Wound Care for the Hand Therapist II: CMHSG
Principles of Wound Management
VAC Application/NPWT
Documentation & Coding
Path to Certification
Cases

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Disclosures

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- Webinars, lectures, presentations for ASHT, AAHS, OT.com, PT.com, various universities
- Specific products may be mentioned but not solely endorsed

Learning Objectives

- Interpret principles of wound healing to guide clinical wound practice
- Discuss wound VAC application and principles of negative pressure wound therapy (NPWT)
- Explain wound care documentation and coding for therapists
- Review paths to certification in Wound Care

Principles of Wound Management

Optimize Wound Healing

- Cells function optimally at normal body **temperature**
  - Dressing change or exposure to air can drop wound base temp
  - Tissue cooling increases infection risk due to vasoconstriction and decreased oxygen for neutrophils to fight infection
  - Foam>film>gauze>air
- **Moist** wound healing- mimics function of epidermis

Moist Wound Healing

- Body mainly composed of water, natural cell environment is moist: “a dry cell is a dead cell”
- Decreased dehydration and cell death
  - Neutrophils, macrophages, fibroblasts cannot thrive in dry environment
- Increased angiogenesis
- Enhanced autolytic debridement
- Increased re-epithelialization
  - Dry crusted wounds act as barrier to cell migration, slow epithelialization
- Decreased pain
  - Moist wound bed insulates and protects nerve endings

Study on Moist Wound Healing

Winter, *Nature* 1962

- Theory of Modern Wound Management: George Winter, PhD
- 1962 study: created multiple small partial thickness wounds on backs of pigs
- Wounds were either allowed to dry out and form scabs or covered with polymer film
- Results: wounds cover with polymer film epithelialize twice as fast vs wounds exposed to air
- Conclusion: moist wounds heal faster

Wet-to-Dry Dressings

Ovington, *Advances in Skin & Wound Care* 2002

- Landmark study: Lisa Ovington, PhD, CWS
- Technically a mechanical debridement technique, not a dressing change
- Reduces tissue temperature which impedes healing, increases susceptibility to infection
- Higher infection rates vs. wounds dressed with transparent films or hydrocolloids
- Bacteria capable of penetrating 64 layers of dry gauze
- Removing dried dressing disperses bacteria into air
- Gauze dressings are “substandard for optimal wound care”

Principles of Wound Management

- **Exudate** is liquid produced by the body in response to tissue damage
  - Derived from fluid that leaked out of blood vessels
  - Contains water, electrolytes, nutrients, inflammatory mediators, proteolytic enzymes, growth factors and waste products
- Flushes away foreign material from the injury site
- Acts as carrier medium to bring collagen and repair cells to the injury site
- Enables movement of phagocytic cells within wound bed
- Nutrients in exudate used to generate granulation tissue

Principles of Wound Management

- **Excess exudate**
  - Causes maceration to surrounding tissues
  - Tissue breakdown due to enzymes released
- **Insufficient exudate**
  - Causes pain and potential dressing adherence
  - Damage to granulation tissue
  - Surface cells dry and die, more necrotic tissue in wound bed
  - Irrigating effect of exudate lost, wound requires moist treatment

Photos: Nora Barrett

Principles of Wound Management

- **Hypoxia-** insufficient supply of oxygen to allow normal healing rate
  - Major impediment to proper healing
  - All healing phases are oxygen dependent
  - Lowers tissue resistance to infection
  - Facilitates growth of anaerobic organisms

Photo: Nora Barrett

VAC Application & Principles

Vacuum-Assisted Closure

- Alternative method of wound management
- Utilizes negative pressure to prepare wound for spontaneous healing or by lesser reconstructive options
- Application includes debridement, hemostasis and sterile foam dressing sealed tight with fenestrated tube embedded in the foam and connected to a vacuum pump with a fluid collection container
  - Sterile foams provide even distribution of negative pressure over entire wound bed

Photo: Nora Barrett

VAC Application & Principles

Suction and Pressure Specifics

- Continuous or intermittent suction delivered through vacuum system
  - Intermittent suction superior to continuous negative pressure
  - Greater blood flow generated during off phase of vacuum
  - Rate of granulation tissue formation 2x higher intermittent vs continuous
- Pressure determined by wound type, characteristics, location
  - Lower pressure (50-70 mmHg) for painful, chronic wounds
  - Higher pressure (150+ mmHg) for large cavity or exudative wounds
  - Optimum pressure setting: 125mmHg

Wound VAC Application

Photos: Nora Barrett

Benefits of NPWT

- Stabilizes wound environment
  - Provides closed moist wound healing environment
- Reduces wound edema
- Reduces bacterial load
- Improves tissue perfusion
- Stimulates granulation tissue and angiogenesis

