What we will be discussing

- Election results!
- Stoma construction/common care issues
- Stomal and parastomal complications
- Treatment of stomal and parastomal complications
- Nutrition and wound healing

Election results.....Who won?
The stoma

- A stoma is a surgically created diversion for urine or stool.
- To make the stoma a part of the bowel is brought up to the surface of the skin on the abdomen.
- Stoma is the Greek word for mouth, Os is the Latin word for mouth.

Types of stomas

- End stoma: the surgeon folds the bowel back and attaches it to the abdomen.
- Loop stoma: a part of the bowel is brought up and a bridge is placed under it.
- Double barrel stoma: involves the stoma and the mucous fistula.

An End Stoma
Loop colostomy

- A loop colostomy is formed when a part of the bowel is brought up through the abdomen
- A bridge is usually placed under the loop
- The bridge may be a red robin catheter or a commercial product

Loop colostomies are usually done in the transverse bowel

Two stomas or double barrel

- One stoma is functional, stool comes out of this stoma
- The other stoma is a mucous fistula and is non-functioning
- More often seen in babies than adults
A patient with a urostomy is more at risk for infections because the urine can flow back into the kidneys. They need to drink lots of water. They need to attach their appliance to a foley bag at night.
Adaptors

- To hook the foley bag up to the urostomy you need an adaptor.
- The type of adaptor you need depends on the type of pouch you have.
- They are not universal.

Using a urostomy pouch with an ileostomy

Stoma sizing

- Use a stoma guide to measure round, regular shaped stomas.
- For irregular or oval shaped stomas you will need to make a template.
Barrier rings or seals are used to help prevent leakage and protect against drainage.

Stomahesive paste is like caulking and is used just around the stoma or opening in the wafer.

Paste that is too far from stoma.
When to empty the pouch

- Empty the pouch when it is ½ to 2/3 full. You do not want a big explosion!
- Teach patients to empty in the toilet.
- Put toilet paper in the toilet prior to emptying.
- If the appliance is leaking, it needs to be changed right away.

Gas......

- Patients self conscious about gas.
- The pouch should not smell because the system is odor proof.
- A two piece system can be burped.
- Many bags now come with charcoal filters which may need to be covered with a sticker when showering.
- The filters do not work with ileostomies.

Diarrhea

- Patients with an ostomy especially an ileostomy can develop diarrhea.
- They need to be careful not to become dehydrated.
- Management of diarrhea with fluid replacement: OTC antidiarrheal meds.
- Teach ileostomy patients to drink a glass of fluid every time they empty their pouch.
- Foods such as white rice, applesauce, bananas, peanut butter, yogurt, bread, cheese, potatoes and pasta help thicken stool.
Diet Considerations for Ileostomies

- No foods high in insoluble fiber for first 6 weeks after surgery.
- High fiber foods include popcorn, nuts, stringy veggies, coconut, corn, olives, mushrooms, meat casings.
- Introduce high fiber foods slowly and chew thoroughly and drink plenty of fluids.

Activities

- Patients can resume their normal activities including sexual activities once they have recovered from surgery.
- Don't assume the doctor will talk to the patient about sex.

Sexuality

- Sexuality and intimacy are among the greatest concerns for people with ostomies.
- Sexual function and intimate relationships important factors to quality of life.
**What to tell patients about sex**

- It is okay to have sex when you feel up to it.
- Empty bag prior to sex
- Closed end bags may be appropriate for intimate moments.
- Crotch less panties for ladies if they do not want appliance to show.
- Stoma cannot be used for anal sex.

**Stomal and peri stomal assessment**

- A stoma should be red, shiny and moist.
- It does not have nerve endings but has a good blood supply and will bleed easily.
- The skin around the stoma should look normal.

**Assessing the stoma**

- **Color and turgor of the stoma**
  - The stoma should be red and moist.
  - A pale pink may indicate low hemoglobin
  - Dark red may indicate bruising, or ischemia
Stoma assessment

- Stomal height, location, and construction can all affect wear time.
- Os location
  - An os that is level with the skin surface or points downward can cause leakage.
- Stomal height
  - A stoma that is at or below skin level can cause pouching problems because a good seal is more difficult to obtain.
- Location of the stoma
  - Proximity to the incision, waistline, abdominal folds or creases.

