A PART OF WOUND SOURCE practice accelerator
Education to improve your practice

Chronic Wound Identification and Assessment

APRIL 2018

SPONSORED BY
ConvaTec
Advanced Wound Care

Chronic Wound Identification and Assessment

by Cheryl Carver LPN, WCC, CWCA, CWCP, FACCWS, DAPWCA, CLTC – Wound Educator

Chronic wounds create a strain and major challenge in every health care setting, and these challenges continue to multiply as a result of health care costs and the aging population. The goal of this white paper is to provide a more simplified structured plan to identify and assess chronic wounds correctly in the health care arena. A discussion will be provided on the key essentials of the chronic wound plan of care, with an emphasis on proactive strategies for preventing wound recurrence.

Chronic wounds affect more than 6.5 million people and cost billions of dollars every year in the United States.[1] Wound identification and a comprehensive assessment make up the foundation for gauging an effective treatment plan. Chronic wounds become stagnant through the normal phases of wound healing, and they usually adopt a vicious cycle. This cycle may include numerous comorbidities, mixed etiologies, and intrinsic and extrinsic factors.[2]

10 Key Aspects Of Chronic Wound Management

In effectively managing chronic wounds and supporting patients on the path to healing, there are a number of aspects of the care plan that need to be addressed. Following are the essential areas of wound management that must be factored into delivering comprehensive and effective care[3]:

1. Wound etiology
2. Wound assessment
3. Wound bed preparation (cleansing, controlling bioburden)
4. Wound depth and exudate amount
5. Dressing wear time (frequency)
6. Nutritional status
7. Pain management
8. Patient compliance, self-abilities, lifestyle changes
9. Patient and caregiver education (ongoing)
10. Payer source (reimbursement, financial)

Strategies To Simplify Identifying Wound Types

Identifying wound types can be difficult at times. There may be mixed etiologies and underlying factors that do not quite fit the normal characteristics of chronic wound types. You should be consistent with a detailed assessment of wound characteristics, including wound location, wound tissue type, periwound and wound edge shape, temperature, pulses, sensation, exudate color and amount, and wound depth.[2]

The following reference tool will provide you with an overview of the characteristics and treatment options for the most common types of chronic wound conditions.

Note: This guide is for informational purposes only; please always refer to your facility's protocol in the assessment and treatment of your patient's wounds.

Arterial Ulcer

LOCATION	Between or on the tips of the toes, outer ankle
SHAPE	Punched-out round appearance, unless a mixed etiology of venous and arterial
COLOR	Pale pink, gray, or yellow and periwound edema
DEPTH	Usually deep, full-thickness
PAIN	Typically yes; patient may report pain while in bed or when limb elevated[4]

Most common causes and risk factors of arterial ulcers are[4]:

- Peripheral vascular disease
- Pyoderma gangrenosum
- Chronic vascular insufficiency
- Sickle cell disease
- Vasculitis
- Obesity
- Diabetes mellitus
- Renal failure
- Hyperlipidemia
- Family history
- Arteriosclerosis
- Atherosclerosis
- Smoking
- Trauma
- Limited joint mobility
- Increased age
- Thromboangiitis

Diagnostic Toolbox

Diagnostic Tests – Arterial Doppler studies with toe pressures if diabetic (include waveforms), Semmes Weinstein monofilament test to rule out neuropathy, and transcutaneous oximetry monitoring or fluorescent angiography to provide tissue perfusion results at the wound site. Ankle-brachial index (ABI) results can be elevated by calcification of vessels. Blood flow impairment; ABI <0.9

Lab Tests – CBC, CRP, and ESR

Imaging – MRI, CTA, and angiogram

Surgical Procedures – Revascularization using endovascular or traditional bypass procedures to promote wound healing[4]

Treatment Plan

1. Manage existing comorbidities (cholesterol, blood pressure, controlled blood sugar levels).
2. Perform weekly thorough lower extremity skin checks.
3. Protect skin to lower extremities to avoid trauma wounds.
4. Smoking cessation. Smoking impedes healing and increases risk of ulcers.
5. Do not cross legs.
6. Wear loose socks and garments to prevent constriction.[4]

Venous Ulcer

LOCATION	Gaiter area of the leg. Above the malleolus to 1 inch below the knee, along distal saphenous vein. Edema in lower extremities
SHAPE	Irregular characteristic
COLOR	Moist, viable red granulation tissue, may or may not have devitalized tissue (slough, eschar)
DEPTH	Shallow and diffuse[4,5]

Most common causes and risk factors of venous ulcers are[4,5]:

- Venous hypertension, incompetent valves
- Varicose veins
- Previous deep vein thrombosis
- Smoking
- Family history
- Lymphedema
- Diabetes mellitus
- Congestive heart failure
- Poor nutrition
- Decreased mobility

Diagnostic Toolbox

Diagnostic Tests – Arterial Doppler studies with toe pressures if diabetic (include waveforms), Semmes Weinstein monofilament test to rule out neuropathy, and transcutaneous oximetry monitoring or fluorescent angiography to provide tissue perfusion results at the wound site. Ankle brachial index (ABI) results can be elevated by calcification of vessels. Adequate blood flow; ABI >0.8 unless mixed etiology with arterial

Lab Tests – CBC, CRP, and ESR

Imaging – MRI, CTA, and angiogram

Surgical Procedures – Revascularization using endovascular or traditional bypass procedures to promote wound healing. Surgical ablation of superficial and/or perforating veins[4,5]

Treatment Plan

1. Manage existing comorbidities (cholesterol, blood pressure, controlled blood sugars, obesity).
2. Consistent wear of compression therapy as prescribed.
3. Smoking cessation. Smoking impedes healing and increases risk of ulcers.
4. Elevate legs above the heart.
5. Walk frequently.

Compression Therapy Options[5]:

1. **Unna boot –** Zinc oxide plaster. Calamine additive also available. (35–40mmHg) Provides sustained therapeutic compression for up to 7 days. ABI (ankle brachial index) >0.7
2. **Two-layer system –** (25–30mmHg, 35–40mmHg) Provides sustained therapeutic compression for up to 7 days. ABI (ankle brachial index) >0.7
3. **Four-layer system –** (35–40mmHg) Provides sustained therapeutic compression for up to 7 days. ABI (ankle brachial index) >0.8
4. **Compression garments –** Velcro, zipper, and pull-on application available
5. **Compression lymphedema pumps –** Dynamic compression devices provide a therapeutic, controlled external compression or pressure cycle to a limb

Diabetic Neuropathic Ulcer

LOCATION	Below ankle, most common plantar aspect of foot
SHAPE	Round and calloused edges (may be referred to as hyperkeratosis, or fibrotic rimmed)
COLOR	Pink, pale, dry
DEPTH	Partial- or full-thickness[4,5]

Most common causes and risk factors of diabetic neuropathic ulcers are[4,5]:

- Uncontrolled blood sugars
- Ischemia, peripheral vascular disease
- Charcot deformity, increased plantar aspect pressure
- Advanced age
- Obesity
- Family history
- Hypertension
- Previous amputation
- Smoking
- Presence of retinopathy
- Absence of vibratory sensation
- Trauma
- Poor fitting shoes – mechanical force causing skin breakdown, callus, and/or ulcer
- Coronary artery disease
- Neuropathy, Insensate

Diagnostic Toolbox

Diagnostic Tests – Arterial Doppler studies with toe pressures (include waveforms), Semmes Weinstein monofilament test to rule out neuropathy, and transcutaneous oximetry monitoring or fluorescent angiography will provide tissue perfusion results at the wound site. Ankle brachial index (ABI) results can be elevated by calcification of vessels. Biothesiometry to determine vibration perception threshold.

Lab Tests – CMP, pre-albumin, ESR, CRP, HgA1c, CBC, screen for leukocytosis and anemia

Imaging – X-ray, MRI, CT angiography, or bone scan as indicated

Surgical Procedures – None[4,5]

Treatment Plan

1. Manage calluses, fissures, corns, hammertoes, bunions, toenail complications, Charcot foot deformities, and chronic non-healing ulcers to prevent limb amputation.
2. Daily inspection of feet. Never walk barefoot. Wear dry, high-wicking clean socks. No lotion should be between the toes, thus causing increased risk of bacteria growth.
3. Control diabetes per physician recommendations that include a well-balanced diet, regular exercise, and healthy lifestyle.[4,5]

Surgical Dehiscence

Wound dehiscence is one of the most common complications of surgical wounds, and it involves breaking open the surgical incision along the suture. When wound dehiscence occurs, the edges start to separate, and the wound reopens instead of healing closed as planned.[2]

Most common causes and risk factors of surgical chronic wounds are[4]:

- Subacute infection
- Poor surgical technique
- Poor perfusion
- Tension to wound edges
- Increased age
- Obesity
- Smoking
- Steroidal therapy
- Poor nutrition
- Diabetes mellitus
- Radiation
- Heart, kidney, and or liver disease

Wound dehiscence can be prevented by taking the following measures:

1. Avoid stress or strain to wound site – lifting, exercise, coughing, vomiting, and constipation. Holding onto a pillow at the wound site may help relieve stress.
2. Comply with physician post-operative instructions.
3. Maintain hydration and a well-balanced diet.[4]

Atypical Wounds

Atypical wounds, also known as wounds of unknown etiology, are wounds caused by conditions or diseases that do not typically form a wound, such as inflammations, infections, malignancies, chronic illnesses, or genetic disorders. Atypical wounds can also stem from rare uncommon causes or occur with an abnormal presentation or location.[7]

Most common causes and risk factors of arterial ulcers are:[7]

- Increased age
- Pre-existing chronic illness
- Infections
- Weakened immune system
- Medications
- Unhealthy lifestyle

Inflammatory Wounds

- Pyoderma gangrenosum
- Bullous pemphigoid

Hereditary or Genetic Wounds

- Scleroderma
- Sickle cell anemia
- Epidermolysis bullosa
- Dermatitis artefacta

Malignancy Wounds

- Kaposi sarcoma
- Squamous cell carcinoma
- Basal cell carcinoma
- Radiation necrosis

Vasculopathy Wounds

- Vasculitis
- Cryoglobulinemia

Infection Wounds

- Blastomycosis
- Atypical mycobacterial infection

Pressure Ulcer/Injury Staging

LOCATION	Usually bony prominence areas, but can be under medical devices or in mucosal membrane
SHAPE	Usually round, but may be irregular in shape depending on friction and shear
COLOR	Based on tissue level of destruction
DEPTH	Intact, partial-thickness, full-thickness

Most common causes and risk factors of pressure ulcers/injuries are:

- Impaired blood supply from prolonged pressure, friction, or shear
- Lack of sensation
- Moisture
- Immobility
- Insensate
- Poor nutrition
- Chronic medical conditions
- History of pressure ulcer/injury

Diagnostic Toolbox

Lab Tests – CBC, ESR, HgA1c (diabetics), CRP, pre-albumin

Imaging – X-ray, bone scan, MRI

Surgical Procedures – Sharp debridement, surgical debridement

In April 2016, the National Pressure Ulcer Advisory Panel (NPUAP) announced a change in terminology from "pressure ulcer" to "pressure injury" and also updated the stages of pressure injury. Note that there is no entry in the ICD-10-CM alphabetic index for pressure injury.

Pressure Injury (NPUAP Level of Injury)[2]	Pressure Ulcer (CMS Terminology)[2]
Stage 1	Stage I
Stage 2	Stage II
Stage 3	Stage III
Stage 4	Stage IV
Unstageable Pressure Injury	Unstageable Pressure Ulcer
Deep Tissue Pressure Injury	Suspected Deep Tissue Injury
Medical Device Pressure Injury	—
Mucosal Membrane Pressure Injury	—

Treatment Plan

1. Offload pressure: Turn and reposition every 2 hours and as needed while in bed. Individuals confined to a wheelchair or chair should shift weight at least every 15 minutes.
2. Follow a well-balanced nutritional diet.
3. Perform wound cleansing, and use select dressings that provide a protective barrier for infection and an optimal moist environment.
4. Control bioburden (debridement methods).
5. Implement patient and caregiver prevention and treatment plan education.

What can we do to reduce friction and shearing in managing our patients?

1. Pad and protect vulnerable areas (transparent, hydrocolloid, composite, foam dressings) as per facility protocol.

2. Use heel or elbow protectors for hospice or palliative patients.

3. Educate caregivers and nursing staff about how to identify key factors for pressure ulcers/injuries.

4. Ensure that support surfaces provide for individual's particular needs: pressure redistribution, shear reduction, and or microclimate control.

5. Use positioning devices in wheelchairs or chairs to reduce shearing.

6. Establish a risk assessment per facility protocol.

7. Use draw sheets to pull up, transfer, and position your patient. DO NOT DRAG.

Moisture-Associated Skin Damage (MASD)/ Incontinence-Associated Dermatitis (IAD)

When Is it MASD, and When Is It Pressure?

