

WOUND VACUUM ASSISTED CLOSURE

ALGORITHM. Dressing Change Steps

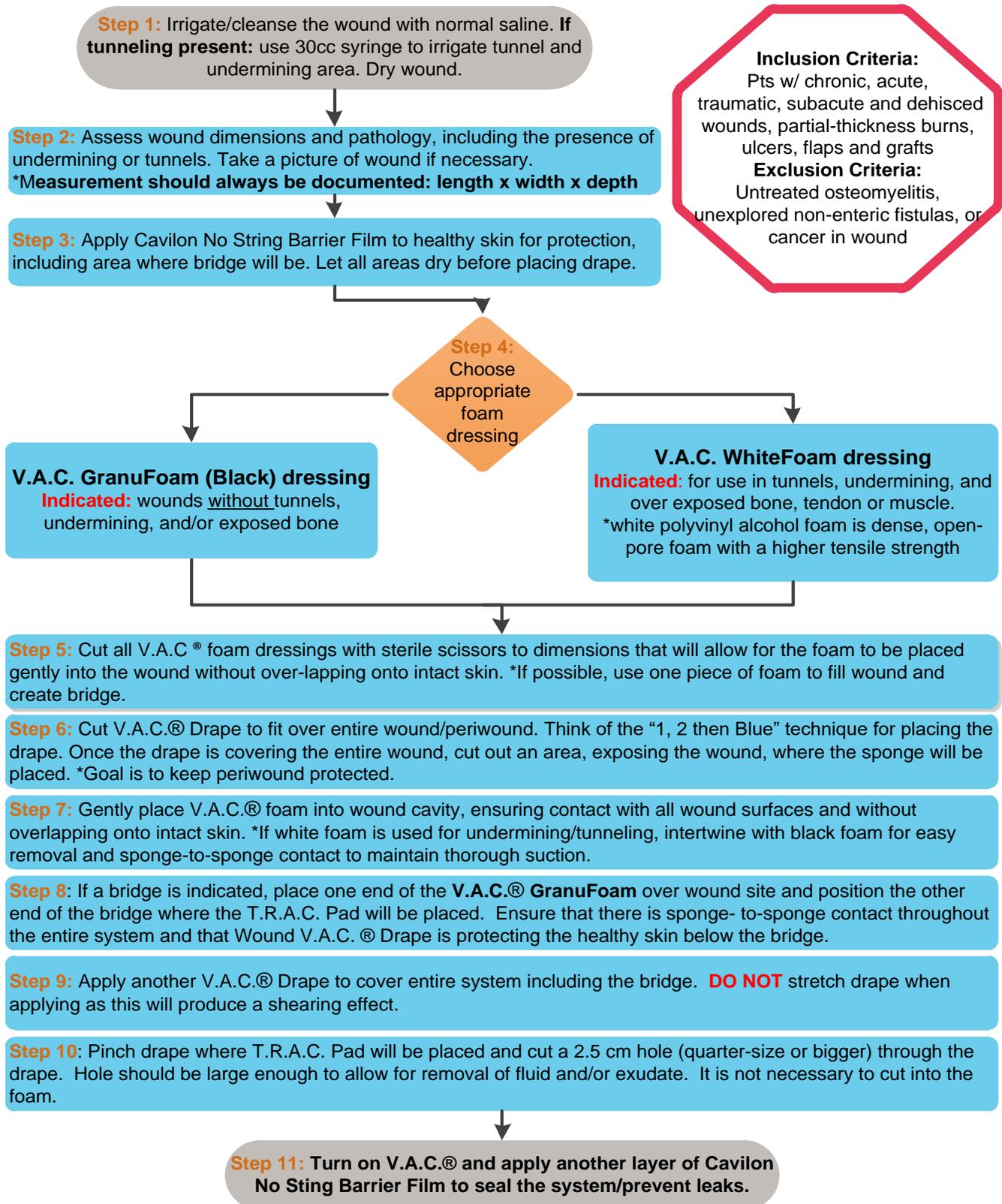


TABLE OF CONTENTS

[Algorithm](#) Dressing Change Steps

[Target Population](#)

[Background | Definitions](#)

Initial Evaluation – N/A

[Clinical Management | Troubleshooting](#)

[Laboratory Studies | Imaging](#)

Therapeutics – N/A

[Discharge](#)

[References](#)

[Clinical Improvement Team](#)

TARGET POPULATION

Inclusion Criteria

- Patients with chronic, acute, traumatic, subacute, and dehisced wounds
- Patients with partial-thickness burns, ulcers, flaps, and grafts

Exclusion Criteria

- Patients with untreated osteomyelitis
- Patients with unexplored non-enteric fistulas
- Patients with cancer in wound

BACKGROUND | DEFINITIONS

Negative Pressure Wound Therapy (NPWT) is a provider prescribed wound therapy used for closure of large often deep wounds or for skin/muscle flaps and grafts. They are intended to create an environment that promotes wound healing by secondary or tertiary (delayed primary) intention by preparing the wound bed for closure, reducing edema, promoting granulation tissue formation and perfusion, and by removing exudate and infectious material. They are indicated for patients with chronic, acute, traumatic, subacute and dehisced wounds, partial-thickness burns, ulcers (such as diabetic, pressure or venous insufficiency), flaps and grafts. A Provider order is required to initiate the V.A.C.® wound therapy. The order should address frequency of dressing changes as well as suction pressure setting. The default setting is 125mmHg on a continuous suction, but settings can be individualized to the patient's specific needs. Dressings should be changed every 72 hours, with frequency adjusted by the Provider as appropriate. Dressings can be changed by the Provider, CWOCN, or trained Provider designee.

