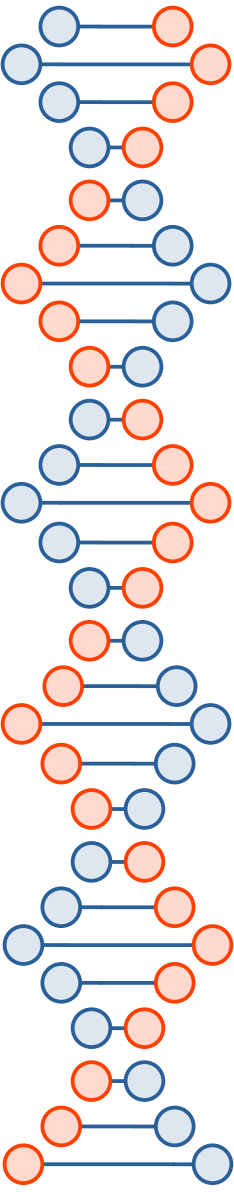


Principles of Chronic Wound Management

Eileen Comstock, MD



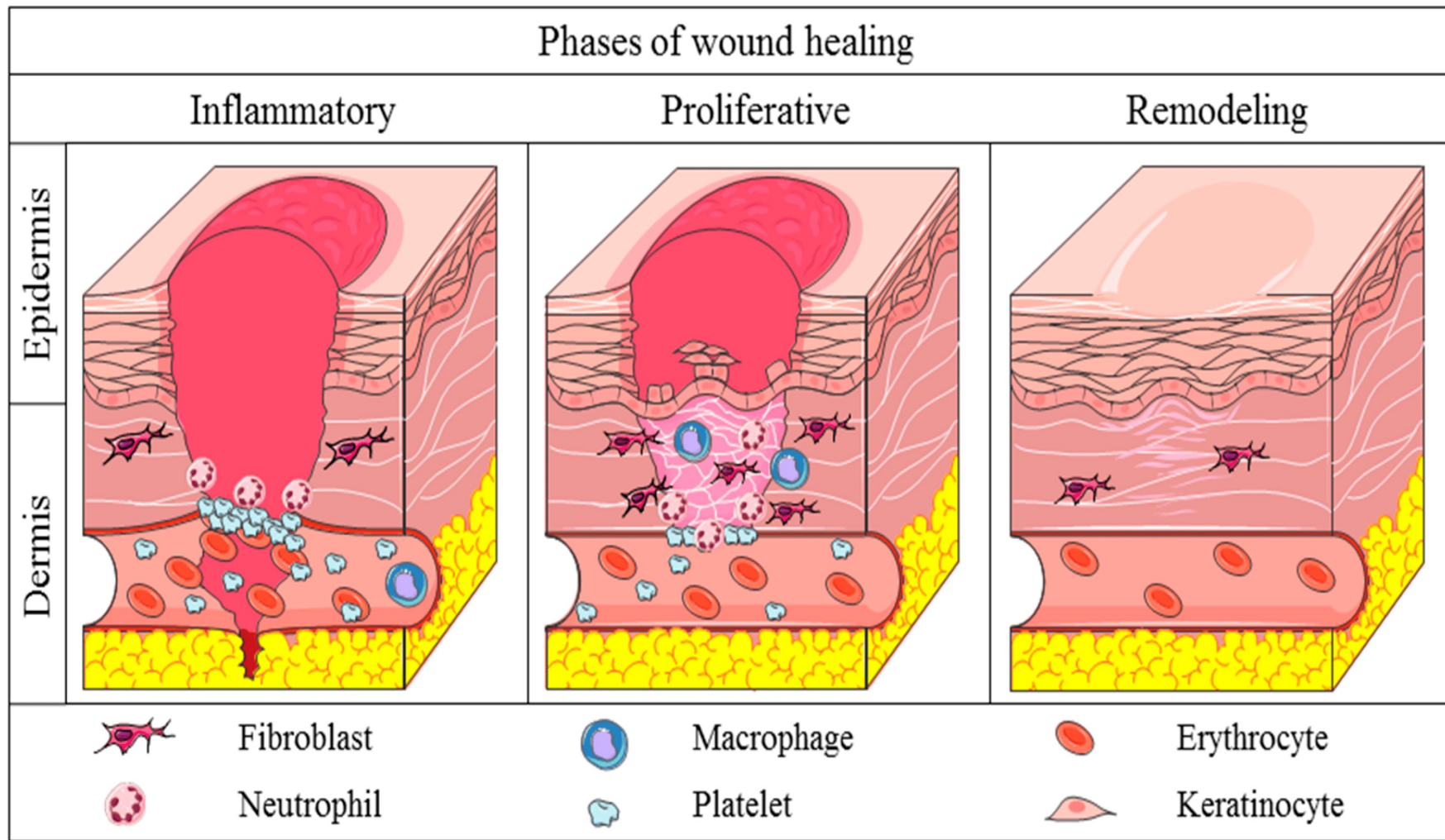
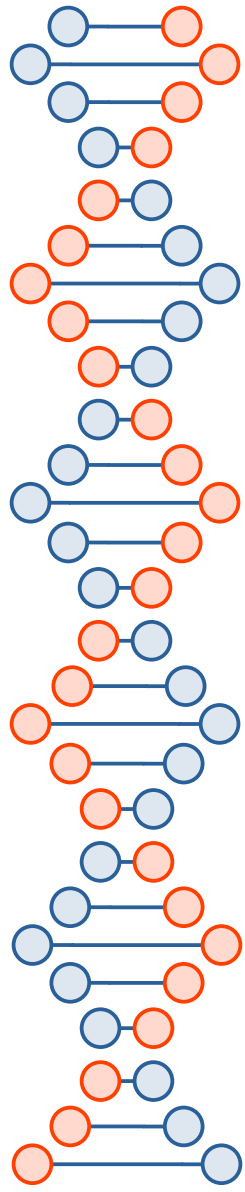
At the end of this presentation, the attendee will be able to:

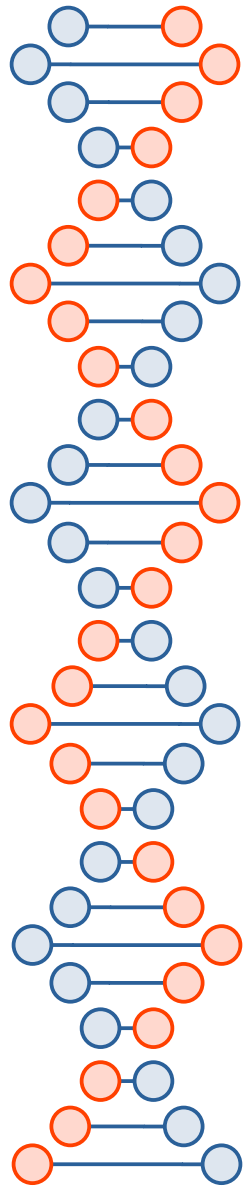
- Understand the basic principles of wound healing
- Describe the etiology and characteristics of arterial, venous, diabetic, and pressure wounds
- Choose wisely: testing, treatments, and/or referral for wound care
- Make sense of the myriad wound care products currently available
- Make practical billing and coding choices for wound care services



Phases of Wound Healing

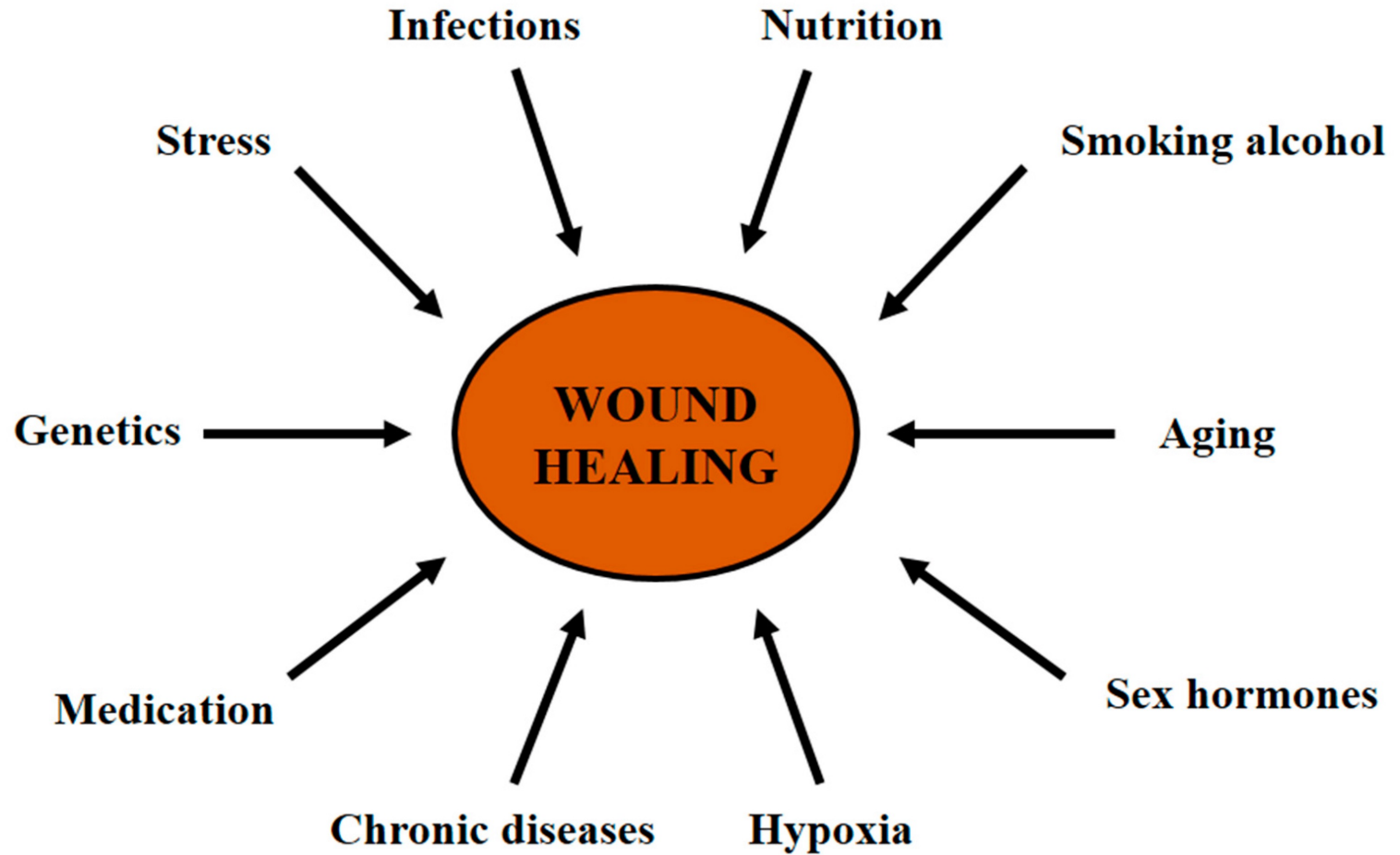
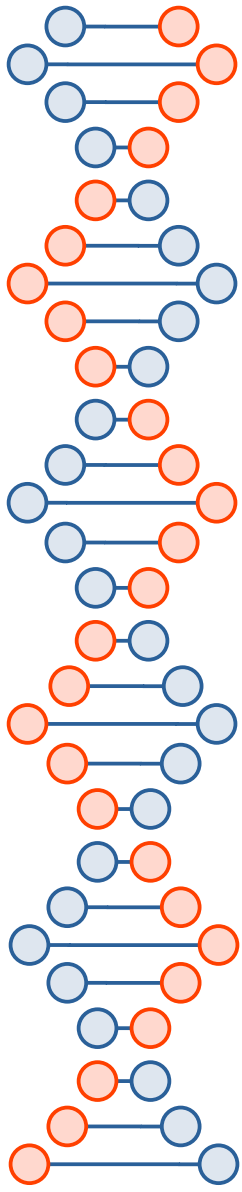
- Wound healing is a natural physiological reaction to tissue injury.
 - Initial phase
 - Inflammatory phase
 - Proliferative phase
 - Remodeling phase





