Prospera® NPWT Dressing Application

Negative Pressure Wound Therapy

Wound Care Solutions

Clinical Guidelines

Reference Resource for Healthcare Professionals

DeRoyal®

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1 INTRODUCTION

1.1 **DEROYAL® PROSPERA® DRESSINGS AND ACCESSORIES**

The application of Negative Pressure Wound Therapy (NPWT) by applying atmospheric pressure continuously or with variable intermittent pressure is an established well-evidenced clinical practice that has been proven to increase the healing response over traditional moist wound care[1].

Wound healing is achieved using open pore reticulated polyurethane black foam (Prospera Black Foam Kits) or gauze (Prospera Gauze Kits) and a semi-occlusive transparent dressing (Transeal® or Transeal MAXX). Dressing kits also include DeRoyal's proprietary Prospera Propel™ technology enhancing fluid removal and pressure regulation at the wound site.

In addition to these key components, the DeRoyal NPWT Continuum Program utilizes Radio Frequency Identification (RFID) and GPS technology to streamline the process of patient care, ensuring an efficient and more expeditious patient discharge to the home or post-acute care setting.

1.2 **NOTICE TO HEALTHCARE PROVIDERS**

The clinical guidelines provided in this manual are intended for use with DeRoyal's Prospera NPWT devices and wound accessories. All dressing kits are sterile packaged, and components are devised for single use only. Dressings may be applied using aseptic or sterile technique depending on physician orders.

Recommendations are based on current clinical evidence and cited throughout, however, patient response to therapy is multi-factorial, and clinical reevaluation is necessary throughout treatment. These guidelines are not a guarantee of performance or outcomes and serve only as a recommendation to establish individual patient treatment protocols.

When using any prescriptive medical device, consult a physician for specific treatment and application instructions. Failure to consult a physician or follow manufacturer Instructions For Use (IFU's) may lead to serious injury or fatality. If you have any questions as to the operation or use of the DeRoyal Prospera family of products, please contact your local DeRoyal representative. **Visit DeRoyal.com or call 1-888-938-7828.**

1.3 **INDICATIONS**

NPWT is intended for use in a variety of professional healthcare settings including but not limited to acute care, extended, and long-term care facilities. NPWT may also be used in the home care settings under the supervision of a healthcare provider.

NPWT can be used for the healing of open wounds by secondary or tertiary wound closure, promoting the growth of granulation tissue, removing excess fluid or infectious material, and providing a protected moist wound environment[2].

- Acute wounds
- Arterial ulcers (after revascularization)
- Chronic wounds
- Closed surgical incisions
- Flaps and grafts
- Dehisced wounds
- Diabetic/neuropathic ulcers
- Explored, enteric fistulas
- Partial thickness burns

1.4 **CONTRAINDICATIONS**

DO NOT place NPWT and consult the DeRoyal Prospera NPWT unit consult the prescribing provider in these circumstances:

Necrotic tissue with eschar present
Unexplored or non-enteric fistulas
Untreated osteomyelitis
Wounds containing malignant tissue
Wounds with significant amount of necrotic tissue or eschar
Exposed arteries, nerves (including vagus nerve), blood vessels, veins, or internal organs
Exposed anastomotic site

⚠1.5 CLINICAL CONSIDERATIONS BEFORE STARTING THERAPY

Bleeding

Certain patients are at high risk of bleeding complications and NPWT can increase the risk of bleeding in those patients. Exercise caution in the following patients:

- Patients who are receiving or have received anticoagulant/antiplatelet aggregate therapy.
- Patients who do not have adequate tissue coverage over vascular structures.
- Patients with hemophilia.
- Patients with non-sutured hemostatic agents used in the wound site.
- Patients without adequate wound hemostasis or have weakened or friable blood vessels or organs in or around the wound as a result of, but not limited to:
  - Infection
  - Radiation
  - Trauma
  - Suturing of the blood vessel (native anastomoses or grafts)/organ

If bleeding develops suddenly or large amounts of blood are seen, or if there is frank blood in the tubing or in the canister, stop NPWT at once, leave the dressing in place, take appropriate measures to stop the bleeding and consult the treating physician or seek medical assistance.

Ensure that adequate hemostasis has been achieved before resuming NPWT use. NPWT should **NOT** be used to halt bleeding, nor to prevent or minimize it. Patients undergoing NPWT who are at risk for bleeding should be treated in the appropriate care setting that is deemed suitable by the prescribing provider.

- Use of continuous pressure therapy is generally recommended for patients at increased risk of bleeding.
- Consider lowering the therapy pressure setting when the patient is at risk for excessive bleeding.
- Consider the use of a protective contact layer for patients at risk of excessive bleeding.

⚠1.5 CLINICAL CONSIDERATIONS BEFORE STARTING THERAPY, CONT.

Protect Vessels and Organs

The NPWT foam dressings should **NOT** come in direct contact with vessels or organs. Protective barriers such as a thick layer of natural tissue, if available, or applied surgically should be used, or multiple layers of non-adherent dressing material may be considered, if deemed appropriate by the treating physician. If using non-adherent materials, check and make sure that they are secured properly providing adequate protection throughout therapy.

Large wounds may contain hidden vessels not readily assessed or visualized and as such, be cautious when using NPWT in this type of situation.

Wounds may also harbor bone fragments or sharp edges that could potentially puncture protective barriers causing injury or uncontrolled bleeding to organs and vessels. Sharp edges or bone fragments should be removed from the wound bed, when possible, before initiating NPWT therapy. Beware of shifting tissues or structures in the wound that could potentially expose any sharp edges causing injury.

Protect Ligaments, Tendons, and Bones

Ligament, tendon, and bone structures should **NOT** come into direct contact with the Prospera® Black Foam. These exposed structures are at risk for becoming desiccated and should be covered with a layer of natural tissue, grafting, or a meshed contact layer. ***See 3.4 Preparation of Wound Bed and Periwound.***

Infected Wounds/Osteomyelitis

NPWT can be used on colonized, critically-colonized, and infected wounds. Infected wounds should be monitored closely and may require more frequent dressing changes than non-infected wounds, taking into consideration factors such as wound conditions and treatment goals. If there are any signs of an onset of systemic infection or advancing infection at the wound site, contact the treating physician immediately to determine if therapy should be discontinued and if other systemic treatments should be instigated.

The NPWT is contraindicated in the treatment of a wound with untreated osteomyelitis. Thorough debridement of all necrosis and infection should be removed in conjunction with antibiotic therapy per provider plan of care. Protect intact, exposed bone with non-adherent mesh material. ***For more information on the treatment of infected wounds please see 3.3 Wound Assessment.***

⚠1.5 CLINICAL CONSIDERATIONS BEFORE STARTING THERAPY, CONT.

Foam Removal

The foam dressings, AMD gauze, and contact layer fillers are **NOT** bioabsorbable. Accurately count the total number of pieces of foam (AMD gauze or other non-bioabsorbable products such as meshed, non-adherent dressings, if used) removed from the wound and ascertain that the same number of pieces were placed. Clinicians or caregivers must document the type and number of wound dressing pieces used in and removed from the wound during placement and removal.

In the event the NPWT dressings adhere to the wound, consider putting in sterile water or normal saline into the foam dressing and wait 15-30 minutes before carefully removing the dressings from the wound.

When NPWT dressings are removed from the wound bed, minor bleeding may occur. Consider using an appropriate foam or non-adherent material underneath the black NPWT foam dressing (see dressing selection for more info) to help minimize the potential to bleed when dressings are removed. ***See 1.5 Warnings/Precautions Bleeding.***

Do **NOT** leave foam dressings and/or contact layers in the wound for greater than the recommended time period. Leaving NPWT dressings on longer than the recommended time frame may make it difficult to remove the dressings, may lead to tissue in-growth in the foam/contact layer/filler, or lead to infection or other adverse events.

MRI, XRAY, Defibrillation, Hyperbaric Oxygen Therapy (HBO)

Magnetic Resonance Imaging (MRI)

- Do **NOT** take the therapy unit in the MR environment. It is unsafe to do so and may harm the patient and caregiver and cause serious damage to the equipment.
- There is minimal risk if the patient keeps the NPWT dressings on in the MRI environment.
- Ensure that the NPWT is **NOT** interrupted for more than two hours.
- Always check with the radiologist or technician if the dressing needs to be removed prior to the MR procedure. The NPWT dressing may cause potential shadowing if the area being imaged is in, near or around the wound.
- When using non-contact layers or other fillers in the wound, always check with the manufacturer if the products are safe in the MRI.
- In order to avoid disruption to NPWT therapy or cause unnecessary patient discomfort, MRI or other tests that may require dressing removal should be scheduled on dressing change days if possible.

⚠1.5 CLINICAL CONSIDERATIONS BEFORE STARTING THERAPY, CONT.

