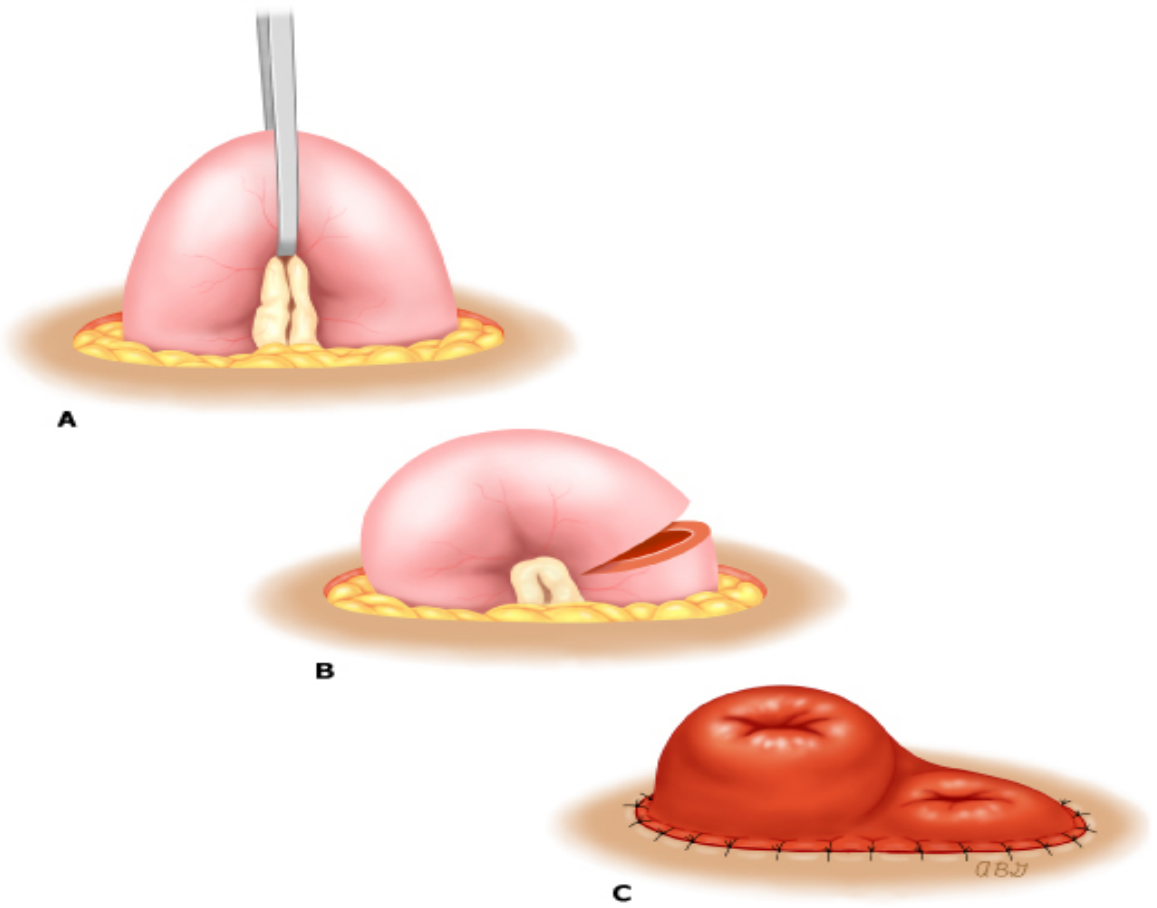
Loop ileostomy

- Temporary fecal diversion following sphincter-saving rectal resections and ileoanal pouch procedures for patients with ulcerative colitis or familial polyposis .

- Provide protection of a distal coloanal or colorectal anastomosis, particularly in patients who have undergone pelvic radiation.

- The diversion itself, however, is associated with some morbidity, and ileostomy closure necessitates an additional surgical procedure.

- In many centers, temporary diversion is now used selectively only for patients considered high-risk for anastomotic breakdown, including patients with previous radiation to the pelvis, on steroids or other immunologics or biologics, or with very distal anastomosis .



- When a loop ileostomy is performed, it is usually closed once the anastomosis is well healed, in approximately six weeks to three months following the initial procedure

- Loop ileostomies are typically more difficult to manage than end ileostomies because the stoma frequently empties close to the skin surface.

- A loop ileostomy performed in conjunction with a pelvic pouch procedure is located more proximal in the ileum and is therefore associated with more fluid and enzymatic output. This also may not allow proper absorption of water and vitamins, minerals, and electrolytes.