Regular inspection of the skin is essential in identifying damage resulting from moisture and/or pressure. The following chart provides a basic guideline for distinguishing MASD/IAD from the formation of pressure ulcers/injuries[8]:

MASD/IAD	PRESSURE ULCER/INJURY
LOCATION: Diffusely distributed	**LOCATION:** Usually over a bony prominence
PAIN: Yes	**PAIN:** May or may not be present
COLOR: Pink or red	**COLOR:** Red or bluish- purple
DEPTH: Partial-thickness, blistering	**DEPTH:** Intact, partial- or full-thickness
TISSUE: No slough or eschar	**TISSUE:** With or without slough or eschar

Moist Wound Healing

Moist wound healing has been shown to improve or reduce healing time. Controlling exudate and bacteria is most effective. Keeping an even moisture balance of the wound bed is vital in healing progress. Moist wound healing increases the speed of the proliferative phase and decreases the intensity and length of the inflammatory phase. Autolytic debridement is also provided with moist wound healing, in return increasing synthesis of collagen and fibroblast proliferation. Less scarring and pain have also been proven with moist wound healing.[9]

Controlling Bioburden

Controlling bioburden and/or biofilm is necessary for a wound to heal. Devitalized tissue (slough and eschar) harbor bacteria and slow down the wound healing process. Most chronic wounds are considered contaminated with biofilm. Biofilm is another culprit that impedes wound healing progress. Most, if not all ulcers develop a biofilm over time. The protective polysaccharide matrix is produced by bacteria. Bioactive wound care dressings can include tissue-engineered products derived from artificial sources or natural tissues (e.g., hyaluronic acid, elastin, silicone, chitosan, alginates, collagen, antimicrobials, skin equivalents, growth factors, cell-free matrices, cell-containing matrices).[10]

Periwound And Surrounding Skin

The periwound is as important as the wound. As clinicians, we should carefully assess the wound bed, but we need to remember also to assess the periwound and surrounding skin. The periwound is a protective barrier and extends 4cm from the wound bed. Chronic wounds may manifest any of the following characteristics, depending on wound type: erythema, induration, epibole, ecchymosis, hyperkeratosis; and they can change in shape.[11]

Five-Step Periwound Assessment

In assessing the tissue surrounding the wound bed, make careful note of the following:

1. Temperature
2. Location
3. Shape
4. Color
5. Wound depth

Simplifying Wound Treatments By Wound Depth And Exudate Amount

Wound Depth	Exudate Amount	Primary Dressing	Secondary Dressing	Frequency
Intact **Non-Blanchable** **Suspected Deep Tissue Injury (Intact)**	Dry	Moisturizer Skin Barrier Skin Prep Transparent Hydrocolloid Composite Gauze Foam	Transparent Hydrocolloid Composite Gauze Foam	Incontinent Patients – Every Episode Daily Hydrocolloid Every 3 Days And PM
Partial-Thickness **Blister** **Scab** **Stage II Pressure** **Moisture-Associated Skin Damage (MASD)***	Dry to Minimal	Skin Barrier Oil Emulsion Petrolatum Gauze Medical Honey Gel Hydrocolloid	Transparent Composite Hydrocolloid Border Gauze	Daily To Monitor Every 2 Days Twice A Week May Require Higher Dressing Frequency If Incontinent
	Moderate	Honey Alginate Calcium Alginate Gelling Fiber Hydrocolloid Oil Emulsion Petrolatum Gauze	Composite Hydrocolloid Gauze Foam	Daily May Require Higher Dressing Frequency If Incontinent *NOTE: Protect Skin And Manage Moisture*
Full-Thickness **Stage III Pressure** **Stage IV Pressure** **Suspected Deep Tissue Injury (Non-Intact)** **Tunneling/ Undermining***	Dry to Minimal	Collagen (Granulating Wounds) Medical Honey Hydrogel Filler Oil Emulsion Petrolatum Gauze Enzymatic Ointment As Indicated (Daily)	Hydrocolloid Composite Foam Super Absorbent	Daily Every Other Day Twice A Week Daily
			Negative Pressure Wound Therapy (NPWT)	3 Times A Week
	Moderate to Heavy	Collagen (Granulating Wounds) Honey Alginate Calcium Alginate Hydrofiber Enzymatic Ointment As Indicated (Daily)	Hydrocolloid Composite Foam Super Absorbent	Daily May Require Higher Frequency If Incontinent Or Copious Exudate
			Negative Pressure Wound Therapy (NPWT)	3 Times A Week *NOTE: Always Fill Dead Space Of Deep, Undermining, And Tunneling Wounds To Promote Healing*

1. Control Biofilm With Debridement Methods, Topical Agents, Antimicrobial, And Or Bacterostatic Dressing As Indicated.
2. Pressure Ulcers/Injuries – Offloading Is Key
3. Non-Bordered And Bordered Secondary Dressing Selection Depending On Location Of Wound And Incontinence.