- Negative Pressure Wound Therapy (NPWT)
 - Also called the Wound VAC. Wound V.A.C.® is a proprietary name for the KCI V.A.C.® Therapy System.
- The V.A.C.® Therapy System
 - An Advanced Wound Therapy System consisting of four parts:
 - The V.A.C.® Therapy unit that delivers negative pressure
 - The sterile plastic tubing which connects the therapy unit to the dressing

- A special foam dressings either V.A.C.® GranuFoam™(Black foam) or the V.A.C.® WhiteFoam
- A clear drape with adhesive backing called V.A.C.® Drape that covers the foam dressing
- V.A.C. Black Granufoam Dressing
- Polyurethane foam dressing with reticulated pores to help evenly distribute negative pressure across the wound bed, assisting in tissue granulation formation in wounds and aiding wound contraction. It is hydrophobic (moisture repelling), which enhances exudate removal.
- V.A.C. White Foam Dressing

Polyvinyl alcohol infused foam that is a dense, open pore foam with a higher tensile strength for use in tunnels and undermining. It is hydrophilic (moisture retaining) and is packaged pre-moistened with sterile water. Its characteristics help to reduce the likelihood of adherence to the wound base. This foam can be used over fresh split thickness skin grafts, to protect exposed bone, tendon, or muscle, for packing of tracks or tunnels, and in situations where hyper granulation responses are likely.

CLINICAL MANAGEMENT

Pressure Setting:

- The default setting is 125mmHg on a continuous suction, but settings can be individualized to the patient's specific needs.
- Consider titrating the V.A.C. pressure setting up by 25mmHg increments for excessive drainage, large wound volume, or V.A.C. white foam dressing in the wound or in tunneled areas.
- Consider titrating the V.A.C. pressure setting down by 25mmHg increments for infants or young age, compromised nutrition, risk of excessive bleeding, circulatory compromise, hyper granulation, excessive pain or discomfort, or periwound or wound bed ecchymosis.

Dressing Change Frequency:

- Dressings should be changed every 72 hours, with frequency adjusted by the Provider as appropriate. The Provider, Provider designee, or CWOCN changes the NPWT dressing at the ordered frequency.
 - Once an order has been placed for Wound V.A.C. therapy, supplies should be ordered for wound V.A.C. dressing changes.
 - The NPWT machine (Wound V.A.C.®) is obtained from Sterile Processing.
 - The canister and the foam dressing kits are obtained from Central Supply. There are three sizes of foam dressing kits, small, medium and large. White foam is also available.
 - **NOTE:** If the system is malfunctioning for more than two hours, the RN or Provider should remove the current V.A.C.® dressing and apply moistened gauze to the wound bed and cover with a Mepilex dressing until a Provider or member of the Wound team can assess the wound and reapply the V.A.C.® system.

Dressing Change Steps: [See Algorithm](#)

TROUBLESHOOTING

Alarming “MALFUNCTION”:

- Confirm the unit is plugged into the wall and has power.
- Restart the unit to see if the problem is with the unit itself.
- If unit is plugged in and restarted and still alarming, think possible leak (see Leak trouble shooting).

Alarming “LEAK ALARM”:

- Check to make sure all connections are secure.

- Press down on the sponge in all areas to identify leak.
- Use Stethoscope or place your ear near the dressing to listen for leak. An air leak will make a whistling sound.
- To secure a leak, apply additional draping/Cavilon No Sting Barrier Film to secure areas where leak is heard.
- Use a barrier ring in troubling areas (i.e., between rectum and wound) to promote a better seal.

Alarming “LOW PRESSURE ALERT”:

- Ensure both clamps on the dressing and canister tubing are open.
- Ensure that tubing is not kinked or blocked in any way.
- If blockage is noted within tubing, change tubing or flush tubing with 10cc sterile saline to remove blockage.
- If the low pressure alert remains after completing steps above, lowering the therapy unit and tubing to be level with or below the wound site may resolve this alert.

LABORATORY STUDIES | IMAGING

- Consider weekly pre-albumin levels to evaluate for optimal nutrition for healing.

DISCHARGE

- If a patient is being discharged with NPWT, home wound vac supplies must be ordered prior to discharge. Provider or designee should work with the Case Manager to fill out appropriate paperwork and ensure dressing supplies are ordered through a home company. Home supplies and the home wound vac machine (KCI Activac) are delivered to the patient's hospital room by the company.
- A plan for dressing changes after discharge should be arranged prior to discharge from the hospital. This can include a home nursing company or scheduled dressing changes in clinic.
- The ordering service is responsible for changing the hospital vac to the home vac prior to discharge and educating the family on troubleshooting the vac at home. This can also be done by the WOCN team upon request.

REFERENCES

1. Raad W1, Lantis JC 2nd, Tyrie L, Gendics C, Todd G (2010). Retrospective evaluation of clinical outcomes in subjects with split-thickness skin graft: comparing V.A.C.® therapy and conventional therapy in foot and ankle reconstructive surgeries. *International Wound Journal*. Dec;7(6) 480-487.
2. Gabriel A1, Shores J, Bernstein B, de Leon J, Kamepalli R, Wolvos T, Baharestani MM, Gupta S (2009). A clinical review of infected wound treatment with vacuum assisted closure (V.A.C.) therapy: experience and case series. *International Wound Journal*. Oct;6(2) 1-25.
3. Zannis J, Angobaldo J, Marks M, DeFranzo A, David L, Molnar J, Argenta L (2009). Comparison of fasciotomy wound closures using traditional dressing changes and the vacuum-assisted closure device. *Annals of Plastics Surgery*. Apr; 62(4) 407-409.
4. Baharestani MM1, Houliston-Otto DB, Barnes S (2008). Early versus late initiation of negative pressure wound therapy: examining the impact on home care length of stay. *Ostomy Wound Management* Nov; 54 (11) 48-53.
5. Apelqvist J1, Armstrong DG, Lavery LA, Boulton AJ. Resource utilization and economic costs of care based on a randomized trial of vacuum-assisted closure therapy in the treatment of diabetic foot wounds (2008). *American Journal Surgery*. Jun;195 (6) 782-788.
6. Blume PA1, Walters J, Payne W, Ayala J, Lantis J (2008). Comparison of negative pressure wound therapy using vacuum-assisted closure with advanced moist wound therapy in the treatment of diabetic foot ulcers: a multicenter randomized controlled trial. *Diabetes Care* Apr;31(4) 631-6.
7. Siegel HJ1, Long JL, Watson KM, Fiveash JB (2007). Vacuum-assisted closure for radiation-associated wound complications. *Journal of Surgery Oncology*. Dec 1;96(7) 575-82.
8. Vuerstaek JD1, Vainas T, Wuite J, Nelemans P, Neumann MH, Veraart JC (2006). State-of-the-art treatment of chronic leg ulcers: A randomized controlled trial comparing vacuum-assisted closure (V.A.C.) with modern wound dressings. *Journal of Vascular Surgery* Nov; 44 (5) 1029-1037.

CLINICAL IMPROVEMENT TEAM MEMBERS

- Mark Erickson, MD, MMM | Orthopedics
- Fred Deleyiannis, MD | Plastic Surgery
- Kristen Devick, PA-C | Plastic Surgery
- Esther Carpenter, BSN, CCRN | Cardiology
- Michelle Usry, BSN, RN, CPN, CWOCN| Wound Team
- David Partrick, MD | General Surgery
- Pam Southwell, BSN, RN| Wound Team
- Kerri Holman, BSN, RN, CWON| Wound Team
- Angela Stowe, MS | Clinical Effectiveness
- Sarah Nickels, PhD | Clinical Effectiveness

APPROVED BY

Clinical Care Guidelines & Measures Review Committee – September 27, 2016

MANUAL/DEPARTMENT	Clinical Pathways/Quality
ORIGINATION DATE	September 27, 2016
LAST DATE OF REVIEW OR REVISION	March 15, 2019 (Colorado Springs alignment)
COLORADO SPRINGS REVIEW BY	 Michael DiStefano, MD Chief Medical Officer, Colorado Springs
APPROVED BY	 Lalit Bajaj, MD, MPH Medical Director, Clinical Effectiveness

REVIEW | REVISION SCHEDULE

Scheduled for full review on September 27, 2020

Clinical pathways are intended for informational purposes only. They are current at the date of publication and are reviewed on a regular basis to align with the best available evidence. Some information and links may not be available to external viewers. External viewers are encouraged to consult other available sources if needed to confirm and supplement the content presented in the clinical pathways. Clinical pathways are not intended to take the place of a physician's or other health care provider's advice, and is not intended to diagnose, treat, cure or prevent any disease or other medical condition. The information should not be used in place of a visit, call, consultation or advice of a physician or other health care provider. Furthermore, the information is provided for use solely at your own risk. CHCO accepts no liability for the content, or for the consequences of any actions taken on the basis of the information provided. The information provided to you and the actions taken thereof are provided on an "as is" basis without any warranty of any kind, express or implied, from CHCO. CHCO declares no affiliation, sponsorship, nor any partnerships with any listed organization, or its respective directors, officers, employees, agents, contractors, affiliates, and representatives.