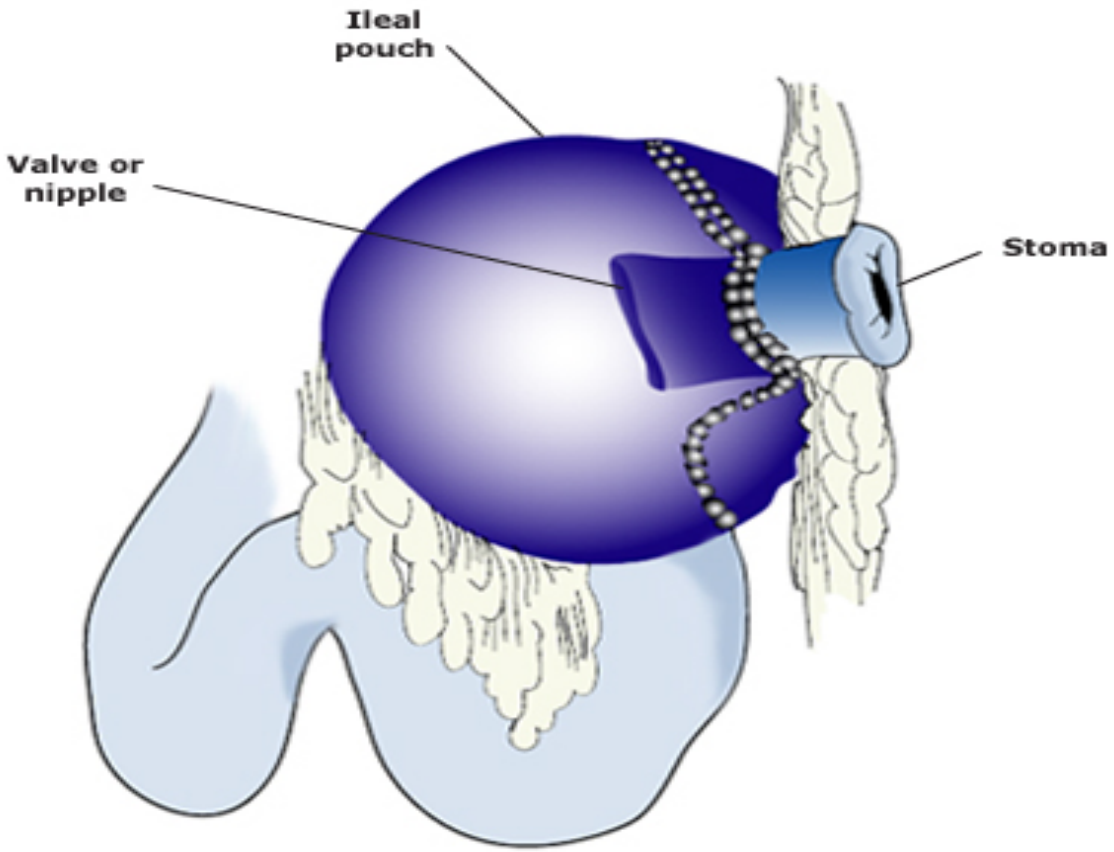
Continent ileal reservoir

- Originally performed by Nils Kock, involves the creation of an internal reservoir fashioned from detubularized ileum and rendered continent by intussuscepting the segment of ileum connecting the reservoir to the abdominal stoma .

- The original procedure was modified by Barnett, who added an ileal "collar" (a segment of ileum looped around the intussuscepted segment of bowel and connecting to the reservoir) that improves continence (Barnett Continent Ileal Reservoir/BCIR).

- The primary advantage of the BCIR procedure is that the patient does not wear an external pouch; instead, the reservoir is emptied by intermittent intubation and irrigation.

- However, the high incidence of complications and the development of the ileal-anal pouch procedure have significantly reduced the frequency with which this procedure is performed.



INCIDENCE OF STOMAL COMPLICATIONS

- The incidence of ostomy complications ranges from 14 to 79 percent .
- Complications vary with type of ostomy, with the least complications occurring in patients with end colostomies and ileostomies .
- Loop ileostomies are associated with the highest complication rates .

- The following risk factors appear to be associated with stomal complications.
  - Absence of peri-operative siting
  - Height of stoma <10 mm
  - Emergent stoma formation
  - Comorbid medical illnesses, such as obesity, Crohn's disease, inflammatory bowel disease, diabetes
  - Tobacco usage

Early complications

- inappropriate stoma site
- stomal necrosis
- stomal retraction,
- mucocutaneous separation
- peristomal skin dermatitis
- surgical wound infection, and sepsis.

Late complications

- parastomal hernia
- stomal prolapse
- retraction,
- stenosis
- stomal bleeding.

Early complications

- **Inappropriate stoma site** — A poorly sited stoma increases the risk of complications (eg, leakage, skin irritation, skin breakdown) and adversely affects the patient's quality of life .
- A poorly sited stoma occurs more often in patients who are undergoing emergency surgery compared with elective surgery .
- Optimal siting of the stoma should be determined prior to elective and emergency procedures by an enterostomal nurse and/or the surgeon.
- In the setting of an emergent procedure without stoma site markings, the optimal location is two-thirds of the way along the line from the anterior superior iliac spine and the umbilicus .
- The stoma should be visible to the patient standing and sitting, and should not be placed in a crease.

Stomal necrosis

- Ischemia or necrosis of the stoma
- venous congestion from excessive tension,
- arterial insufficiency from aggressive mesenteric dissection, or a tight fascial aperture.
- The incidence is as high as 14 percent in the immediate post-operative period .

- Adequate mobilization of the bowel, preservation of the blood supply to the stoma, and an adequate trephine are critical factors for avoiding this complication.

Stomal retraction

- Stomal retraction is defined as a stoma that is 0.5 cm or more below the skin surface within six weeks of construction .
- The incidence of stomal retraction ranges between 1 and 40 percent.
- Approximately 1 percent of patients experience stomal retraction more than 30 days after construction, most likely related to postoperative weight gain.
- Retraction leads to leakage and difficulties with pouch adherence, resulting in peristomal skin irritation.
- The best method to prevent stomal retraction is to construct a stoma at least 10 mm high for colostomies and 2 to 3 cm high for ileostomies.

Mucocutaneous separation

- Separation of the ostomy from the peristomal skin may be partial or completely circumferential.
- Typically, it occurs in 12 to 24 percent of patients in the early postoperative period .
- As a result, stomal stenosis or retraction can occur if the mucocutaneous separation is circumferential and heals by secondary intention.
- Mucocutaneous separation also results in leakage and skin irritation.

- Complete dehiscence of the suture line with retraction of the stoma should be revised immediately.

- The best approach to preventing this complication is meticulous technique when approximating the bowel to the skin.

Peristomal skin breakdown

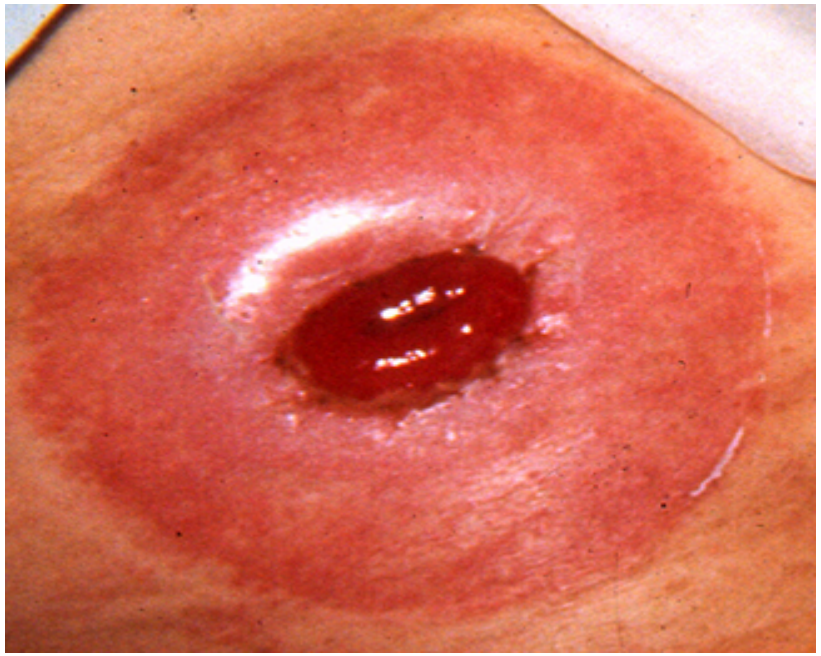
- Mechanical trauma
- Effluent contact damage (irritant contact dermatitis)
- Allergic reactions (allergic contact dermatitis)
- Fungal infections
- Peristomal pyoderma gangrenosum

Stomal stenosis

- Stomal stenosis refers to a narrowing of the stoma sufficient to interfere with normal function.
- Stenosis can occur at the skin or the fascia level.