Photo: Nora Barrett

- Overall: reduced rate of dressing changes, reduced hospital stay, increased patient comfort

Results of NPWT use

- Improved possibility of primary wound closure
- Reduced need for plastics procedures
- Simple and more effective then conventional dressings for management of difficult wounds
  - Reduction in wound volume, depth, treatment duration and cost

VAC Indications

Applicable to hand therapy patients

- Skin graft fixation
- Flap salvage
- Crush injuries
- Fasciotomy wounds
- Animal bites
- Frostbite
- Burns
- Extravasation wounds

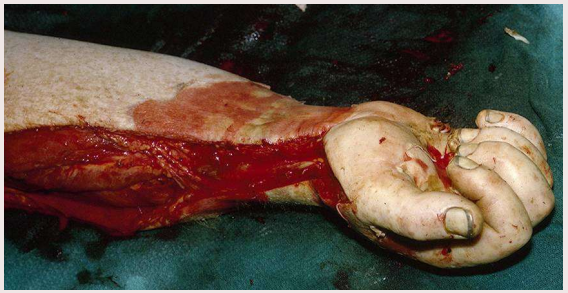


Photo: Nora Barrett

VAC Contraindications

Applicable to hand therapy patients

- Malignant wounds
- Untreated osteomyelitis
- Presence of necrotic tissue
- Exposed arteries/nerve/anastomosis site

- Relative contraindications:
  - Actively bleeding wounds
  - Patients on anticoagulants

Photos: Nora Barrett

Red flag signs during NPWT

- Active or excessive bleeding
- Surrounding or invasive sepsis
- Increased pain
- Allergic reaction to adhesive
- Signs of infection
  - Fever
  - Pus
  - Foul smelling drainage

Photo: Nora Barrett

Complications of NPWT

- Failure of VAC system
  - Loss of seal
  - Power failure
  - Drainage system blocked
- Wound infection
- Pain
- Bleeding
- Allergic reaction to adhesive drape
- Skin excoriation
- Restricted mobility
- Tissue adherence to foam
- Lack of patient compliance
- Skin necrosis

Photo: Nora Barrett

Pre- VAC

Principles Prior to Application

- Osteomyelitis/infection must be treated
- Primary role: prep tissue for closure
  - Removal of exudate
  - Stimulate granulation tissue
  - Stimulate angiogenesis

Photo: Nora Barrett

Post-VAC Closure

- Infection cleared
- Debris and necrotic tissue cleared
- Granulation tissue stimulated
- Exudate managed
- Appropriate for closure

Photo: Nora Barrett

VAC Case

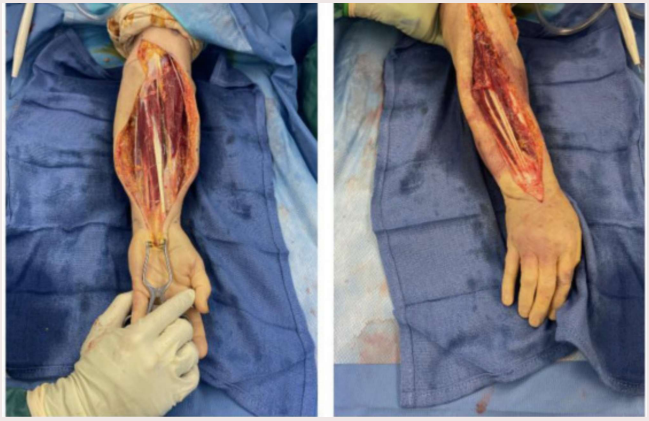
Initial presentation: L Forearm

4/5/22

Photos: Joshua Schwartz

VAC Case

Complete fasiectomy volar, dorsal and mobile wad compartments



Photos: Joshua Schwartz

VAC Case

Secondary debridement

Photos: Joshua Schwartz

VAC Case

STSG to L FA

Photos: Joshua Schwartz

VAC Case

Post-VAC

5/24/22

Photos: Nora Barrett

VAC Case

Post-VAC

9/20/22

Photos: Nora Barrett

VAC Case

Post-VAC function and motion

Photos: Joshua Schwartz

Photo: Nora Barrett

Documentation & Coding

- "Sharps debridement of dead or devitalized tissue" must accompany documentation for wound care code reimbursement
- Codes 97597, 97598 or 97602, selective or non-selective
- Suture removal not a billable wound care charge
  - Included in surgical fee for suture/staple application
- "Dressings applied to the wound are part of the services for CPT codes 97597, 97598 and 97602 and they may not be billed separately". -cms.gov

- AOTA Position Paper
- HTCC releasing Position Paper

Charging for Wound Care Supplies

A challenge but worth the effort!