X-Ray
The NPWT foam dressings and AMD gauze are radiolucent, not detectable on X-Ray.

Defibrillation
- Disconnect the device from the wound dressing prior to defibrillation.
- Remove the NPWT dressings if defibrillation occurs around the wound site. The dressings may interfere with the transmission of electrical energy and may cause the resuscitation to fail.

Hyperbaric Oxygen Chamber (HBO)
Do **NOT** take the NPWT unit into the hyperbaric oxygen chamber. The unit is considered a fire hazard in the HBO environment.

After disconnecting the unit, either:

- Replace the NPWT dressing with another HBO compatible material that can be used during the HBO treatment, or cover the unclamped end of the tubing with dry gauze. For HBO therapy, the NPWT tubing must **NOT** be clamped.

Never leave NPWT dressings in the wound bed without active negative pressure therapy for more than two hours. Leaving the foam dressings in the wound without suction increases the risk of infection.

Other Precautions
These circumstances also require close monitoring of patient and wound status. Consult with the provider before initiating therapy if the following conditions exist:

- Non-adherent or combative patients.
- Non-responsive patients.
- Untreated malnutrition.
- Paralysis associated with the affected area or spinal cord injuries[10,11]. Circumferential dressing application needed ***see 3.6 Circumferential Wounds.***
- Risk for fluid loss. Infants, children, some small adults and elderly patients should be closely monitored for excessive fluid loss and dehydration. In addition, patients with heavily exudating wounds or large wounds should be monitored carefully because they may have a risk of excessive fluid loss and dehydration.
- Proximity to the vagus nerve. Do **NOT** place NPWT in proximity to the vagus nerve to minimize the risk of bradycardia.

⚠1.5 CLINICAL CONSIDERATIONS BEFORE STARTING THERAPY, CONT.

Other Precautions, Cont.

- If the patient appears to have autonomic dysreflexia (sudden changes in blood pressure or heart rate stimulated by the sympathetic nervous system), immediately stop negative pressure wound therapy to minimize the sensory stimulation and immediately call for medical assistance.
- Fragile periwound skin. Protect fragile periwound with adhesive sealing films, hydrocolloid, or Transeal® transparent film dressing. Do **NOT** cover intact skin with gauze/foam dressing to avoid risk of maceration or injury to tissue. ***See 3.4 Preparation of Wound Bed and Periwound.***

1.6 GENERAL THERAPY RECOMMENDATIONS

- The NPWT systems require a prescription from a physician and are only to be used by healthcare professionals or those considered clinically able.
- Read and follow all IFU's, warnings/precautions, and safety instructions that accompany DeRoyal products before initiating therapy.
- Confirm the patient is clinically suitable for NPWT therapy and assess all factors that could affect the treatment protocol including but not limited to wound etiology, comorbidities, and nutritional status.
- Ensure the wound bed is properly prepared before treatment, removing nonviable tissue and debris.
- Select the appropriate Prospera Dressing according to wound indications. Do **NOT** place dressing over exposed organs, nerves, blood vessels, or anastomotic sites.
- Do **NOT** leave Prospera Black Foam dressings in the wound bed without suction for more than 2 hours. Black foam dressings must be removed and replaced with a moist dressing if therapy cannot be resumed within the 2-hour window. Therapy should not be stopped more than once per day in order to maintain continuous therapy.
- When dressing a wound, it is prudent to try to use only 1 piece of black foam, reducing the risk of retained products. This can be achieved by cutting the foam into a continuous strip as opposed to multiple pieces, however this is not always possible due to wound configuration. Always document the number of dressing filler pieces placed into a wound bed and label and date the dressing. When removing the dressing, document the number of pieces removed and verify this against the previous dressing change documentation. Ensure all dressing pieces have been removed from the patient's wound bed.

1.6 **GENERAL THERAPY RECOMMENDATIONS, CONT.**

- Loosely pack foam into wound bed, ensuring that black foam does **NOT** directly touch intact periwound skin.
- Continually monitor the patient for tolerance of therapy and signs of infection.
- If the wound does not respond to treatment after two weeks of continuous therapy, consult the physician and re-evaluate the treatment plan.
- Consult with DeRoyal Representatives as needed for clinical training and general information.
- Follow all infection prevention protocols set forth by the facility or organization. Always utilize standard precautions.

2 WOUND ASSESSMENT AND DRESSING APPLICATION

2.1 **PRESSURE SETTINGS**

These guidelines are general recommendations and pressure settings will vary according to individual need and wound healing optimization. A physician's order is needed for all therapy settings and changes. For wound specific pressure settings, refer to the Specific Wound Application section.

A setting of -125mmHg is generally accepted as a starting pressure that is appropriate for most wounds, however, literature has shown that a wide range of pressures may be more appropriate when considering wound etiology and healing factors[12].

Consider lowering the pressure when:

Using NPWT in the pediatric population[13].
Using NPWT in the elderly population.
NPWT is being used over delicate autologous or exogenous graft/skin substitute[14].
Patients are at risk for excessive bleeding. ***See 1.5 Warnings/Precautions.***
Patient is diagnosed with vascular compromise or microvascular disease[15,16].
Patient has unrelieved wound pain.
Patient has periwound bogginess and/or ecchymosis.
NPWT is being used for comfort[17].

Consider increasing the pressure when:

Large or copious amounts of drainage present.
Using white foam for undermining or tunneling[12].
Wound dimensions are voluminous.

2.1 **PRESSURE SETTINGS, CONT.**

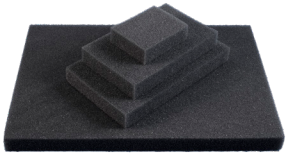
Continuous therapy is recommended after initial placement for the first 48 hours. After 48 hours, variable pressure therapy can be selected for appropriate wounds. Intermittent or VPT therapy has been shown to have increased granulation formatting and contracture of the wound bed when compared to continuous therapy[18]. Wound types and characteristics that may **NOT** be appropriate for Variable Pressure Therapy are as follows:

- Wounds with large amounts of drainage or at risk of bleeding. Once bleeding or drainage subsides, Variable Pressure Therapy can be selected.
- Wounds that require splinting (sternal), or wounds with tunnels and undermining.
- Grafts or flaps that require a bolstering effect to prevent shearing.
- Patients who experience pain with pressure variation.

2.2 **DRESSING SELECTION**

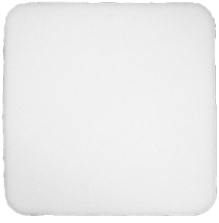
DeRoyal offers a large selection of dressing kit options and accessories for the Prospera units. Kits contain a filler of foam or gauze, the Prospera™ Propel dome, transparent film dressing, and disposable measuring tool. For all variations of kits and accessory items, please refer to the DeRoyal® NPWT catalog.

Fillers



Black Foam

Black foam are hydrophobic open pore reticulated polyurethane foam formulated specifically for fluid removal and wound contraction.



White Foam

White foam is a hydrophilic, dense, polyurethane foam with increased tensile strength. It is recommended for use in undermining and tunneling. White foam should be used in conjunction with Black Foam filler for best performance and fluid removal.

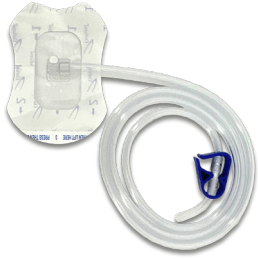
2.2 **DRESSING SELECTION, CONT.**

Fillers, Cont.

Gauze

AMD Impregnated Gauze is a fluff dried woven gauze impregnated with polyhexamethylene biguanide (PHMB), an antimicrobial and anti-fungal agent. Gauze can be used in place of foam fillers for shallow wounds.

Dome



Prospera Propel™ Dome

The Prospera Propel dome connects the dressing to the Prospera unit acting as a conduit to deliver suction and remove fluid using proprietary pressure distribution technology.

Tranparent Dressing

Transparent Dressing

Transeal Triple Release™ dressing is an adhesive semi-permeable dressing that allows for the exchange of vapors and acts as a barrier to bacteria and contaminants.

Transeal® MAXX dressing is also an adhesive semi-permeable dressing that allows for the exchange of vapors and acts as a barrier to bacteria and contaminants. Transeal MAXX dressing has a strong adhesive. Transeal MAXX is recommended for:

- Dressings that need to be applied around challenging anatomical structures i.e. toe amputation wounds.
- Dressings that involve external hardware.
- Dressings that require a longer wear time.