- **Mild stenosis** is asymptomatic and identified only by digital examination of the stoma
- Mild stenosis can usually be managed by dietary modifications (eg, avoidance of insoluble fiber); gentle routine dilatation of the stoma may also be helpful but is not evidence-based.

- **Clinically significant stenosis** usually causes cramping pain followed by explosive output.
- Clinically significant stenosis usually requires surgical correction .
- **Local revision** may be the preferred approach,
- Local repair requires excision of all scar tissue and adequate mobilization with a new tension-free stoma at a relocated site.
- Enlargement of the skin opening via a double Z-plasty technique may be useful in some situations (eg, limited number of sites for ostomy relocation, limited scarring) .



Peristomal varices

- Peristomal varices are most frequently seen in patients who underwent a colectomy for ulcerative colitis in the setting of primary sclerosing cholangitis. Peristomal varices can also develop in patients with other causes of portal hypertension.

- Initial management consists of direct pressure followed by injection sclerotherapy or direct suture.

- However, recurrence is frequent and transjugular intrahepatic portosystemic shunting (TIPS), or, less commonly, a portacaval shunt is advised for select surgical candidates .

- Beta blockers have been effective in controlling variceal bleeding in selected patients .

Stomal prolapse

- Stomal prolapse can occur in patients with elevated intraabdominal pressure.

- Prolapse is most common in transverse loop colostomies and end descending colostomies.

- Prolapse presents a management problem but does not compromise bowel integrity or function unless it is significant enough to produce ischemic changes or make appliance placement difficult.

- Prolapse can be managed conservatively
- cold compresses and/or application of an osmotic agent
- manual reduction of the prolapse
- application of a binder with a prolapse overbelt

- Severe prolapse or prolapse producing ischemic changes or severe mucosal irritation and bleeding usually requires surgical intervention.

- Local revision of the prolapse is accomplished by performing a full-thickness resection of the prolapsed intestinal segment with construction of the stoma at the original site.

- In the event of a further recurrence, additional bowel resection and relocation of the stoma may be necessary

Recurrent disease

- Malignant disease and inflammatory disease can recur at the stoma site or in the bowel proximal to the stoma, and the patient with Crohn's disease may also develop a fistula immediately adjacent to the stoma or proximal to the stoma.

- thorough evaluation, including biopsy of any stomal lesions.

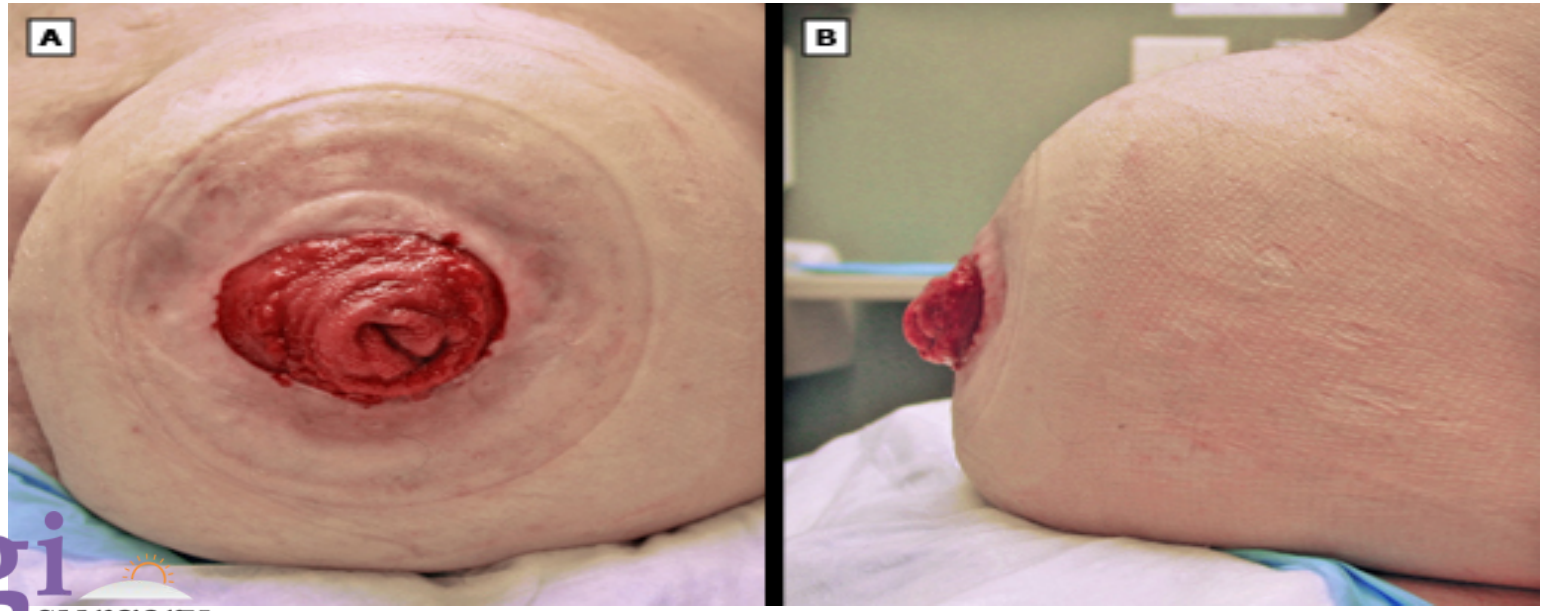
- Treatment is based on the underlying disease process and findings after evaluation.

Diversion colitis

- Diversion colitis is an inflammatory process that occurs in segments of the colorectum that are diverted from the fecal stream by surgery.
- The most common symptoms in adults are rectal bleeding, tenesmus, mucus discharge, and abdominal pain.
- Treatment may involve instillation of short chain fatty acid (SCFA) enemas, topical steroid enemas, mesalamine (5-ASA derivatives) enemas or suppositories.
- In rare or severe cases of colitis, hyperbaric oxygen is administered or a completion proctectomy and abdominal perineal resection is performed.
- Reversal of the colostomy when bowel continuity is restored will effectively treat the diversion colitis

Parastomal hernia

- **INTRODUCTION** — A parastomal hernia (PSH) is a type of incisional hernia that occurs at the site of the stoma or immediately adjacent to the stoma.