- Not covered by insurance
- Clinic covers initial dressing and issues one extra, additional up to patient
- Affordable options on Amazon and at pharmacies, ie CVS
- Handouts in clinic for ordering needed materials
- Therapist responsibility to identify appropriate selection

Photos: Nora Barrett

Handouts in Clinic

Examples of dressings/supplies for purchase

UVA Health Orthopedic Center Ivy Road

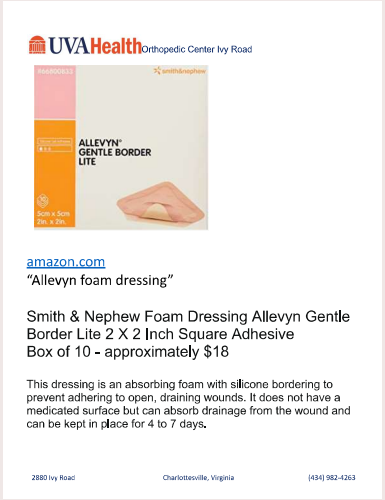
amazon.com

"Skintegrity hydrogel dressing"

Skintegrity Hydrogel Wound Dressing 1 oz. bottle - approximately $8

This dressing is a gel type material that is designed to be put into a wound bed to donate and maintain moisture in a dry or deep wound. It should not be used on a wound that is heavily draining or already has too much moisture. A primary dressing needs to cover the hydrogel on the wound.

2880 Ivy Road Charlottesville, Virginia (434) 982-4263



UVA Health Orthopedic Center Ivy Road

amazon.com

"Allevyn foam dressing"

Smith & Nephew Foam Dressing Allevyn Gentle Border Lite 2 X 2 Inch Square Adhesive Box of 10 - approximately $18

This dressing is an absorbing foam with silicone bordering to prevent adhering to open, draining wounds. It does not have a medicated surface but can absorb drainage from the wound and can be kept in place for 4 to 7 days.

2880 Ivy Road Charlottesville, Virginia (434) 982-4263

Paths to Wound Care Certification

Certified Wound Specialist: CWS

- American Board of Wound Management (ABWN)
- http://www.abwmcertified.org/abwm- certified/
- Certification types for licensed PT/OT: Certified Wound Specialist (CWS)
- Separate certification type for PTA/OTA: Certified Wound Care Associate (CWCA)
- Both require 3+ years clinical wound experience
- Passing score on ABWN CWS or CWCA exam

Paths to Wound Care Certification

Wound Care Certified: WCC

- National Alliance of Wound Care and Ostomy (NAWCO)
- https://www.nawccb.org/wound-care-certification
- Many certification types, WCC most applicable for hand therapist
- OT, PT, OTA or PTA
- License in good standing
- 2 years full time or 4 years part time
- Wound care component of job duties within last 5 years
- Complete approved accredited Skin and Wound Management Course
- Passing score on NAWCO WCC exam

Case: T money

Double zero: too much moisture

Photos: Nora Barrett

Case: T money

One week post change to Adaptic

Photos: Nora Barrett

Case: T money

Deadly dry-out

Photos: Nora Barrett

Case: 2 week golden rule

L IF fracture with ST deficit

Photos: Nora Barrett

Case: 2 week golden rule

3 weeks later

Photos: Nora Barrett

Case: 2 week golden rule

2 more weeks

Photos: Nora Barrett

Case: 2 week golden rule

3 more weeks

Photo: Nora Barrett

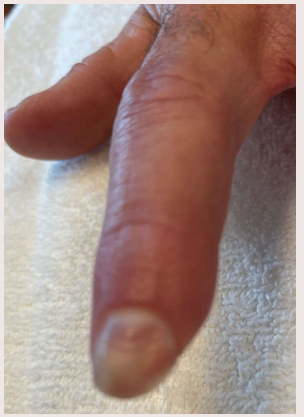
Case: 2 week golden rule

4 more weeks

Photo: Nora Barrett

Case: 2 week golden rule

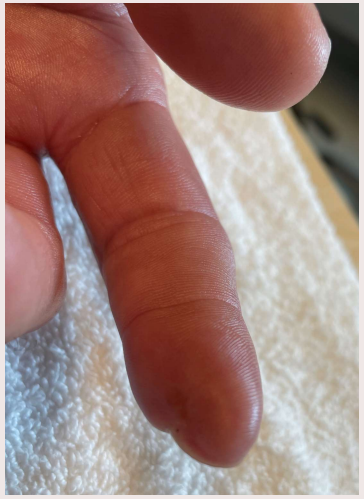
4 more weeks



Photos: Nora Barrett

Case: 2 week golden rule

5 more weeks



Photos: Nora Barrett

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