Post-op assessment of the mucocutaneous suture line

- Any separation at the suture line

Intact and healthy peristomal skin

- Skin damage such as erythema, maceration, denudation, rash, ulceration, or blisters should not be evident.

Stomal complications

- A stomal prolapse occurs when the bowel telescopes out.
- It will not resolve spontaneously.
- It can be repaired surgically or left as is.
- Nu Hope hernia belt has a prolapse overbelt.
Parastomal hernias

- Parastomal hernias are the most frequent stomal complication following construction of a colostomy or an ileostomy, occurring in up to 50% of patients.
- A parastomal hernia is a type of incisional hernia that allows protrusion of abdominal contents through the abdominal wall defect created during ostomy formation.
- Surgical repair is usually avoided since hernia may recur.
- Urgent or emergent surgical repair is necessary for patients with a bowel obstruction from an incarcerated hernia because of risk of bowel ischemia.

Hernia

- Hernia belts are available from Nu-Hope.

Measuring for a Nu Hope Belt

- Nu Hope has a guide available online for hernia belt measurement. It is available with prolapse support.
- Measure standing and laying down.
- Measure size of hernia, capture ¾ of the hernia.
- Nu Hope flat panel support belt is for reducible hernia.
- Nu-Form support belt for non-reducible hernias.
Necrosis of the stoma

- Notify MD
- If there is viable tissue, necrotic area will usually spontaneously slough off.

Mucocutaneous separation

- Separation of skin from stoma.
- If opening is extensive fill area with calcium alginate or hydrofiber.
- If small use stomahesive powder.
- Cover with barrier.
Wound near a stoma
- The wound needs to be protected from the stool.
- This wound was managed with a wound VAC.

Stoma near a skin fold or in a skin fold
- Use flexible one piece ostomy appliance.
- May need flexible convexity with a belt.

Management of a flat or retracted stoma
- Often convexity is used for a flat or retracted stoma.
- Fill small defects with paste, paste strips or barrier rings.
- If stoma is flat you want to make sure your barrier products are flat at stoma border to create a ramp not a retaining wall.
Convexity wafers

- Wafer is curved not flat
- Convatec And Hollister have moldable convexity which can be shaped to fit around the stoma rather than cut
- Moldable work best with budded stoma
- Some companies such as Coloplast make flexible convex appliances usually one piece.

Which stoma needs convexity?
Ostomy belts

- Belts provide support at 3 and 9 o’clock and are useful for patients with a skin level or retracted stoma or a stoma in a skin fold.
- Used with convex barriers

Skin complications

Irritant contact dermatitis

- The stool from the ileum or ascending colon can be very irritating to the skin.
- Change appliance immediately if any sign of leakage

Treatment for irritant dermatitis

- Use stomahesive powder to treat the denuded peristomal skin
- After applying the powder to the excoriated skin, blot or spray over powder with “no sting” skin sealant
Peristomal yeast rash (candidiasis)

- People with stomas are prone to yeast rashes because the area is warm and moist and usually covered.
- Treat with an anti fungal powder & skin sealant.

Allergic contact dermatitis

- May be caused by any of the products in the ostomy system.
- May do a patch test.
- Eliminate any unnecessary products.

Folliculitis

- Inflammation at base of hairs.
- Shave or clip hairs in peristomal area.
- Gentle pouch removal.
Pyoderma gangrenosum is often associated with autoimmune diseases. Classic PG is characterized by deep ulcerations that are painful. Classic PG may occur around stoma sites; this type is known as peristomal PG. Pyoderma gangrenosum is a diagnosis of exclusion because no specific criteria have been determined to confirm the diagnosis. All other potential causes of similar lesions must be excluded prior to making the diagnosis.

