WOC Complex Plan of Care

Name: __Kelsi Critzer_____ Date: _10/21/23_____

Pertinent Medical/Nursing History	Pertinent lab/diagnostic test results
21 m.o. female with no significant past medical history who presents as trauma alert (7/13/23) with multiple crush injuries after accident occurred where patient was backed over by father driving large machinery. Pt was initially brought to an outside hospital where a CT of the head and spine were obtained along with a CT of the abdomen. She was given morphine and antibiotics before being flown to current location. Pt lives with mother, father, and three older siblings. Department of Children and Family are involved due to the nature of the accident and fathers' involvement. Of note, mother is 8 months pregnant and remains at the bedside. No other family members present currently. Patient's injuries include posterior open pelvic fractures including fracture of right iliac, dislocated SI joint, ASIS, left iliac bone, left proximal femur fracture and concern for herniated bowel into L femoral ring. Hemoperitoneum present. She is s/p irrigation and debridement of pelvis, external fixation pelvis, fixation left femur, exploratory laparotomy, diverting end ileostomy, and perineal exam under anesthesia resulting in laceration repair with penrose drain placement with peds ortho and peds surgery. Patient arrived to PICU extubated but was reintubated for pain control and safety of bedside left eye laceration repair. Wounds have grown multiple organisms. Pt completed cefepime and flagyl for treatment of pseudomonas from the left anterior knee but required pulse lavage and debridement in the OR two days later due to green discharge from the wound. Wound vac was placed at that time. She was then placed on ciprofloxacin (started 7/29), fluconazole (started 8/10) and amoxicillin (started 8/10) for Pseudomonas, rare Candida Albicans and Enterococcus, respectively. Her treatment was extended until her surgery/removal of pins and discontinued on 8/22. Ortho ordered NWB BLE and to keep legs straight. Foley placed 07/23 and removed 07/26. Urology consulted. Required intermittent catheterization for a few weeks but has been spontaneously voiding for about a week without difficulty.	**CT Chest Abdomen Pelvis W IV Contrast** Final Result 1. Comminuted, complex fractures throughout the pelvis with traumatic herniation of the pelvic contents through the distracted left superior pubic ramus fractures. The herniation appears to contain bowel and bladder which extends into the left femoral region. Additional herniation is seen extending higher in the left lower abdominal wall. Delayed images would be of value to better assess bladder anatomy and evaluate for urinary extravasation. 2. Additional pelvic fractures are as detailed above. Of note there is dislocation of the right sacroiliac joint with an associated fracture and superior displacement of the iliac bone relative to the sacrum. 3. Evaluation of the pelvic fractures and associated soft tissue abnormality is complicated by motion artifact in this location. The artifact also limits assessment for active extravasation of contrast in the pelvis. Follow-up imaging with stabilization of the patient may be of value for preoperative planning. **COMPREHENSIVE METABOLIC PANEL - Abnormal** Sodium 140 Potassium 3.6 Chloride 111 (*) 98-107 mmol/L Carbon Dioxide 16.0 (*) 22-29 mmol/L Anion Gap 13 BUN 18.0 Creatinine <0.47 (*) 0.24-0.41 mg/dL BUN/Creatinine Ratio 33.3 (*) 7.3-21.7 Glucose 249 (*) 60-100 mg/dL Calcium 8.0 (*) 9-11 mg/dL AST 91 (*) 5-34 U/L ALT 80 (*) 6-55 U/L Alkaline Phosphatase 219 Protein, Total 4.2 (*) 5.6-7.5 g/dL Albumin 2.80 (*) 3.8-5.4 g/dL Globulin 1.4 A/G Ratio 2.0

Tube feeds started on 7/15 and advanced as tolerated to regular diet. She initially received NG feeds to supplement her nutrition, however her PO intake improved and NGT was removed on 8/18. On 7/30, ostomy was found to have discharge around the side of the stoma. When taken to the OR for wound debridement, fistula was found. No surgical intervention advised for fistula, will continue to drain into bag. GI consulted 8/21 to assist with care.