INCIDENCE

- Most frequent complication
- certain degree of PSH is almost inevitable.

- The reported incidence varies widely
- A review found that PSH occurs in
  - 1.8 to 28.3 percent of patients with end-ileostomy,
  - 0 to 6.2 percent with loop ileostomy,
  - 4.0 to 48.1 percent with end-colostomy,
  - 0 to 30.8 percent with loop colostomies .

- The lower rate for loop ostomy is related to the temporary nature of most of these stomas and the short duration of follow-up. Most parastomal hernias occur within the first two years of construction, and studies with longer follow-up report higher PSH rates

CLASSIFICATION

- The hernia sac may contain bowel and / or omentum.

- Parastomal hernia (PSH) is classified clinically into four subtypes :

Subcutaneous (most common type) - The herniation extrudes from the abdomen alongside the bowel for the stoma and bulges into the subcutaneous fat alongside the stoma.

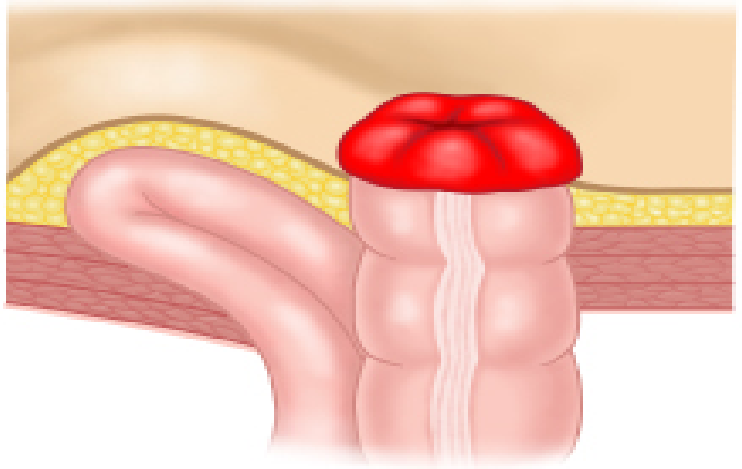
Interstitial - The herniation extrudes alongside the bowel for the stoma, then burrows into one of the intermuscular planes.

Perstomal - The stomal bowel is prolapsed and loops of bowel and/or omentum enter the hernia space produced between the layers of the prolapsed bowel.

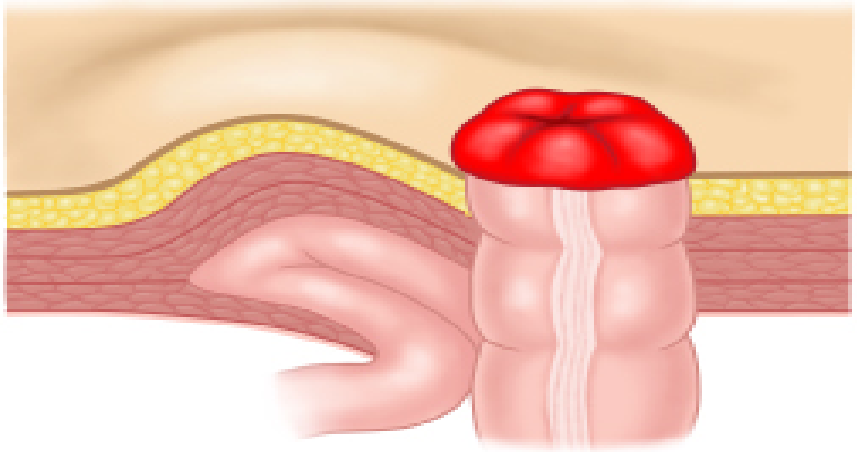
Intrastomal - The herniation extrudes from the abdomen alongside the bowel for the stoma and enters the plane between the emerging and the everted part of the bowel. It usually occurs in the spout type of stoma such as an ileostomy.