Patient-Caregiver Education And Communication

Patient-caregiver education and communication are vital in chronic wound prevention and good healing outcomes. There should be collaboration among the patient, the caregiver, and the health care team. You will need to determine the current knowledge base of your patient's condition, support network, and any challenges moving toward their plan of care.

Conclusion

The leading method for preventing a wound from becoming "chronic" is to avoid all risk factors. The primary focus of treatment should be removing the underlying cause if all possible. The correct wound type diagnosis is imperative. Regular monitoring of wounds, appropriate consistent wound care, and maintaining a healthy lifestyle will help in prevention and to enhance the wound healing progress. Patient education, communication, and follow-up are vital in helping prevent chronic wound recurrence.

References

1. Bates-Jensen BM. Chronic wound assessment. *Nurs Clin North Am* 1999;34(4):799–845, v.
2. Gupta S, Andersen C, Black J, et al. A compendium of clinical research and practice. management of chronic wounds: diagnosis, preparation, treatment, and follow-up. *WOUNDS*. 2017;Suppl. Available at: http://www.woundsresearch.com/files/wounds/Acelity_Supp_PRINTER.pdf. Accessed March 16, 2018.
3. Carver C. Pressure Injury Prevention: Managing Shear and Friction. WoundSource. http://www.woundsource.com/blog/pressure-injury-prevention-managing-shear-and-friction. Published November 23, 2016. Accessed March 16, 2018.
4. Cleveland Clinic. Lower Extremity (Leg and Foot) Ulcers. Cleveland Clinic. http://my.clevelandclinic.org/heart/disorders/vascular/legfootulcer.aspx. Published August 17, 2017. Accessed March 16, 2018.
5. Franks PJ, Barker J, Collier M, et al. Management of Patients With Venous Leg Ulcers: Challenges and Current Best Practice. *J Wound Care*. 2016;25 Suppl 6:S1-S67. Accessed March 16, 2018.
6. Klose Training Lymphedema Certification. Compression Therapy Options. http://klosetraining.com/wp-content/uploads/2016/04/Compression-Therapy-Flow-Chart.pdf. Accessed March 16, 2018.
7. Wound Care Centers. Atypical Wound Basics. Wound Care Centers. https://www.woundcarecenters.org/article/wound-basics/atypical-wound-basics. Accessed March 16, 2018.
8. Carver C. Is it Moisture Associated Skin Damage or a Pressure Ulcer? WoundSource. http://www.woundsource.com/blog/it-moisture-associated-skin-damage-or-pressure-ulcer. Published April 28, 2015. Accessed March 16, 2018.
9. Myers BA. Wound Management, Principles and Practice. Prentice Hall; 2012.
10. Carver C. The Future of Bioactive Wound Care Dressings. WoundSource. http://www.woundsource.com/blog/future-bioactive-wound-care-dressings. Published April 12, 2016. Accessed March 16, 2018.
11. Bryant RA, Nix DP. Acute and Chronic Wounds, Current Management Concepts. Elsevier Health Sciences; 2015.

POWERED BY Hydrofiber® TECHNOLOGY

Protect. Defend. Nurture.

A range of wound dressings designed for any level of exudate.

Help create an environment to support wound healing, defend against maceration and protect skin from breakdown by using the AQUACEL® Foam family of dressings, powered by Hydrofiber® Technology, or FoamLite™ ConvaTec dressings. AQUACEL® Foam dressings are designed for moderate to heavily-exuding chronic wounds, while FoamLite™ ConvaTec dressings manage low to non-exuding wounds. Discover more at Convatec.com or call 1-800-422-8811.

ConvaTec | Advanced Wound Care

WOUND SOURCE™

THE WORLD'S DEFINITIVE SOURCE FOR WOUND CARE
& PRODUCT INFORMATION

2018 Advisory Board Members

WoundSource™ Team

STAFF

Publisher/President | Jeanne Cunningham
jeanne@kestrelhealthinfo.com

Vice President | Brian Duerr
brian@kestrelhealthinfo.com

Print/Online Production Manager | Christiana Bedard
christiana@kestrelhealthinfo.com

Editorial Director | Miranda Henry
miranda@kestrelhealthinfo.com

HOW TO REACH US

Corporate Office:
P.O. Box 189 – 206 Commerce St., Hinesburg, VT 05461

Phone: (802) 482-4000 – **Fax:** (802) 473-3113

E-mail: info@kestrelhealthinfo.com

WEBSITE: www.kestrelhealthinfo.com, www.woundsource.com

Editorial inquiries: editorial@kestrelhealthinfo.com

Advertising inquiries: sales@kestrelhealthinfo.com

For more information on chronic wound management, click here.

FOLLOW US: