Title:	**NPWT Negative Pressure Wound Therapy for Wounds in Adults**	 Tracking Checklist 2016.dotx
Manual:	Clinical	
Section:	Patient Safety	
Approval Body:	SLT Final – COO, CNE, EVP	

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Cross References:	Risk Assessment and Prevention of Pressure Ulcers, Consent to treatment, Assessment and Management of Stage I to IV Pressure Ulcer, Hand Hygiene, Personal Protective Equipment, Workplace Hazard: Recognition, Rating and Control		
Key Words:	negative pressure dressing, negative pressure wound therapy, therapy, wound management		

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POLICY:

NPWT - The purpose of this document is to standardize the management of wounds where Negative Pressure Wound Therapy (NPWT) isindicated and to ensure safe initiation and maintenance of NPWT according to best practice guidelines. These guidelines will be followed by all health care staff providing wound care.

DEFINITION(S):

Flap: Is a unit of tissue that is transferred from one site (donor site) to another (recipient site) while maintaining its own blood supply. A flap is transferred with its blood supply intact.

Graft: Is a unit of tissue that is transferred from one site (donor site) to another (recipient site) without its own blood supply. Therefore, survival of the graft depends entirely on the blood supply from the recipient site.

Negative pressure wound therapy(NPWT): applies controlled subatmospheric pressure to mechanically stress the tissues to remove exudate and reduce periwound edema, increase local microvascular blood flow/ test vascularity, promote formation of granulation tissue, reduce complexity/size of the wound, optimize the wound bed prior to and following surgery and reduce complexity and length of surgical wound closure procedures.

VAC: trade name for the non-disposable equipment we presently utilize at the hospital, offering -75 to -150 mmHg of negative pressure, intermittent or continuous suction.

Veraflow: the trade name for NPWTi

NPWTi: is a NPWT system that delivers negative pressure coupled with automated, controlled delivery and removal of solutions to the wound bed.

Abthera: a specific NPWT dressing applied to an open abdomen with exposed organs that is unable to be closed temporarily.

Prevena: disposable, incisional NPWT dressing which can be applied to a surgically closed wound for up to 7 days. Ideally should be applied in the operating room (OR) under sterile conditions. These disposable dressings cannot be altered or cut. The disposable pump runs at preset -125 mmHg.

PICO: disposable, silicone foam dressing that provides -80 mmHg of negative pressure over a wound or incision for up to 7 days

Intensity setting: how quickly the target pressure is reached after initiation of therapy

PROCEDURE:

Assessment:

1. Confirm order for NPWT including therapy settings (negative pressure, intensity, continuous or intermittent), foam type, frequency of dressing changes, contact layer (if required) and instillation solution if applicable.
2. A complete wound assessment including measurements will be performed by the clinician initiating the treatment, prior to the initial application of NPWT and at every dressing change during therapy.
    a. Measurements include length (longest length from head to toe), width (perpendicular to length) and depth(in deepest location).

b. Undermining or tunneling noting location and size (documented by using the clock method, 12 o'clock is always the head).

c. Evidence of bone, muscle or tendon exposure.

d. Appearance of wound bed, percentage of tissue types i.e. 50% pink/red, 20% yellow, 30% black.

e. Amount and type of exudates.

f. Presence of odor after cleansing.

g. Type and number of foam pieces removed/inserted/applied.

h. Type and number of other dressing materials used in the wound i.e., Adaptic x3.

i. Client tolerance to procedure.

3. Documentation will be in the nursing intervention or in the physician's progress notes.

4. Monitoring Therapy

a. Visually check dressing every 2 hours to ensure:

i. Foam is collapsed

ii. Therapy is active

iii. Clamps are open, and tubing is not kinked

iv. Canister is not full

Note: If system is not operating effectively, refer to manufacturer's guidelines for troubleshooting or vendor's clinical support line.

5. Images should be taken every 1-2 weeks during treatment for the patients chart with a hospital approved Haiku app, as long as patient/substitute decision maker consent is obtained.

Application Procedure:

1. Ensure wound bed is clear of necrotic devitalized tissue. If wound bed is not 50% pink/red tissue,

debridement is recommended by a trained clinician, or Cleanse Choice foam dressings may be utilized.

2. Collect supplies including:

a) Vac ULTA machine

b) Sterile dressing tray and sterile gloves

c) Appropriate VAC foam dressing size

d) Canister (change q 7 days or when full)

e) Sterile scissors

f) Contact layer if required (exposed bone, tendon, muscle, or extreme pain on removal)

g) Skin barrier

h) Appropriate personal protective equipment (PPE)

3. Asceptic technique will be used.

4. Don PPE as required per routine practices and additional precautions.

5. If edges of wound are defined and no immeasurable tunneling or undermining is present, cleanse wound bed well with normal saline (NS) or solution specified by physician.

6. Dry periwound skin well, then use barrier spray to protect and let dry.

7. Set up sterile field, open supplies, and don sterile gloves.

8. If periwound skin is fragile or macerated, apply strips of drape to frame the wound and protect the periwound skin from further damage. Moldable stoma rings can also be used to protect periwound skin.

9. Cut and apply the non-adherent contact layer if applicable (exposed tendon, muscle or bone)

10. Cut the desired negative pressure foam to allow the foam to be placed in the wound without overlapping onto intact skin and at a height that is flush or higher than the periwound skin once vacuum is applied. Note: Do not cut over the wound, fragments may fall into wound bed.

11. Cut a piece of drape large enough to cover the foam plus 3 to 5 cm of intact periwound skin, peel off layer number one, apply without stretching the drape, and obtain an occlusive seal.

12. Remove layer number two and application tab if applicable (blue strip)

13. Pinch transparent drape where the TRAC pad will be situated, and cut a hole 2.5 cm diameter through the drape.

14. Remove backing of TRAC pad and place opening in track pad directly over the hole in drape.

Note: Consider which way the tubing will lay to prevent interference with mobility and avoid pressure related damage. Remove blue tab.

15. Insert canister into VAC Ulta.

16. Turn on power and select desired therapy from options:

a. VAC or Veraflow or Prevena or Abthera.

17. Set therapy settings per PPDO or physicians orders.

18. Check a good seal was attained.

19. Secure tubing as required.

20. Record number of foam pieces and dressing change date on label supplied, place on top of the dressing.

21. Doff PPE, perform hand hygiene.

22. Record date and number of pieces of foam and other dressing materials used in nursing intervention/notes or physician progress notes.

Dressing Removal procedure:

1. NPWT dressings will be changed every 72 hours or earlier per physician order.

2. NPWT dressings should be changed every 5-7 days if applied over a skin graft or dermal substitute.

3. Incisional NPWT dressings can be changed every 7 days.

4. Dressing should be removed if negative pressure has been off for a period exceeding 2 hours.

5. Provide pain management prior to dressing change and allow time for it to take effect.

6. For unmanageable pain during dressing changes, consider consulting the Acute Pain Service (APS)
and Wound Care.

7. PICO/Prevena removal:

a. Turn off therapy

b. Perform hand hygiene and don gloves

c. Gently stretch the transparent drape horizontally and remove slowly while supporting the exposed skin

d. Remove dressing in line with sutures or staples

e. Remove gloves, and perform hand hygiene

8. Granufoam dressing removal:

a. Administer analgesia as ordered

b. Turn therapy off and close tubing clamps 15-30 min prior to removal

c. Instillation of warm Normal Saline (NS) down the dressing tubing and then clamping for 15-30 min prior to removal can also aid in a non-traumatic removal process.

d. Stretch drape horizontally while supporting exposed skin

e. Ensure the correct number of foam pieces are removed from wound.

Instillation Therapy:

1. Wound Care should be consulted for use of instillation with NPWT.

2. Normal Saline will be the solution of choice unless otherwise indicated by the physician.

3. Veraflow cassette is required to support/administer solutions on the left side of VAC machine.

4. Fill Assist will be utilized if instillation volume is not specified by ordering physician.

5. When fill assist is on, it will verify a good seal, then prompt you to start instilling solution. When you visualize the foam darkening with fluid around the edges, you stop instillation, it will show you your instilled volume, subtract 10 ml, this will become your programmed instillation volume. This can be changed if required by utilizing the “Therapy settings” button, then pressing “Advanced settings” and making necessary alterations.

6. Should leakage problems not be correctable, and wound care support is not available, convert Veraflow therapy to VAC therapy and continue with NPWT alone until

assistance is available. If VAC alone is not functioning, discontinue therapy as the dressing should not sit in a wound for longer than 2 hours off suction.

Discontinuation of NPWT should be considered when:

- The goal of therapy has been met, uniform granulation tissue with little depth to wound bed.
- No response or improvement in the wound is observed within two weeks.
- Contraindications are present.
- Extreme pain.
- Excessive bleeding.
- Client is unable to tolerate or declines plan of care.

Safety considerations:

1. Do not place foam directly over organs, blood vessels or nerves.
2. If troubleshooting the equipment fails:
    a. NPWT foam dressing will need to be removed if negative pressure is off longer than 2 hours
    b. Moist NS gauze/packing will be applied to the wound if not specified in physician order.
    c. Physician will be notified of removal.
    d. Consider consulting wound care to assist.
3. Physician will be notified if wound drainage exceeds 500 ml in 30 minutes
4. If frank red blood or bowel contents are observed in VAC tubing or canister, stop NPWT and notify physician immediately.
5. VAC machines are not safe for the MRI suite. VAC dressings may remain in place disconnnected as long as it is no longer than 2 hours.
6. Avoid circumferential dressing applications, if necessary, use multiple smaller pieces of drape over one continuous piece and monitor circulation/distal pulses frequently.

* See Appendix A for indications, contraindication, special consideration, pain assessment, trouble shooting and disposal.

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APPENDICES:

APPENDIX A: Indications, Contraindication, Special consideration, Pain Assessment, Trouble Shooting and Disposal.

Indications for NPWT Therapy:

1. When a wound is not progressing in the expected time frame
2. Control of excessive exudate
3. Awkward size or location for standard dressing application
4. Reduce size to achieve surgical closure
5. Reduce frequency of dressing changes.
6. Can be utilized for the following wound types:
    - Diabetic foot ulcers
    - Pressure injuries
    - Surgical wounds
    - Grafts and flaps
    - Traumatic wounds
    - Partial-thickness burns
    - Pilonidal sinus wounds
    - Necrotizing fasciitis
    - Wound Dehiscence
7. More recently, the use of NPWT over closed surgical incisions has been shown to reduce rates of surgical site infections (SSI), seroma/haematoma and dehiscence, and to improve scar quality
8. NPWT being suggested as the 'gold standard treatment' for open abdominal wounds and dehisced sternal wounds

Contraindications for NPWT Therapy:

1. Malignancy of the wound
2. Untreated osteomyelitis or wound infection
3. Nonenteric or unexplored fistulas
4. Do not place dressings into blind/unexplored tunnels
5. Known allergies or sensitivity to acrylic adhesives
6. Placement of negative-pressure dressings directly in contact with exposed blood vessels, organs, or nerves
7. Anticoagulation
8. Active bleeding or difficulty in achieving hemostasis
9. Absence of blood supply
10. **Note**: Necrotic tissue: debridement, including bone if osteomyelitis is present, is necessary prior to the application of NPWT.

Special Considerations that require consultation with physician and wound care nurse:

- Pediatric patients
- Difficult wound hemostasis
- Patients receiving anticoagulant therapy (physician to review all meds for possible anticoagulant effects)
- History of thrombocytopenia
- Low hemoglobin level
- Low albumin level
- Exposed blood vessels and nerves should be protected by transposition of available fascia or muscle, as performed by physician. Exposed tendon, ligaments, nerves should be covered with a monolayer of non-adherent dressing (e.g. Adaptic®).

Additional Considerations:

- Nonviable bone; must be debrided by physician prior to application.
- Fistula(e) to organs or body cavities (discontinue therapy immediately if fecal matter is noted in the drainage).
- Prior to consideration of NPWT therapy, compromised intestine should be protected by placement of a sheet of mesh (e.g. Marlex® or Vicryl®) as directed by physician
- Bridging two wounds:

a. Ensure that ALL intact skin between the two wounds is protected by clear drape prior to applying foam.

b. Fill wound(s) with Granufoam and place an additional strip of foam over the draped intact skin between the wounds, ensure contact with foam from both wounds.

c. Cover wound and connecting foam with drape, cut 2.5 cm hole in the desired location for the track pad application.

d. Set up VAC as previously described.

*Bridging wounds of different etiologies (or infected to non-infected) is not recommended.

- Tracking NPWT to alternate location There are wounds in difficult locations where the track pad could cause increased pressure on the wound or the tubing could cause further breakdown under the patient. In these situations, placing the track pad in an alternate location can assist, i.e. sacral wounds can have the track pad place on the top of the thigh to prevent tubing breakdown under the buttocks. a. Ensure that ALL intact skin where foam will be applied is protected by clear drape prior to applying foam.

  b. Drape should protect intact skin from the edge of the wound to the desired location of track pad

  c. Medium spiral foam works well for this method.

  d. Fill the wound with foam and then continue the foam strip over draped intact skin to the chosen location for track pad.

  e. Cover wound and tracking foam with drape, cut 2.5 cm hole where the track pad will be applied.

- Spinal Cord Injury: In the event a patient experiences Autonomic Dysreflexia (sudden changes in blood pressure or heart rate in response to stimulation of the sympathetic nervous system), discontinue NPWT and notify the physician.
- Periwound Skin: To protect periwound skin, a skin barrier should be used at minimum. If periwound skin is fragile or friable, protect with additional drape, hydrocolloid or barrier ring.
- Diagnostic testing with NPWT dressing in place:
  a. VAC dressing will not impede radiographic images
  b. VAC dressing is safe to go into MR
  c. VAC Silver foam may impede radiographic images

Pain Assessment:

- Pain must be assessed prior to, during and after application of the NPWT therapy using an accepted tool for pain assessment.
- An increase in pain between NPWT dressing changes, with no identified cause, may be an indication for an earlier dressing change to allow for visual assessment of the wound.
- Appropriate pain management for the NPWT dressing change must be planned for, in advance of the actual dressing change.

Trouble shooting:

- Check drape for any lifting edges, put pressure on any areas to re-establish suction, patch with drape. If unable to determine where the air leak is, a stethoscope to listen can help.
- If a leak is detected, reinforce with extra drape or Tegaderm. (*drape is meant to provide some evaporation, so do not apply more layers than necessary to maintain a seal, maceration may occur)
- Check tubing to ensure no kinks or clots are present.
- Ensure VAC canister is fully engaged or alarm will sound
- A connector is included in every Prevena incision management system kit that will connect Prevena dressing to the VAC Ulta if the Prevena canister fills too quickly or is not providing sufficient negative pressure.

Disposal:

- All disposable NPWT machines should have batteries removed and disposed of per hospital protocol, the devices should be sent down to Biomedical for disposal.