Parastomal Hernia- classification

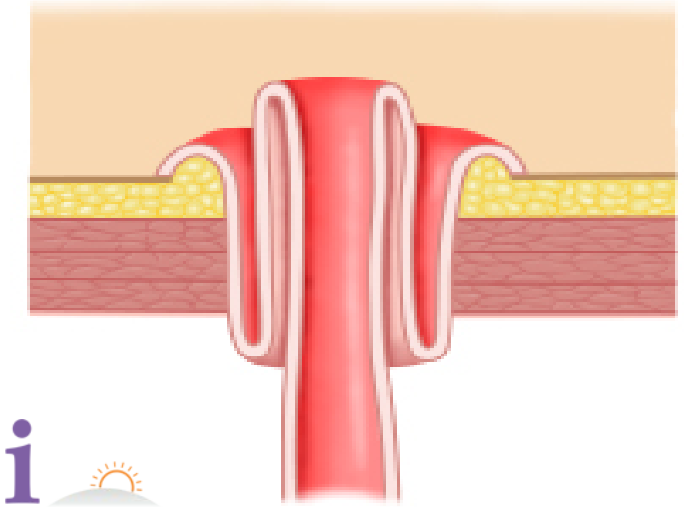
A. Subcutaneous



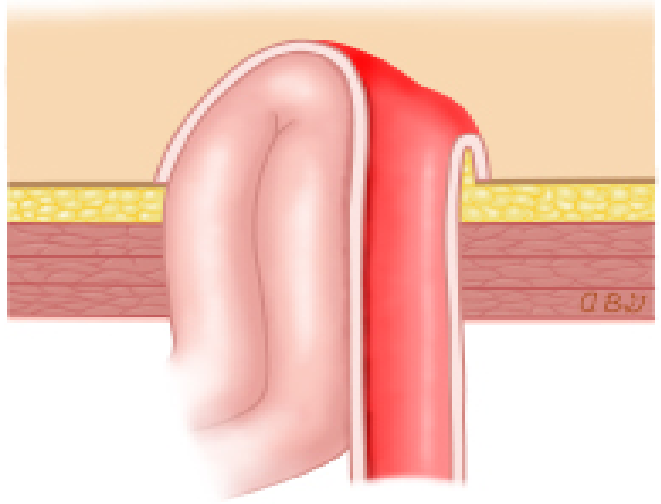
B. Interstitial



C. Perstomal

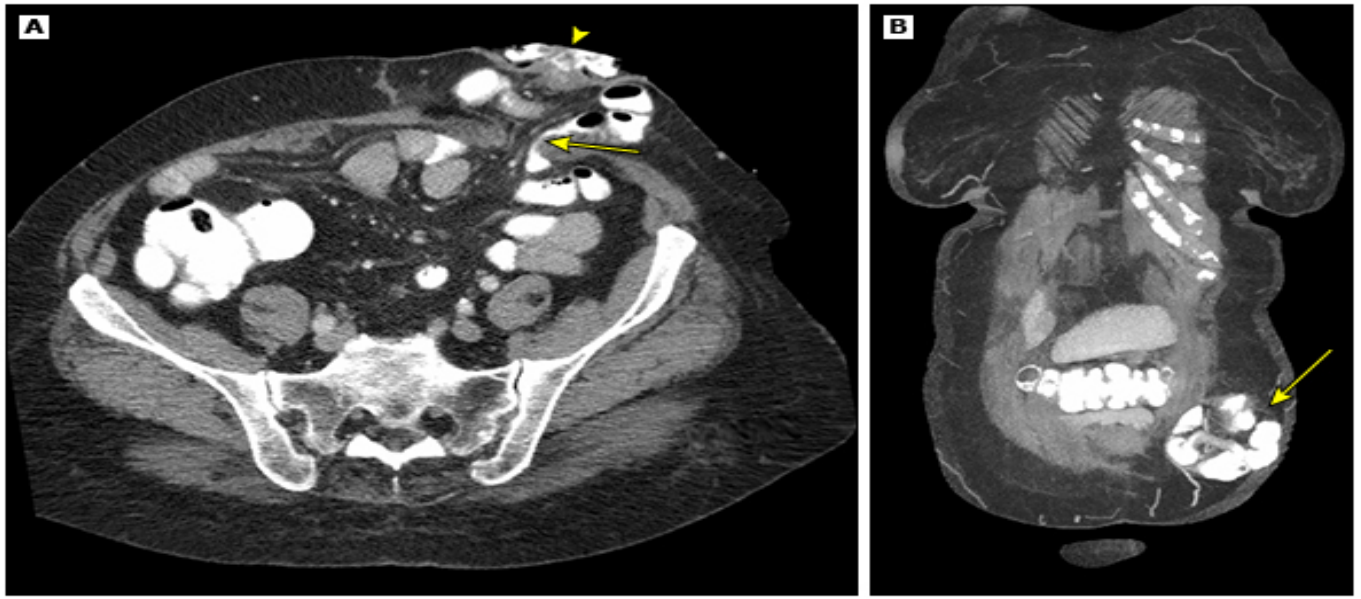


D. Intrastomal



Radiologic classification

- A radiologic classification scheme using findings from cross sectional imaging has also been developed . This scheme distinguishes between possible contents of the hernia sac, including omentum, the loop of bowel forming the ostomy, and other loops of bowel not forming the ostomy.



- While these classification schemes may be useful in research and for academic discussions, in practice there is little need for such a system since **management is based on the symptoms** induced by the hernia, rather than differences in the hernia composition, which may be difficult to appreciate on physical examination

RISK FACTORS

- **Patient characteristics**
- obesity
- weight gain after ostomy construction, poor nutritional status,
- immunosuppressive drugs (eg, corticosteroids),
- emergency construction of a stoma,
- chronic or recurrent increases in abdominal pressure (chronic coughing),
- infection, and underlying disease such as malignancy or inflammatory bowel disease .
- Of these, the association with obesity, defined as waist circumference >100 cm or body mass index >30 kg/m^2, is best supported by clinical evidence

- **Technical factors**
- stoma placement,
- surgical technique for ostomy construction,
- abdominal wall strength .

- The **size of the trephine** may be particularly important. An analysis of the forces acting upon the trephine that cause dilatation, thus a hernia, revealed that the larger the trephine radius, the stronger the tangential force pulling the trephine apart .

- PSH is less common following an ileostomy than a colostomy or end stoma as compared with a loop stoma .

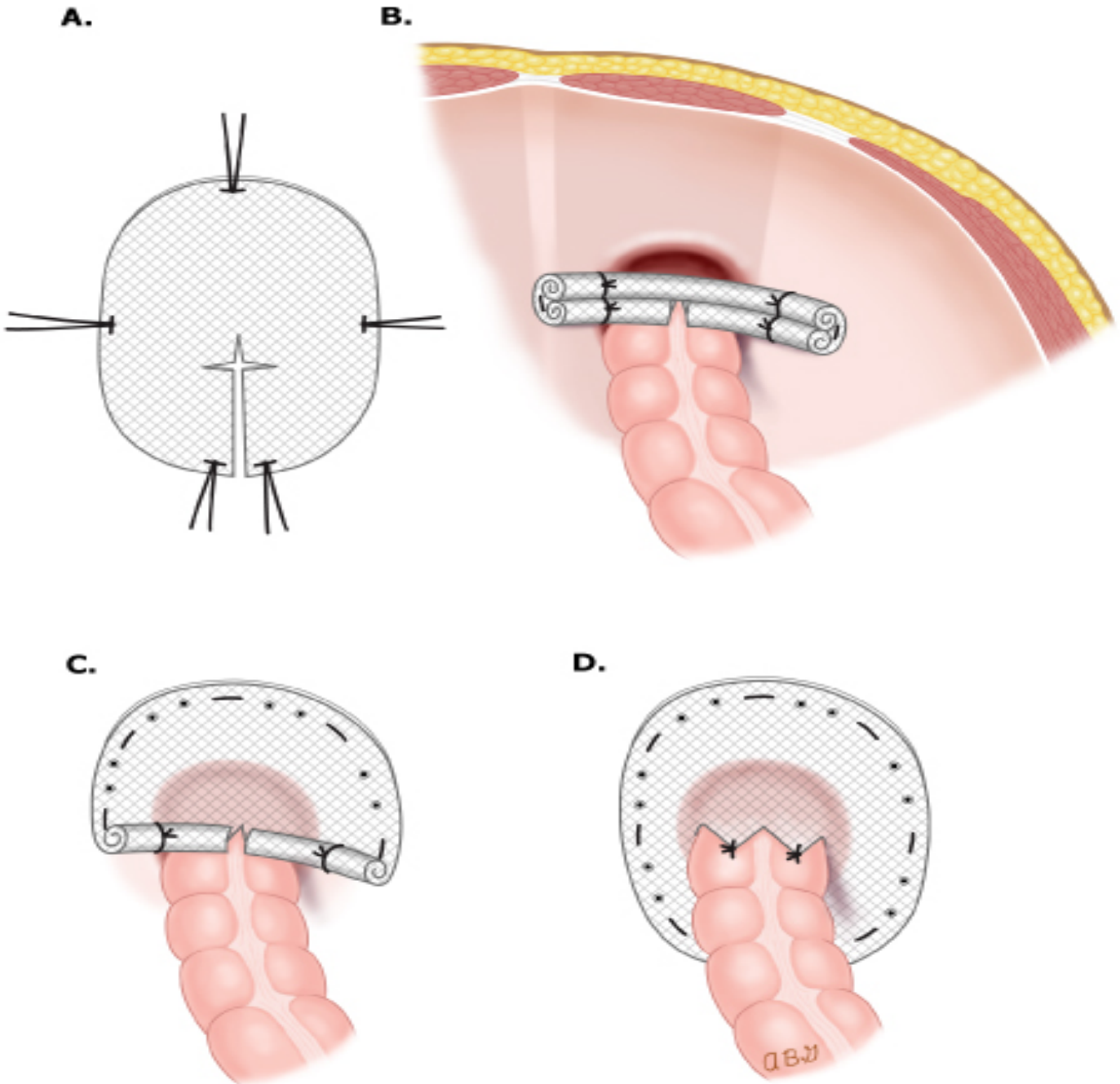
- One study evaluated patients with permanent colostomies and found that no patient with an abdominal wall opening ≤25 mm developed a PSH at a median follow-up of 26 months, further supporting the concept that a smaller trephine is less likely to lead to PSH .

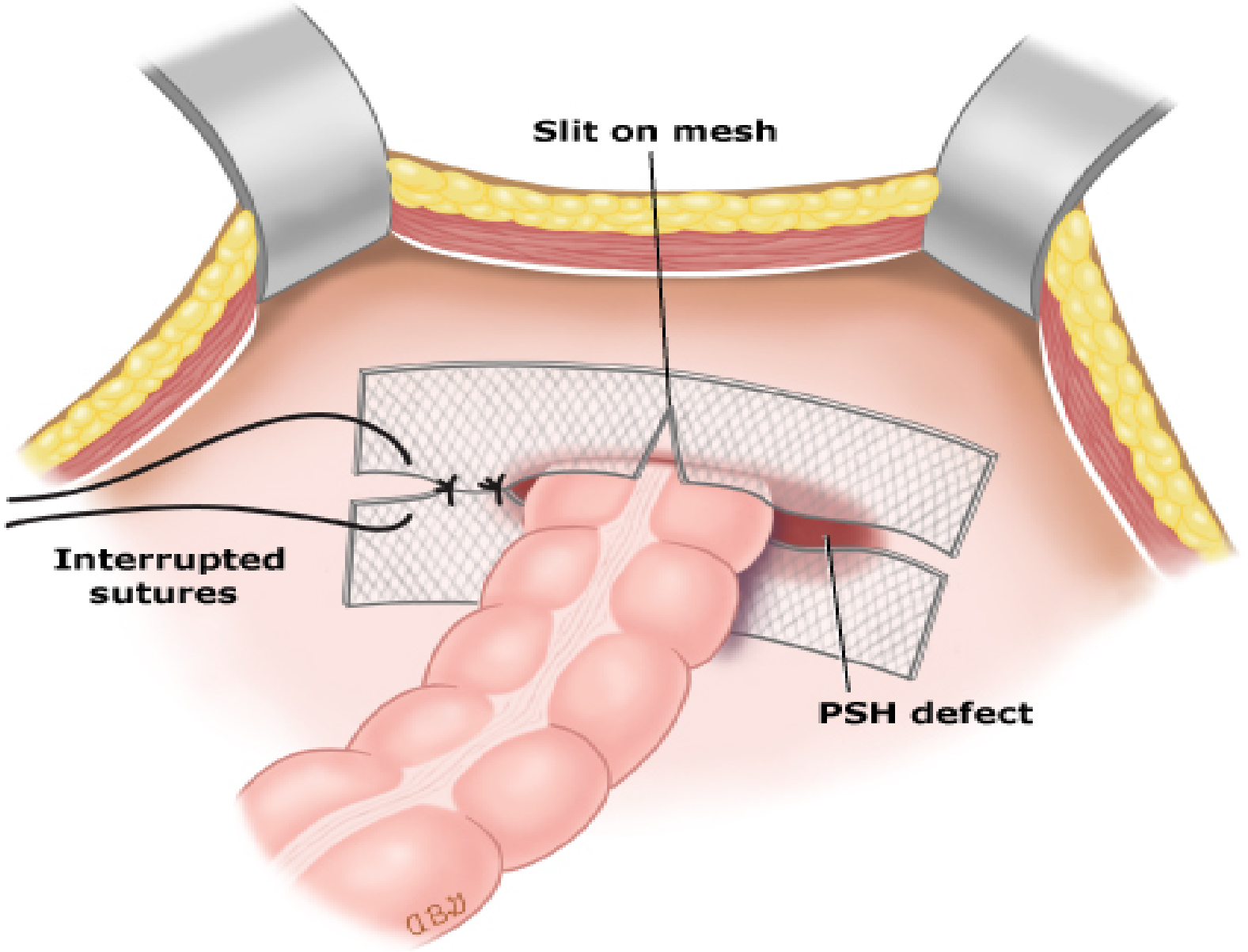
PREVENTION

- **Strategy** :

- Modifying risk factors for PSH formation prior to surgery
- Better primary stomal construction techniques to strengthen the abdominal wall

- The first data on prevention of PSH came from a randomized trial in which 54 patients who required a colostomy following an abdominal perineal resection were randomly assigned to ostomy construction with or without sublay mesh .
- There were significantly fewer parastomal hernias in the mesh group (15 versus 41 percent) with no difference in complication rates. There were no episodes of mesh intolerance or the need to remove the mesh during the two year follow-up period.





- A number of other studies have similarly concluded that prophylactic mesh placement significantly reduces the incidence of PSH with few complications .

- Biologic mesh, rather than synthetic mesh, has also been used in fewer patients with limited follow-up, but with a reduced incidence in PSH formation .