Pt recently underwent anorectal manometry by in September 2023. RAIR was present. Sensation at 15 to 20 mL, normal. Patient was able to push the balloon. Resting tone 20 mmHg. The results were reassuring anorectal mechanics appear functional. Findings of the anorectal manometry testing and further planning with general surgery were discussed. Plans for anastomosis and further discussion with the family are needed. General surgery will examine the rectum/anus possibly prior to anastomosis to ensure no fistula, no further procedures requested from GI standpoint. Ileostomy takedown is expected to occur by the end of the year pending follow up exams.

Bilirubin, Total <0.10
Osmolality Calc 281 (*) 261-280 mosm/kg

CBC W/AUTO DIFF, REFLEX MANUAL DIFF IF INDICATED - Abnormal
Result Value
WBC 43.01 (*) 3.6-10.0 10*/uL
RBC 2.74 (*) 4.2-6.10 10*6/uL
Hemoglobin 6.5 (*) 12-16 g/dL
Hematocrit 21.6 (*) 37-52%
MCV 78.8 (*) 80-100 fL
MCH 23.7 (*) 26-34 pg
MCHC 30.1 (*) 31-37 g/dL
RDW 16.0 (*) 11.5-13.5 %
Platelet Count 470 (*) 150-450 10*3/uL
MPV 9.4

MANUAL DIFFERENTIAL - Abnormal
Neutrophils % 22.0 (*) 40-85 %
Lymphocytes % 55.0 (*) 20-40 %
Monocytes % 0.0
Eosinophils % 0.0
Basophils % 0.0
Bands % 22.0 (*) 0.0-4.0 %
Metamyelocytes % 1.0 (*) 0.0%
Neutrophils Absolute 9.46 (*) 1.4-6.5 10*3/uL
Lymphocytes Absolute 23.66 (*) 1.2-3.4 10*3/uL
Monocytes Absolute 0.00 (*) 0.1-0.6 10*3/uL
Eosinophils Absolute 0.00 (*) 0.1-0.5 10*3/uL
Basophil Absolute 0.00
Bands Absolute 9.46
Neutrophils Absolute (Segs+Bands) 18.92 (*) 1.4-6.5 10*3/uL
Anisocytosis 1+ (*) none
Microcytes 1+ (*) none
Platelet Estimate Increased (*) adequate
WBC Morphology Normal
Platelet Morphology Normal

MICRO:

7/19 wound culture of the left leg: Growing *Pseudomonas aeruginosa* and *Enterobacter cloacae*.

7/19 anaerobic culture from left leg: Negative.

7/19 peripheral blood culture: Negative.

7/24 Intraop left hip wound fluid cultures: Negative.
7/28 Wound cx: *Pseudomonas aeruginosa*.
7/28 Blood cx: Negative.

7/30 Intraop left hip tissue cultures: Enterococcus faecalis

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	8/07 wound culture of the left leg: Growing Enterococcus faecalis and rare Candida albicans

Assessment	Plan/Interventions/Alternatives	Evaluation	Rationale
Braden Q Scale a) Sensory perception- 2 very limited b) Moisture- 3 occasionally moist c) Activity- 2 chairfast d) Mobility- 2 very limited e) Nutrition- 3 adequate f) Friction and shear-2 potential problem g) Tissue perfusion and oxygenation- 3 adequate Score: 17 Indication: patient at risk/ mild risk Support surface: standard crib with Z-flo positioners Height: 83.5 cm Weight: 11.7 kg BMI: 17	a) Establish a repositioning schedule, protect occiput from prolonged pressure and utilize Z-flo positioners to float heels. b) Utilize barrier wipes and barrier cream with each incontinent episode. Frequently monitor for urinary incontinence and mucus from rectal stump. c) Keep HOB below 30 degrees, use a transfer sheet to reposition in the bed, and assist pt with slight shifts frequently. d) Consult physical therapy to assist with mobility. Utilize a wagon due to patient's restrictions and equipment. e) Consultation to dietician and maintain caloric intake as prescribed (tube feeds). f) Use two people to reposition patient and avoid sliding their body across the bed during transfers. g) Monitor perfusion and	a) No new pressure injury development. b) No occurrence of incontinence associated skin damage noted. c) No new skin breakdown from prolonged pressure noted. d) Patient's mobility will improve once mobility restrictions are lifted. e) Patient will maintain weight and wounds will show improvement. f) Patient will have no shearing injuries from transfers. g) No DVT present in BLE.	a) The occiput is the boney prominence that has the highest risk of developing a pressure injury due to large boney surface and weight (Borchert, 2022). b) Moisture caused by stool or urine alters the pH of the skin compromising the tissue tolerance. The application of a barrier cream helps prevent the skins contact with urine and stool minimizing the damage caused to the skin by the irritants (Borchert, 2022). c) Keeping the head of the bed as low as possible or below 30 degrees minimizes soft tissue damage (Borchert, 2022). d) Early mobilization programs that increase mobility and activity improve patient outcomes (Borchert, 2022). e) Nutritional management is an important consideration of comprehensive care for pressure injury prevention and treatment (Borchert, 2022). f) Friction can result from a patient

	coloration of all extremities.		being pulled or dragged up in bed instead of being properly lifted (Borchert, 2022). g) Prolonged pressure can lead to occlusion of smaller vessels. Increased amounts of pressure can cause total occlusion of larger vessels. The reduction in blood flow can lead to tissue ischemia as the delivery of oxygen is compromised (Edsberg, 2022).
Assessment	**Plan/Interventions/Alternatives**	**Evaluation**	**Rationale**
Impaired tissue integrity related initial trauma and surgical interventions to wound and presence of infection. The left lateral leg presents with three open areas. All three open areas are clean and pink except for a very small amount of tan tissue noted to the proximal wound. The medial wound undermining is much improved today and there is no further communication with the distal wound. The proximal wound is the largest and is noted to have undermining at 1 and 9 o'clock and continues to communicate with the medial wound. Undermining is improving and the proximal wound appears	VAC therapy to left lateral thigh: NPWT with saline instillation at -125 mm Hg continuous, dressing change 2x weekly by WMST Foam: VAC VeraFlo-Medium Number of pieces of foam used at last dressing change: 3 Volume of saline instillation: 8 mL Soak time: 10 minutes Instillation frequency: every 2 hours Change canister weekly and as needed. Keep the VAC machine plugged in as much as possible. May	Wounds continue to approximate, and measurements continue to decrease without evidence of infection. Distal wound no longer communicates with medial and proximal leg wounds.	NPWT with installation and dwell element intermittently flushes and cleanses wound, which limits the wound's bioburden, augmenting antimicrobial action. This combination of negative pressure, instillation, and dwelling increases local blood flow, improves oxygenation, drains fluid, and stimulates deposition of granulation tissue (Crumbley & Andrew, 2022). It has been shown that NPWT with installation and dwell time with sterile normal saline has a positive wound healing trajectory with granulation tissue formation occurring within 7 days of therapy

shallower today. All open areas are clean with no hardware exposed. Will continue to use the VAC with saline instillation to expedite granulation tissue. Black instillation foam was used to gently fill all open and undermined areas. The medial and proximal wounds were connected with foam over the intact skin bridge. The distal wound is much smaller today and no longer communicates with the other two wounds. This wound was not included in the VAC dressing. A good seal was achieved at -125 mm Hg continuous. 8 mL was saline was used for instillation. The periwound skin is improved today and is pink with no further pustules. The patient remains on antibiotics and Diflucan. The distal wound was gently filled with Aquacel Ag and covered with a Mepilex Ag border dressing. All three wounds were measured: Proximal wound: 5.5 cm L X 4.5 cm W X 1 cm D, undermining	disconnect machine for transport but should be reconnected once at the destination. If therapy remains disconnected for greater than 2 hours, remove entire dressing and place Vashe moistened gauze in each wound. If flowing bright red blood is noted the tubing, turn the VAC off, apply pressure to the wound and call the doctor immediately. Cleanse wound and periwound skin with Vashe after each dressing removal, allow Vashe soaked gauze to act as a compress for each wound for at least 30 seconds. Protect periwound skin with No-Sting Barrier Film Wipes prior to NPWT application. Ensure outpatient wound clinic appointment is scheduled for 1 week after discharge. Educate family on importance of following up with outpatient clinic and being compliant with at home wound care.	Patient's periwound skin will remain intact with no sign of breakdown. Patient will not be readmitted to hospital with complication of wound. Wound continues to decrease in size	use. It was also found that hospital stay and visits to the operating room were decreased with this therapy versus NPWT alone (Crumbley & Andrew, 2022).

at 1 and 9 o'clock up to 1 cm D Medial wound: 3 cm L X 1.9 cm W X 0.2 cm D, undermining at 1 and 9 o'clock up to 0.4 cm Distal wound: 1.5 cm L X 0.33 cm W X 0.2 cm D Previous assessment and measurements for comparison prior to initiating instillation therapy: The proximal wound is the largest and is noted to have undermining from 12-6 o'clock up to 2.5 cm. The proximal wound communicates with the medial wound at 7-8 o'clock. The medial wound communicates with the proximal wound at 1-2 o'clock and at 5 o'clock with the distal wound. The medial wound undermines at 6 o'clock up to 2.5 cm and from 8-12 o'clock up to 1.4 cm. The distal wound is noted to communicate with the medial wound at 11 o'clock. Proximal wound: 6.5 cm L X 5 cm W X 2 cm D, connects to the medial wound at 7-8 o'clock, undermining 12-6 up to 2.5 cm D	Since the wound no longer communicates with the other wounds, inclusion in the NPWT in no longer necessary. Wound has contracted significantly and is nearly resurfaced. A small piece of Aquacell Ag was placed in the distal wound and secured with a Mepilex Ag. Alternatives: Traditional NPWT Gentle packing of wounds with hydrofiber dressing with impregnated silver secured with an ABD pad and tape. This would require more frequent dressing changes and additional labor. Additionally, this would be much easier for the patient to remove.		

Medial wound: 4 cm L X 2.5 cm W X 0.9 cm D, undermining at 6 o'clock up to 2.5 cm and from 8-12 o'clock up to 1.4 cm. Distal wound: 2.2 cm L X 1.1 cm W X 1 cm D			

References:

Borchert, K. (2022). Pressure injury prevention: Implementing and maintaining a successful plan and program. In L. L. McNichol, C. R. Ratliffe, & S. S. Yates (Eds.), *Wound, Ostomy, and Continence Nurses Society core curriculum: Wound Management* (2nd ed., pp. 396-424). Wolters Kluwer.

Crumbley, D. R., & Andrew, L. E. (2022). Traumatic wounds assessment and management. In L. L. McNichol, C. R. Ratliffe, & S. S. Yates (Eds.), *Wound, Ostomy, and Continence Nurses Society core curriculum: Wound Management* (2nd ed., pp. 723-737). Wolters Kluwer.

Edsberg, L. (2022). Pressure and shear injuries. In L. L. McNichol, C. R. Ratliffe, & S. S. Yates (Eds.), *Wound, Ostomy, and Continence Nurses Society core curriculum: Wound Management* (2nd ed., pp. 373-395). Wolters Kluwer.

Assessment	Plan/Interventions/Alternatives	Evaluation	Rationale
Presence of ileostomy:	Involve family members as pt is dependent on them for completion	No peristomal skin breakdown noted when pouch is changed.	Ileostomy teaching for toddlers is focused on the parent, the child

End ileostomy located in the RLQ. Stoma is 1", pink, moist, and prolapsed. Liquid yellow stool and gas noted in pouch prior to removal. A fistula is noted at 1 o'clock. The peristomal skin directly adjacent to the fistula site is pink and denuded but otherwise unremarkable. Mother states pt constantly scratches around the pouching system and has recently began pulling the pouch off. Mother is competent in pouch changes and emptying pouch, she states she has no concerns.	of care. Arrange for outpatient ostomy follow up post discharge to assess wounds/continue ostomy teaching. The redness was treated with Stomahesive Powder and Marathon skin protectant. Eakin and wafer cut wide to accommodate the fistula. Ileostomy care: Hollister 1-piece peds, Eakin dough, Stomahesive Powder, No Sting Barrier Film, scissors 1. gather supplies and cut wafer to size 2. gently remove the old pouch, may use the adhesive releaser spray 3. cleanse skin with warm water only, dry thoroughly 4. dust any reddened/open areas with Stomahesive powder, then dab/spray with No Sting Barrier Film to form a protective crust. 5. place a ribbon of Eakin dough on the skin, around and snug to the stoma. 6. apply the wafer/pouch 7. cover the pouch with hand for at least 2 minutes to better activate adhesive	Patient will not be readmitted to the hospital for complications related to ileostomy. Pt mother states pouching system remained intact without leakage since last changed. Typically, 2-3 days wear time unless patient pulls pouching system off.	may be included but the parent should be changing the pouch (Baker, et al, 2022). Typically wear time of pouching system is between 24 hours and 5 days (Baker, et al, 2022). Peristomal skin should be kept clean, dry, and intact. The skin should be free of rashes and denuded skin by containing stool output appropriately (Baker, et al, 2022).

	8. Connect adaptor to open spout of urostomy bag and urinary drainage bag Alternatives: Hollister Pouchkins 2-piece lock n'roll closure with flat wafer and an ostomy belt to help secure pouching system.	Patient gets increased wear time of pouching system.	As patient becomes more mobile and active, dislodgement of pouching system is common. Pediatric ostomy belts may be beneficial due to the added securement (Baker, et al, 2022).

References:

Baker, C., Phearman, L., & McIltrot, K. (2022). Assessment and management of the pediatric patient. In J. Carmel, J. Colwell, & M. T. Goldberg (Eds.), *Wound, Ostomy, and Continence Nurses Society core curriculum: Ostomy management* (2nd ed., pp. 223-249). Wolters Kluwer.

Assessment	Plan/Interventions/Alternatives	Evaluation	Rationale

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Potential for urinary retention secondary to removal of indwelling urinary catheter history of pelvic trauma, and history of urinary retention requiring intermittent catheterization.	<u>Initially, when patient was not voiding:</u> Intermittent catheterizations q4-6 hours to ensure complete bladder emptying. Obtain a UA via straight catheterization to rule out infection as potential etiology of retention. <u>Patient began spontaneously voiding:</u> Educate mother on intermittent catheterization if no wet diapers are noted after 6 hours. Measure voided/catheterized amounts of urine and document until follow-up with urologist. Educate mother on the importance of establishing patient with outpatient urology. appointment to follow-up on urologic concerns Alternative: Initially check PVR using sterile catheterization to assess if bladder is emptying completely.	Mother performs ISC using sterile catheter and clean technique four times a day. UA negative Correctly notes volume of urine voided/obtained from catheterization. Correct implementation of intermittent catheterization of patient following absence of wet diapers during 6-hour period. Patient will not be readmitted to the hospital with urologic complications.	Intermittent catheterization allows the bladder to fill and then be emptied mimicking normal bladder functioning which in turn reduces the risk of infection (Newman, 2022). Intermittent catheterization is the preferred method of urinary drainage with acute urinary retention, this method maintains renal function by removing urine thus reducing bladder pressure until spontaneous voiding occurs (Newman, 2022).

References:

Newman, D.K. (2022). Indwelling and intermittent urinary catheterization. In J.M. Ermer-Seltun, & S. Engberg (Eds.), *Wound, Ostomy, and Continence Nurses Society core curriculum: Continence management* (2nd ed., pp. 405-432). Wolters Kluwer.

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Intensity and Duration of Pressure					Score
Mobility – Ability to change & control body position	**1. Completely Immobile** Does not make even slight changes in body or extremity position without assistance	**2. Very Limited** Makes occasional slight changes in body or extremity position but unable to completely turn self independently	**3. Slightly Limited** Makes frequent though slight changes in body or extremity position independently	**4. No Limitation** Makes major and frequent changes in position without assistance	2
Activity – The degree of physical activity	**1. Bedfast** Confined to bed	**2. Chair Fast** Ability to walk severely limited or non-existent. Cannot bear own weight &/or must be assisted into chair	**3. Walks Occasionally** Walks occasionally during day but for very short distances with or without assistance. Spends majority of each shift in bed or chair	**4. All patients too young to ambulate *OR* walks frequently** Walks outside the room at least twice daily and inside room at least once every 2 hours during waking hours	2
Sensory Perception – The ability to respond in a developmentally appropriate way to pressure related discomfort	**1. Completely Limited** Unresponsive to painful stimuli due to diminished level of consciousness or sedation **OR** limited ability to feel pain over most of body surface	**2. Very Limited** Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness **OR** has sensory impairment which limits the ability to feel pain or discomfort over half of body	**3. Slightly Limited** Responds to verbal commands but cannot always communicate discomfort or need to be turned **OR** has sensory impairment which limits the ability to feel pain or discomfort in 1 or 2 extremities	**4. No Impairment** Responds to verbal commands. Has no sensory deficit, which limits ability to feel or communicate pain or discomfort	2
Tolerance of the Skin and Supporting Structure					
Moisture – Degree to which skin is exposed to moisture	**1. Constantly Moist** Skin is kept moist almost constantly by perspiration, urine, drainage, etc. Dampness is detected every time patient is moved or turned	**2. Very Moist** Skin is often, but not always moist. Linen must be changed at least every 8 hours	**3. Occasionally Moist** Skin is occasionally moist, requiring linen change every 12 hours	**4. Rarely Moist** Skin is usually dry, routine nappy changes, linen only requires changing every 24 hours.	3
Friction – Shear *Friction* – occurs when skin moves against support surfaces. *Shear* – occurs when skin and adjacent bony surface slide across one another.	**1. Significant Problem** Spasticity, contracture, itching or agitation leads to almost constant thrashing and friction	**2. Problem** Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance.	**3. Potential Problem** Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relative good position in chair or bed most of the time but occasionally slides down.	**4. No Apparent Problem** Able to completely lift patient during a position change. Moves in bed and chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.	2
Nutrition	**1. Very Poor** NBM &/or maintained on clear fluids, or IV's for more than 5 days **OR** albumin < 25mg/l	**2. Inadequate** Is on liquid diet or tube feedings/TPN which provide inadequate calories and minerals for age **OR** albumin < 30mg/l	**3. Adequate** Is on tube feedings or TPN which provide adequate calories and minerals for age	**4. Excellent** Is on a normal diet providing adequate calories for age. Does not require supplementation	3
Tissue Perfusion and Oxygenation	**1. Extremely Compromised** Hypotensive (MAP < 50mmHg; < 40mmHg newborn) **OR** the patient does not physiologically tolerate position changes	**2. Compromised** Normotensive; Oxygen saturation may be < 95% **OR** haemoglobin may be < 100mg/l **OR** capillary refill may be > 2 seconds; Serum pH is < 7.40	**3. Adequate** Normotensive; Oxygen saturation may be < 95% **OR** haemoglobin may be < 100mg/l **OR** capillary refill may be > 2 seconds; Serum pH is normal	**4. Excellent** Normotensive; Oxygen saturation >95%; normal haemoglobin; & capillary refill < 2 seconds	3

Patient 'At Risk' / Mild Risk	'Moderate Risk'	'High Risk'	'Very High Risk'
16 - 23	13 – 15	10 - 12	9 or below

Score: 17