Impaired Healing

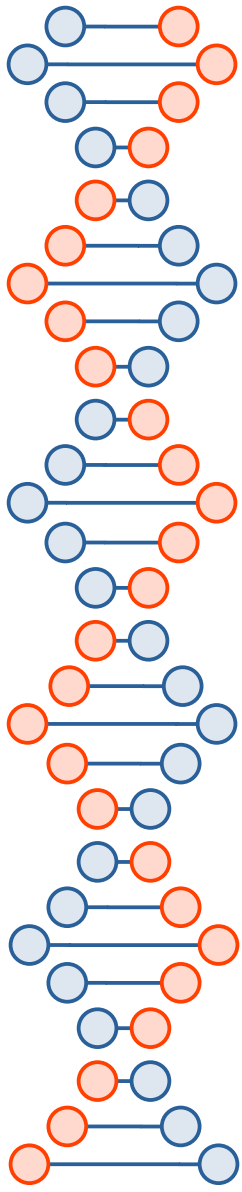
- systemic illness, such as diabetes
- chronic conditions such as smoking or malnutrition
- Local factors that can impair wound healing are
 - Pressure - Tissue edema
 - Maceration - Dehydration - Hypoxia
 - Infection - Bacterial biofilm





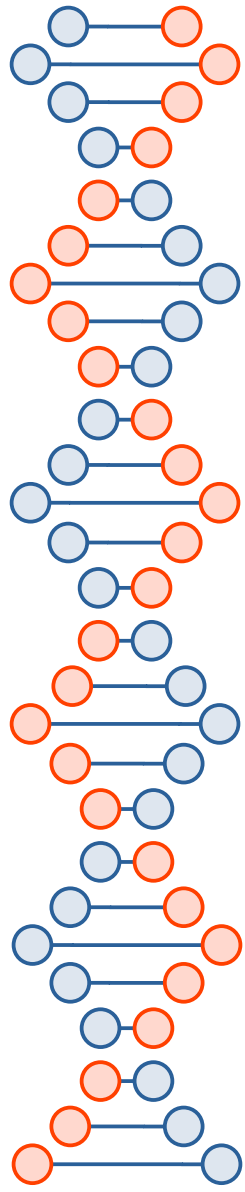
Etiology and Characteristics of:

- Arterial wounds
- Venous wounds
- Diabetic wounds
- Pressure wounds



Arterial wound characteristics

- Deep
- Eschar
- Punched out
- Well -demarcated borders
- May expose deep structures



Paul Kim, DPM,
MS.



Arterial wound assessment

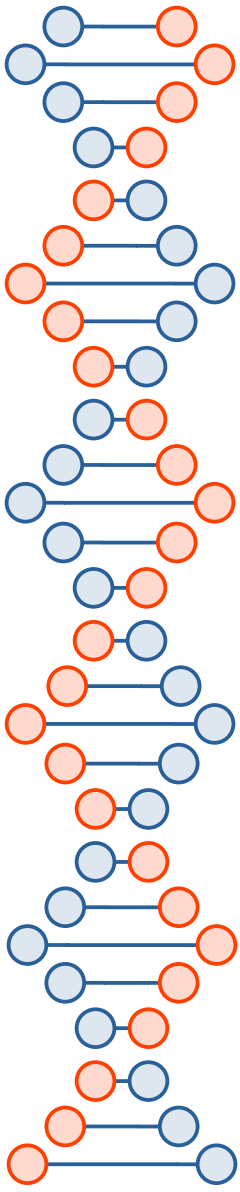
- **Macro circulation**

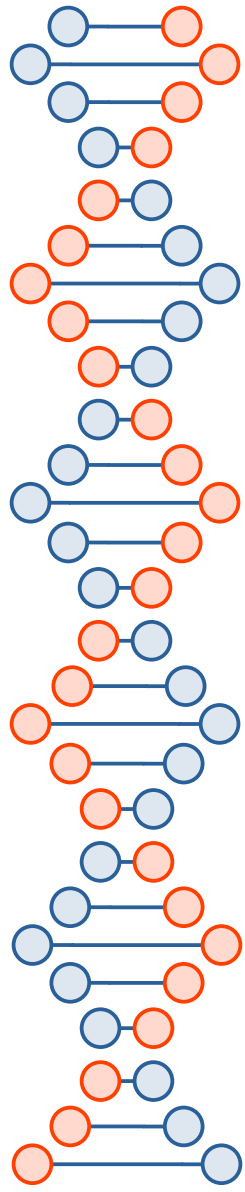
- Palpate pulses
- Angiography
- Ankle or toe – brachial index
- Arterial duplex ultrasonography
- Pulse volume recording
- Segmental limb pressure

Arterial wound assessment

- **Microcirculation**

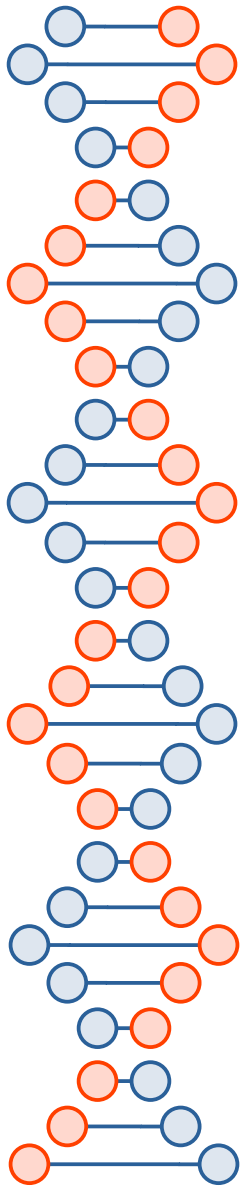
- Skin perfusion pressure
- Transcutaneous oximetry





Venous wound characteristics

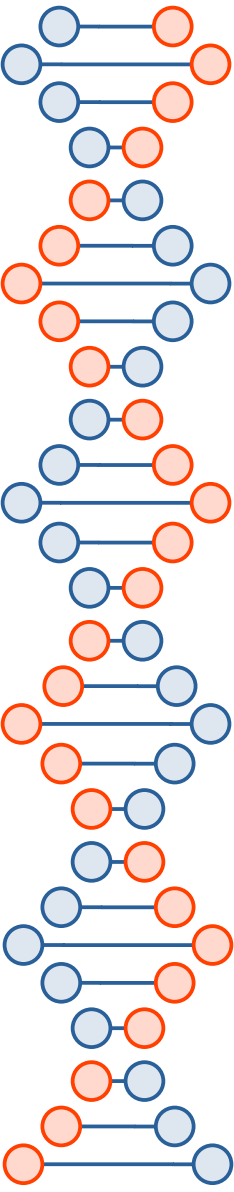
- Shallow
- No eschar
- Located over medial aspect of lower extremity