2.2 **DRESSING SELECTION, CONT.**

Additional Items for NPWT Application Available from DeRoyal

Dermanet® Dressing

Dermanet is a meshed, non-adherent, permeable contact layer that conforms to the wound bed preventing trauma to fragile tissue and allowing the passage of exudate to the wound filler substrate. Contact layers may be used in conjunction with DeRoyal® NPWT therapy units. ***See 4 Specific Wound Application for detailed instructions.***

Dermanet® Ag+

Dermanet Ag+ is a meshed, non-adherent, permeable contact layer that conforms to the wound bed preventing trauma to fragile tissue and allowing the passage of exudate to the wound filler substrate. This contact layer is also impregnated with a unique combination of ionic silver, maltodextrin, and alginate designed to provide quick and sustained antimicrobial action against a broad spectrum of microbial organisms for up to seven days. Contact layers may be used in conjunction with DeRoyal NPWT therapy units. ***See 4 Specific Wound Application for detailed instructions.***

Dermanet® GTL

Dermanet GTL contains the strength and beneficial healing properties of Dermanet while incorporating the softness of silicone. Contact layers may be used in conjunction with DeRoyal NPWT therapy units. ***See 4 Specific Wound Application for detailed instructions.***

Y-Connector

Y-connectors can be used to treat multiple wounds simultaneously with the same pressure settings. It is recommended to change the Y-connector every 7 days. ***See 3.3 Multiple Wounds for specific application information.***

2.3 **WOUND ASSESSMENT**

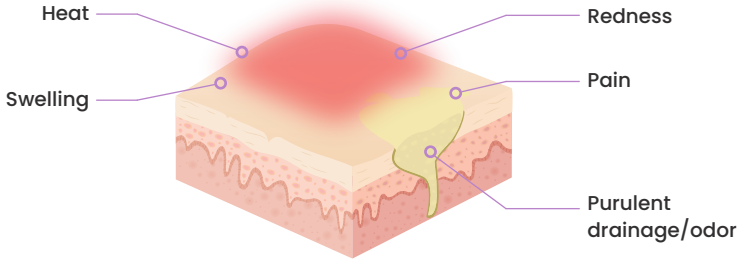
When negative pressure is selected as a means of treatment for a patient, it is essential to establish a baseline assessment of the patient's wound(s) before it is initiated. Overall therapy goals should be determined with the patient taking in account medical history, facility policies, and available patient resources. The baseline assessment will allow for the evaluation of patient therapy healing progress during treatment with NPWT. Wound assessment should take place at every dressing change and be documented according to facility policy.

When assessing the patient wound, consider using the below clinical data points to obtain measurable documentation for outcome evaluation.

- Wound etiology (and stage if it is a Pressure Injury).
- Patient medical history/co-morbidities, medications, nutritional status.
- Pain
- Anatomical location of the wound.
- Wound measurements L x W x D – standard of practice axis for length and width is head to toe and side to side respectively. Depth is measured at the deepest part of the wound.
- Wound tunneling and undermining measurements. Use the points of a clock to document the location of the tissue erosion or tract. Measurement is documented at the outmost point.
- Wound bed tissue type documented in percentage.
- Drainage type, amount, and odor – odor should be assessed after the wound bed has been cleansed.
- Wound edge
- Periwound condition
- Ancillary support devices – offloading shoes, orthotics, braces etc.

Infection

It is important that the wound is cleansed properly between dressing changes and assessed for signs of infection. Common acute signs of infection include:



2.3 **WOUND ASSESSMENT, CONT.**

Chronic wounds may have different or more subtle presentations of infection including:

Wound tissue regression or delayed healing
Increased serous drainage
Pale, gray, or bleeding granulation tissue
Satellite lesions

NPWT can be applied to infected wounds with caution. This therapy should be used as an adjunct treatment of the infection along with other infection control interventions[20,21]. These factors should also be considered when applying NPWT to infected wounds:

- Removal of necrosis
- Systemic antibiotic therapy prescribed by physician
- Increased frequency of wound assessment and dressing changes
- Appropriate pressure settings on the NPWT system
- Use of contact layer antimicrobial dressings such as Dermanet® Ag+ dressing

If wound conditions persist and exhibit no progress towards healing, NPWT should be paused and the wound treatment re-evaluated. As a reminder NPWT is contraindicated for patients with untreated osteomyelitis infections.

2.4 **PREPARATION OF WOUND BED AND PERIWOUND**

Prospera® PRO NPWT Dressing Kits Application Video

1. Once the wound has been assessed, and NPWT treatment prescribed, the wound bed should be cleansed and debrided by a licensed clinician, making sure to remove as much non-viable tissue as able. NPWT is contraindicated in wounds containing 20% or more non-viable slough or eschar. Nonviable tissue will not transfer fluid and exudate like viable tissue and can cause pressure distribution changes in the wound bed[2,22].

2. Although optional, additional periwound protection is encouraged to prevent the breakdown of the surrounding intact skin in which the transparent dressing must adhere. Periwound breakdown can result in delayed healing, increased wound size, and increased pain for the patient[23]. To protect the periwound, cut the provided Transeal® dressing into 2cm strips, ensuring you will have enough film remaining to cover and seal the wound. "Window-Pane" the periwound with the appropriate number of strips to cover exposed skin. Alternately, apply an appropriate skin protectant to the periwound area, following the manufacturer's instructions. Hydrocolloids and other skin protectant products may be considered as well.

2.4 **PREPARATION OF WOUND BED AND PERIWOUND, CONT.**

Non-Adherent Wound Contact Layers

Non-adherent wound contact layers may be used with the DeRoyal® Prospera® Family of NPWT units and dressing kits. Wound contact layers may include the following:

Dermanet® and Dermanet® Ag+

Oil Emulsion Dressings

Petroleum Impregnated Dressings

Silicone Based Dressings

Prospera® PRO NPWT Dressing Kits Application Video

1. Contact layers can provide protection to exposed fragile structures, decrease pain, control hypergranulation, decrease bleeding from foam removal, provide protection from sharp edges, act as a barrier between newly placed grafts and flaps, and serve other clinical rationales. A wound contact layer must be deemed necessary by the prescribing provider.

2. Cut the contact layer to the shape of the wound, unless applying to a graft, flap, or incision. ***See 5 for specific Wound Application.*** The contact layer can be overlapped or applied in multiple layers in order to achieve protection of structures, taking in consideration shifting that may occur in the wound bed. Remember to document the number of pieces placed in the wound bed.

2.5 **APPLICATION OF NPWT**

Prospera® PRO NPWT Dressing Kits Application Video

2.5.1 Initial Dressing Placement

1. Once the periwound is assessed, appropriately protected, and if needed, a wound contact layer applied, dressing placement may begin. The initial dressing change after placement should occur after 48 hours. Subsequent dressing changes should occur every 48-72 hours with more frequent changes and monitoring for infected wounds.

2. Cut the wound filler to wound shape, place inside packing entire wound bed while allowing 1-2cm of foam to rise above the surface of the wound bed. Ensure the foam is cut away from the wound to prevent loose foam particles from entering the wound bed. Do **NOT** overpack the wound as wound trauma can occur. Do **NOT** let the wound filler overlap directly onto intact periwound skin unless protected by window paning with a transparent film dressing or similar dressing.

3. Count and document the number of wound filler pieces and other wound dressing components used in the wound.

4. Cut the Transeal® dressing to cover the wound with at least 5cm of periwound overlap. Do **NOT** stretch the drape during application as tension can cause skin trauma and/or pain.

2.5 **APPLICATION OF NPWT, CONT.**

Prospera® PRO NPWT Dressing Kits Application Video

5. Apply the Transeal® dressing by removing the bottom release liner labeled “1” and affixing to the wound area. Pull the release liner “2” and secure the dressing. Holding onto the handling tab, remove the carrier layer “3”.

6. Gently tear off handling tabs.

7. Pinch and cut a 2.5cm round hole in the Transeal dressing over the wound filler. Next, take the dome and remove the bottom release liners 1 and 2. Place the center of the dome pad directly over the hole. Position the direction of the tubing to optimize patient comfort and dressing securement. Remove the carrier layer 3 from the dome.

8. Connect the dome tubing to the canister tubing, making sure clamps are open. Initiate therapy on the therapy unit, ensuring the correct and prescribed pressure settings are programmed. Once therapy begins, the dressing will compress. Identify leak areas by listening or using a stethoscope pressing down the edges of the dressing for an adequate seal. Apply additional Transeal strips as needed for leak correction.

2.5 **APPLICATION OF NPWT, CONT.**

Prospera® PRO NPWT Dressing Kits Application Video

9. Multiple layers and overlapping of Transeal® dressing may decrease the moisture vapor transmission (MVT) of the dressing which could lead to increased maceration of the periwound skin. Use Transeal dressing adequately, but sparingly.

10. Secure or anchor the tubing if necessary to reduce tension or pulling on the dressing. The tubing should be unimpeded, placed away from areas of pressure, the perineum, folds or creases, etc.