- A cost analysis predicted that the use of prophylactic mesh to prevent PSH was overall less expensive and more effective compared with no mesh

CLINICAL MANIFESTATIONS

- Most common - Asymptomatic - do not require surgical repair. They typically present with a bulge at the site of or adjacent to the intestinal stoma, with or without pain .

- Symptoms
- mild abdominal discomfort, back pain, intermittent cramping, distention, nausea, vomiting, diarrhea, constipation, and a reducible hernia, to severe abdominal pain, fever, and an unreducible hernia, which can be signs of a life-threatening complication.

DIAGNOSIS

- Diagnosis is based upon characteristic findings of a parastomal hernia on physical examination.
- After removal of the appliance, the patient is examined in the standing position and asked to perform the Valsalva maneuver.
- A hernia and the paracolostomy or paraileostomy tissue can be identified by digital exploration .
- Diagnostic imaging to evaluate subclinical PSH in patients with a negative physical examination is unnecessary.

COMPLICATIONS REQUIRING SURGICAL INTERVENTION

- There is a low rate of life threatening complications associated with parastomal hernia (PSH)

- Patients with the following signs or symptoms can be repaired electively:
  - Increasing PSH size
  - Peristomal skin breakdown
  - Intermittent bowel obstructions
  - Stoma appliance dysfunction and leakage
  - Chronic back and/or abdominal pain related to the PSH
  - Psychological distress caused by any of the previous symptoms
  - Stoma dysfunction

NONSURGICAL MANAGEMENT

- Surgical repair is avoided in most patients with no or mild symptoms because of the high recurrence rates.

- Most patients with mild symptoms can be managed with an ostomy hernia belt.

- There is no ideal repair and all are associated with varying recurrence rates.

Surgical repair

- The techniques for repair of parastomal hernia (PSH) include
  - Relocation of the stoma
  - Direct repair of the fascial defect
  - Repair using a prosthetic mesh

- The overall success rate for a repair with mesh is relatively high compared with repair without mesh.

- However, a mesh repair is still associated with a local failure rate of 4 to 30 percent .

- Furthermore, complications such as contamination of the mesh and fistula formation, while very rare, can be devastating

Direct fascial repair with mesh

- In this technique, an incision is made in the abdominal wall well away from the stoma and a subcutaneous dissection along the rectus and oblique fascia is performed circumferentially around the stoma.

- The content of the hernia is reduced into the abdomen and abdominal wall defect is closed using a tension free mesh repair.

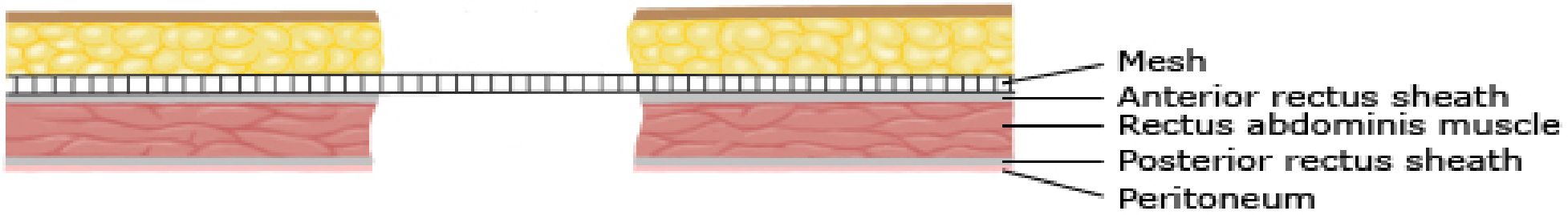
- The advantages of a direct fascial repair are: (1) that it avoids the need for a formal laparotomy and (2) it does not require relocation of the stoma.

- A disadvantage is that undermining the skin around the stoma risks ischemic injury to the skin, which can result in significant management problems with the stoma appliance. Furthermore, the risk of infection contaminating the mesh is higher than intraperitoneal placement of mesh

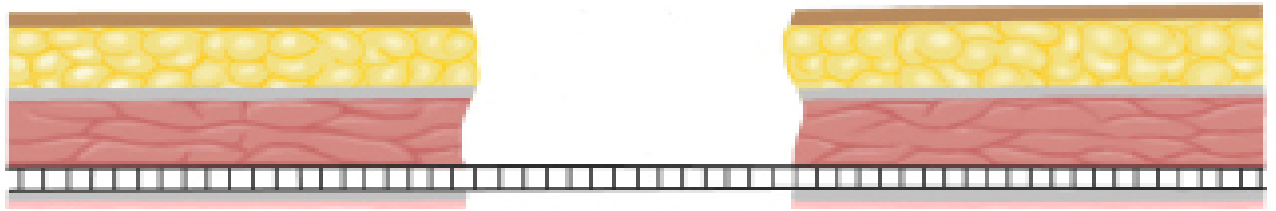
Intraabdominal repair with mesh

- most common approach
- Insertion of mesh into the abdominal wall defect (inlay technique) has been abandoned because of high failure rates.
- **The onlay technique** has the advantage of being technically a more straight forward repair and avoids a large intra-abdominal dissection. It is associated with a higher risk of contamination and sepsis than the sublay technique.
- **The sublay technique** has a higher risk of adhesions and intestinal obstruction .
- Identifying the best suited material for the mesh and establishing the best site for the placement of the mesh are the main problems with this technique. sublay technique is associated with fewer recurrences because intra-abdominal pressure does not dislocate the mesh from the repair .