Arterial versus venous ulcer

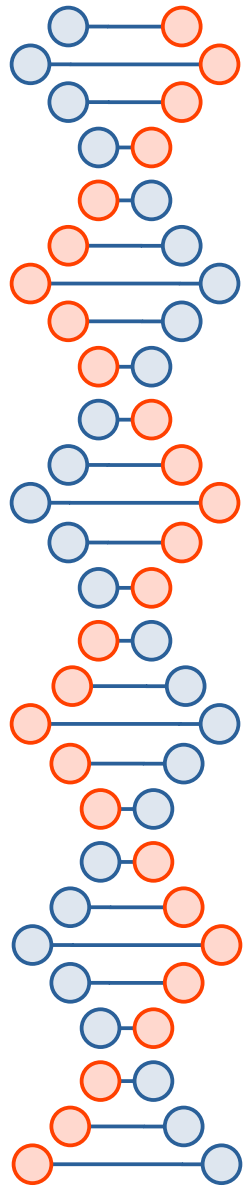


Venous wound assessment

- 
- Palpate pulses
 - Transcutaneous oximetry
 - Ankle-brachial index
 - Doppler ultrasonography
 - Lower extremity arterial duplex
 - Lower extremity venous duplex with reflux

Diabetic ulcer characteristics

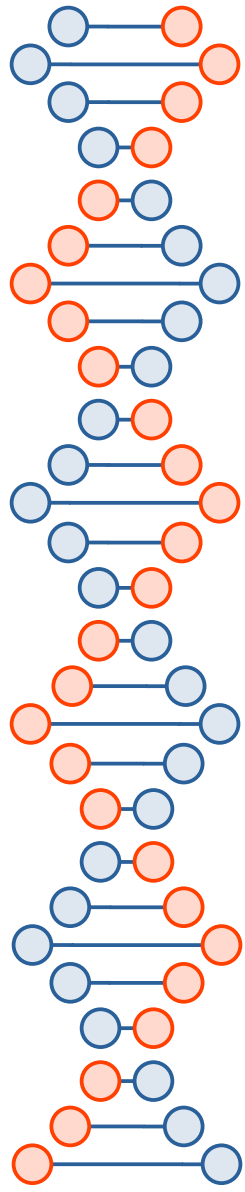
- Often located on plantar aspect of foot
- Extensive callus formation
- Superficial to deep





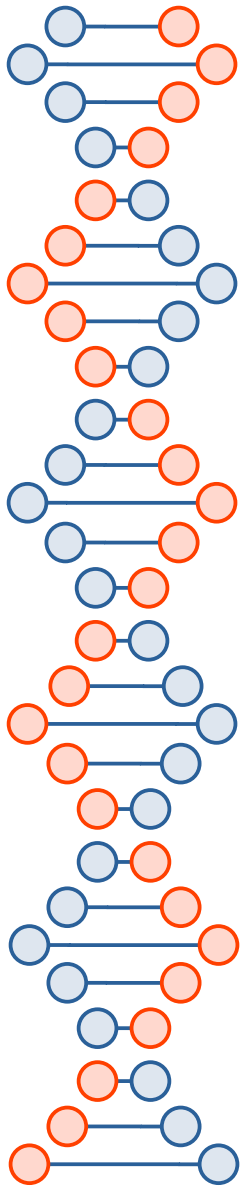
Diabetic ulcer assessment

- Transcutaneous oximetry
- Ankle-brachial or toe-brachial index
- Radiography
- Lower extremity Arterial duplex ultrasonography
- Bone scan if concern for osteomyelitis
- MRI if concern for osteomyelitis



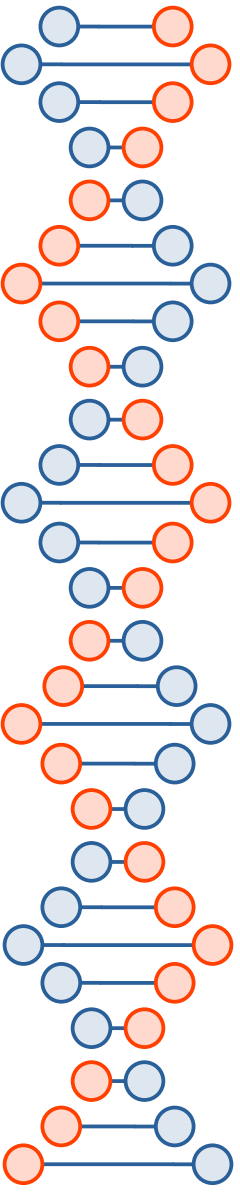
Pressure injuries

- Also known as:
 - Decubitus ulcer
 - bed sore
 - pressure sore
 - pressure ulcer
- Terminology officially updated in 2016 to:
PRESSURE INJURY



Pressure Injuries

- Located over bony prominences
- Superficial to deep
- Severe pain vs. no pain
- Common in patients with decreased mobility



PRESSURE ULCER CLASSIFICATION

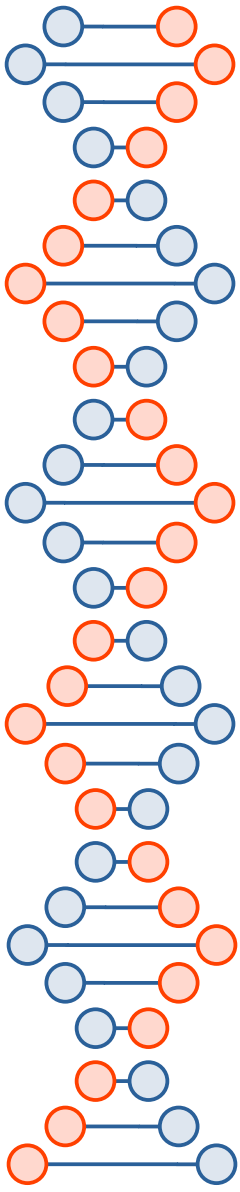
 <p>STAGE 1</p>		<p>Category / Stage 1: Intact skin with non-blanchable redness of a localized area usually over a bony prominence. The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Category I may be difficult to detect in individuals with dark skin tones¹</p>
 <p>STAGE 2</p>		<p>Category/ Stage II: Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled or sero-sanguinous filled blister¹</p>
 <p>STAGE 3</p>		<p>Category/ Stage III: Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss¹</p>
 <p>STAGE 4</p>		<p>Category/ Stage IV: Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present. Often includes undermining and tunnelling. Category/Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule)¹</p>
 <p>UNSTAGEABLE</p>		<p>Unstageable/Unclassified: Full thickness skin or tissue loss - depth unknown Full thickness tissue loss in which actual depth of the ulcer is completely obscured by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed. ¹</p>
 <p>SUSPECTED DEEP TISSUE INJURY</p>		<p>Suspected Deep Tissue Injury - depth unknown Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue. ¹</p>