11. Assess patient comfort and document procedure.

2.5 **APPLICATION OF NPWT, CONT.**

Prospera® PRO NPWT Dressing Kits Application Video

2.5.2 Dressing Removal

1. Before removing the dressing, power down the DeRoyal® Prospera® negative pressure wound unit and allow the dressing to decompress. Clamp off dressing to ensure exudate and fluid in the tubing is contained. Assess patient comfort level and medicate as prescribed.

2. Gently loosen edges of the Transeal® dressing and stabilize skin with one hand. Remove the dressing slowly in direction of hair growth, keeping it close to skin surface and pull back over itself. Removing the dressing at an angle can cause tension in the epidermal layer increasing the risk of mechanical trauma. Carefully work the dressing away from the skin around the wound filler. Gently lift the filler from the wound bed, assessing for excessive bleeding or trauma. If the wound filler is difficult to remove, consider instilling sterile water or normal saline into the foam dressing and wait 15-30 minutes before removing the dressing. Use of a contact layer or more frequent dressing changes may be necessary if patient is experiencing bleeding, pain, or tissue ingrowth. ***See 1.5 Warning/Precautions for Bleeding instructions.***

3. Once all pieces have been removed from the wound bed, count the number of wound filler pieces and check the previous documentation for exactness. Discard soiled dressing according to facility protocols.

3 ADVANCED DRESSING TECHNIQUES

3 **ADVANCED DRESSING TECHNIQUES**

3.1 Bridging

Clinical Considerations

- Bridging is used to treat multiple wounds with one dressing kit, offset the dome in narrow wounds or to avoid placing the dome over an area subject to pressure.
- It is not recommended to bridge wounds of different etiologies or to bridge an infected wound to a non-infected wound.
- Care must be taken to prevent pressure or trauma when placing the dome and tubing particularly over bony prominences or areas subject to pressure.

Recommended Application

Select a non-weightbearing area to relocate Prospera Propel™ dome.

1. Apply dressing to wound per general application instructions in ***Section 2.4.1 Initial Dressing.***

2. Apply transparent film over any intact skin between the wound and site selected for dome relocation ensuring the transparent film is 1-2cm wider than the width of the foam bridge and dome.

3 **ADVANCED DRESSING TECHNIQUES , CONT.**

3. Utilize a foam bridge kit or cut a foam bridge approximately 3cm wide that is long enough to connect the wound with the relocation site and accommodate the dome. All foam pieces must be in direct contact with each other.

4. Apply the bridge over the transparent film previously placed over intact skin and secure with transparent film that is 3-5cm wider than the foam to ensure an adequate seal. The foam should not have any direct contact with intact and unprotected skin.

5. Select area for dome application and cut a 2.5cm round hole in the drape. Apply the dome, connect tubing, and initiate NPWT per prescribed settings.

6. If bridging two wounds together, place the Prospera Propel™ dome in a central area where exudate from one wound will not be drawn into the other wound.

3 ADVANCED DRESSING TECHNIQUES , CONT.

3.2 Tunneling or Sinus Tracts

Clinical Considerations

- This dressing technique serves as a wicking agent to remove exudate from the tunnel or sinus tract and support progressive closure from the base.
- It should not be utilized in blind or unexplored tunnels.
- White foam is recommended for tunnels, sinus tracts.
- Filler should be cut wide at one end and narrow at the other to ensure the opening to the tunnel or sinus tract remains patent until the distal end has closed.
- Ensure filler selected can be easily removed from the wound without risk of dressing retention. Ensure tunnel is not overpacked as this can result in impaired wound healing and tissue damage. Continuous NPWT settings are recommended until the tunnel or sinus tract has completely closed. Necrotic tissue should be debrided prior to NPWT application.
- Always count the total number of wound filler pieces used and document on dressing label and in patient's chart.

Recommended Application

1. Determine the length and width of the tunnel, sinus tract or undermining. Cut wound filler to accommodate dimensions plus an additional 1-3cm into the wound bed to ensure contact with the primary NPWT wound filler. Gently place filler into the sinus tract, tunnel or undermining all the way to the distal portion and pull out 1-2cm and then pull filler out of tunnel, sinus tract or undermining 1-2cm. This placement leaves the distal portion of the tunnel, sinus tract or undermining clear of foam enabling granulation tissue formation from the distal portion forward.
2. Continue dressing applicate per general application instructions in ***Section 3.5 Application of NPWT.***

3. Continue this process at each dressing change until the tunnel, sinus tract or undermining is resolved. Monitor exudate and granulation tissue at each dressing change.

3.3 Multiple Wounds

Clinical Considerations

- A Y-connector may be utilized to treat multiple wounds on the same patient and all dressings should have an adequate seal.
- It is not recommended to use more than one Y-connector per NPWT unit, connect wounds with different etiologies, connect non-infected to infected wounds, or to connect wounds that would be optimally treated with different NPWT settings.

Recommended Application

1. Apply NPWT dressings to each wound per general application instructions in section 3.5 Utilize Y-connector to connect the dome tubing from each dressing to the canister tubing. The Y-connector should be changed once weekly or as needed with canister changes.

3 ADVANCED DRESSING TECHNIQUES , CONT.

3.4 Orthopedic Devices/External Fixators

Clinical Considerations

- Wounds may be treated with NPWT in the presence of orthopedic hardware such as pins and rods.
- Care should be taken to applying Transeal® around pins, ensuring to not place external pressure on sites.
- All pin sites should be cleansed and assessed per policy prior to the application of NPWT.

Recommended Application

1. Pin sights should be protected using a moldable, nonreactive material such as a hydrocolloid strip or skin barrier seal. This should fit snuggly around the pin.

2. Cut the wound filler to wound shape, place inside packing entire wound bed while allowing 1-2cm of foam to rise above the surface of the wound bed. Ensure the foam is cut away from the wound to prevent loose foam particles from entering the wound bed. Do **NOT** overpack the wound as wound trauma can occur. Do **NOT** let the wound filler overlap directly onto intact periwound skin unless protected by window paning with a transparent film dressing or similar dressing.

3. Cut strips of Transeal® dressing and apply around pins sites to secure the dressing, making sure seal is airtight.

3 ADVANCED DRESSING TECHNIQUES , CONT.

3.5 Small Wounds

Recommended Application

1. Protect the periwound using the "picture framing" (also known as "window paning") method: apply an alcohol-free liquid film protectant on the periwound and allow to air dry. Cut a few strips (3cm wide) of the Transeal® transparent dressing to protect the periwound skin. When applying Transeal dressing, make sure it is properly applied and the top carrier is removed.

2. Cut the wound filler to wound shape, place inside packing entire wound bed while allowing 1-2cm of foam to rise above the surface of the wound bed. Ensure the foam is cut away from the wound to prevent loose foam particles from entering the wound bed. Do **NOT** overpack the wound as wound trauma can occur. Do **NOT** let the wound filler overlap directly onto intact periwound skin unless protected by window paning with a transparent film dressing or similar dressing.

3. To accommodate the size of the dome pad, cut another piece of black foam that is large enough to extend about 2-3cm beyond the dome pad. Lay this on top of the black foam that is in the wound and make sure that it is not laying on intact skin.

4. Apply the Transeal® dressing to cover the foam dressing. Select area for dome application and cut a 2.5cm hole in the drape. Apply the dome, connect tubing, and initiate NPWT per prescribed settings.

3.6 Circumferential Wounds

Clinical Considerations

- Circumferential NPWT should be avoided in most cases as dressings can cause complications with limb perfusion. Do **NOT** use a circumferential dressing on patients with impaired perfusion or extreme fluid fluctuations of the limbs.
- Circumferential NPWT dressings may be considered in the case of severe complex wounds that require the management of copious fluid due to anasarca, lymphatic conditions, or severe vascular ulcers.
- Patients must be monitored closely, frequently assessing limb perfusion, when using this dressing technique. Dressing changes should have increased frequency.
- The dressing should be removed immediately, and the provider consulted, with any signs of circulatory compromise which can include changes in periwound color, changes in limb temperature, pain, wound condition worsening, and any sign of impaired or delayed healing.
- Refer to system IFU for specific indications.