Pseudoverrucous lesions

- Hyperplasia (wart-like lesions) caused by chronic exposure to urine or feces
- Adjust opening in barrier for proper fit
- Change appliance at first sign of leakage
Diagnosis and Treatment

Diagnosis
- A. Irritant Dermatitis
- B. Contact dermatitis
- C. Yeast Rash
- D. None of the above

Treatment
- A. Prevent leakage of stool with barrier ring, possible convexity, belt.
- B. Treat with stomahesive powder
- C. Use a new barrier product
- D. Treat with an antifungal powder
Diagnosis
- A. Retracted stoma
- B. Sink hole stoma
- C. Mucocutaneous separation

Treatment
- A. 2 piece rigid convexity with a belt
- B. Barrier ring
- C. Flexible one piece convexity with a belt
- D. Flat one piece appliance

Hint pt has satellite lesions

Diagnosis
- A. Irritant Dermatitis
- B. Contact dermatitis
- C. Yeast Rash
- D. Slough @ mucocutaneous border

Treatment
- A. Don’t debride slough
- B. Treat with stomadhesive powder and skin sealant
- C. Debride slough
- D. Treat with an antifungal powder and skin sealant
Diagnosis
A. Ostomy care ignorance
B. Irritant Dermatitis caused by exposure to stool
C. Yeast Rash
D. Contact Dermatitis

Treatment
A. Create a template to cut ostomy appliance to fit
B. Treat with stomahesive powder and skin sealant
C. Use a new product
D. Treat with an antifungal powder and skin sealant
Diagnosis
- A. Ostomy care ignorance
- B. Irritant dermatitis caused by exposure to stool
- C. Yeast rash and irritant dermatitis caused by exposure to stool
- D. Contact dermatitis

Treatment options
A. Use your common sense and remove release paper before applying ostomy appliance
B. Treat with stomahesive powder and skin sealant
C. Use a new product
D. Treat with an antifungal powder and skin sealant
Diagnosis
A. Retracted stoma
B. Viable stoma
C. Mucocutaneous separation
D. Necrotic stoma

Treatment
A. Don’t notify MD since stoma is viable
B. Notify MD
C. Debride necrosis
D. Allow necrotic area to slough off

Pt was from Kaiser and transferred to Sutter

Diagnosis
A. Patient is elderly
B. Double barrel stoma
C. Loop colostomy
D. Mucocutaneous separation

Treatment
A. Pack separated area with an alginate
B. Cut ostomy barrier so separated area is exposed
C. Cut barrier so separated area is not exposed
Pt has Crohn's disease

- Diagnosis
  - A. Pyoderma gangrenosum
  - B. Irritant Dermatitis
  - C. Pressure ulcer from ostomy appliance
  - D. Parastomal hernia

- Treatment:
  - A. Biopsy
  - B. Topical treatment such as hydrofera blue or calcium alginate, hydrofiber
  - C. One piece flat appliance
  - D. 2 piece flexible moldable convex appliance
Pt was not experiencing leakage

- **Diagnosis**
  - A. Irritant Dermatitis
  - B. Yeast Rash
  - C. Contact dermatitis
  - D. Hernia

- **Treatment:**
  - A. Change brand of ostomy appliance
  - B. Obtain Nu hope hernia belt
  - C. Treat with steroidal powder
  - D. Treat with stomahesive powder
Diagnosis:
- A. Os points downward
- B. Irritant dermatitis
- C. Contact dermatitis
- D. Fungal rash

Treatment:
- A. Barrier ring
- B. Flexible convexity
- C. Ostomy belt
- D. Stomahesive powder

Diagnosis:
- A. Best looking stoma in presentation so far
- B. Budded stoma
- C. Intact peristomal skin
- D. Fresh post op stoma

Treatment:
- A. Flat wafer
- B. One or two piece
- C. Stomahesive powder
The role of nutrition in wound healing may be overlooked in the wound care patient. Suboptimal nutrition can alter immune function, collagen synthesis, and wound tensile strength. It is also important to remember that not all wounds are equal: a burn is different from a diabetic foot ulcer, which is different from a pressure ulcer.

Chronic wounds are characterized by a prolonged inflammatory response with low levels of growth factors and an increased bioburden on the wound. Malnutrition is a common contributor to wound chronicity. Nutrition should be considered in wound prevention (e.g., pressure ulcers in hospitalized patients) and wound preparation (e.g., presurgical assessment), as well as in the treatment of acute and chronic wounds.
Malnutrition

- Malnutrition includes inadequate intake, overconsumption, and specific nutrient deficits.
- Risk factors for malnutrition include poor appetite, inability to feed oneself, impaired sense of taste and smell, or simply inadequate or excessive intake of calories, protein, fluid, or micronutrients.
- The elderly are disproportionately burdened with risk of nutritional deficiency.
- Clinical markers of malnutrition include significant weight loss, loss of subcutaneous fat, localized or generalized fluid accumulation, and reduced grip strengths.
- Extremes in body mass index (BMI, low or high) should increase suspicion for malnutrition.