European Pressure Ulcer Advisory Panel (2014)



Pressure injury assessment

- Radiography
- Wound culture
- CT if indicated
- MRI if concern for osteomyelitis
- Nutritional review



Chronic wounds

- Wounds generally heal in 4 to 6 weeks.
- Chronic wounds are those that fail to heal within this timeframe.
- Many factors can lead to impaired healing.

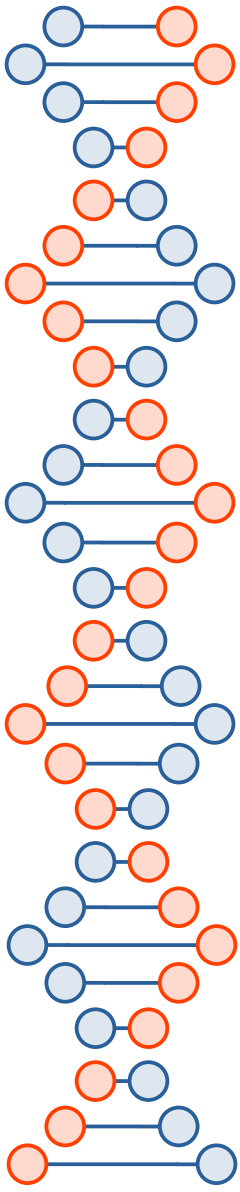
Evaluation and treatment of chronic wounds

- Etiology ✓
- Characteristics ✓
- Testing ✓
- Treatments
- Referral



Chronic wound treatment

- TIME Principle
 - Applies broadly to all wound management
- Correct or mitigate root causes if possible
 - Reposition
 - Elevate
 - Offload pressure
 - Re-vascularize
 - Balance nutrition



TIME Principle

- T – Tissue debridement
- I – Infection control
- M – Moisture balance
- E – Edges of the wound



Clinical considerations

Clinical considerations in wound management include:

- preventing further injury
- preventing and controlling infection and contamination
- maintaining adequate moisture
- treating edema

Arterial wound treatment

- Re-vascularize – refer to vascular surgeon
 - without blood supply, injury will continue to worsen
- May need amputation
- Hyperbaric oxygenation



Venous wound treatment

- Determine and mitigate venous problem
 - Compression – the mainstay or treating venous insufficiency
 - Elevation
 - Exercise
 - Medication
 - Adjunctive/biophysical technologies
 - Surgery



Diabetic ulcer treatment

- Provide for adequate blood supply
- offload pressure
- provide local wound care
- Address chronic disease process



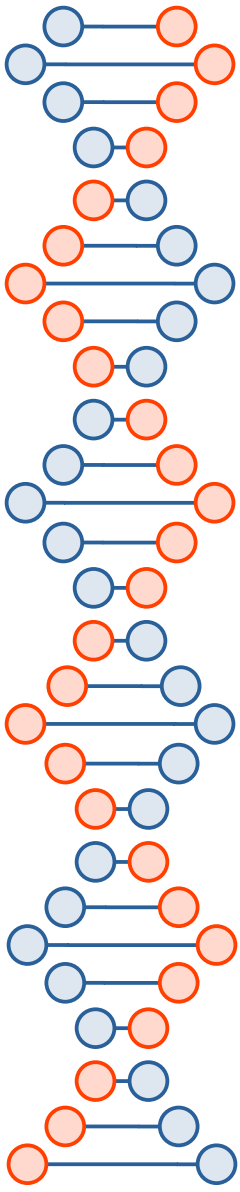
Diabetic ulcer treatment

- Underlying disease process
 - Elevated blood blood pressure
 - Chronic inflammatory state
 - Hyperglycemia
 - Nutrition
 - Infection



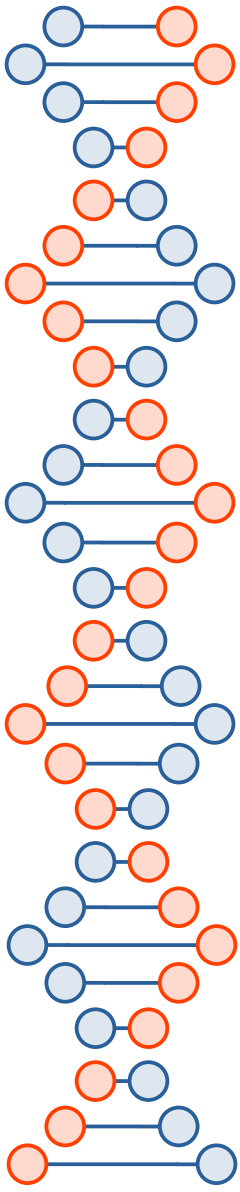
Pressure injury treatment

- Most, if not all, pressure injuries are avoidable
- Treatment and prevention both rely on eliminating the pressure source
- Acute trauma / Long-term care / Palliative care
- Limited mobility
- Skin status



Pressure Injury Assessment / Treatment

- Skin status
 - Scarring / prior pressure injury
 - Perfusion / circulation / oxygenation
 - Moist skin



Pressure Injury Treatment / Prevention

- Advanced age
- Medical device use
- Impaired sensory perception
 - Neurologic injury
 - Coma
 - Severe trauma
 - Prolonged surgery



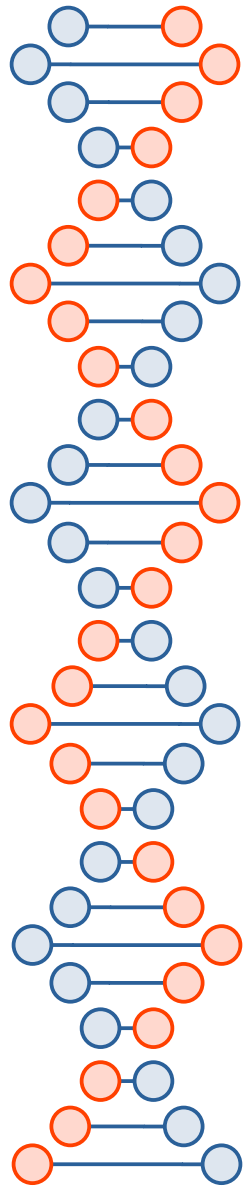
Topical wound care

- Basics are the same for all types of wounds
- TIME principle
- Continue addressing the underlying cause



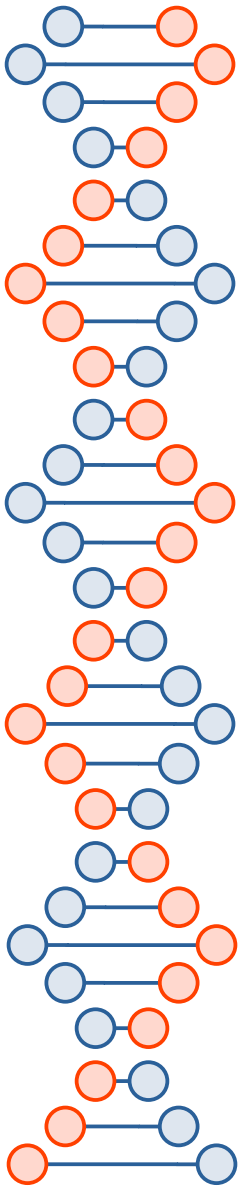
Prevent Further Injury

- Avoid substances that damage tissue
 - Bleach, Povidone-Iodine Solution, Hydrogen Peroxide
- Don't let the wound dry out
- No Wet to Dry dressings



Topical wound care – Cleansing; Use fluids to gently remove contaminants

- Purpose -
 - Remove bacteria and debris
 - Protect
 - Improve visualization
- Solution -
 - Normal saline is cost effective
 - Tap water is acceptable if bone or tendon are not exposed
- Temperature - Room temperature or warmer



Topical wound care – Cleansing

- Procedure
 - Cleanse surrounding skin
 - Pour, spray, or pat
 - Surfactants can assist with loosening particles of debris

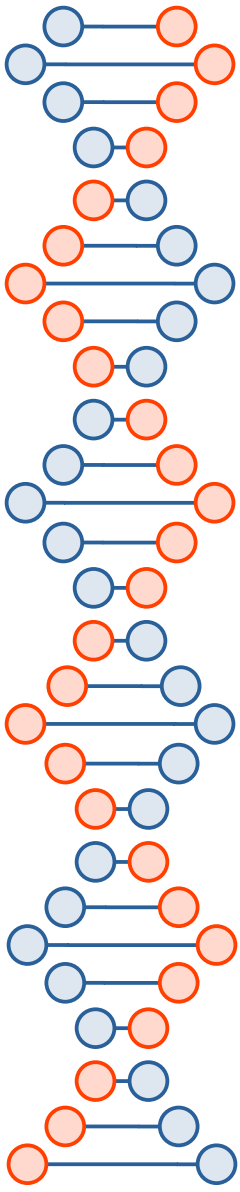
Topical wound care

- Debride
 - Mechanical
 - Sharp
 - Enzymatic
 - Autolytic



Topical wound care - Infection

- All wounds host bacterial growth
- Culture if signs of infection
- Treat IF INDICATED



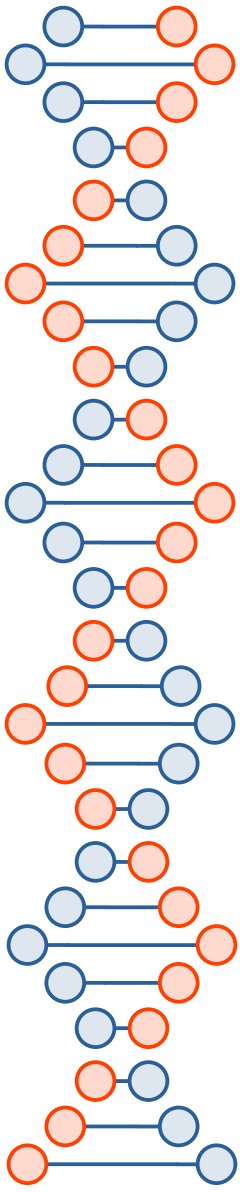
Topical wound care: moisture balance

- Careful cleaning and disinfecting
- Dressings to absorb moisture
- Dressings to prevent drying



Topical wound care - Dressings

- 4000+ wound care products on the market
- Wound care \neq special, magical products
- Wound care = correcting pathophysiology
- Limit products
 - Very expensive
 - confusing



Topical wound care - Dressings

- There is little clinical evidence to aid in the choice of different types of wound dressings.
- Consensus opinion supports the following general principles:
 - Hydrogels for the debridement stage
 - Low-adherent dressings that maintain moisture balance for the granulation stage
 - Low-adherent dressings for the epithelialization stage



Types of Wound dressings

- Films
- Foams
- Alginates
- Hydrocolloids
- Hydrogels
- Hydroactive



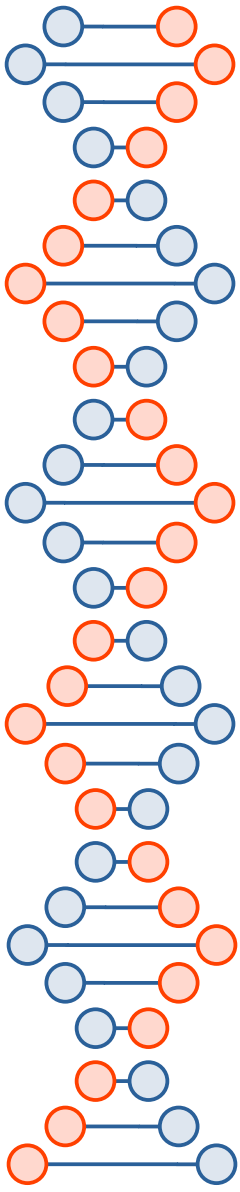
Topical wound care

- Wound Edge considerations
 - Prevent contamination
 - Gently remove debris
 - Protect fragile new tissue
 - Eliminate barriers
 - Treat infection



Topical wound care

- Specialized care
- Vacuum: Wound-Vac
- Hyperbaric
- Stem cell science
- Surgical coverage



Nutrition? Yes!