3 **ADVANCED DRESSING TECHNIQUES , CONT.**

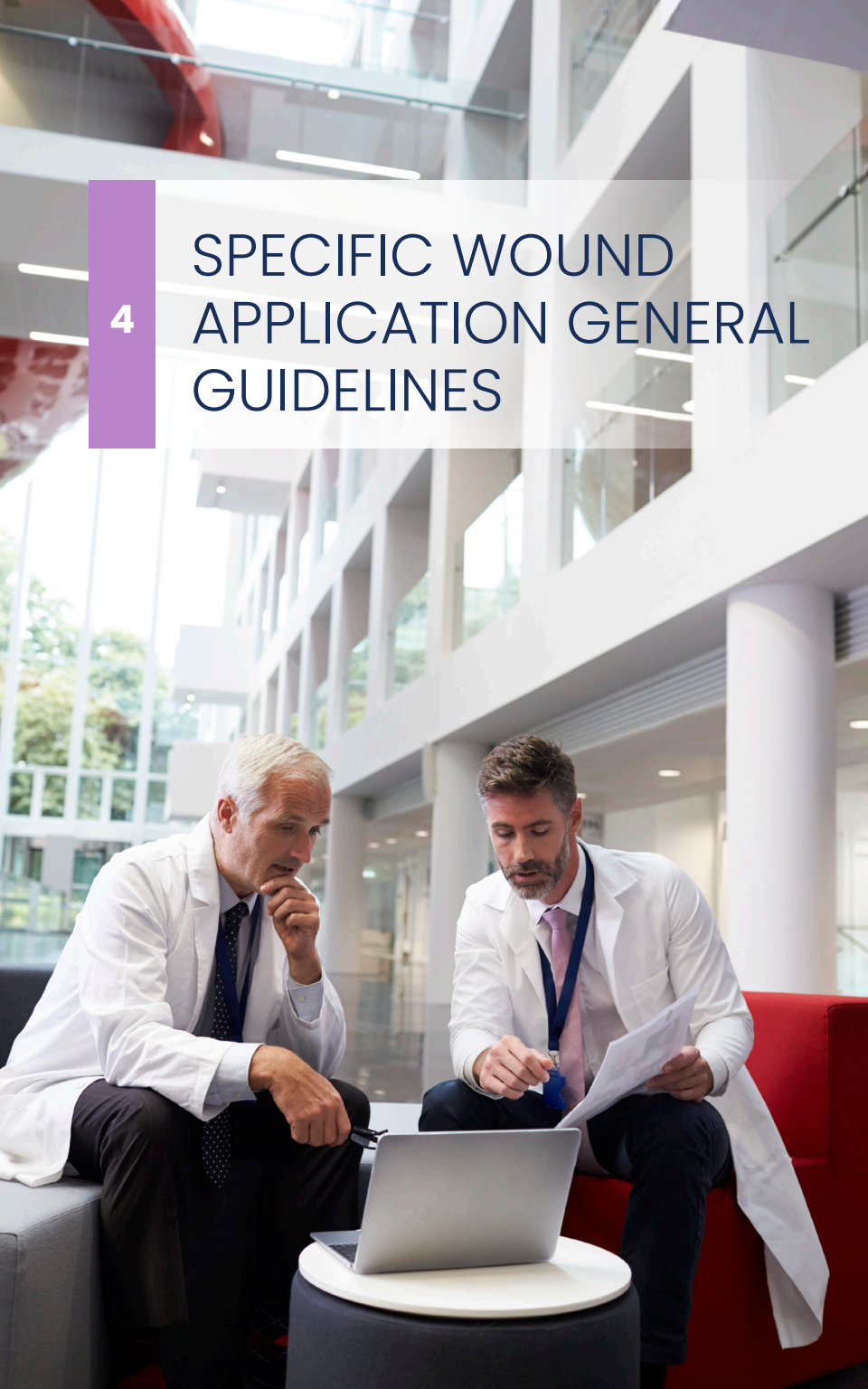
Recommended Application

1. When applying circumferential dressings, use multiple small pieces of Transeal® dressing to seal wound filler so as to allow skin expansion under the dressing decreasing the risk for impairing circulation.

2. Do **NOT** pull or stretch Transeal dressing during application as this may increase tension on the skin.

3. Dressing may benefit from light compression on the outside of NPWT to prevent excessive swelling of the limb which could compromise perfusion.

4 SPECIFIC WOUND APPLICATION GENERAL GUIDELINES



4 SPECIFIC WOUND APPLICATION GENERAL GUIDELINES

4.1 Acute Wounds

4.1.1 Acute/Traumatic Wound and Partial Thickness Burns

Goals

- Granulation
- Fluid Removal
- Edema Reduction
- Increase Perfusion
- Moist Wound Healing Environment
- Protection of External Contaminants

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
48 Hours Continuous	Continuous VPT	-125mmHg	48-72 Hours, 3x/wk

Clinical Considerations

- The recommendations for acute/traumatic and partial thickness burns may vary depending on the condition of the patient. Consult the treating physician for specific prescriptions.
- Protect vital structures such as tendons, ligaments, blood vessels, organs and nerves. Protective barriers such as a thick layer of natural tissue, if available, or applied surgically should be used, or multiple layers of non-adherent dressing material may be considered, if deemed appropriate by the treating physician.
- The NPWT should **NOT** be initiated on a wound with untreated osteomyelitis. Thorough debridement of all necrotic, devitalized, non-viable tissue, and infected bone (if necessary), and use of antibiotic therapy should be considered. Protect intact, exposed bone with non-adherent mesh material.
- Stabilize any fractures before applying NPWT.
- Sharp edges or bone fragments can potentially puncture organs or vascular structures and as such they must be removed from the wound bed or covered by a non-adherent contact layer. Carefully remove wound.
- If large amounts of blood are seen in the tubing or in the canister, stop NPWT at once, leave dressing in place, take appropriate measures to stop the bleeding and consult the treating physician or seek medical assistance. Ensure that adequate hemostasis has been achieved before resuming NPWT use. NPWT should **NOT** be used to halt bleeding, nor to prevent or minimize it. The patient should be closely monitored for bleeding in a care setting deemed appropriate by the treating physician.

Partial Thickness Burns

For a partial thickness burn treated with a skin graft, NPWT can assist with graft adhesion. ***Please read section 4.1.2 Meshed Skin Grafts/Dermal Substitutes.***

The NPWT can promote integration of a dermal substitute applied on a burn. Please check with the manufacturer of the dermal substitute if applying NPWT over their product is suitable and if they have any specific recommendations.

4.1.2 Meshed Skin Grafts and Dermal Substitutes

Goals

- Holds the graft in place and helps improve graft integration.
- Facilitates removal of fluids and prevents accumulation of fluids under the graft.
- Protects the wound from outside contamination.
- Protects the area from shearing.
- Aids with revacularization of the new graft.

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous	-75 to -125mmHg	4-5 days after placement

Clinical Considerations

- NPWT should be applied immediately after placing the graft with therapy commencing as soon as possible post-operatively.
- Use continuous mode throughout the therapy.
- When using white foam, the recommendation is -125mmHg and can be titrated up.
- NPWT dressings may be removed in 4-5 days.
- Drainage should taper off significantly after 24 hours. If drainage persists, remove dressing and consult provider.

4 SPECIFIC WOUND APPLICATION, CONT.

Recommended Application

1. Protect the periwound using the "picture framing" method as outlined in section 3.4 When applying the Transeal® dressing around the wound, be careful **NOT** to apply the Transeal transparent dressing over the staples because the staples may be pulled out inadvertently during the removal of the dressing. Ensure that the Transeal dressing is applied properly and that the top carrier has been removed.

2. Select a single-layer, non-adherent meshed material (not required if using Polyderm™ White Foam).

3. Apply the non-adherent meshed material over the newly grafted area and make sure the meshed material extends 1cm outside the staple line. The non-adherent layer serves as interface between the foam and the graft to prevent the foam from adhering to the graft and at the same time it helps prevent unintentional lifting of the graft when the dressings are removed. If using Polyderm White Foam, a meshed contact layer is not necessary. Cut white foam to the size of the grafted area plus an additional 1cm border.

4. Cut the black foam to the size of the meshed material and apply the foam over it.

5. Apply Transeal® dressing and rest of dressing as outlined in section 3.5 Initiate therapy according to guidelines above.

Dermal Substitutes

Confirm with the manufacturer of the dermal substitute if using NPWT and follow manufacturer directions for application of NPWT.

4.1.3 Skin Flaps

Goals

- Assist with revascularization of tissues.
- Provide bolster and stability for the flap.
- Minimize shearing forces.

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous	-125mmHg to -150mmHg	4-5 days after placement

4 SPECIFIC WOUND APPLICATION, CONT.

Clinical Considerations

- Use continuous mode for the duration of the therapy.
- NPWT dressings may be removed in 4-5 days.
- Higher pressures may be used for bulkier flaps.
- Drainage should taper for duration of therapy.

Recommended Application

1. Protect the intact epidermis of the flap and around the suture line using Transeal® dressing or other protective semi-occlusive skin barrier. When applying Transeal dressing or barrier around the suture line, be careful not to apply the dressing over the suture line as fluid will move through this.

2. Select a single-layer, non-adherent meshed material and apply the non-adherent meshed material over the exposed suture line.