Diagnostic markers of malnutrition

- Unfortunately, diagnostic markers of malnutrition remain elusive, particularly in the chronic inflammatory state of chronic wound healing.
- Albumin, prealbumin, transferrin, have all been evaluated, but have not been validated for use in patients with chronic inflammation.
- In addition to malnutrition, other factors affect albumin levels.

Nutritional Assessment

- One of the most published tools in assessing malnutrition in the elderly is the Mini Nutritional Assessment (MNA) (Nestlé Nutrition Institute, Lausanne, Switzerland) which has since been shown to be useful across varying demographics.
- The MNA incorporates food intake and weight loss patterns, mobility, along with current BMI or calf circumference to determine risk of malnutrition or malnourished status.
Protein-calorie Malnutrition

- Overall, nutrition in wound healing must provide adequate support for an increased energy demand during the wound healing process. Caloric needs during wound healing are estimated at 30–35 kcal/kg, or up to 40 kcal/kg if the patient is underweight, but may need to be individualized based on age, comorbidities, body weight, activity level, stage of the healing process, and the severity, size, and number of wounds.
- Protein-calorie malnutrition (PCM) is a form of malnutrition with decreased calories and decreased protein content of diet, leading to deficient lean body mass (LBM).

CHO/FATS

- Carbohydrates stimulate insulin production, which is helpful in the anabolic processes of wound healing, particularly during the proliferative phase.
- However, hyperglycemia can reduce granulocyte function and increase infectious complications.
- Adequate fat intake in the patient with an acute or chronic wound can supply additional energy to the wound healing process, as well as structural functions including axonal myelination and lipid bilayers in cell membranes.

Protein

- Protein plays an essential role in all stages of wound healing.
- Protein supplies are essential to collagen synthesis, angiogenesis, fibroblast proliferation, immune function, tissue remodeling, wound contraction, and skin structural proteins.
- Protein deficiency results in impaired fibroblast proliferation and collagen synthesis during the proliferative phase of healing.
- One key role of protein is the maintenance of oncotic pressure, particularly in venous insufficiency wounds and edema.
Protein cont’d

- Also, as with fat intake, overall protein and calorie malnutrition may shunt protein reserves away from wound healing processes into other required functions, thereby slowing wound healing.
- The presence of a wound increases protein demand by up to 250% and caloric demand by up to 50% to maintain adequate LBM stores.
- Additionally, large quantities of protein can be lost through wound exudate.

Good source of protein for a diabetic patient

- Which of the following is a good source of protein for a diabetic patient:
  - A. Hawaiian shaved ice
  - B. Milk shake
  - C. Broiled chicken breast
  - D. Fried chicken from KFC

Fluid intake

- Apart from calories, another factor of malnutrition to consider in wound healing is fluid intake. The function of fluid in wound healing is to maintain skin turgor and promote tissue perfusion and oxygenation.
- Water serves as a diluent for glucose, waste removal, and micronutrients.
- Risk factors for dehydration should be evaluated in the wound patient including fever, diarrhea, vomiting, diuresis, fistulae, wound drainage, and poor intake.
Micronutrients

- Micronutrients must also be considered in the evaluation of the wound care patient including amino acids, vitamins, and minerals.
- Amino acids have also been implicated in the role of wound healing, in particular arginine and glutamine.
- Arginine is a conditionally essential amino acid, normally synthesized in the kidney and liver.
- Supplementation of arginine may be required in states of increased demand, including patients with sepsis, trauma, and wounds.

Arginine

- The role of arginine in wound healing is diverse.
- Arginine is a precursor for nitric oxide, which is essential in the inflammatory process of wound healing.
- Arginine is also a precursor of proline, which is necessary for the synthesis of collagen.
- Arginine supplementation was observed to increase collagen deposition in wounds.
- Recommendation for arginine supplementation is 4.5g/day in patients with venous leg ulcer or pressure ulcer & adequate protein intake.