- Yes
 - Protein is the single best recommendation that
 - you can make
- No
 - Vitamin C
 - Zinc
 - Anabolic steroids like Oxandrolone
 - No Megace



Standard of Care

- Days to healing (average is 65 days)
- Cost of care
- Control of symptoms



Standard of Care

- Diabetic Foot Ulceration
 - Home health
 - weekly visits
 - antibiotics
 - arterial study
 - monitoring blood sugars



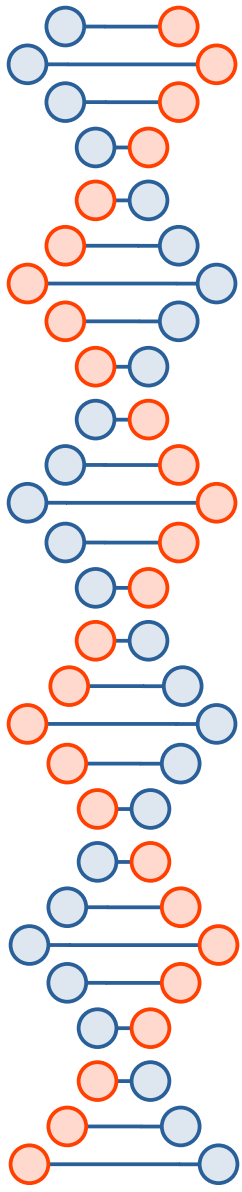
Standard of Care

- Specialists:
 - Plastic Surgeons
 - Vascular Surgeons,
- Interventionalists:
 - Cardiologists
 - Radiologists
 - Orthotist
 - Many patients are on dialysis



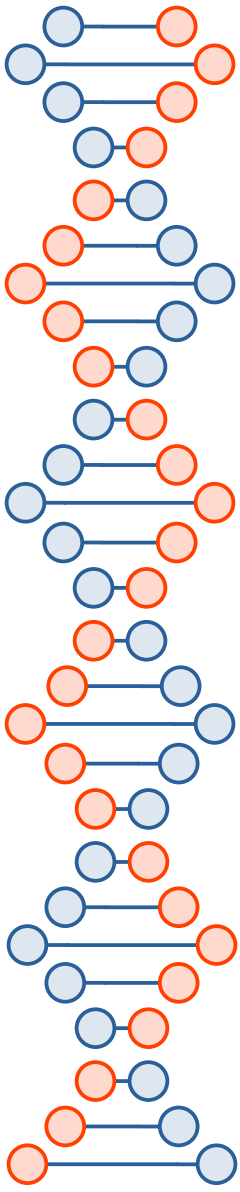
Goals of Treatment

- Wound care is labor intensive
- Wound care is expensive
- Collaboration is essential
 - Patient, family, PCP, specialists, wound therapists



Goals of Treatment

- Communicate with patients
- Healing as completely and quickly as possible
 - Symptom control?
 - Restoration of function?
 - Comfort, palliation?
- Commitment
- Realities, necessities



Referral

- Which patients should be referred to a wound healing specialist?
- Patients with non-healing wounds that have been present for more than 4-6 weeks.



Refer Patients with:

- Non-healing wounds with significant risk factors such as diabetes, peripheral vascular disease, renal failure.
- Chronic wounds with nerve, tendon, bone or muscle exposed.
- Non-healing diabetic foot ulcers
- Ischemic ulcers



Refer Patients with:

- Neuropathic ulcers
- Pressure injuries (previously called pressure ulcers)
- Vasculitic ulcers
- Venous stasis ulcers
- It is wise to offer referral for ALL non-healing wounds



Practical Billing and Coding

- Wound Care is Resource Intensive
 - Home Health
 - Wound nurses in hospital
 - Wound centers
- Infusion Centers
- Specialists



Practical Billing and Coding

- Wound care products and dressings are not separately billable
- Documentation is critical to accurate coding



Practical Billing and Coding

- Limit products
 - 4000+ products on the market
 - Very expensive for primary care physicians
 - Confusing
- Wound care \neq special, magical products
- Wound care = **Correcting pathophysiology**



Practical Billing and Coding

- Document, Document, Document!
- Describe the wound
 - Location
 - Etiology
 - Length, width, depth
 - Appearance in plain English
 - Color
 - Odor
 - Drainage
 - Pain



Practical Billing and Coding - Documentation

- Monitoring and describing what you do is important
- What goals are you trying to accomplish?
 - Aggressive
 - Palliative
- Monitoring diabetic patients is very important
- Clear, complete documentation is the most important factor supporting reimbursement

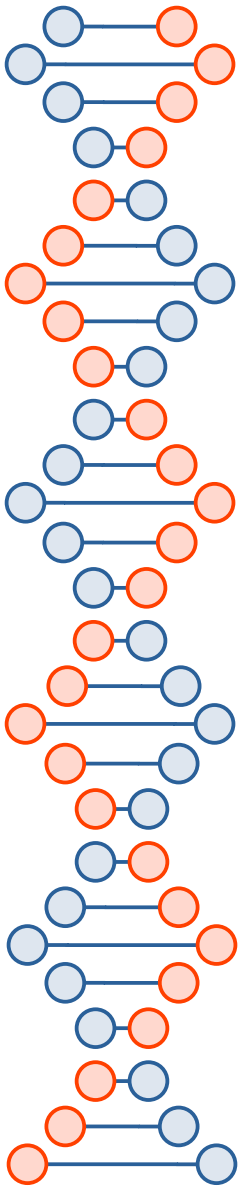


Practical Billing and Coding

CPT Coding Guidance

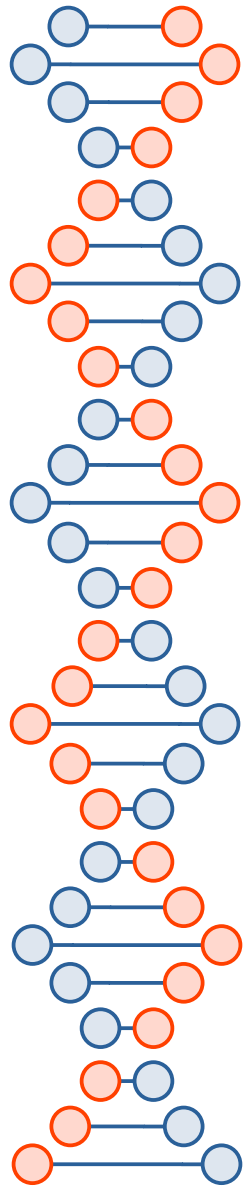
<https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleid=55818&ver=20&>

Claims must be submitted with an ICD-10-CM code that represents the reason the procedure was done. The ICD-10-CM code must be billed to the highest level of specificity for that code set. The ICD-10-CM code must be linked to the appropriate procedure code.