3. Cut the black foam and apply over the entire flap including the suture line and 2-3cm beyond the flap. Make sure the area touched by the black foam is protected skin. If the flap bed being treated has heavy drainage, cut a thin strip of white foam and place it under the flap, between the sutures. The white foam serves as a wick of the fluid from under the flap. The white foam and black foam must touch—this ensures direct communication between the dressings when the negative pressure is initiated.

4. Apply Transeal® dressing and Prospera Propel™ dome over rest of dressing. Initiate therapy as suggested above.

5. When removing the dressings, apply a lateral stretch (pull) on the dressing. Remove dressings carefully to avoid lifting the flap.

4.1.4 Incisions/Sutures/Staples

Goals

- Manage the environment of the surgical incision for patients at high risk for surgical dehiscence or complications.
- Create an external barrier to prevent Surgical Site Infections (SSI's).
- Decrease lateral tension of sutures or staples and keep incision edges approximated.
- Edema reduction.
- Removal of fluid and infectious material.

4 SPECIFIC WOUND APPLICATION, CONT.

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous	-75mmHg to -125mmHg	Initial dressing should be left in place for a minimum of 48 hours (2 days) up to a maximum of 168 hour (7 days)

Clinical Considerations

- Prepare incision site according to facility protocols immediately post-operatively. Ensure the application site is completely dry before application to maintain dressing integrity.
- Choose appropriate dressing size for length of incision.
- Initial dressing can remain in place up to 7 days on continuous therapy.
- If the incision is over a mobile area, position the limb mid-range of motion while applying the dressing to ensure dressing integrity and patient comfort.
- Drainage should taper through duration of wear time, consult prescriber if exudate levels do not diminish.
- Incision dressings may be used in conjunction with drains, however the dressing border should not overlap drainage insertion site or drain itself. The drainage system must function independently of the NPWT system.

Recommended Application

If using an incisional wound dressing specific for incision management, please refer to the product specific guidelines for dressing application.

If using a Prospera® NPWT kit:

1. Protect the intact epidermis surrounding the incision using and appropriate incisional wound dressing or by using Transeal® dressing or other protective semi-occlusive skin barrier. When applying Transeal dressing or barrier around the suture line, be careful not to apply the dressing over the suture line as fluid will move through this. The protective drape should measure at least 8cm wide and extend 3cm over the ends of each side of the incision.

2. Select a single-layer, non-adherent meshed material and apply over suture line ensuring the edges do **NOT** overlap onto intact epidermis beyond the protective drape layer.

3. Apply the black foam dressing (it must be cut about 6cm wide and a little bit under 3cm over either end) over the non-adherent layer. Cover the black foam dressing with Transeal® dressing, place Prospera Propel™ dome and initiate therapy.

4.1.5 Dehisced Incisional Wounds

Goals

- Manage the treatment of postoperative complications in surgical wounds.
- Facilitate removal of fluids, exudate and infectious materials.
- Protect the wound from outside contamination.
- Provide a closed moist wound environment.
- Promote perfusion.
- Reduce edema.
- Pull wound edges together to facilitate wound closure and healing.
- Assist with tissue granulation.
- Stabilize wound thus aiding patient's transfers, repositioning and mobility.

4 SPECIFIC WOUND APPLICATION, CONT.

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous	-125mmHg to -150mmHg	48-72 hours, 3x/wk, infected wounds may need more frequent dressing changes

Clinical Considerations

- Management of the wound should begin with treating underlying etiology for wound dehiscence, debridement of necrotic tissues, antibiotic therapy if necessary, and surgical stabilization and protection of exposed wound structures.
- Select foam dressing type, gauze, and non-adherent meshed contact layers based on wound characteristics and the goal of therapy. Dermanet® Ag+ dressing may be used for infectious wounds to provide ionic silver therapy. Polyderm™ White Foam may be selected for use over exposed tendon or bone, titrate pressure higher is necessary for fluid removal.
- Dressing changes may need more frequent changes if infection is present.
- Prospera® NPWT is **NOT** recommended for use over exposed organs, vessels, or anastomotic sites. Consult with provider if these structures are exposed in the wound bed. An appropriate protective barrier must be established before NPWT can be initiated.
- Propsera NPWT can be used in dehisced abdominal wounds with mesh present and no exposed viscera.
- If the NPWT dressing is near or around retention sutures or drain (puncture) sites, ascertain that the Transeal® dressings are properly adhering. The Transeal dressing may be applied on adjacent drain (puncture) sites if the NPWT dressing is not properly collapsing (achieving an adequate seal).
- Please refer to the Sternal Wounds section when treating dehisced wounds on the sternum.
- ***See section 3.4 for Preparation of Wound Bed and Peri-wound.***

4.1.6 Sternal Wounds

Goals

- Manage the treatment of postoperative sternal wounds.
- Stabilizes wound thus aiding patient's transfers, repositioning and mobility.
- Aid respiratory function and provide patient comfort.
- Facilitate removal of fluids, exudate, and infectious materials.
- Protect the wound from outside contamination.
- Provide a closed moist wound environment.
- Reduce edema.
- Assist with tissue granulation and perfusion.

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous	-75mmHg to -150mmHg	48-72 hours, 3x/wk, infected wounds may need more frequent dressing changes

Clinical Considerations

- Vital structures are in the thoracic cavity and as such, meticulous care and attention are paramount when applying NPWT dressings on this area.
- Follow the guidelines for Dehisced Wounds when applying NPWT dressings on superficial sternal wounds that are intact, stable and with no bone infection present.
- For patients with deep sternal wounds, such as those with mediastinitis or infection on the sternal wound, the dressing changes should be supervised or performed by the cardiovascular/cardiothoracic surgeon preferably or by the specialist surgeon or by the lead healthcare provider.
- For any bleeding issues, please refer to the Bleeding section of this guideline.
- Dressings should be performed every 48 to 72 hours but not less than three times per week for non-infected wounds. If the physician deems it necessary, more frequent dressings may be performed.
- If NPWT is considered appropriate by the surgeon, protect underlying structures with the adequate layers of meshed, non-adherent contact layers before applying the foam dressings.
- Continuous therapy is recommended for sternal wounds to provide adequate splinting hence aiding patient's mobility and comfort.

- For sternal wounds, use the lowest negative pressure setting initially then may increase the pressure to the target setting after careful monitoring of the patient and assessment of patient's tolerance of the therapy.
- *See section 3.4 for Preparation of Wound Bed and Peri-wound.*

4.1.7 Enteric Fistulas

An enteric fistula is pathway that communicates between the gastrointestinal tract and skin. NPWT may be used to manage the wound surrounding the fistula, however it is **NOT** recommended to be used to contain or manage effluent. Management of acute and chronic fistulas is complex and NPWT should only be placed by a specialized clinician.

Contraindications for NPWT involving fistulas

Non-enteric or unexplored fistulas.
If the patient cannot receive adequate nutritional support.
If there is an obstruction distal to the fistula.
If there is an abscess associated with the fistula.
If drainage is too thick and cannot be separated from the rest of the wound.
If exposed viscera or organs are visualized.

Acute Enteric Fistula NPWT Treatment Selection Criteria

The fistula opening is easily visualized and accessed.
Has low to moderate amount of effluent which is thin to slightly viscous in consistency.
If there is an obstruction distal to the fistula.
Patient is NPO (Nothing by mouth).
There are no epithelial cells or growth on the opening of the fistula, has NO "pseudostoma" formation.
Patient is receiving TPN (Total Parenteral Nutrition).

4 SPECIFIC WOUND APPLICATION, CONT.

Goals

» Promote wound healing using mechanisms of NPWT to enable closure of the acute fistula.

Recommended Application

1. Protect the periwound using the "picture framing" method as outlined in section 3.5 Other protective semi-occlusive skin barriers may used to secure dressing and protect periwound skin.

2. Using 2-3 layers of petroleum gauze, cover the opening of the fistula.

3. Irrigate and clean the abdominal wound per physician's orders or facility/agency protocol.

4 SPECIFIC WOUND APPLICATION, CONT.

4. Remove all the layers of the petroleum gauze that were used to cover the fistula opening.

5. Cover the fistula opening with one layer of non-adherent meshed material.

6. Apply one piece of Polyderm™ White Foam over the non-adherent material covering the fistula. The foam should extend 1-2cm beyond the fistula opening.

7. Cut and place the black foam in the wound making sure the black and white foam are touching. If the black foam will cover the white foam, note where the white foam is located because of the placement of the Prospera Propel™ dome. (See Step 10).

4 SPECIFIC WOUND APPLICATION, CONT.

8. Cover the whole NPWT foam dressings with Transeal® dressing keeping an additional 3-5cm Transeal dressing border.

9. Cut a 2.5cm round hole on the Transeal dressing directly over the location of the fistula opening.

10. Apply the Prospera Propel™ dome pad aligning the opening of the pad with the newly cut hole. Initiate therapy at -125mmHg continuous negative pressure or per the physician's order.

11. Note amount of fistula effluent present after immediate initiation of therapy.

4 SPECIFIC WOUND APPLICATION, CONT.

12. If there is effluent present in the tubing, increase NPWT by 10-25mmHg, and check effluent again in 20-30 minutes.

13. If effluent is still present and secreting from fistula, keep increasing NPWT by 10-20mmHg up to a maximum of -200mmHg until effluent stops.

14. If effluent is still present and draining at a maximum of -200mmHg, reapplication of the dressing may be necessary to find the correct configuration for fistula approximation.

15. The goal of therapy is to approximate the fistula and reduce effluent drainage for spontaneous resolution.

4 SPECIFIC WOUND APPLICATION, CONT.

NOTE: If above procedure is unsuccessful or is effluent is still present after 4-7 days of NPWT, segregating and pouching the fistula should be considered. ***See 4.1.7 Chronic Enteric Fistula Dressing Technique Application.***

Chronic Enteric Fistula NPWT Treatment Selection Criteria

Evidence of stomatization or epithelial growth around opening of fistula.
Mouth of fistula is easily visualized and accessed.
NPO (Nothing by mouth).
TPN (Total Parental Nutrition).
Currently not a surgical candidate.

Goals

» Promote wound healing to prepare the wound bed for the eventual surgical repair of the chronic fistula.

Recommended Application

1. Protect the periwound using the "picture framing" method as outlined in section 3.5 Other protective semi-occlusive skin barriers may used to secure dressing and protect periwound skin.

2. Using 2-3 layers of petroleum gauze, cover the opening of the fistula.

4 SPECIFIC WOUND APPLICATION, CONT.

3. Irrigate and clean the abdominal wound per physician's orders or facility/agency protocol.

4. Remove all the layers of the petroleum gauze that were used to cover the fistula opening.

5. Segregate the fistula from the wound by wrapping the fistula with a petroleum-based gauze, ostomy ring, ostomy paste, fistula device, or other fistula segregation method.

6. Place a gauze pad over the fistula to absorb any effluent before the NPWT is initially applied.

4 SPECIFIC WOUND APPLICATION, CONT.

7. Place black foam and other appropriate dressing components into the wound bed. Surrounding, but not covering the fistula. The fistula will remain segregated from the wound dressing.

8. Apply Transeal® dressing over entirety of the dressing covering the wound and fistula (with drainage gauze still present).

9. Cut a 2.5cm hole on the Transeal dressing that is **NOT** directly adjacent to the fistula and apply the Prospera Propel™ dome.

10. Initiate the NPWT and check that there is a seal. The abdominal dressing should compress. Turn off NPWT.

4 SPECIFIC WOUND APPLICATION, CONT.

11. Cut an opening in the drape over the gauze pad covering the fistula.

12. Remove the gauze pad to now expose the fistula.

13. Apply an ostomy barrier ring or ostomy paste on the Transeal® dressing around the fistula opening. Gently press the Transeal dressing around the fistula to seal the ostomy barrier ring or ostomy paste. Doing this will help maintain an effective seal and facilitate segregation of the effluent from the surrounding wound.

4 SPECIFIC WOUND APPLICATION, CONT.

4.2 Chronic Wounds

4.2.1 Pressure Injuries

The use of NPWT is appropriate for stage 3 and 4 pressure injuries, debrided unstageable pressure injuries, and debrided deep tissue injuries. NPWT may be used as a definitive treatment or to prepare the wound bed for surgical closure.

Goals

» Promote formation of granulation tissue and increase tissue perfusion

» Promote wound contraction and closure

» Prepare the wound bed for possible surgical intervention such as rotational flap, free flap, or skin grafting

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous or Variable Pressure	-125mmHg to -150mmHg	48-72 hours, 3x/wk, infected wounds may need more frequent dressing changes

Clinical Considerations

- Use continuous pressure therapy for the initial dressing placement. Subsequent dressing changes may need continuous therapy if the wound is in a location that is difficult to get a seal such as the perianal region.
- Patient offloading devices or surfaces should be used concurrently with NPWT if wounded area is over a bony prominence or in an area of weight bearing that could cause pressure to wound tissues.
- Consider use of bridging techniques to move the Prospera Propel™ dome away from bony prominences or other high-risk to ensure the placement of the does not increase the risk of further tissue damage.
- If bone is visible in the wound bed, cover with a non-adherent meshed contact layer or white foam prior to application of the foam dressing. Tunneling or undermining should be managed as outlined in section 4 Consider increased pressure settings with use of Polyderm™ White Foam.
- As with all wounds that require NPWT, patients with pressure injuries should have nutritional counseling for optimal wound healing.
- ***See section 3.5 for application guide.***

4 SPECIFIC WOUND APPLICATION, CONT.

4.2.2 Venous Insufficiency Ulcers

Venous insufficiency ulcers occur as a result of impaired venous return. Management must include measures to optimize wound healing through reduction of edema, prevention of complications, and appropriate topical therapy[24,25].

Goals

» Promote formation of granulation tissue

» Manage exudate and remove edema

» Promote perfusion

» Provide a closed environment for moist wound healing, contraction, and closure

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous	-125mmHg to -150mmHg	48-72 hours, 3x/wk, infected wounds may need more frequent dressing changes

Clinical Considerations

- Continuous therapy is recommended due to the high volume of exudate associated with this type of wound.
- Cleanse periwound skin thoroughly as weeping through the skin can make dressing adherence difficult.
- Compression dressings may be used in conjunction with NPWT, however the Prospera Propel™ dome must be bridged to above the proximal level of the compression dressing to a place where pressure of the dressing will not cause damage to underlying tissues. ***See section 4A for bridging technique.***
- An excessive or sudden increase in exudate may warrant further assessment by a physician.
- Avoid circumferential application of Transeal® dressing.
- ***See section 3.5 for application guide.***

4.2.3 Diabetic Foot Ulcers

Diabetic Foot Ulcers (DFU's) are a major cause for non-traumatic limb amputation and management is centered around a multi-disciplinary approach for prevention and care. NPWT can be a tool for wound closure when the underlying disease is managed, debridement of nonviable tissues is performed, and offloading is implemented. Using the Wagner Scale grade or University of Texas Diabetic Foot Classification System, the provider can determine when the right time in treatment NPWT can be utilized. Ulcers with Wagner grade 2-5 or UT scale II-III may benefit from NPWT[26,2728,29,30].

Goals

- Promote formation of granulation tissue.
- Manage exudate and remove edema.
- Promote perfusion.
- Provide a closed environment for moist wound healing with wound contraction and closure.
- Prepare the wound bed for possible surgical intervention such as rotational flap, free flap, or skin grafting.

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous or Variable Pressure	-50mmHg to -125mmHg	48-72 hours, 3x/wk, infected wounds may need more frequent dressing changes

Clinical Considerations

- Revascularization and infection control should be addressed prior to NPWT implementation to optimize therapy.
- Underlying DM must be managed to promote optimal wound healing.
- If osteomyelitis is present, debridement of infected bone and the initiation of appropriate antibiotic therapy is warranted before NPWT is applied. NPWT can be applied if osteomyelitis is being treated the appropriate antibiotic therapy.

- Assessment of the DFU wound and periwound is recommended after 24 hours of the initial placement of the dressing. Assess for maceration, infection, tissue tolerance, and continue therapy if appropriate.
- Any healthy bone visible or palpable in the wound bed should be protected with a non-adherent contact layer prior to application of foam dressing.
- Ensure placement of Prospera Propel™ dome does not cause undue pressure to the wound or the surrounding skin as this disease process may cause altered sensation. Bridging techniques may be required.
- Transeal® dressing should never be applied in a circumferential fashion to the limb or toes as this could cause circulation issues resultant in serious injury.
- Patient should be assessed for a foot offloading device.
- Tubing position should be carefully planned to avoid fall risk potential.

4.2.4 Palliative Wounds

Management of palliative wounds is focused on wound stabilization and symptom management - pain with dressing changes, odor and exudate control to promote patient well-being and improved quality of life. The priorities of palliative care are to comply with patient goals and wishes, maintain or improve quality of life, and reduce burdensome symptoms[31]. NPWT can be a useful tool when achieving these goals in the palliative care setting[32]. Management of these factors may also encourage resumption of social activities. The use of NPWT was shown in a case series to reduce nursing time required for care[32].

Goals

- To improve quality of life by controlling odor, managing exudate, and decreasing pain associated with frequent dressing changes.
- To comply with patient wishes and goals.