Glutamine

- Glutamine, like arginine, is also conditionally essential and can be manufactured endogenously; but with increased demand and metabolic stress, supplementation may become necessary.
- In the process of wound healing, glutamine likewise has many roles to play.
- Glutamine decreases infectious complications and protects against inflammatory injury.
Glutamine supplementation

- Glutamine supplementation is controversial.
- In critical situations such as trauma, burns, and sepsis, glutamine has been shown to improve gut function, decrease septic complications, and improve insulin sensitivity.
- However, in the case of chronic wounds where the chronic inflammatory state is not present, the role of glutamine supplementation is less clear.
- In states of chronic malnutrition, however, its role in supplementation may be augmented due to intestinal mucosal atrophy, and overall muscle mass decrease leading to decreased glutamine stores, both leading to increased requirement of exogenous glutamine.

Research

- Like arginine, most studies regarding glutamine supplementation are confounded by the use of combination supplements.
- According to Molnar et al., glutamine supplementation is relatively safe in select patients with malnutrition, and the benefits of glutamine supplementation appear to be many.
- However, the researchers reiterate that glutamine and arginine should never be considered a substitute in the correction of PCM, and that without overall adequate protein intake supplementation is of no value.

Vitamins

- The role of vitamins in wound healing has been evaluated more extensively, particularly given the cofactor role of many vitamins in enzymatic processes related to wound healing.
- Vitamin A (retinoic acid) has been shown to be beneficial in wound healing regardless of deficiency status, with deficiency showing impairment in wound closure.
- Vitamin A has been used topically in management of dermatologic conditions due to its ability to stimulate epithelial growth, fibroblast, and ground substance.
- It has also been shown to have an anti-inflammatory effect in open wounds, increasing the number of monocytes and macrophages at the wound site early in the inflammatory phase and facilitating epithelial cell differentiation.
- Vitamin A 10,000-15,000 IU/day for 10-14 days.
Vitamin C

- The role of vitamin C in wound healing is believed to be due to an influence on collagen formation, immunomodulation, and antioxidant functions.
- Deficiency results in impaired immune response during the inflammatory phase with reduced collagen tensile strength and synthesis during the proliferative and remodeling phases, with risk of wound dehiscence.
- Supplementation in the deficient patient is clearly beneficial; however, the evidence supporting the use of vitamin C alone in the non-deficient patient has been inconclusive.

Vitamin D

- Vitamin D is a fairly new player to join the wound care supplementation repertoire; however, vitamin D deficiency has been shown to have increased incidence in patients with venous ulcers and pressure ulcers.

Zinc

- Zinc deficiency affects all phases of wound healing. In the inflammatory phase, there is decreased immunity and increased susceptibility to infections.
- In the proliferative phase, there is impaired collagen synthesis and tensile strength.
- Finally, in the remodeling phase, there is a dampening of fibroblast proliferation, collagen synthesis, and epithelialization.
- However, excess zinc supplementation can interfere with the absorption of other cations, specifically iron and copper.
- Therefore, supplementation should be avoided unless deficiency is present.
Zinc

- The most common causes of zinc deficiency include diarrhea, malabsorption, and hypermetabolic states including stress, sepsis, and burns.
- Measurement of zinc in the plasma is simple and readily available in many laboratories. A low plasma zinc usually is defined as a value less than 60 mcg/dL. Because most plasma zinc is bound to albumin, measured zinc levels will typically be reduced in patients with hypoalbuminemia.
- Recommendations for zinc supplementation in the zinc-deficient patient range from 40 mg/day up to 220 mg 2 times per day for 10-14 days.

Bottom line

- In conclusion, there are several roles for optimizing macronutrients and micronutrients in the management of patients with wounds; however, available data does not seem to support robust use.
- A review of multiple trials looking at the impact of supplementation of wound healing noted convincing evidence only exists for a protein and energy rich ONS (oral nutrient supplement) providing at least 500mg of Vitamin C, 17mg of Zinc, and 3gm of L-arginine in pressure ulcer therapy.
- The data supports evaluating the patients’ nutritional status and ensuring sufficient calories from a balanced diet of carbohydrates, fats, and protein, and supplementing protein, fluid, and vitamins A and C as needed.