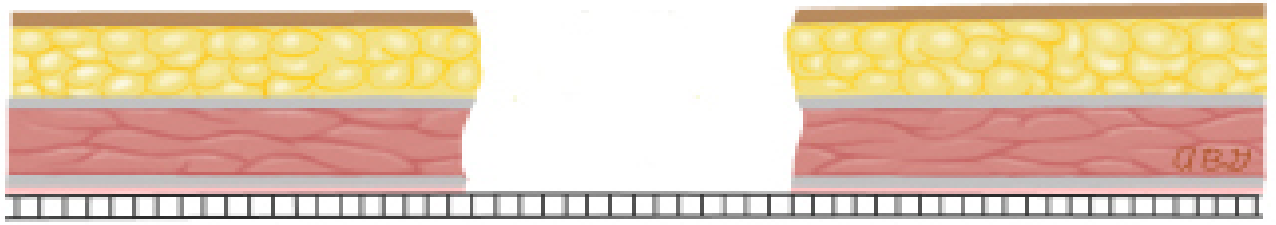
A. Onlay mesh

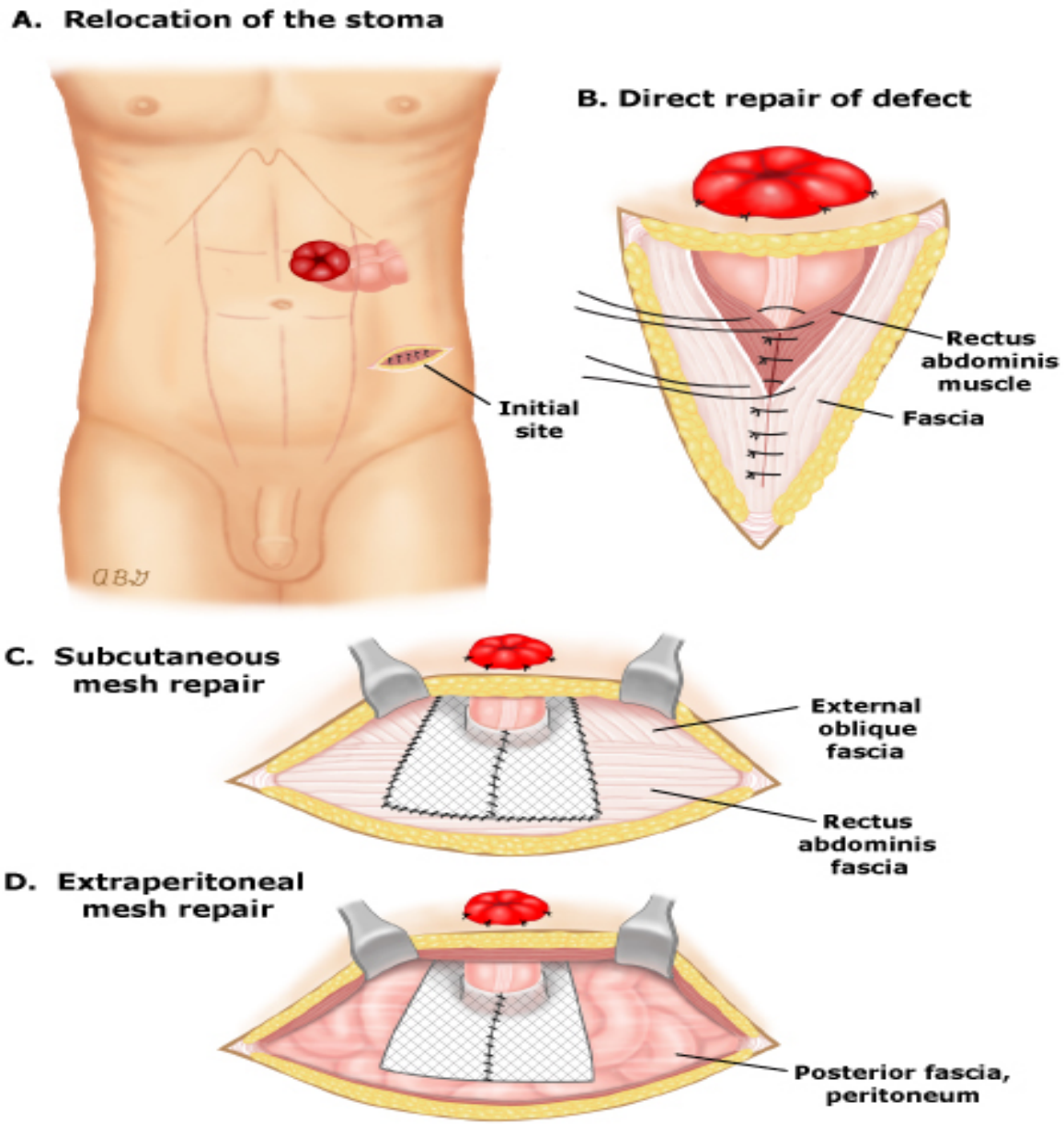


B. Sublay mesh



C. Intraperitoneal onlay mesh





- There are several variations on the technique to place the mesh.

- The common aspect of all of the approaches is the reduction of the hernia contents into the abdominal cavity and closure of the defect by securing a piece of mesh under the defect with wide overlap onto the normal abdominal wall.

- The loop of bowel forming the ostomy is either brought out directly through a defect in the mesh, the "key hole" technique, or around the mesh, similar to the extraperitoneal ostomy construction.

- The bowel loop exiting at the stoma site is secured to the lateral and anterior abdominal wall and then a large piece of mesh is attached to the anterior and lateral abdominal wall over this loop of bowel, excluding all other bowel loops from contacting or protruding through the abdominal wall at the trephine for the stoma.

Laparoscopic mesh repair

- The **Sugarbaker technique and modifications**
- avoids the need for making apertures in the mesh, which make laparoscopic placement more difficult .
- Short-term results are promising (recurrence rate less than 2 percent) , but longer term results (more than 24 months) are not available

- There is very little data to determine which patients with PSH are best treated via a laparoscopic approach or an open approach.
- Based upon the experience with midline incisional hernias, a laparoscopic approach is best offered in patient with a smaller (<8 to 12 cm) hernia.
- Laparoscopic repair is also best reserved for when the surgeon does not anticipate extensive intestinal adhesions or extensive anterior peritoneal wall scarring from prior surgery .

Biologic substitutes for prosthetic mesh

- The most recent approach for PSH repair is use of biologic tissue instead of prosthetic mesh .
- it avoids the placement of synthetic material near the bowel
- cost thousands of dollars per piece.

- A review of four retrospective studies that included 57 patients with a PSH repaired with a biologic graft found a recurrence rate of 16 percent and wound complication rate of 26 percent .
- This is comparable to the failure rate of PSH repair using prosthetic mesh.

- While the data are limited regarding the use of biologic tissue substitutes for PSH, it should be considered in patients who are at especially high risk for synthetic mesh complications, such as inflammatory bowel disease patients

Relocation of the stoma

- This approach is to be generally avoided
- The local recurrence rate is approximately 36 percent (range 0 to 76 percent) and complication rates are as high as 88 percent .

Direct repair of the fascial defect

- A direct fascial repair involves reducing the size of the hernia defect by reapproximating the fascial edges of the trephine with permanent sutures.

- A direct local repair involves a dissection of the fascia at the site of the stoma. This approach can be performed at the local site externally or via a laparotomy incision or laparoscopically.

- It violates an important surgical tenet of successful tissue healing: no tension should be placed on the repair.

- Recurrence rates for a primary fascial repair are high, ranging from 30 to 76 percent