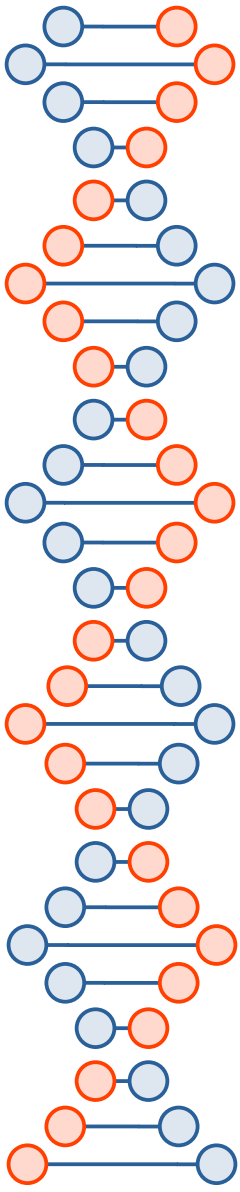


Review

- Discussed different types of wounds you'll see
 - It's not about the dressings; it is about the underlying etiology of the wound
 - Know your community resources
 - Know when to refer out
- Understand that in the primary care office or in the skilled nursing facility, optimal wound care cannot always be delivered



Questions?



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Karen Evans, MD, Paul J Kim, DPM, MS

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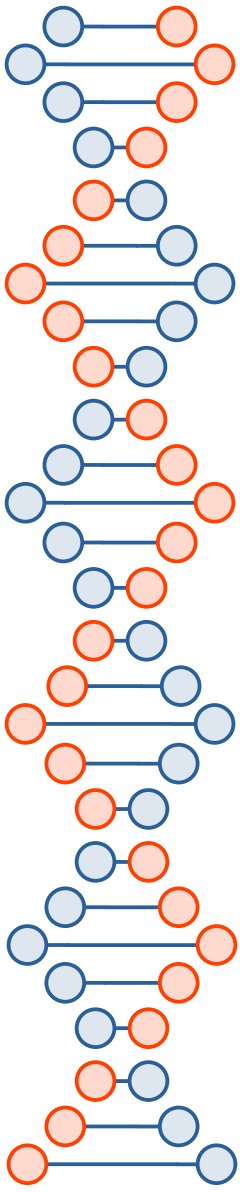


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From the 2015 Wild on Wounds Conference

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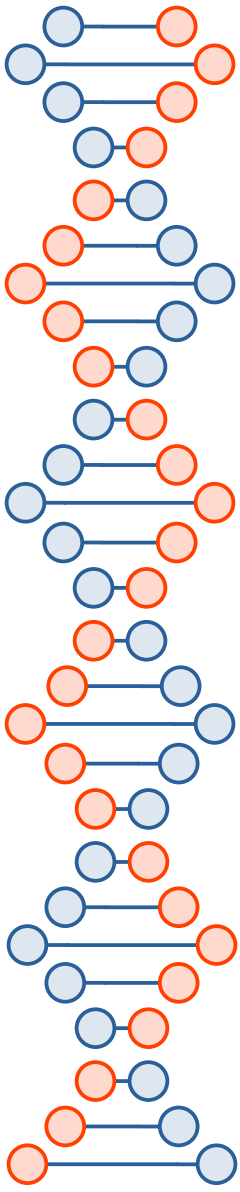


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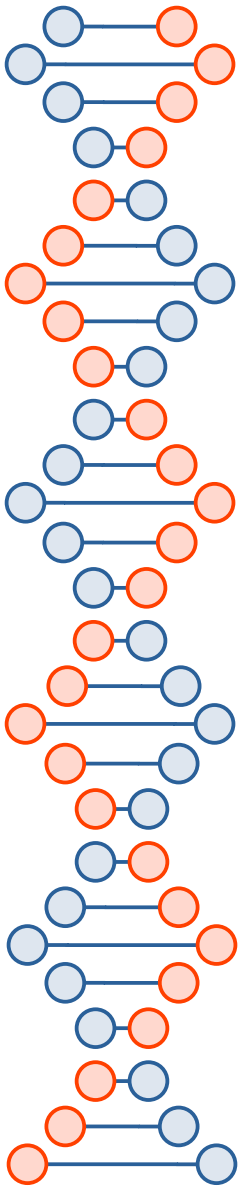
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[Introduction to Chronic Wound Care](#)



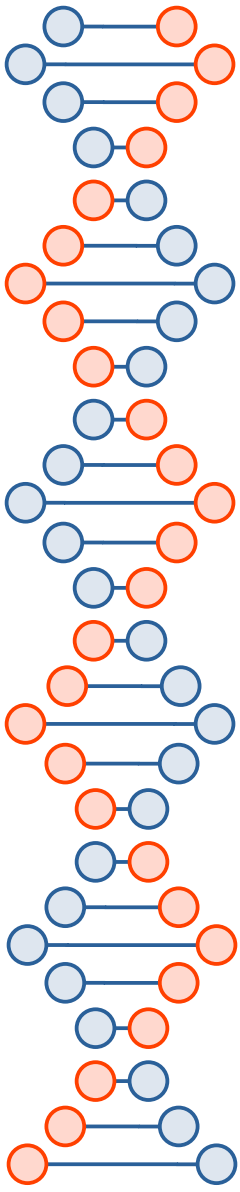
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Steven Bowers, DO, and Eginia Franco, MD

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◆ *Volume 101, Number 3*



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Wound Care Education Institute

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