General Therapy Recommendations

Initial Dressing	Subsequent Dressings	Pressure Settings	Dressing Change Frequency
Continuous	Continuous	-50mmHg to -125mmHg	48-72 hours, 3x/wk, infected wounds may need more frequent dressing changes

4 SPECIFIC WOUND APPLICATION, CONT.

Clinical Considerations

- Pressure settings should be determined by the provider where as a dressings seal is maintained, there is adequate fluid removal to keep dressing functional, and patient comfort is prioritized.
- Lower continuous pressure may be the most comfortable for the patient depending on patient condition and wound location.
- Utilize wound contact layers at the base of the wound to prevent pain with removal of dressing.
- Less frequent dressing changes may be implemented to maximize patient comfort, however monitor the periwound for maceration so as to not cause further skin breakdown or pain.
- Utilize bridging techniques and offloading to promote patient comfort and avoid additional pressure to wound or bony prominences.

5 NPWT MONITORING

5 NPWT MONITORING

5.1 Pain Management - Transeal® MAXX & TR Dressing Recommendations

Patients that are receiving NPWT may experience pain throughout treatment especially during initiation of therapy and during dressing changes. Pain should be measured and documented before, during, and after any procedure involving NPWT. Untreated or ongoing pain can lead to adverse healing and detrimental physiological effects[33]. As therapy progresses, and wound healing is sustained, wound pain should decrease. Consult with the provider if pain persists despite pain relief interventions.

When employing NPWT, the following should be considered if the patient is experiencing pain during treatment or dressing changes:

- If prescribed and advised, dispense appropriate pain or anxiety medication to the patient before dressing changes and during NPWT therapy. This should be documented and closely monitored according to facility protocol and provider.
- During dressing removal, support the skin and gently grasp one edge of the transparent dressing then slowly peel the dressing from the skin in the direction of the hair growth (if hair is present). Peel the dressing back and Do **NOT** pull it up from the skin. Applying a lateral stretch (pull) on the transparent dressing may also be helpful. Using a medical adhesive solvent when removing the transparent dressing may help.
- When applying the transparent dressings, do not stretch or pull them to avoid trauma to the periwound skin. Any trauma to the periwound skin can cause pain in addition to compromising skin integrity.
- Consider the use of a contact layer or white foam at the base of the dressing if foam removal is painful.
- Consider stopping therapy 10-15 minutes before the dressing change, and soak the dressing in an appropriate solution, like saline, before removal.
- Use conservative pain management modalities like deep breathing or distraction.

NOTE: Transeal® MAXX dressing has an adhesive that is strong. Please refer to section Dressing Selection to read more about the recommendations on when to use Transeal MAXX dressing for patients with thin or sensitive skin or among patients experiencing pain during the removal of the NPWT dressings, Transeal™ dressing may be used as an alternative.

5 NPWT MONITORING, CONT.

5.2 Skin and Periwound Management

Ongoing protection and assessment of the periwound skin is vital to overall wound healing using NPWT. Monitor for infection, maceration, irritation, and deterioration of the periwound skin edges[34]. ***See Section 3.4 for periwound skin protection prior to NPWT dressing placement.***

As a reminder:

- Do **NOT** stretch the transparent dressing during application as tension can cause skin trauma and/or pain.
- Ensure that the black foam and other wound fillers used are confined in the wound bed. Do **NOT** overlap the foam and other fillers on intact skin.
- Protect fragile periwound skin with liquid skin barrier, adhesive sealing films, hydro-colloid, or Transeal® dressing.
- Multiple layers of transparent can decrease moisture vapor transmission rate (MVTR) which contributes to periwound skin maceration and breakdown.
- If the patient receiving NPWT develops any signs and symptoms of irritation or sensitivity to Transeal dressing or any component of the NPWT dressing, discontinue the therapy and contact the treating physician or seek medical attention.
- For patients with sensory impairment such as those with neuropathy, paralysis on the area with NPWT, or those with circulation problems, be extra careful when using NPWT.

5.3 Interpreting Changes in the Wound Bed

5.3.1 Metrics of Effective Therapy

Once NPWT commences, notable changes in the wound bed will appear if therapy is effective and sustained. These changes may include:

- Decrease in drainage.
- Change in drainage color from serous to serosanguinous, or sanguineous.
- Possible decrease in pain.
- Increased redness in granulation tissue due to increased perfusion
- Wound dimensions will decrease in size over time, with new epithelial tissue at the wound edges. Measurements should be documented per facility protocol, but at a minimum weekly, to ensure wound is responding adequately to therapy[35].
- If the above characteristics are not met, a thorough assessment of the wound and patient should be conducted with the provider. Troubleshooting strategies should be implemented immediately.

5.3.2 Metrics of Ineffective Therapy

I. Wound Size

Weekly wound measurements, wound assessments, and documentation should be completed to evaluate wound progress. If the dimensions of the wound are not decreasing after one to two consecutive weeks of NPWT, perform a thorough patient assessment and implement a care plan to address any issues affecting wound progress. When there is little or no decrease in wound size for one or two consecutive weeks, assess for:

- Patient adherence to therapy
- Appropriate dressing techniques
- Patient co-morbidity management
- Proper pressure redistribution, if needed
- Nutritional deficiencies
- Infection. ***See section 5.3.2 III. Wound Odor, Drainage and Infection.***

Other Considerations

If the therapy is on Continuous mode, consider using Variable Pressure Therapy (VPT) and vice versa.
Consider pausing the NPWT for 1-2 days, then resume therapy.
Assess if there are other products being used in the wound that impact proper delivery of negative pressure such as wound contact layers.
Ensure that the NPWT is being used for at least 22 hours per day. If not, address any issue why this is not occurring.
For wounds with little depth, consider cutting the foam slightly smaller than the wound edges as this may facilitate inward migration of epithelial cells.

5 NPWT MONITORING, CONT.

II. Wound Tissue Changes

Wound bed tissue and drainage will change over the course of therapy, however be wary of signs of wound deterioration or stagnation.

A patient's wound may not be healing properly if there is dark discoloration. Corrective interventions may include:

- Checking if the patient is on anticoagulants, and if so, evaluate the laboratory values related to coagulation.
- Decreasing NPWT pressure by 20mmHg increments at dressing changes until tissue coloration is beefy red.
- Assessing for mechanical trauma – pressure, excessive packing, wound debris, etc – and removing or treating the source.

A patient's wound may not be healing properly if there is excessive moisture or maceration to wound edges causing tissue to be pale or white. Corrective interventions may include:

- Ensuring therapy is on for 22 hours per day.
- Assess for infection and have it treated as needed.
- Increase the pressure in –25mmHg increments if the drainage increases.
- Determine if there is a positional leak and assess if proper offloading of the patient is performed adequately.
- Consider employing the bridging technique and applying the Prospera™ Propel contour dome away from the wound.
- Please refer to the Skin and Periwound Management section below for additional recommendations on preventing maceration and skin breakdown from excess moisture.

III. Wound Odor, Drainage, and Infection

Wound drainage may have and odor due to the presence of biologic debris in both the dressing and canister. Odor is a normal physiologic occurrence in wound healing however changes should be noted and assessed for infection. A patient's wound may not be healing properly if there is an increase in drainage or change in type of drainage. ***If a large amount of bleeding is noted, please refer to the Bleeding section for management recommendations.***

5 NPWT MONITORING, CONT.

Clean the wound and periwound thoroughly to decrease bacterial load and foul odor.

Meticulous debridement of necrotic tissue also prevents wound infections.

If foul odor persists, this may be a sign of infection. Assess the patient and consult a physician for further evaluation and treatment.

Using canisters with solidifiers and changing the canisters more often can help decrease foul odor.

If the exudate becomes thick and/or cloudy, or if bile or bowel effluent (in abdominal wounds) are observed, stop the NPWT and contact the treating physician.

Common acute signs of infection include rubor, heat, pain, swelling, purulent drainage/odor. Chronic wounds may have different or more subtle presentations of infection including wound tissue regression or delayed healing, increased serous drainage, pale, gray, or bleeding granulation tissue, and satellite lesions.

If infection is suspected:

- NPWT may be used with infected wounds in conjunction with standard treatment of infection as prescribed by the treating physician.
- Increasing the frequency of dressing changes may be necessary during the period of infection especially with an increase in the volume of the drainage. Change at least every 48 hours.
- Clean the wound thoroughly when changing the dressings.
- Debride wound bed as needed.
- Manage bacterial bio-burden.

5 NPWT MONITORING, CONT.

IV. When to Discontinue Therapy

The duration of therapy is determined by the goals set by the provider in charge. When surgery is not an option, NPWT may be used for an extended period, as long as the wound is improving. For chronic wounds, NPWT may also be continued for an extended duration provided there is evidence of wound healing.

Discontinue therapy when:

- The goal of the therapy has been met.
- The prescribing provider orders for the treatment to be discontinued.
- Discontinue therapy if patient is uncooperative, non-adherent, or unable to follow the plan of care.

6 ADDITIONAL SUPPORT

For additional clinical or training support, visit DeRoyal.com

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