Wound Care Certificate

2021

Dear Student/Participants,

Please find the York University copyright statement. This is an annual reminder to all students about the copyright policy of the University.

Access to and use of the course materials is restricted to students enrolled in the Wound Care course offered by Health Leadership & Learning Network. All materials for this course are provided with the permission of the rights holder, under the terms of a license or other agreement, or under the application of statutory exceptions of the Copyright Act. Copyright and all rights are maintained by the author(s) or by other copyright holder(s). Copying this material for distribution (e.g. uploading material to a commercial third-party website) can lead to a violation of Copyright law. Find out more about copyright here: www.yorku.ca/copyright

If you have any questions, please contact us here in HLLN at 416 736 2100 X22170 or hlln@yorku.ca. Thank you, Tania Xerri

Tania Xerri, Director, Health Leadership and Learning Network
A Leader in Health Continuing Professional Education
Faculty of Health York University
4700 Keele St. HNES 019, Toronto, ON M3J 1P3

Information, Privacy and Copyright | Office of the Counsel
1050 Kaneff Tower | York University | 4700 Keele St., Toronto ON M3J 1P3
Canada

Table of Contents

The goal of education is…

- Pass it on!

- At the end of this program, you will feel confident in sharing what you have learned…

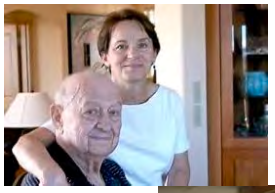
Everything we say and do should encourage learning and knowledge transfer.

- Open
- Respectful
- Purposeful
- Valuable

Knowledge/InformationEnablers. How many can you spot?

Dr. Rosemary Kohr 2020

What can YOU do to be an ENABLER??

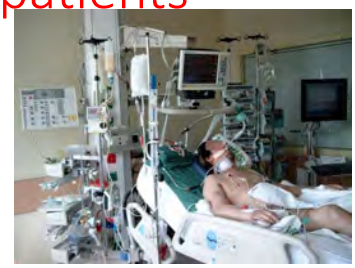


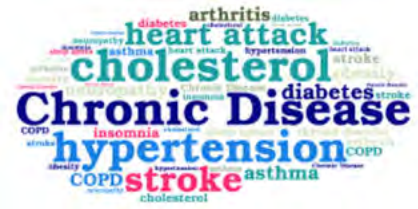
Keep this in mind…

Skin Health: the Basics

- Evidence based practice
- Risk assessment
- Prevention strategies
- Brief overview of skin
- Impact of aging and incontinence on skin
- Review of skin care products
- Impact of skin care on the patient and family

Today's Reality: our patients





Today's Reality: Healthcare Professional

Dr. Rosemary Kohr 2020

EVIDENCE BASED PRACTICE

- Within the standard of practice for healthcare professionals
- Provides consistency of care
- Structure for documentation (liability!)
- Cost-effective
- Most appropriate treatment from objective point of view.

Dr. Rosemary Kohr 2020

Risk Assessment Tools

For example, simply <u>assessing risk</u> for pressure injury development (with <u>no intervention</u>) can :

- ❑↓ incidence of pressure ulcers in institutions by ~60%
- ❑↓ overall costs

Risk assessment in your organization:
What tool(s) do you use?

Thorough PATIENT ASSESSMENT

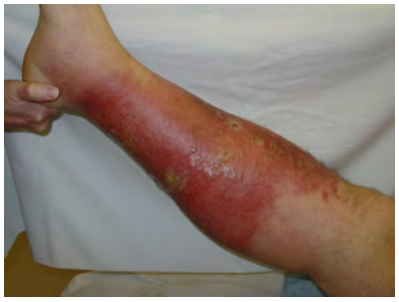
- ❑Medical Hx past & present illnesses, allergies
- ❑Family Hx
- ❑Social Hx
- ❑Medications past and current
- ❑Labs, vascular studies
- ❑Nutritional status
- ❑Support/positioning devices
- ❑Physician and other consultations
- ❑Patient's knowledge level

CONTRIBUTING FACTORS TO SKIN BREAKDOWN:

- Pressure
- Moisture
- Immobility
- Nutritional/fluid deficits
- Chronic illness (e.g., diabetes)
- Aging process

More...CONTRIBUTING FACTORS TO SKIN BREAKDOWN:

- Chemicals and enzymes (urine, feces)
- Circulatory problems
- Bacteria
- Allergic reaction
- Radiation damage



Contributing Factors to Skin Breakdown:

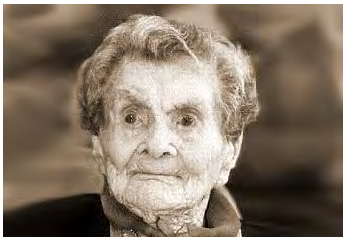
CAUSED BY:

- ❑**PRESSURE**
- ❑FRICTION/SHEAR
- ❑MOISTURE

PATIENT VARIABLES

- ❑AGE
- ❑NUTRITION
- ❑MOBILITY
- ❑CONSCIOUSNESS/COGNITION
- ❑SENSATION

Dr. Rosemary Kohr 2020



REMEMBER, IT IS THE WHOLE PERSON YOU ARE CARING FOR…

Dr. Rosemary Kohr 2020

Back to Basics:
What is Required:

- Risk Assessment
- Every patient has excellent skin care
- Full attention to nutrition and hydration
- All support surfaces provide a minimum of pressure reduction

Anatomy & Physiology *of the Skin*

Facts About The Skin

- Body's largest organ
- Covers approximately 3000 square inches
- Expands seven times over a lifetime
- Weighs six pounds or 20% of body weight
- 3 to 100 cells thick
- Thinnest in the Tympanic Membrane; thickest on the soles and palms
- Capable of self-regulations and self-regeneration

Skin Function

- Protection from bacteria, chemicals, Ultraviolet rays, water
- Heat Regulation
- Insulation
- Communication through sensation.
- Vitamin D synthesis
- Holds everything together.

Skin Layers

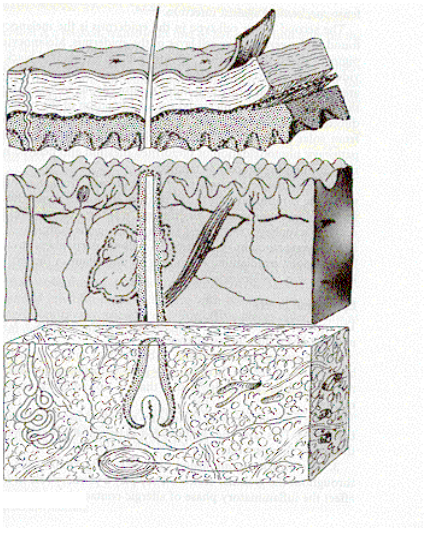
Three layers all attached.

Epidermis: the keratinocytes.

Dermis: the vasculature, sweat glands

Subcutaneous layer.

- Epidermis
- Dermis
- Subcutis



EPIDERMIS

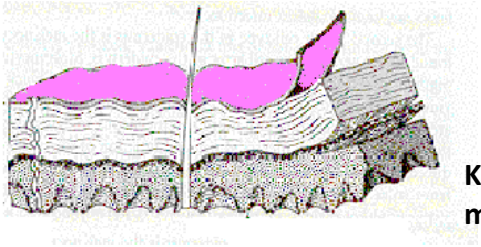
- Outermost protective skin layer
- Formed by the continuous upward migration of k*eratinocytes*
- *Takes about I months to migrate to surface*
- 3 to 100 cells thick
- Avascular layer (no blood supply)

Epidermis

Stratum Corneum: outermost layer

- Dead skin cells create a protective barrier
- Abraded daily by mechanical and chemical trauma (normal exfoliation)
- Composed of keratinocytes, melanocytes and lipids (fats and oils)
- Skin tears are an example of mechanical trauma

Acid Mantle



Keratin and lipids maintain moisture levels

"Acid Mantle"
Protects against bacterial growth

Dr. Rosemary Kohr 2020

Dermis

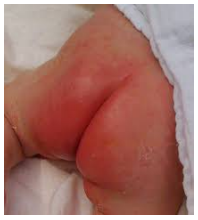
- Skin is sometimes called the "third kidney"
- Contains endocrine glands (sweat ducts), hair follicles, blood vessels, lymphatics and nerves
- Adipose tissue provides energy, insulation and pressure distribution
- Vascularity provides heat exchange, nutrition and inflammatory response

Dr. Rosemary Kohr 2020

From the very young to the very old

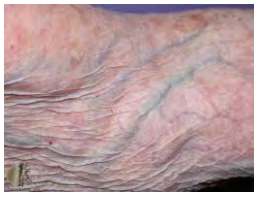
Fragile skin can be problematic for anyone:

- Infants, medically complex/technology dependent individuals, pediatric patients as well as the elderly



Dr. Rosemary Kohr 2020

Aging Skin



Increased dryness ←

Easy bruising ← **Normal Aging**

Slower healing response ←

Wrinkles ← **Sun/environment damage (Photoaging)**

Skin cancers/precancers ←

Dr. Rosemary Kohr 2020

Aging Skin:

- Functional Changes :
  - Altered skin permeability
  - Decreased Inflammatory response
  - Decreased immunologic responsiveness
  - Decreased thermoregulation
  - Impaired wound healing

Aging Skin:

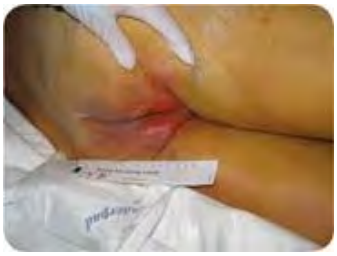
- Further Reduction:
  - Decreased Vitamin D synthesis
  - Impaired sensory perception
  - Decreased sweating and sebum production
  - Decreased elasticity
  - Thinning of attachments

Incontinence And Aged Skin

- Excess of moisture and bacteria.
- Macerated skin requires less friction to cause damage
- Urea in urine is turned into ammonia
- This results in a high pH (alkaline)

Incontinence And Aged Skin

- Acid mantle is now alkaline and cannot function
- If feces are present, digestive enzymes can be activated
- The barrier function of the skin can be overwhelmed



So How do You Clean Skin?

- All Bar soap is alkaline
- Bar Soap therefore reduces the normal acid mantel, resulting in dry skin that is more prone to infections
- Washcloths are often rough and can result in friction injuries
- **Think about a body wash and a method to wash the skin that reduces friction**

Factors Affecting Skin

Soaps:

- Alkaline soaps reduce the thickness and number of cell layers in the stratum corneum
- Normal flora washed away
- Normal washing requires 45 minutes for skin to restore its acidic pH
- Repeating washing requires 19 to 24 hours to restore the skin's normal pH

No more rough washcloths

ALTERNATIVES (examples):

Moisture has to be just right!

- Skin that is too wet is 5 times more likely to ulcerate than dry skin
- Skin that is too dry is 2.5 more likely to ulcerate than normal skin

Skin Care Products
What to choose?

- Look for clinical evidence
- Goal should be to support normal skin functioning
- Look for:
  - **Sensitizers** such as lanolin, perfumes & AVOID THEM!
  - pH of 4 -7
  - Ingredients that support skin functioning

Skin layers, pH, Acid Mantle *A review of what we've just talked about...*

Barriers

- Goal is to increase the barrier function of the skin
- Formulations: Ointments, creams or films
- Petrolatum and Zinc are common
- Dimethicone more popular now
- Ointments or creams can reduce the effectiveness of incontinence products
- Liquid films (No Sting, Skin Prep)

PENATEN Cream Crème

Application of Durable Barrier Cream

Moisturizers

- Occlusives, Emollients or Humectants
- Goal is to support well hydrated skin
- All work by: preventing moisture loss, adding moisture, or drawing moisture from the environment
- Petroleum jelly is the most effective occlusive but is greasy (apply immediately after bathing)

Moisturizers:Emollients

- Emollients work by hydration, enhanced flexibility and smoothness
- Dimethicone is an emollient and an occlusive
  - Most tested ingredient
  - Silicone based, non sensitizing
  - Resists wash off
- **Adding more** dimethicone turns it into an occlusive

Humectants

- Draw moisture from the ambient environment
- Urea and lactic acid are examples
- May cause burning– so “patch test” first.

Perineal Cleansers

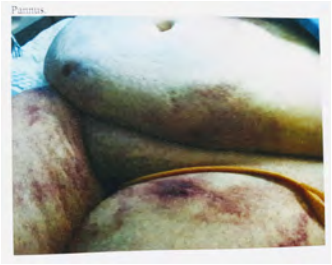
- The goal should be to remove feces, maintaining a normal pH and deal with odour
- Consider a product with a surfactant that is pH balanced
- Odour Control
- Consider time with a no rinse formula

Back to our Skin Assessment:

- **Accurate history**
- **Asses skin turgor**
- **Skin should feel warm and dry**

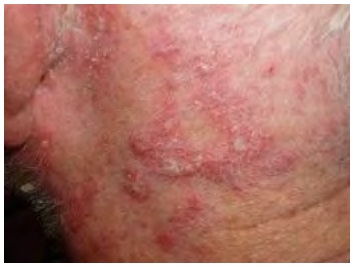
•Remember to assess any are of skin that is hiding from the obvious:

- Skin folds, creases, under breasts, abdominal pannus, behind the ears
- Lower legs, feet, between the toes
- Perineal and perianal areas
- Around joints and over bony prominences
- Around braces, casts, orthodics and prosthetic devices



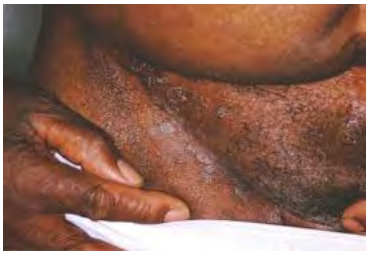
Dr. Rosemary Kohr 2020

Other issues: Fungal Infection



Treat the underlying cause (always);
Keep the area dry
Avoid talcum powder
Can use clotrimazole
Wick moisture away (e.g., InterdryAG)

- Red flakey irritated skin
- Satellite lesions
- Skin folds

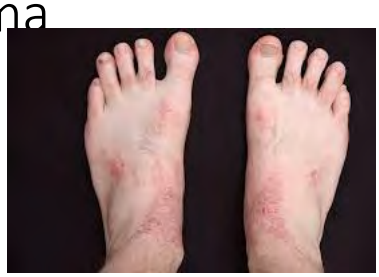


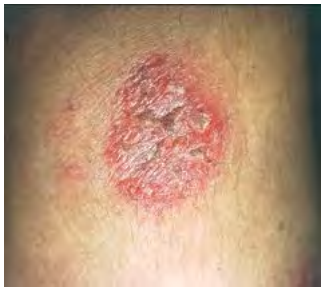
Dr. Rosemary Kohr 2020

How to use Interdry AG

Dr. Rosemary Kohr 2020

Eczema



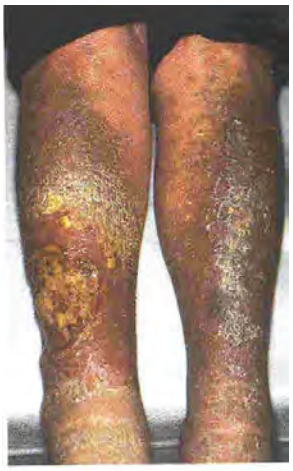


Itchy, scaly, leathery, bumpy, red
Anywhere on the body

Minimize itching with moisturizers
Low-dose OTC hydrocortisone (for short time only)
If persistent, or symptoms are problematic, refer to Primary Health Care Professional (PHCP)

Dr. Rosemary Kohr 2020

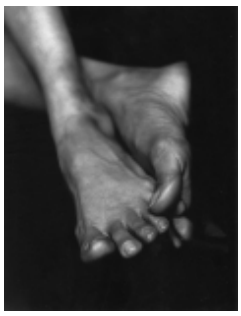
What to do here?



Dr. Rosemary Kohr 2020

Skin tears: avoiding a bigger mess.

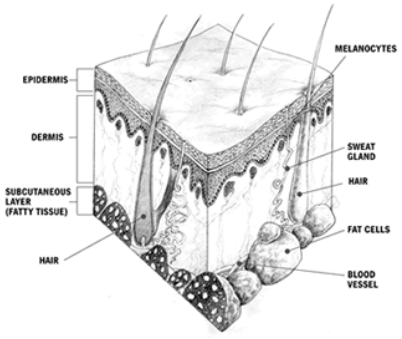
Fragile skin at risk



Dr. Rosemary Kohr 2020

Risk factors

- Aging skin at risk:
  - thinning epidermis
  - Separation of epidermal-dermal junction
  - Skin stripping (stratum corneum)
  - Impaired ability to retain moisture



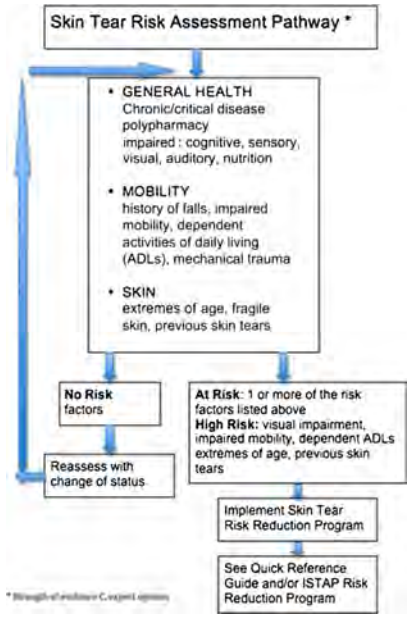
Risk factors (continued):

- Compromised nutrition
- Dehydration
- Impaired mobility
- Medications
- Use of topical corticosteriods
- Cognitive/perceptual limitations
- Chronic illness (eg, diabetes, renal failure, CHF)

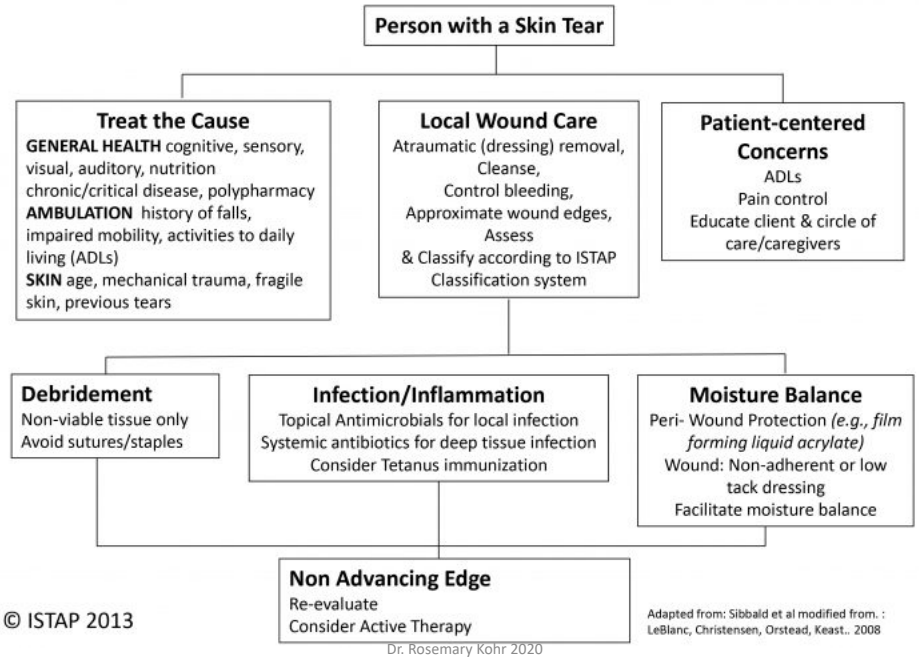
The International Skin Tear Advisory Panel (ISTAP) was formed to raise international awareness of the prediction, assessment, prevention, and management of skin tears.

The ISTAP Panel includes a broad range of healthcare professionals representing: North America, South America, Europe, Asia, the Middle East, Australia/New Zealand, and Africa.

www.skintears.org

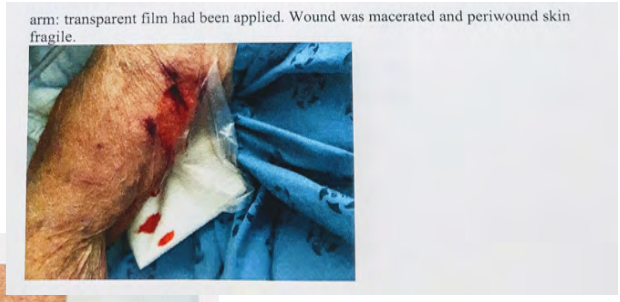


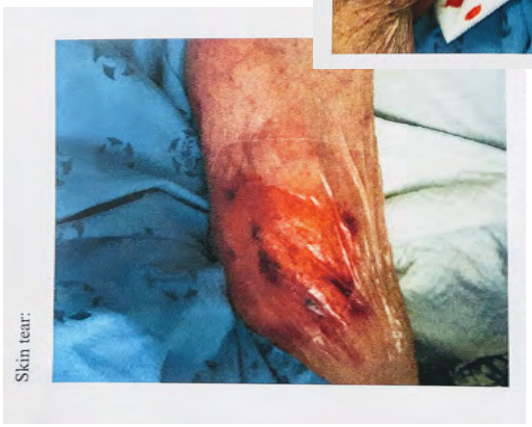
Dr. Rosemary Kohr 2020



Dr. Rosemary Kohr 2020

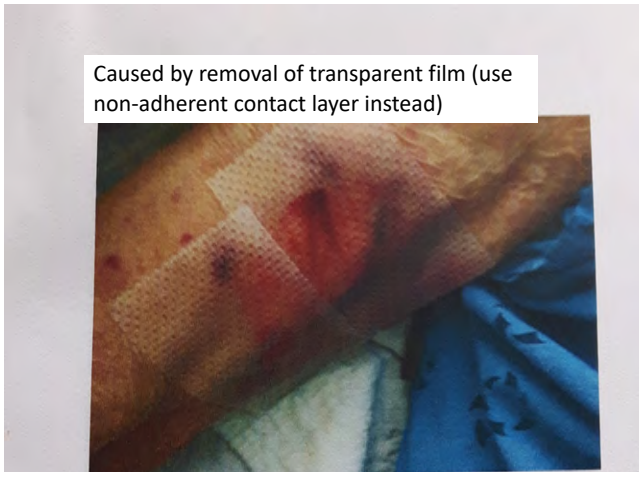
TRANSPARENT FILM





Dr. Rosemary Kohr 2020

INSTEAD USE NON-ADHERENT DRESSING (EG MEPITEL® or ADAPTIC® or... ABSORBENT ACRYLIC DRESSING (3M®) or... other non-adherent contact layer dressing.

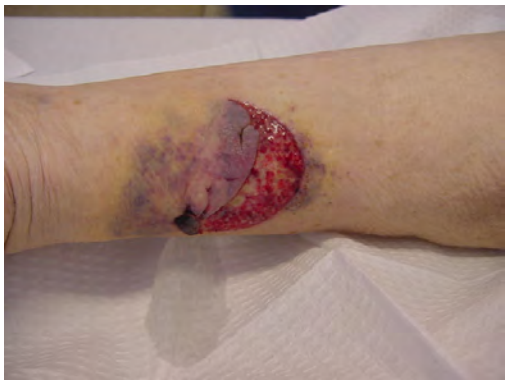


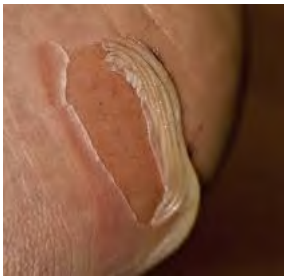
Dr. Rosemary Kohr 2020

Is this an appropriate dressing?

Dr. Rosemary Kohr 2020

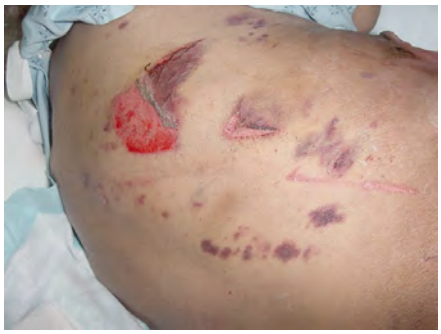
Remove the devitalized tissue and protect the wound.

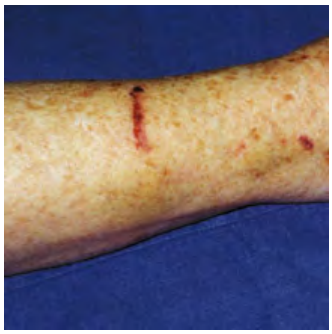




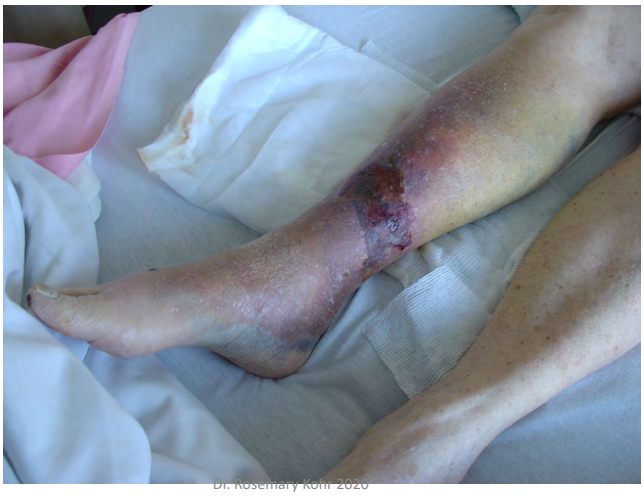
Dr. Rosemary Kohr 2020

friction

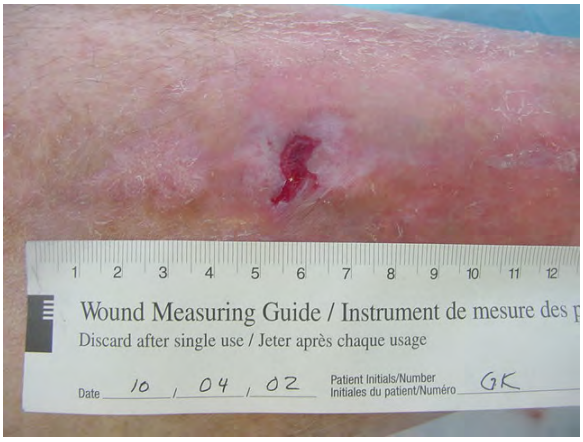




accidental

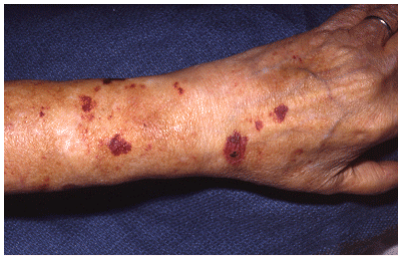


Fragile skin/edema



Dr. Rosemary Kohr 2020

NOT a skin tear: *Senile purpura*



- Also known as Bateman's or Solar purpura
- Usually on forearms of the elderly
- Non-palpable, dark red/brownish bruising (ecchymosis)
- Leaked/coagulated RBCs
- Often from photodamaged connective tissue

Dr. Rosemary Kohr 2020

- Skin tears are as common (or more) than pressure injury in the aging population
- Prevention and treatment for both types of injury to the skin is essential
- Skin tears are acute wounds, which can become chronic, more complex wounds
- "There is a **possible link between the risk factors associated with pressure ulcer development and those associated with skin tear development**. Further research is required to establish if such a link exists and if a bundled approach to prevention and management is best practice. "

From: Clinical Challenges in Differentiating Skin Tears from Pressure Injury.

Prevention is the key!

- Recognize fragile skin
- Caution during bathing, dressing, transferring
- Proper transfer techniques & positioning

What other preventive strategies would be important?

Treatment:underlying factors.

- Cause of the skin tear: injury?
- Underlying/contributing disease
- Steroids or anticoagulant medications
- Tetanus status
- Arterial status
- Mobility/independence
- Extent of injury

Prevention is the key!
Recognize the underlying cause(s)

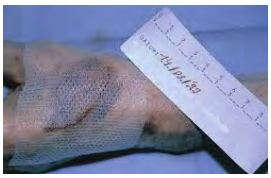
- Pad hard surfaces, bed rails, etc.
- Use pillows & blankets to protect& support arms & legs
- Maximize nutrition & hydration
- Long sleeves, pants to add layer of protection

- Apply moisturising cream/agent
- Use emollient, neutral pH soaps & cleansers
- Atraumatic tapes/ dressings or stockinette, gauze wrap—NO ADHESIVES!!

Treatment:

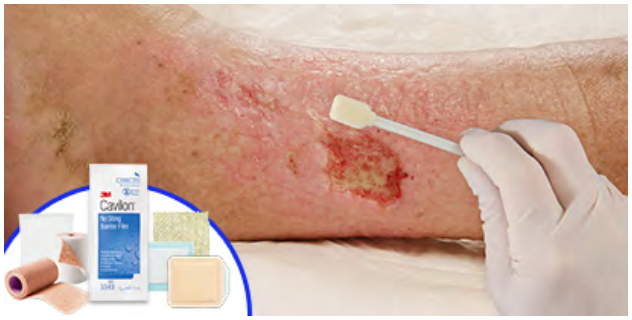
- Skin flap: if possible, moisten & approximate edges
- Non-viable flap: consult MD or wound care specialist to debride.
- Dressing options:
  - **atraumatic dressing**: leave in place ALAP* to reduce interference with healing process.
- Pain control

*ALAP= As Long As Possible



Dr. Rosemary Kohr 2020

Protect the peri-wound skin.



- Gently clean the area, pat dry and apply barrier to the peri-wound skin
- If using a non-adherent contact layer, there is no need for additional peri-wound skin protectant.

Dr. Rosemary Kohr 2020

An example: Cavilon ™ No Sting Barrier Film

Application of Cavilon No Sting Barrier Film

AREAS OF USE

Intact or damaged skin from body fluids, adhesives and friction.

- Incontinence care
- Peri-stomal skin protection
- Peri-wound skin protection
- Peri-tube skin protection

DESCRIPTION & BENEFITS

- Cavilon No Sting Barrier Film is an alcohol-free liquid barrier that dries quickly to form a breathable, transparent coating on the skin.
- Designed to protect intact or damaged skin from irritation, trauma and friction.
- Hypoallergenic and non-cytotoxic. Does not usually sting, even on broken skin.
- **Provides up to 72h of protection** from irritation of urine and feces.
- Will not clog or reduce absorbency of diapers or pads.

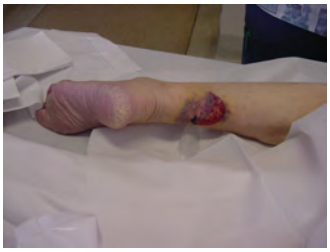
Dr. Rosemary Kohr 2020

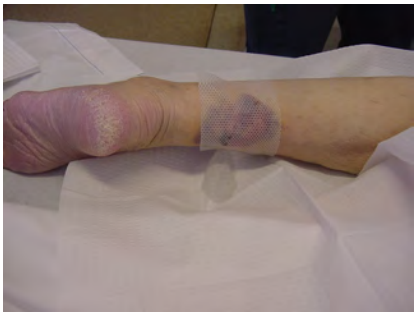
Many to choose from:
less is better than more!

Dr. Rosemary Kohr 2020

Use an atraumatic dressing:

- Soft silicone (e.g., Mepitel®, Restore® Contact Layer)
- Absorbent Clear Acrylic® (3M)
- Adaptic Touch ®





Dr. Rosemary Kohr 2020

Practical Wound Care

for Nurses and other Health Care Professionals

On-line "live" Day 1

Course design/development:
Rosemary Kohr, PhD, RN

kohrconsulting@gmail.com

2020

Zoom orientation

- I hope you have read the information from HLLN (York University) on how to use Zoom.
- At the start, your audio will be automatically muted– but you can unmute (see the microphone icon)
- Video: remember, we can SEE you and what you are doing! My preference is that you to keep your video ON– you will see all the participants arranged in a gallery/tile across the top of the screen.
- The Chat function: you can post to the whole group or to me (the Host)

Agenda for this on-line course

You have the course schedule located on the York HLLN web-page*

Self-directed presentations and activities are located on the course page.

We meet via Zoom from 9:30-12:00 each day of the course (be prepared to run a bit longer than noon...)

A 10 minute stretch-break will be around 10:30

Please be ready to start at 9:30am (audio/video and the dressing samples)

Videos for you to watch are located on the HLLN course web-page

- ***Please refer to the Course content webpage for activities and subsequent days' schedule (keep it open during the course)**

A note on Dressing Samples

- You have received a package of dressing samples
- The samples are not intended as an endorsement of a particular product/company, but serve as EXAMPLES of product type & have been provided free of charge from the companies
- As we go through the samples, please open your samples to try out
- I recommend that you have a container with water (spray bottle is useful) on hand

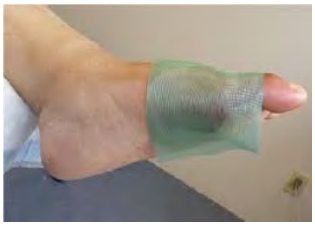
Dr. Rosemary Kohr 2020

Introductions...

Your turn!

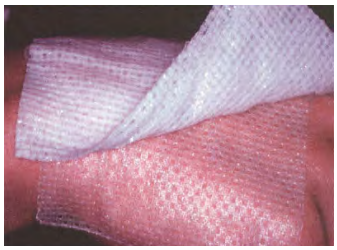
Your name, your role, where you work, one thing about wound care that interests/excites you.

Contact Layer Dressings: Require a Cover dressing and NO adhesive borders please!!



Dr. Rosemary Kohr 2020

Soft silicone wound contact layer: e.g., Mepitel ®



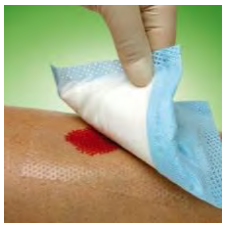
AREAS OF USE

Exuding wounds:

- Second degree burns
- Graft fixations
- Surgical incisions
- Diabetic ulcers
- Lacerations & skin tears
- Skin abrasions
- Blistering
- Venous and arterial ulcers
- Epidermolysis Bullosa (EB)

BENEFITS

- Minimizes trauma to wound and surrounding skin while easing wound pain.
- Silicone does not stick to wound bed yet adheres gently to the surrounding skin.
- Can remain in place up to 14 days, only changing secondary dressing, permitting undisturbed and cost-effective healing.
- Prevents sticking of secondary dressing to wound.
- Can be used in combination with topical treatment (e.g. antimicrobials).



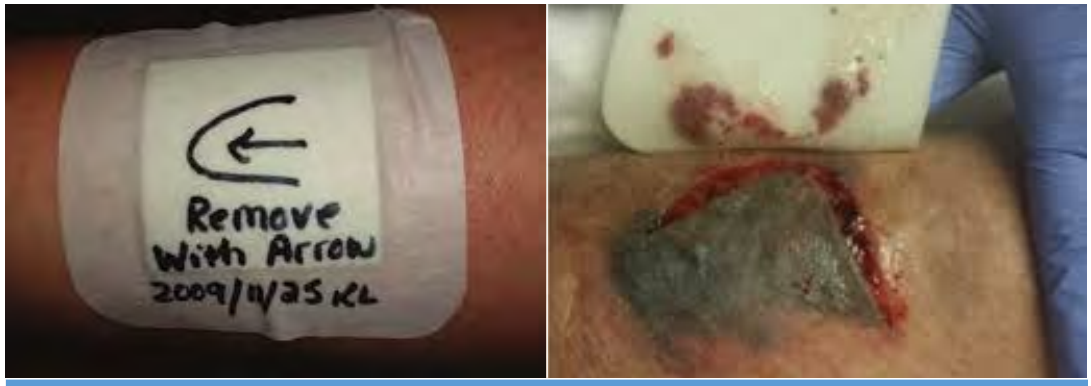
Dr. Rosemary Kohr 2020

Dressings: Adaptic **Touch**

Dr. Rosemary Kohr 2020

Dressings: Absorbent Clear Acrylic

Dr. Rosemary Kohr 2020



REMOVING the dressing

Dr. Rosemary Kohr 2020

Why **NO** to these products:

- **Jelonet**: Paraffin-gauze
- **Adaptic** ("old version"): Petrolatum emulsion

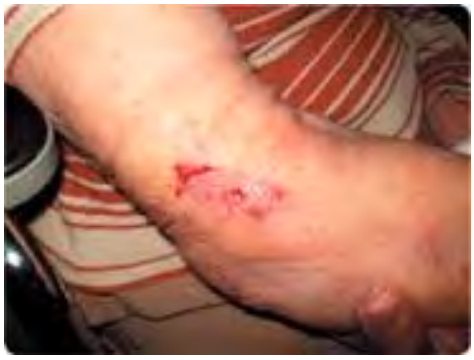
Limited Moisture Vapour Transfer (MVT)

- leads to maceration of wound/periwound

- **Bacitracin** (1940s): Contact dermatitis develops in up to 44% of patients

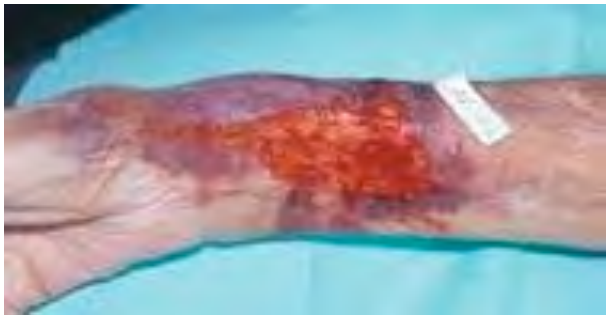
Dr. Rosemary Kohr 2020

Case example 1



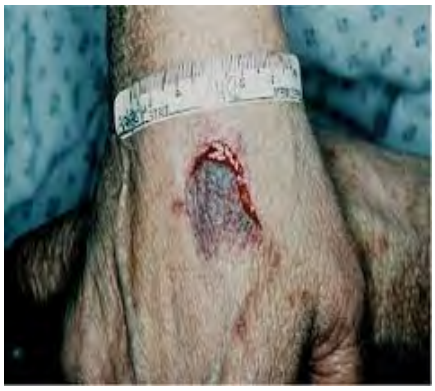
Dr. Rosemary Kohr 2020

Case example 2



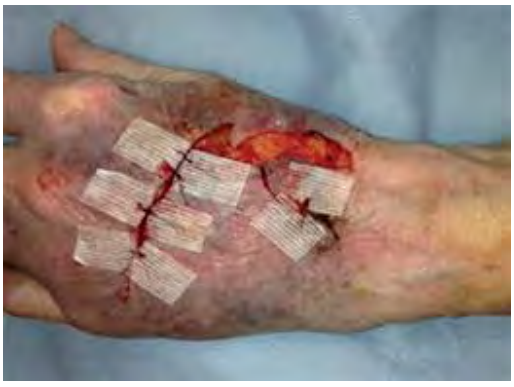
Dr. Rosemary Kohr 2020

Case example 3



Dr. Rosemary Kohr 2020

Case Example 4



Dr. Rosemary Kohr 2020

Dr. Rosemary Kohr 2020

Assess for risk! Prevention is the key.

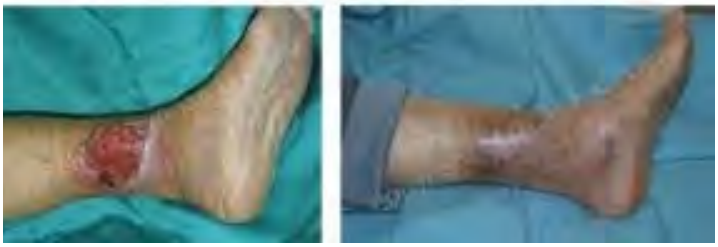
Dressings: How (and what) to select

The ABCDs

Dr. Rosemary Kohr 2020

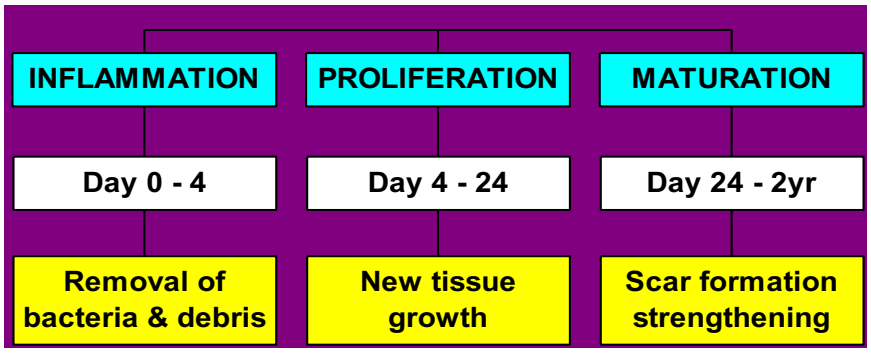
CHRONIC WOUND

CHRONIC VENOUS ULCER TREATED BY MODERN WOUND DRESSING

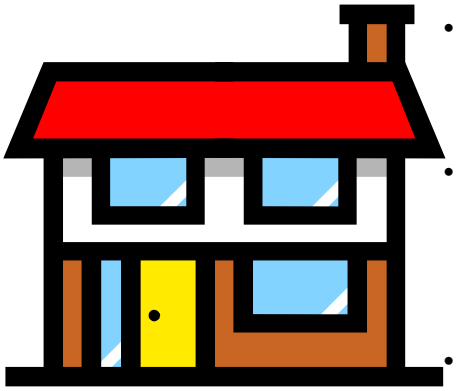


Keep in mind… wounds CHANGE over time

Three Phases of Wound Healing



Damaged House Analogy



- Hemostasis/Utility Workers
- Inflammation/Non-skilled Laborers & Contractor
- Granulation/Framers & Skilled workmen (plumber, electrician, etc)
- Maturation/Interior finishing

Dr. Rosemary Kohr 2020

Manage the WOUND

BARRIERS

Exudate (Amount)	Bacteria	Necrosis **(CRUST)**
Moisture Balance	REDUCE	DEBRIDE

Dr. Rosemary Kohr 2020

How to choose a dressing: A B C D s

A AMOUNT (of fluid)
B BACTERIA
C CRUST
D DRY
S SKIN TEARS

Dr. Rosemary Kohr 2020

*Choosing the dressing…ABCDs:

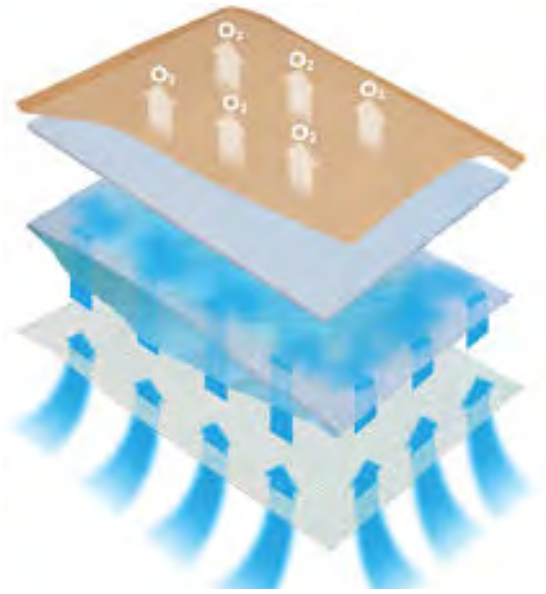
Base Dressing Selection on A = Absorption, B = Bacteria, C = Crust, D = Dry , S = Skin Tear	What are our dressing options ?
A	
A + B	
A + C	
A + B + C	
B	
B + C	
C	
D (just needs protection)	
S (Skin Tear)	

Dressing type: Polymer fibre, Foam, Absorbent Acrylic, Hydrocolloid, Hydrofibre, Contact Layer, Calcium Alginate, Hypertonic Sodium, Island Dressing, Barrier, Silver, Iodine, Honey dressings, Hydrofera Blue.

Dr. Rosemary Kohr 2020

The Importance of MOISTURE-VAPOUR TRANSFER (MVT).

- Wounds that are too wet are unable to process the healing cascade.
- Dressings that do not provide MVT can stall wound closure by keeping the wound bed saturated.
- Dressings should provide effective MVT to support effective wound closure.



Dr. R. Kohr 2020

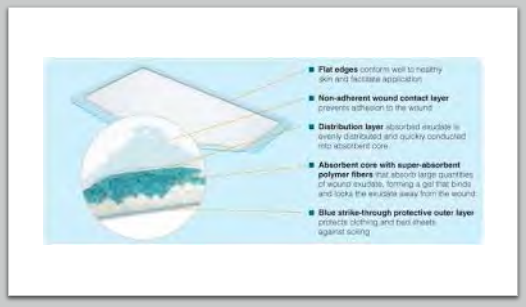
AMOUNT of FLUID

- **VERY HEAVY** – soaks through pads requiring frequent dressing changes (O.D. +)
- **HEAVY to *moderate* – dressing requires changing q 1-2 days)**
- ***Light*** – dressing change q 5-7 days
- ***Minimal* or *DRY* – protective dressing (stays on as long as possible)**

Dressing depends on: AMOUNT of FLUID

- **VERY HEAVY** – soaks through pads* requiring frequent dressing changes (O.D. +)
- Examples: MEXTRA or EXTRASORB (with polymer beads– like baby diapers)

Avoid "Abd" pads!!



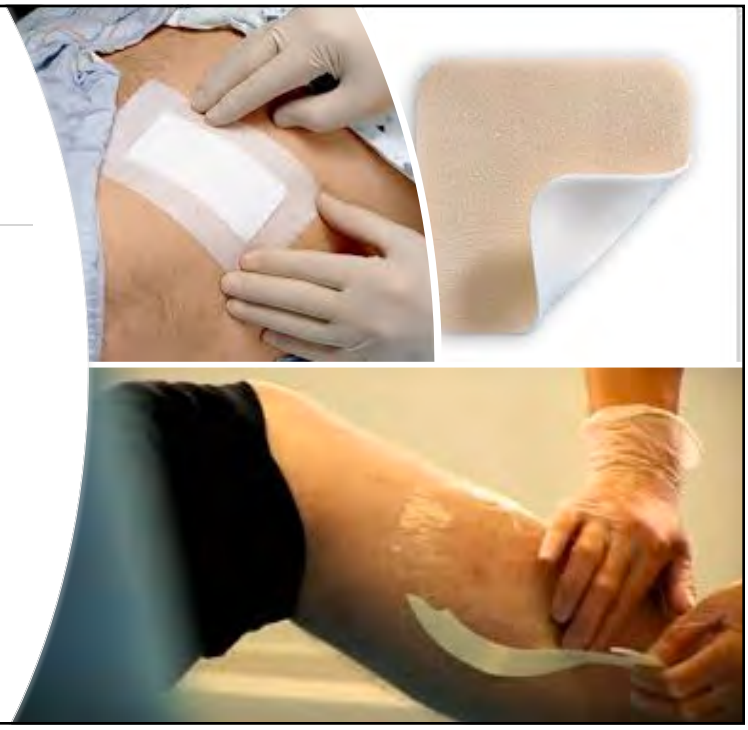
Amount of fluid/dressing

- **HEAVY to *moderate* – dressing requires changing q 1-2 days)**
  - **Examples: Mesorb (requires wrap or tape)**
  - **Foam: e.g., Mepilex with/without border, with/without AG**

Dr. R. Kohr 2020

- ***Light*** – dressing change q 5-7 days
  - Use a light FOAM dressing or CLEAR ACRYLIC

- ***Minimal* or *DRY* – protective dressing (stays on as long as possible)**



Dr. R. Kohr 2020

Absorbing exudate/drainage

Need to provide balance (not too wet, not too dry)

Use absorbent pad:

*Mesorb or | Heavy drainage: *Mextra or *Xtrasorb

If likely to have daily dressing, consider *Tubigrip or *Comprilan wrap (which can be washed) until drainage is managed.

ABD pads ('abdominal pads') do nothing to absorb drainage & should be replaced by pads that actually DO absorb & provide Moisture-vapour transfer (e.g., Mesorb *)

*Dressing examples. You may have others available.

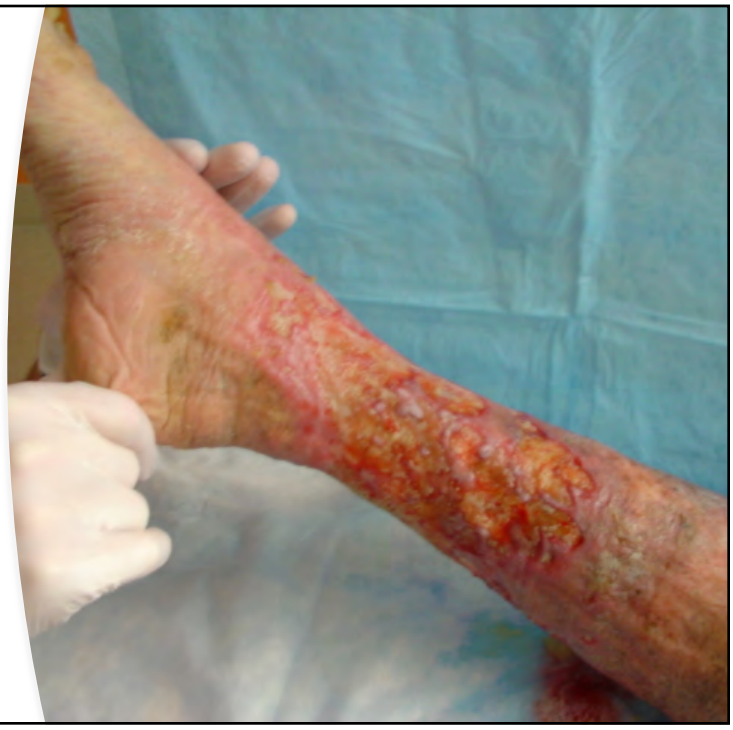
Dr. R. Kohr 2020

DRESSING selection DEPENDS ON: **Bacteria**

- **Goal: decrease the bacterial burden**
- **Unless systemic infection, treat with topical antimicrobial dressings**

- Topical options:
  - Salt, silver, honey, iodine, Hydrofera Blue, PHMB

Compression is possible while infection present.

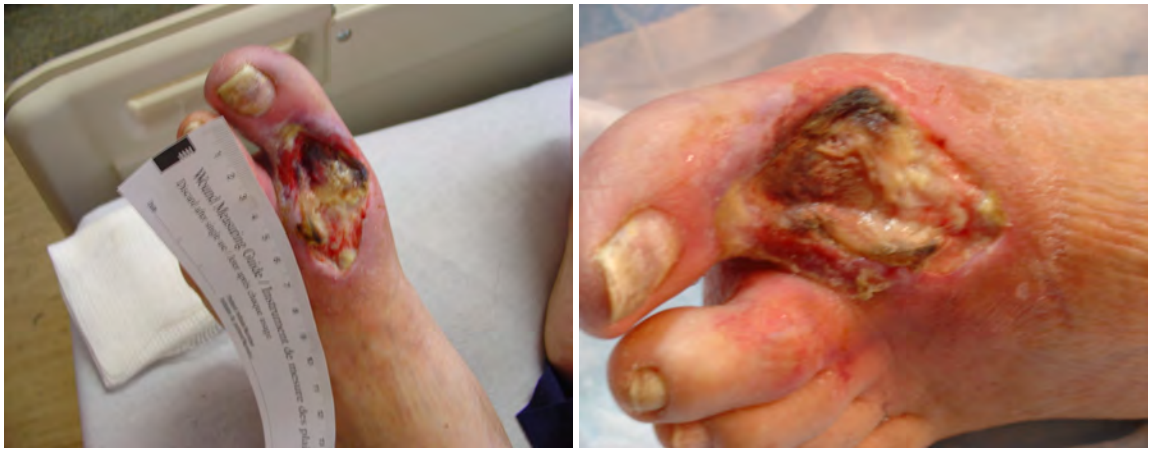


B: Bacteria

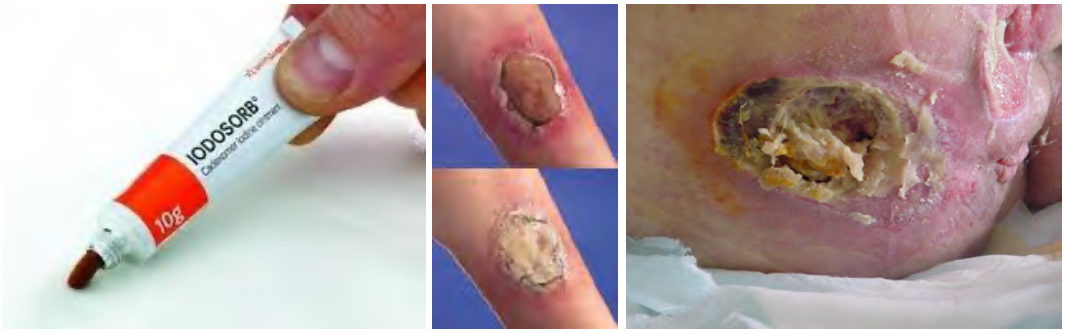
In wounds, often drainage increases w bacterial load:

- TOPICAL DRESSING OPTIONS:
  - Silver –any dressing with "AG"
  - Medical-grade Honey (NB usually increased drainage initially)
  - Hypertonic sodium (eg: Mesalt: daily; goes on DRY)
  - Iodine in slow-release form
    - (eg: Iodosorb/Inadine) **q 3 days**
  - Hydrofera Blue (gentian violet/methelyn blue)
    - Change when white ("when it's white, it's lost the fight")
  - PHMB (Polyhexamethylene Biguanide)
    - E.g., Kerlix™ AMD gauze, etc

- **Always know the properties of the dressing: READ the information before using!**



Dr. Rosemary Kohr 2020



Dr. Rosemary Kohr 2020

Use an “autolytic” debrider when possible

Key: leaving the dressing intact as long as possible to allow autolytic debridement to occur.

Examples:

- hydrocolloid (e.g., Comfeel ®, Tegaderm®)
- Medical-grade honey (paste/patch with colloid)
- foam (Mepilex®, Biatain®)
- And sometimes hypertonic salt (Mesalt®)

More about these dressings later...

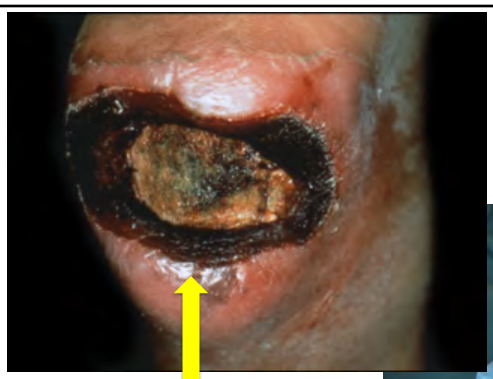
C: Dressing depends on Cleaning up the Crust

Debride **yellow/gray/black** slough in the wound:

- Wound cleanser a good option (surfactant action)
- Autolytic debriding agents work well under compression
- Leave on as long as you can… “until strike-through”
- Allow the body to naturally work to separate dead from viable tissue

Cleaning out the crust:
Getting rid of sloughy material in the wound bed.

Dr. Rosemary Kohr 2020



IMPORTANT QUESTION!

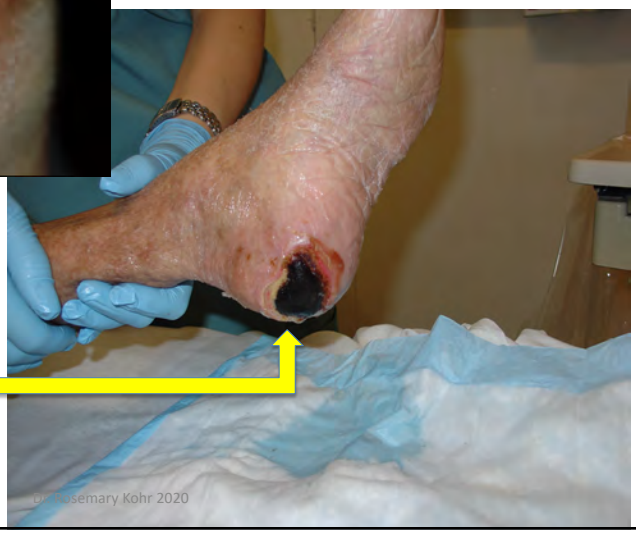
IS THIS WOUND HEALABLE??

(see handouts)

Ask yourself: **is this wound healable?**

If YES, progress to the "ABCs" & debride.

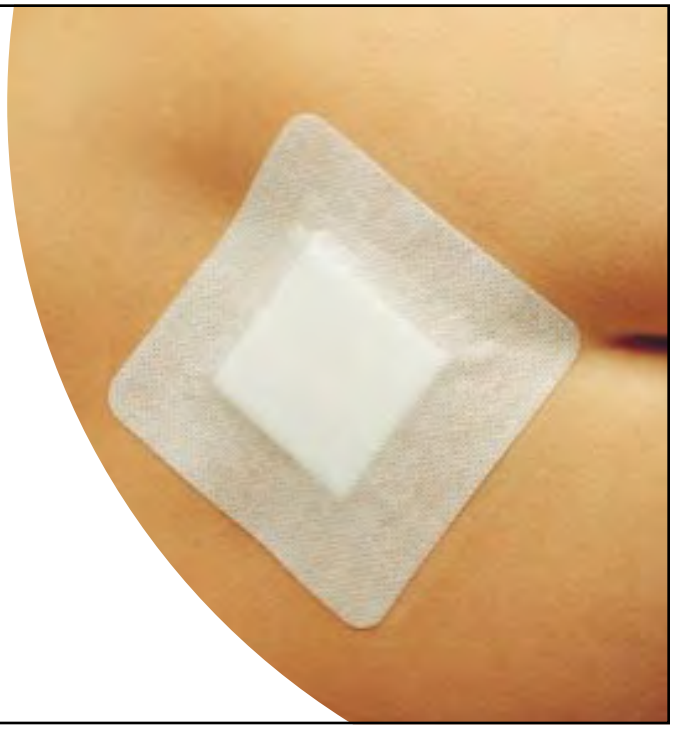
If "NO", paint with iodine (e.g., Betadine) & protect.

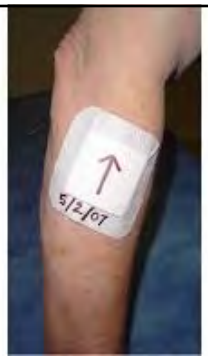


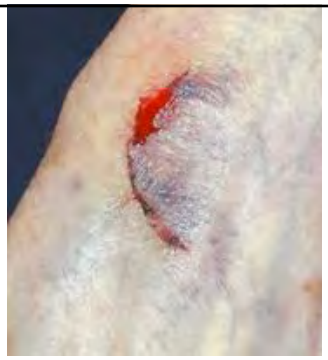
D = DRY WOUND

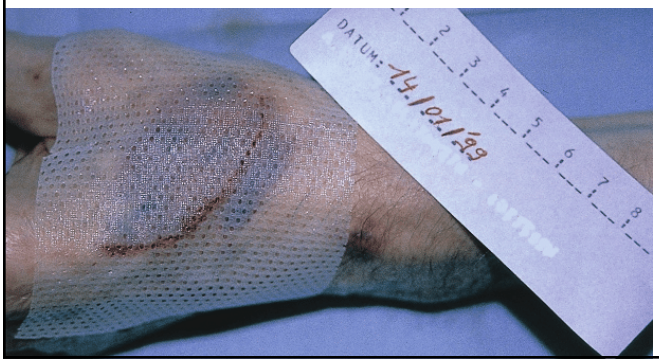
- When you don't need a dressing for **"A, B, or C"**
- Just need something to cover, protect:
  - Virtually no drainage
  - Healing well
  - Moving towards closure
- Choose something "cheap & cheerful" (e.g., an Island dressing– gauze with gentle tape)
- Could also use a silicone-based (dimethicone) barrier cream

Dr. Rosemary Kohr 2020









SKIN TEARS ("S")

Skin tears require GENTLE treatment!

- Avoid adhesives
- Avoid transparent film (doesn't allow moisture vapour transfer)
- Contact layer + cover dressing:
  - Only change cover dressing when saturated
  - Leave contact layer on ALAP (As Long As Possible)

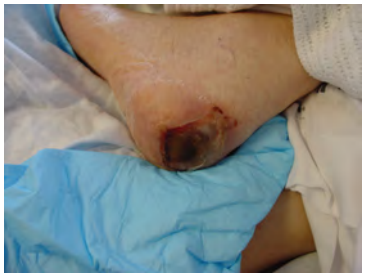
Dr. Rosemary Kohr 2020

Let's review the steps for wound care:

First step: Take a good look at the individual who has the wound... Ask yourself:

WHAT ARE THE UNDERLYING CAUSES??

And <u>always</u> **TREAT THE UNDERLYING CAUSE (TULC)**



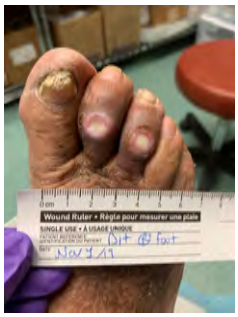
Dr. Rosemary Kohr 2020

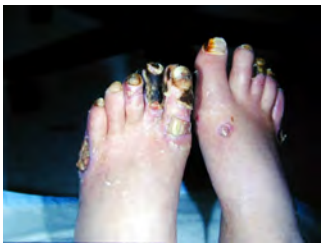
Discussion:
What are the possible underlying causes for this wound?

Then, your next question:

"Is this wound healable?"

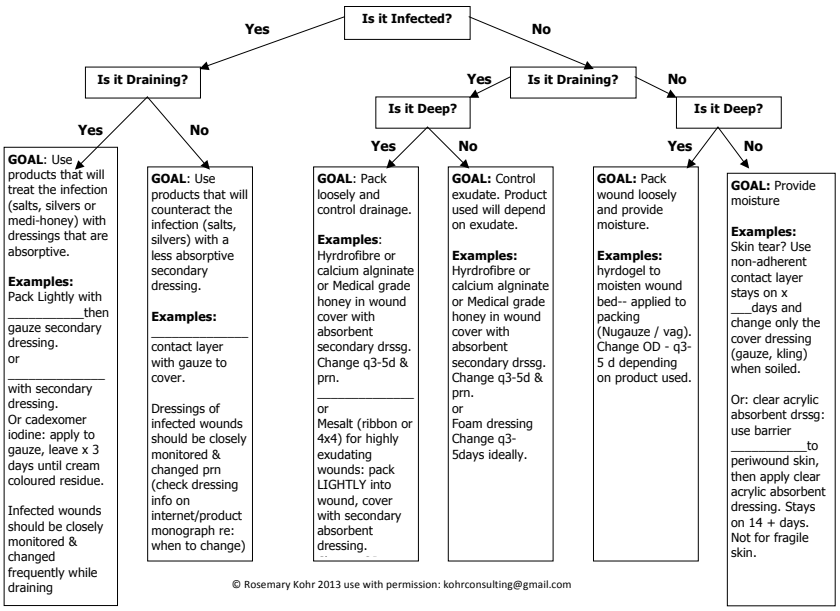
If the answer is "no", then what are the options for dressing selection/management?



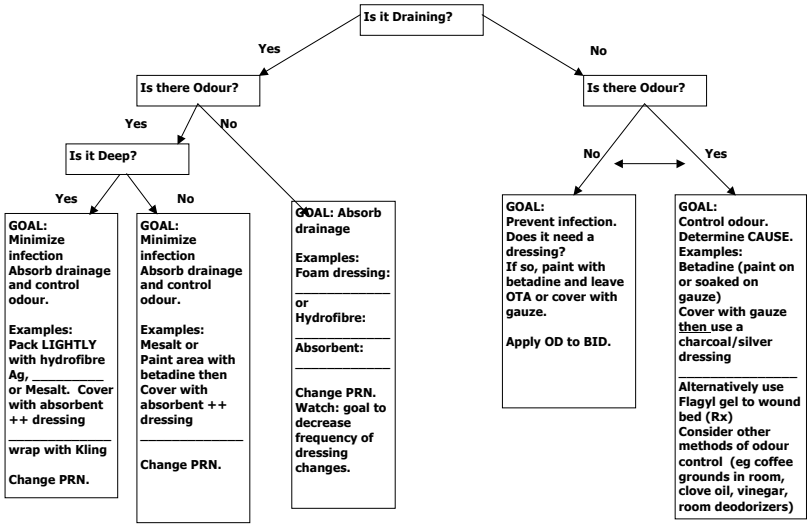


Dr. R. Kohr 2020

Healable Wounds



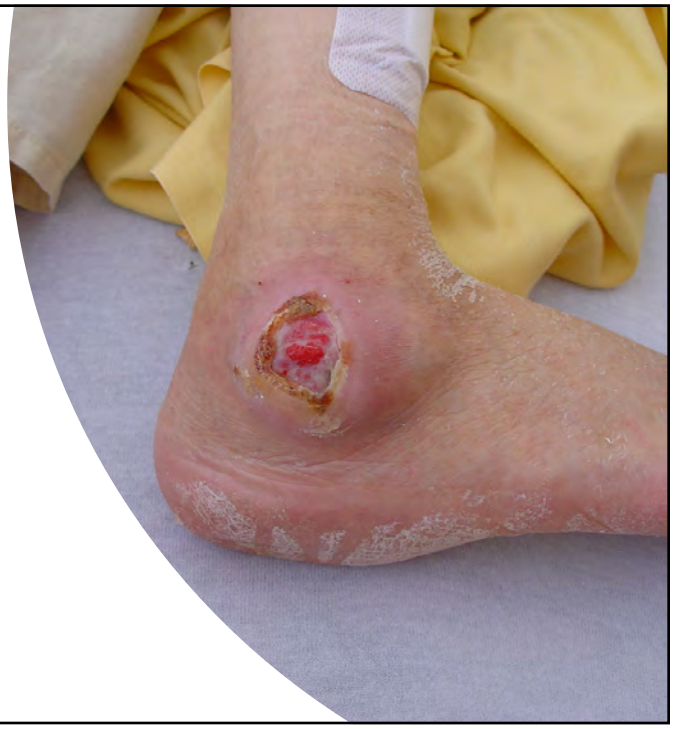
NON-HEALABLE WOUNDS
GOAL: COMFORT ! But continue to Treat the Underlying Cause (TULC)
****Includes eschar and necrotic wounds**
If wound is a PRESSURE SORE, the pressure MUST be offloaded!



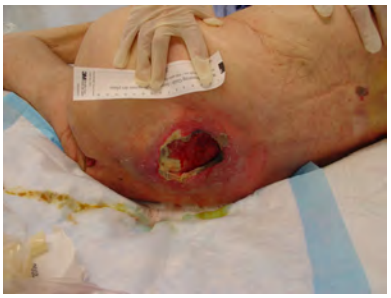
ALWAYS Prepare & Protect:

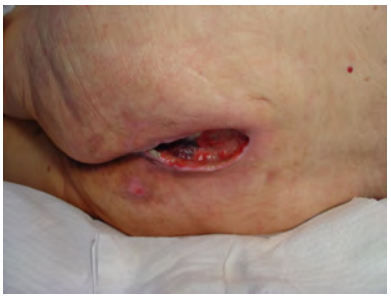
PREPARE:

- Cleanse wound (preferably with warmed solution)



Dr. Rosemary Kohr 2020





Irrigate, and then irrigate again…

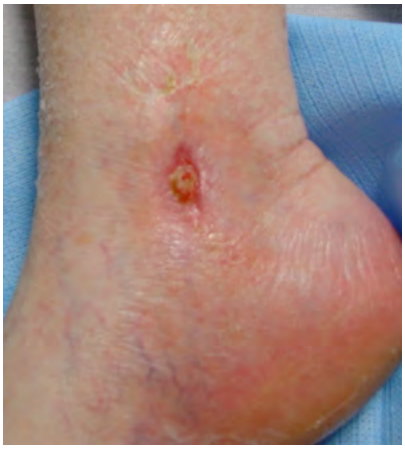
APPROPRIATE PSI: 8 – 15 .

USE WARMED IRRIGANT;

POSITION BODY TO PROVIDE PASSIVE DRAINAGE OF IRRIGANT SOLUTION

Dr. Rosemary Kohr 2020

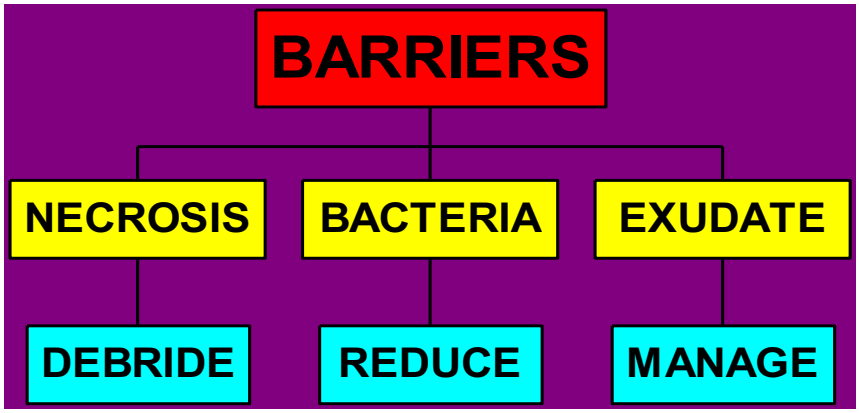
PROTECT the PERI-WOUND SKIN



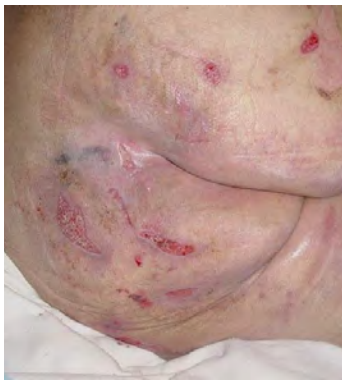
BARRIER FILM/WIPE AROUND THE PREPARED WOUND, ONLY ON PERI-WOUND SKIN.
IF USING A SILICONE DRESSING, NO NEED FOR ADDITIONAL BARRIER/SKIN PREP.

Dr. Rosemary Kohr 2020

CLINICAL MANAGEMENT



Skin Sealants/Barriers



- designed for intact skin* or including Stage II Pressure Injury
- easy to apply
- Inexpensive (compared to dressings)
- prevents tape damage
- Examples: *No Sting,
- Cavilon Cream, CriticAid Clear,
- ProShield Plus, Baza Cleanse & Protect

WHY MOIST WOUND HEALING:

- Maintains **optimal temperature** for healing
- **Decreases trauma** to the fragile granulating tissue of wound bed
- **Decreases infection** potential
- **Decreases** patient **pain** at dressing change

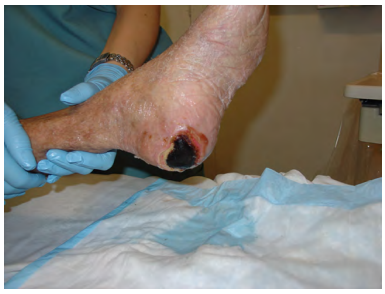
Dr. Rosemary Kohr 2020

CASE STUDIES

Dr. Rosemary Kohr 2020

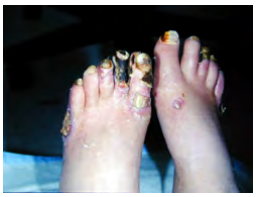
Dressing selection:
Is the wound healable?
Is it infected?

1.

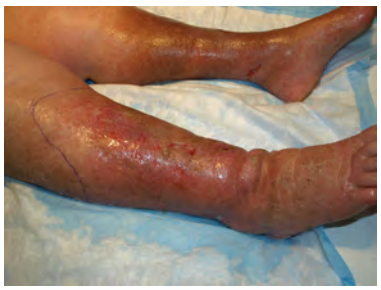


Treat the underlying cause (TULC)
Prepare/protect
ABCDs

2.



3.



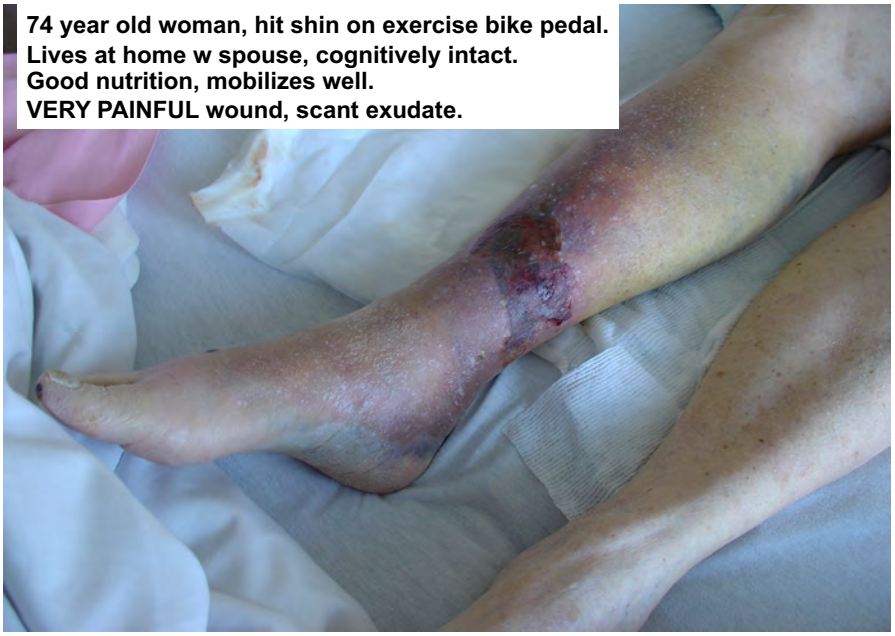
Dr. R. Kohr 2020

Underlying cause?

Treatment selection?

A
B
C
D
s

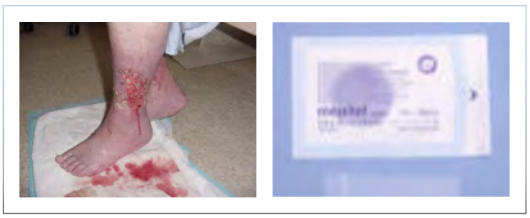
74 year old woman, hit shin on exercise bike pedal.
Lives at home w spouse, cognitively intact.
Good nutrition, mobilizes well.
VERY PAINFUL wound, scant exudate.



Dr. Rosemary Kohr 2020

MANAGING FRAGILE SKIN:

- AVOID USING ADHESIVE DRESSINGS.
- AVOID products that adhere to the wound bed.
- **CHOOSE a non-adherent cover dressing**, cover with gauze & Kling.



Dr. Rosemary Kohr 2020

Underlying cause?

What is the wound telling us?
A
B
C
D
s

82 year old woman, from nursing home;

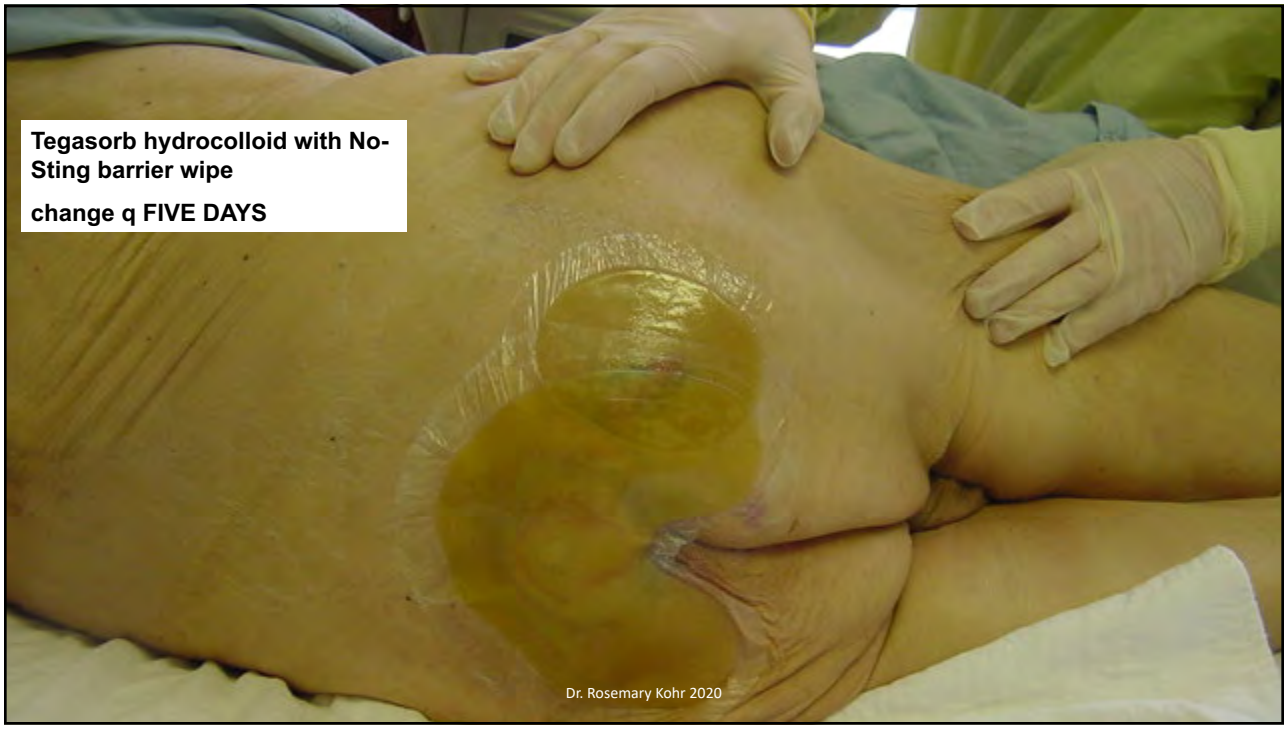
Recent stroke (left side weakness), poor appetite, incontinent.

Dr. Rosemary Kohr 2020

HYDROCOLLOID DRESSINGS:

- best for wounds with minimal drainage/wound requiring debridement.
- No need for added hydrogel (already donates moisture to wound)
- Occlusive: if intact but soiled, just wipe off.
- can stay in place for 5-7 days.
- characteristic odour that should not be confused with an infection.
- Caution with fragile periwound skin: may cause trauma (e.g., skin tears)
- **Not for use on infected wounds.**

Dr. Rosemary Kohr 2020



DRYING A WET WOUND, or supporting the moist wound bed.

- FOAM DRESSING (e.g., Mepilex*, Mepilex Border*)
- Absorbs exudate.
- Can be left intact up to 7 days!!
- Does NOT provide pressure relief.
- *Dressings with silicone base/border can be lifted up to check (and the same dressing reapplied)*

Dr. Rosemary Kohr 2020

Soft silicone dressings:

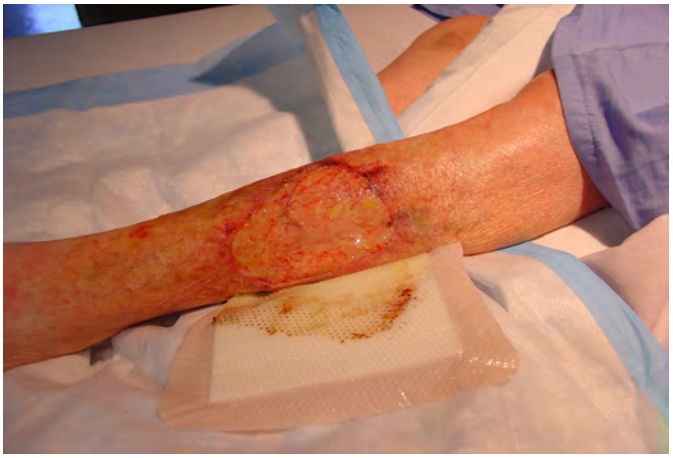
- For wounds or skin tears with fragile periwound skin;
- Silicone base won't adhere to wound bed;
- "Tacky" –conforms to heels, elbows, etc.;
- Can be lifted to assess wound then re-applied
- Not for diaphoretic skin or if other silicone product (barrier cream) is used.

Dr. Rosemary Kohr 2020

Case 3: 91 year old man, from home.
Alzheimer's disease, poor nutrition, incontinent.
Fragile skin, wound with mod. amount of exudate.

Underlying cause?

What is the wound telling us?
A
B
C
D
s

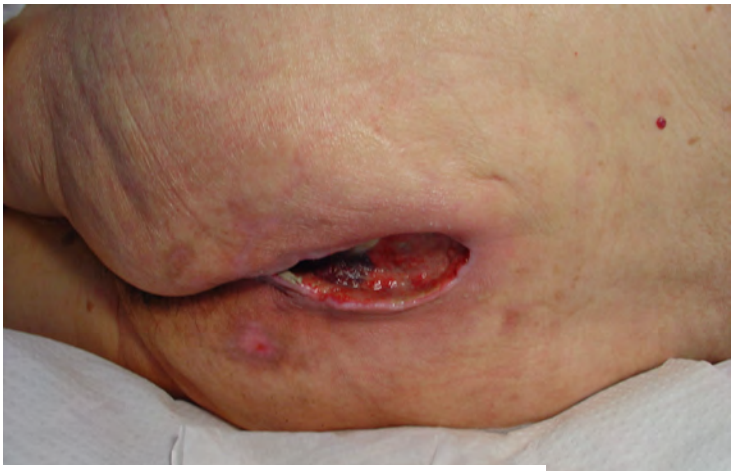


Dr. Rosemary Kohr 2020

Case 4.

Underlying cause?

What is the wound telling us?
A
B
C
D
s



78 year old woman w sacral ulcer: surgically debrided. Copious amounts of drainage, wound still has yellow slough but Good granulating tissue (60%)

Dr. Rosemary Kohr 2020

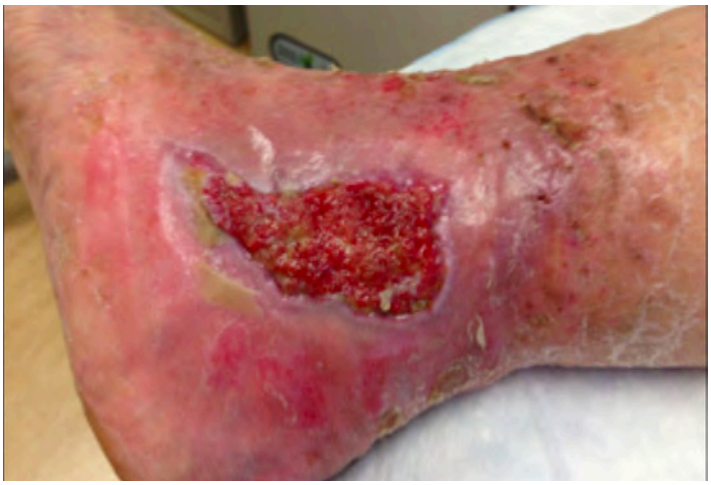
DRYING A WET WOUND:

- Hydrofibre or Calcium alginate:
- Goes on DRY.
- Soaks up exudate into gel form.
- Can be 'layered'.
- Use with cover dressing *(e.g., abd. pad, gauze, All-dress).*

Dr. Rosemary Kohr 2020

Case 5.

53 year old truck driver with poor circulation and diabetes.



Underlying cause?

What is the wound telling us?
A
B
C
D
s

Wet wound = increased bioburden

- **Hydrofera Blue:**
- Polyvinyl alcohol foam containing Methylene Blue & Gentian Violet
- Broad spectrum antimicrobial activity, effective against a variety of bacteria & yeasts
- For wounds with exudate with S&S of local wound infection
- Can be used with enzymatic debridement/growth factor products
- Dressing must remain moist (Dressing goes on WET)

Dr. Rosemary Kohr 2020

Hydrofera Blue: what's the story? Hydrofera Blue

- Special foam dressing contains 2 anti-bacterial dyes: methelyn blue and gentian violet
- Action: *pulls* bacteria out of the woundbed where it is killed within the foam dressing (no dye is actually *deposited* in the wound).
- Also effective when wound edges are rolled (indicating stalled healing)
- Dressing can be cut to fit OR placed over the wound/peri-wound.

Hydrofera Blue **Ready**

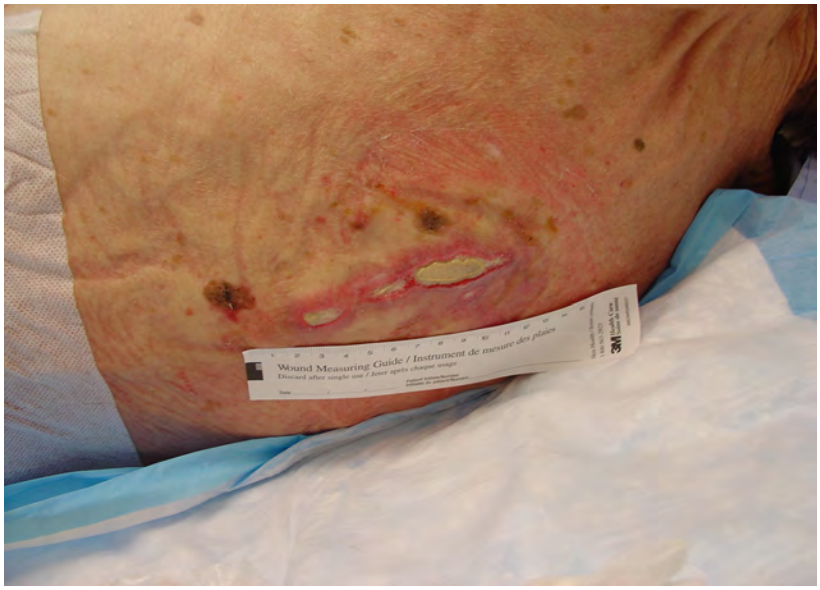
- **Ready version** does not require hydration or a cover dressing
- **Classic version** requires hydration AND a cover dressing.
- **Transfer version** acts as a medium to trap bacteria but requires a cover dressing as well.
- **When the dressing is white, it has "given up the fight" & needs to be replaced.**

Case 6

89 year old man
- "Failure to thrive"
- Poor nutrition/ hydration
- Weak (has been bedridden)

Underlying cause?

What is the wound telling us?
A
B
C
D
s



ADDING MOISTURE TO A DRY WOUND:

- Use a hydrogel—such as Intrasite™ gel to support autolytic debridement.
- Moist wound bed is optimal for debridement and healing.
- Scant amount will be effective.
- Can be mixed with Iodosorb to improve application.

Wound care "myths": (don't do these!!)

- Massage a reddened area (non-blanchable erythema)
- Cornstarch/Maalox Tx to dry up a wound
- Brown Soap or Rubbing Alcohol to 'toughen' skin
- Irrigate wounds*withBetadine/Chlorhexadine
  - Only in some cases (gangrene; for a few days if heavily infected)
- Leave wounds open to the air
- Donut cushions
- Firm packing of wounds

Dr. Rosemary Kohr 2020

Remember: TULC + ABCDs and E (x2)

1. Treat the underlying cause (TULC)
2. Wounds change (or SHOULD change) over time
3. Wound bed: "Moist like your eyeball"
4. Irrigate, irrigate, irrigate
5. Prepare the wound, Protect the peri-wound
6. ABCDs for dressing selection
7. Evaluate
8. Educate patient/family

Dr. Rosemary Kohr 2020

Dr. Rosemary Kohr 2020

Chronic Disease: The Effect of Diabetes

Diabetes & Kidney Disease

Diabetes and your kidneys (Saint Michael's Hospital)

- **Diabetes is the leading cause of kidney disease.**
- About one-third of people who have had diabetes for more than 15 years will develop kidney disease
- Over time, high blood glucose levels damage tiny blood vessels in the kidneys, impairing their ability to filter the blood properly.
- Diabetic neuropathy affects nerves to indicate bladder is full -- pressure from a full bladder can damage kidneys;
- UTI re: residual urine in bladder.

DIALYSIS UNITS

Dr. Rosemary Kohr 2020

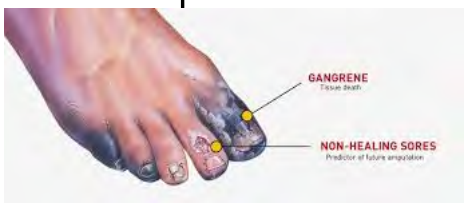
Prevention/treatment of kidney disease

Screening: annual microalbumin (urine test) and serum creatinine (blood test).

For individuals with Diabetes:

- Maintain blood glucose within target range;
- Maintain blood pressure at target (below 130/80);
- Don't smoke;
- Take prescribed medications, eg, BP meds.

Risk for Amputation



Jack's Story (Diabetic Amputation)

- Peripheral vascular disease & diabetes account for majority of L.L. amputations;
- 1/2 of these are due to diabetes.
- Prognosis is poor.
  - Within 3 years, (30%) 2nd limb amputation
  - Within 5 years, 50% + will die.

Amputation complications:

- Infection
- Tissue necrosis
- Pain
- Dehiscence/wound breakdown
- Problems associated with the surrounding skin
- Bone erosion/osteomyelitis
- Haematoma
- Stump edema.

Dr. Rosemary Kohr 2020

Management

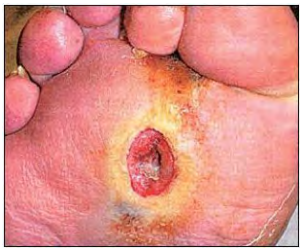
- **PREVENTION is the key!**
- careful foot care: hygiene, inspection, footwear
- Good diabetic control (sugars within range)
- Local infections: debridement (if viable) & topical infection management;
- Oteomyelitis: X-rays, MRI to determine
  - Systemic antibiotics along with topical treatment & pain management

- **Teamwork:**
  - Patient (positioning, foot care)
  - Dietitian
  - MD/RN
  - PT/OT
  - Family & Support Services
- **Educate yourself** re: treatment options:
  - Canadian Diabetes Association
  - RNAO BPG
  - Wounds Canada

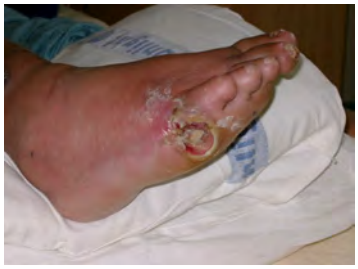
Dr. Rosemary Kohr 2020

"Diabetic Feet"

Foot ulcers affect 30-50% of people with Type 2 diabetes



#1 Case example



#2 Case example

Impaired function of nerves & blood vessels supplying the feet.

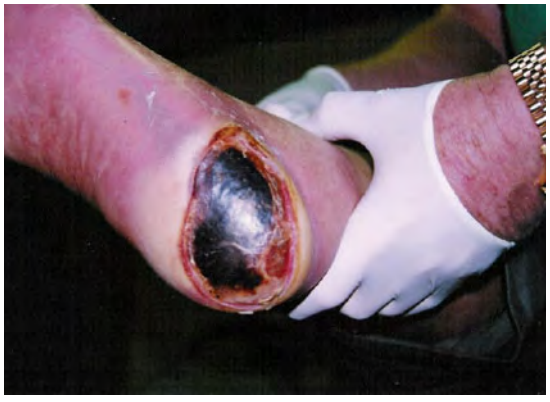
Feet are dry--callus, dry skin.

Prone to fissures, cracks & pressure ulcers--leading to infection which can enter and spread through the foot.

Discussion:
What do we need to do here?
#1 case example
#2 case example

Dr. Rosemary Kohr 2020

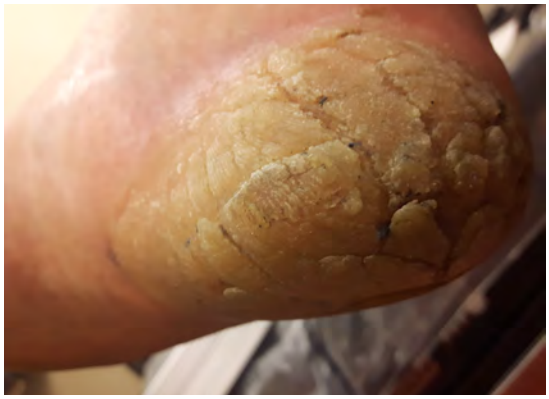
Sensory neuropathy:



- robs the diabetic foot of the protective mechanism of pain allowing ulceration to develop in response to minor trauma or rubbing.

Dr. Rosemary Kohr 2020

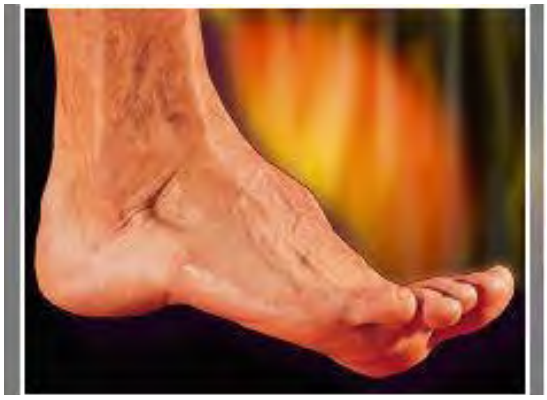
Autonomic neuropathy



- reduces sweating and opens arteriovenous shunts in the foot.
- diabetic foot is typically warm, may have strong pedal pulses and dry, cracked skin.
- skin fissuring allows entry of bacteria causing localized infection.

Dr. Rosemary Kohr 2020

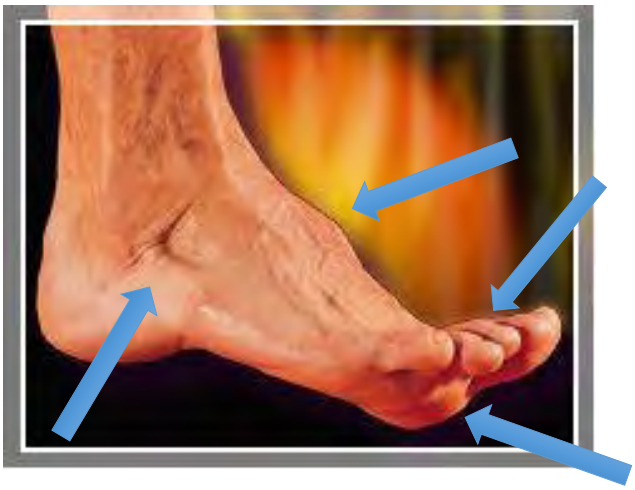
Motor neuropathy



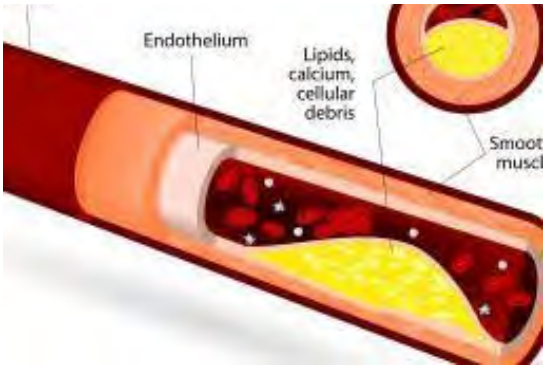
- Causes wasting of the small intrinsic muscles of the foot with collapse of the longitudinal and transverse arches
- Creates deformities to the foot
- abnormal pressure areas then develop which progress to ulceration (foot-wear is crucial).

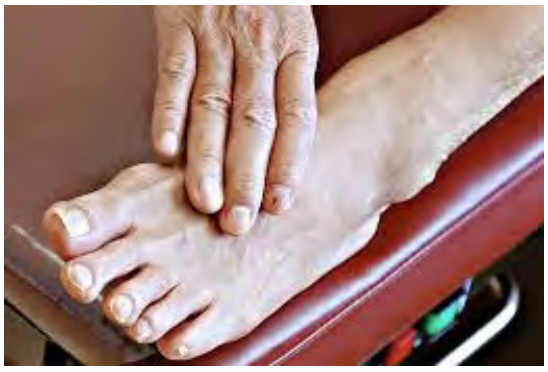
Dr. Rosemary Kohr 2020

Motor neuropathy foot deformity



Dr. Rosemary Kohr 2020





Atherosclerosis (plaque build-up)

- develops at a much younger age and is more extensive and distal.
- Not uncommon for a diabetic to have a critically ischemic foot in the presence of a normal popliteal pulse due to occlusion of the crural arteries.
- In addition to disease of the major arteries, capillary basement membranes thicken, impairing oxygen diffusion to the tissues of the foot.

Dr. Rosemary Kohr 2020

- **MONOFILAMENT Testing**
  - **Examine both feet**
  - **Look for signs of neuropathy**
  - **Should have score of minimum 6/10**
-

Dr. Rosemary Kohr 2020

Prevention: EDUCATE EDUCATE EDUCATE: How do we do this best?

Patient Education on Diabetic Foot care

- TEACH about the importance of:
  - Daily foot inspection
  - Daily footwear inspection
  - Proper hygiene
    - drying / fungal powder / moisturize
  - Proper footwear (all the time)

Dr. Rosemary Kohr 2020

Prevention/Treatment

Chiropody / podiatry

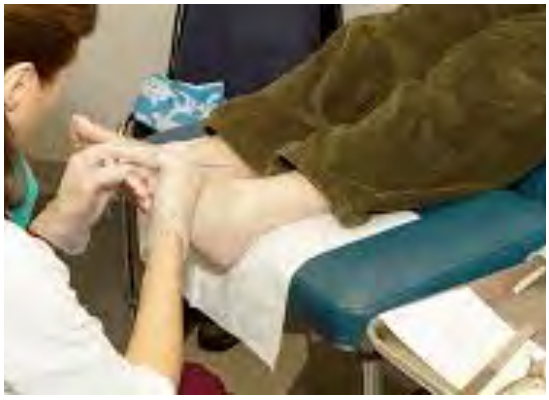
- footwear – pressure OFF loading
- attention to corns/callous
- attention to pressure sites

Arterial Dopplers, ABI and/or vascular flow studies to determine treatment options:

- revascularize
- antiplatelet agents

Dr. Rosemary Kohr 2020

Prevention: Footcare & Footwear



What is available in your location?

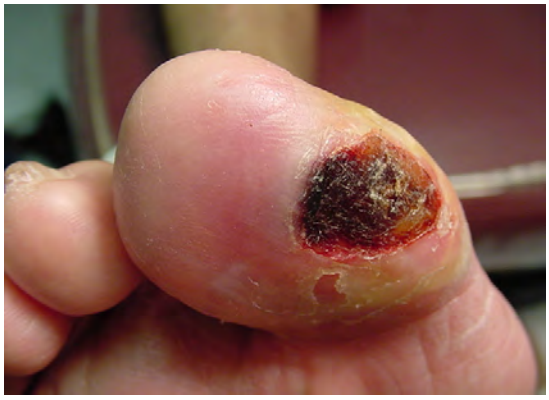
- Refer to chiropodist/pedorthist/home health services (e.g., Foot care nurse/clinic)
- Chiropodist/Podiatrist
  - able to deal with majority of foot issues, including surgical intervention
- Pedorthist/Orthotist
  - Provide orthotics & other devices

Dr. Rosemary Kohr 2020

Footwear

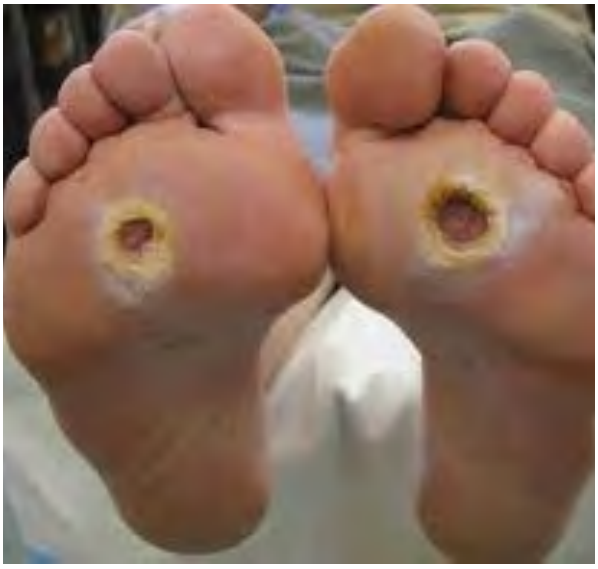
Dr. Rosemary Kohr 2020

SUMMARY: **PREVENTION**



- Start with INSPECTION **OF BOTH FEET**
- HEELS off the surface (bed, chair)
- Foot hygiene--wash, dry feet & toes, apply cream to dry, cracked skin, observe & document any areas of skin breakdown or callus
- Specific diabetic socks and footwear
- Off-loading orthotics
- STOP SKIN BREAKDOWN BEFORE IT STARTS!!

Dr. Rosemary Kohr 2020

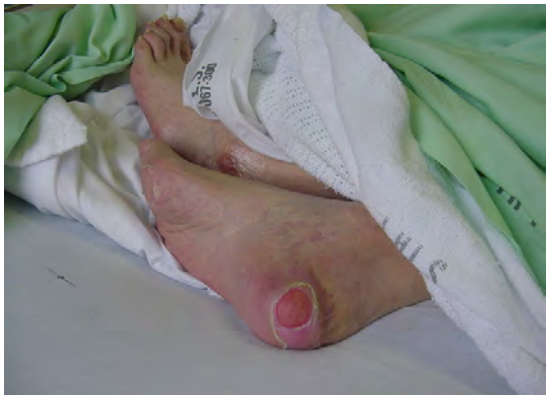


Treat the Underlying Cause (TULC) Diabetic foot ULCER

- Systemic (glucose/nutrition)
- Perfusion
- **Pressure**
- **INFECTION**

Dr. Rosemary Kohr 2020

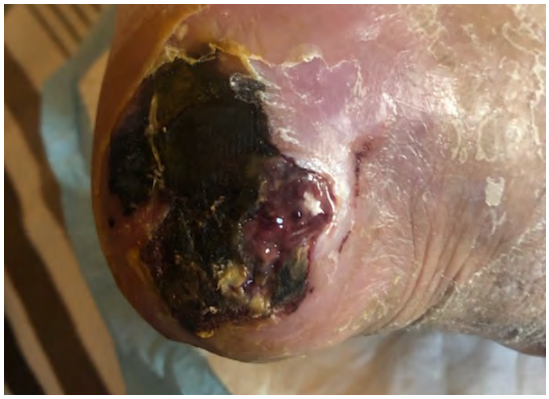
Diabetic Foot INFECTION



- Impaired host response may exhibit only subtle signs of infection
- *Raised blood sugar may be only indicator of local or systemic infection*
- RISK for infection
  - > 30 days wound
  - Recurrence
  - Chronic Kidney Disease & vasculopath

Dr. Rosemary Kohr 2020

Diabetic foot ulcer: First question:



Is the wound healable?

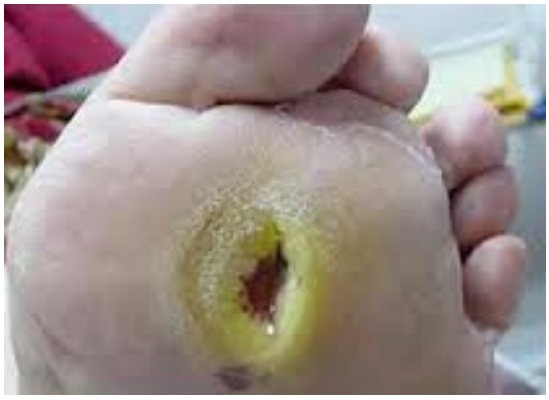
If the answer is “no”, then what are the options for dressing selection/management?

Goals:

- decrease potential for infection
- decrease potential for deterioration of the wound

Dr. Rosemary Kohr 2020

Remember: PREPARE the Wound



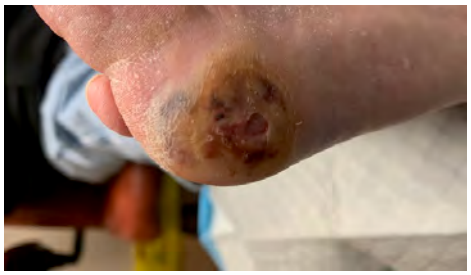
- Cleanse (surfactant)
- PROPER irrigation (8-15 psi)
- Careful sharp debridement IF APPROPRIATE & you have the scope of practice/institutional policies

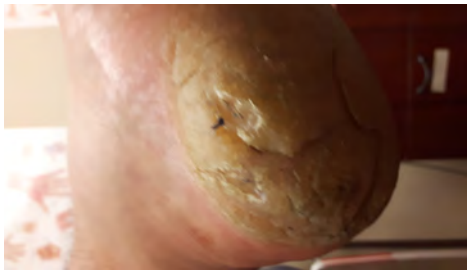
Dr. Rosemary Kohr 2020

Protect the skin/periwound

- Consider a moisturizer for dry/cracked skin
  - Atractain™ -- only need a small amount
  - Vaseline (high quality)

- Peri-wound:
  - Protect with barrier
    - E.g., NoSting wipe or Cavilon
  - Silicone drsg: no barrier needed





Dr. Rosemary Kohr 2020

Manage the WOUND

	BARRIERS	
Exudate (**Amount**)	**Bacteria**	Necrosis (**CRUST**)
Moisture Balance	REDUCE	DEBRIDE

Dr. Rosemary Kohr 2020

Health Leadership & Learning Network

health YORK U

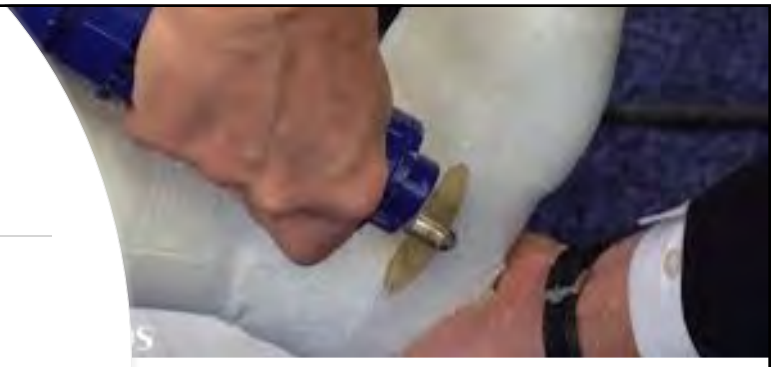
Pressure Management for existing DFU?

- Crutches ?
- Walker ?
- Air cast?
- **Orthotic off-load devices**
- TOTAL Contact Casting (Gold Standard)

April's story (Mississauga-Halton LHIN)

Dr. Rosemary Kohr 2020

Video: TCC application: Watch on your own



- Total Contact Cast Application
- Total Contact Cast Removal

Dr. Rosemary Kohr 2020

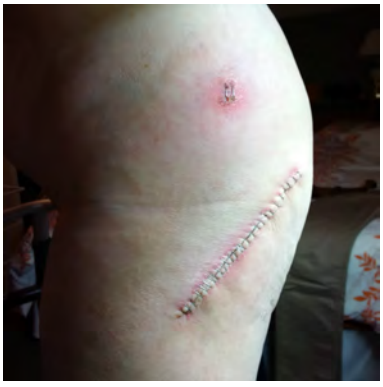
Case example for discussion

Meet Mrs. Irma Kay, your patient.

75 year old lady, lives in own home but has been in hospital and rehab setting

Hip replacement 2 weeks ago…

- Alert, oriented
- Requires an adult brief (urinary incontinence)
- Walking with walker, tires easily (up with physio/family)
- Can move independently, but lies in bed on her back: "hurts to move"
- Appetite "poor"
- Requires some assistance with transferring to/from bed or chair



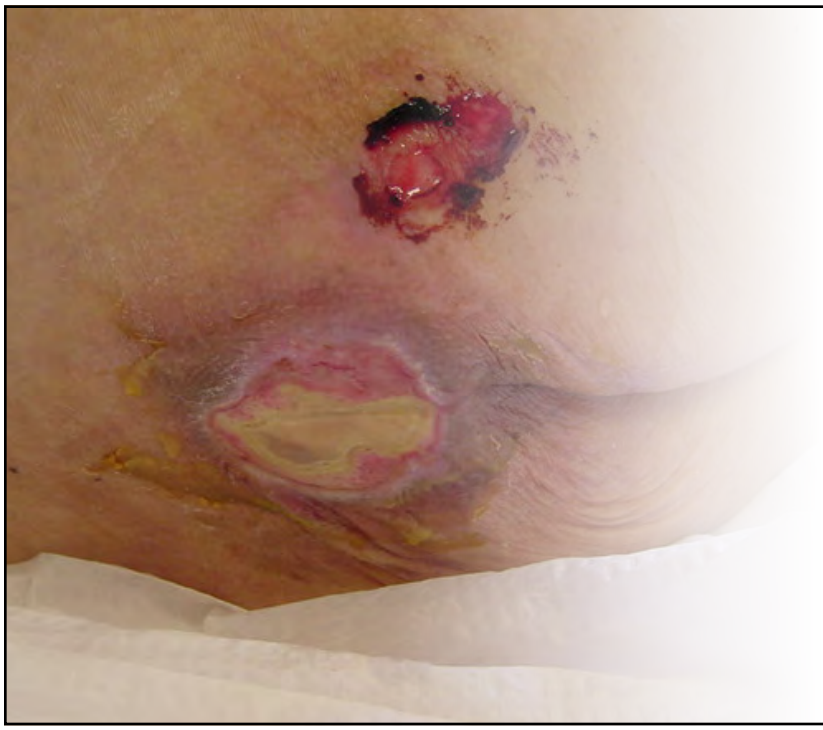
WHAT SHOULD YOUR ASSESSMENT INCLUDE?

Dr. Rosemary Kohr 2020

More about Mrs. Irma Kay

- Alert, oriented
- Requires an adult brief (urinary incontinence)
- Walking with walker, tires easily (up with physio/family)
- Can move independently, but lies in bed on her back: "hurts to move"
- Appetite "poor"
- Requires some assistance with transferring to/from bed or chair

Dr. Rosemary Kohr 2020



Mrs. Kay's 'other' wounds:

Dr. Rosemary Kohr 2020

Discussion: First questions: *Healable? Infected?*

Causative Factors:

- Extrinsic?
- Intrinsic?

Treatment:

TULC: *Treat the Underlying Cause*

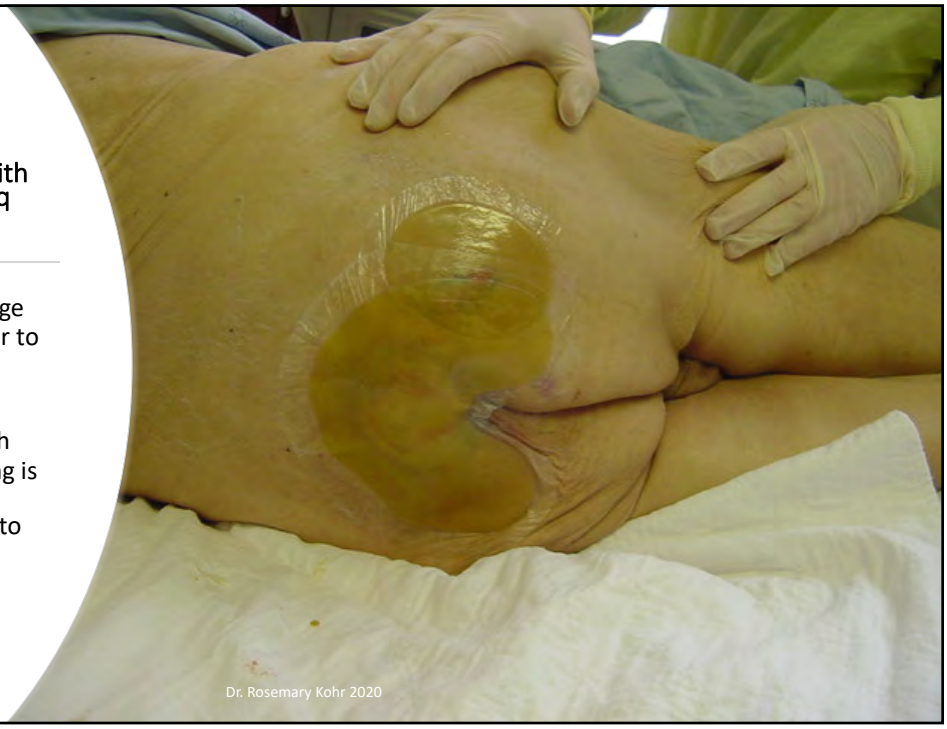
P&P: *Prepare and Protect*

ABCDs: *Absorption, Bacteria, Crust, Dry, skin tear*

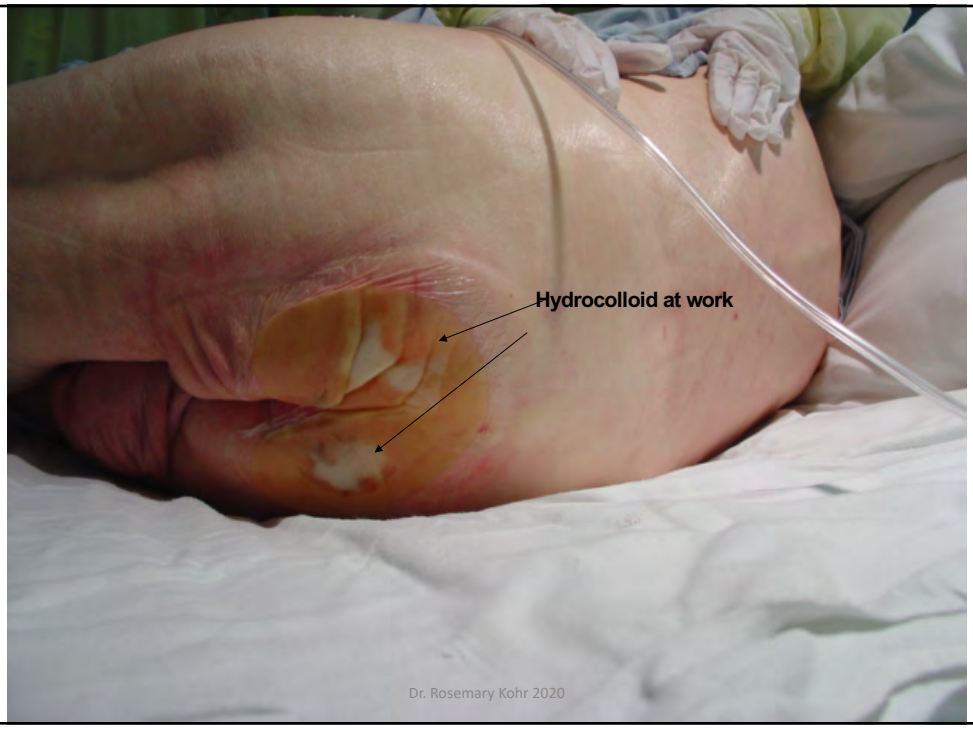
Dr. Rosemary Kohr 2020

Example:
Tegasorb hydrocolloid with No-Sting wipes: change q FIVE DAYS

- Warm the sealed package (hydrocolloids are easier to apply when slightly warmed)
- Protect peri-wound with wipe, then after dressing is applied, go around the outside of the dressing to help create that second skin/prevent rolling.



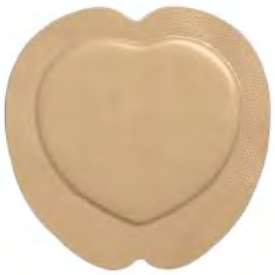
Dr. Rosemary Kohr 2020



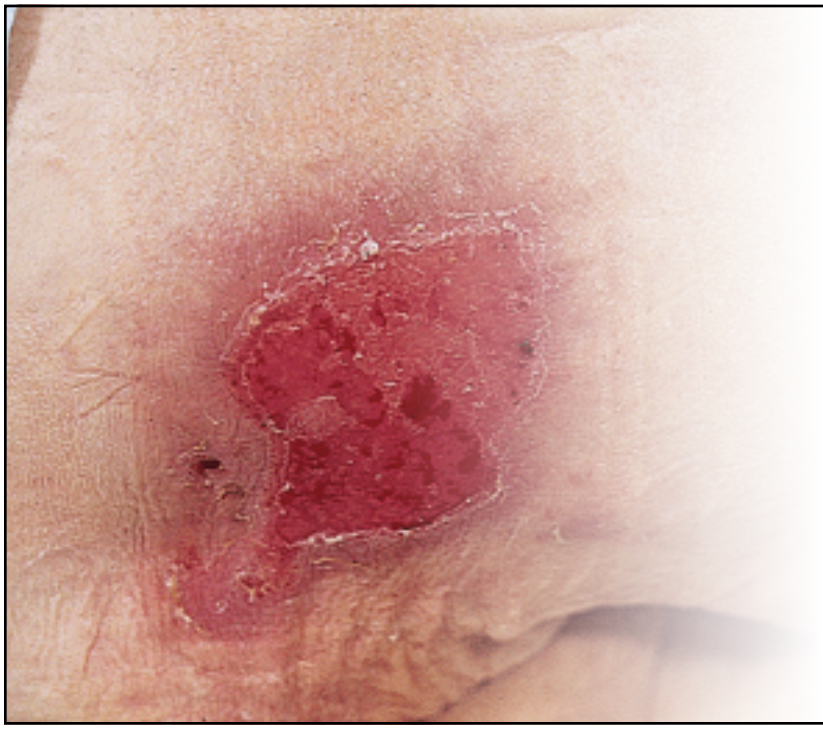
Dr. Rosemary Kohr 2020

Other dressing options:

- Foams
- “island” dressing
- Barrier products

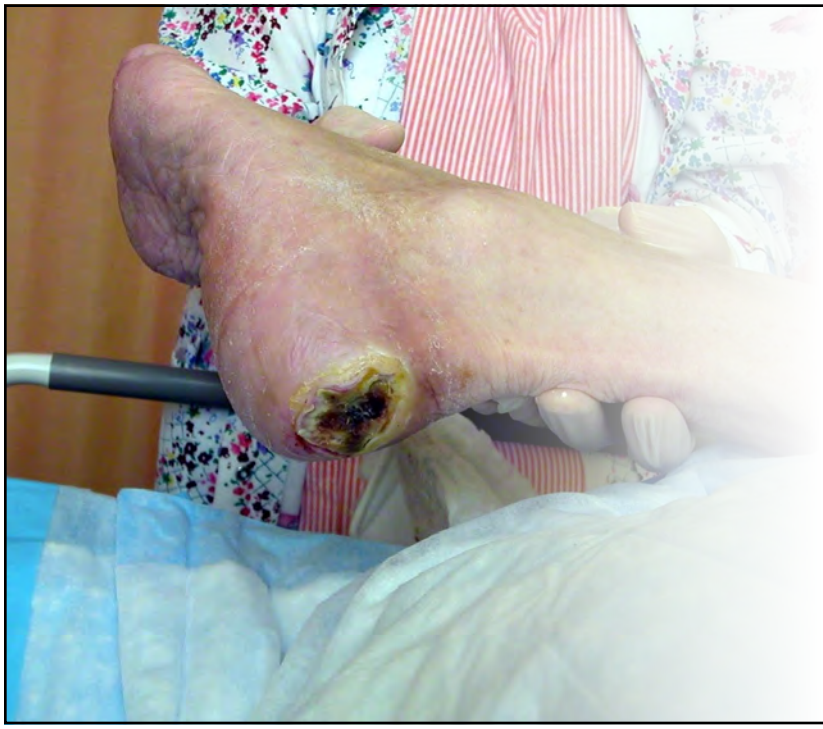


Dr. Rosemary Kohr 2020



Other pressure injuries: what to use?

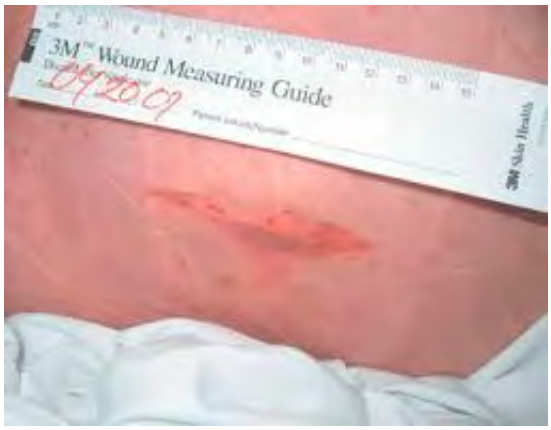
Dr. Rosemary Kohr 2020

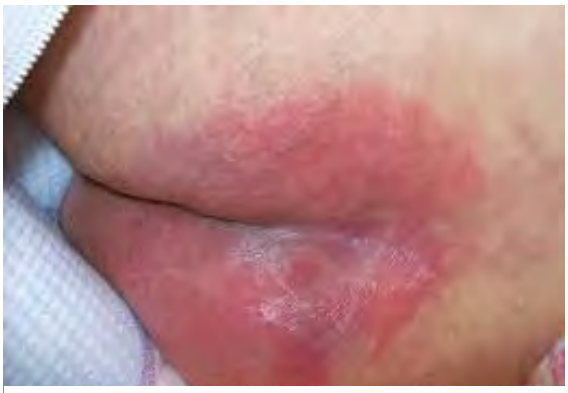


What do we need to do here?

Dr. Rosemary Kohr 2020

...and here?





Dr. Rosemary Kohr 2020

Dr. Rosemary Kohr 2020

Let's talk about:

Clinical Best Practices in Wound Care

- Documentation
- Wound Measurement
- Pressure Injury: prevention, treatment
- Effect of Pain

Day 2: self-directed

Discussion:

- What do we mean by "Best Practice"?
- Implementing best practice guidelines
- Methods to evaluate
  - Risk Assessment tools (eg, Braden)
  - NPIAP
  - Skin tear
  - Diabetic ulcers
  - Bates-Jensen Wound Assessment Tool (B-WAT)
  - LUMT (Leg Ulcer Measurement Tool) *handout*
- Measuring change
  - Prevalence vs incidence
  - Cost & quality measures
- What to do with the results…

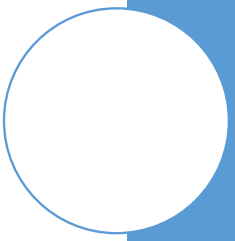
Best Practice Guidelines

- What are they?
- Why are they used?
- How are they implemented?
- Do they make a difference?

In your organization, do you use BPGs for wound care?

Value of pressure injury prevention

- Difficult to determine current prevalence of pressure injury in Canada as we have no way of tracking nationally.
- However, the literature (most recent is from 2013) suggests approx. 25% prevalence of skin breakdown/pressure injury across all settings.



Dr. Rosemary Kohr 2020

Cost to the system:

- In Canada, one month of care in the community for a Stage III uncomplicated pressure injury is **$9,000**. (Allen J, Houghton PE. Electrical Stimulation: A Case Study for a Stage III Pressure Ulcer. *Wound Care Canada.* 2004;2(1):34-36.)
- The cost for treating a deep-tissue injury or Stage 1 or 2 wound: $2,450 per month; an uncomplicated Stage 3 or 4 is $3,616 per month.
- In England the mean length of stay in hospital for a pressure injury was **38.3 days** (Hospital Episode Statistics, Department of Health, England, 2002-03).

Dr. Rosemary Kohr 2020

What does this mean for your facility?

- Assuming an average cost of even $2000/month for a Stage I or 2 Pressure Injury:
- You can consider that even 5 individuals with 'simple' skin breakdown will cost an additional $10,000/MONTH.
- This is a very conservative approach to cost.
- Consider conducting a PREVALENCE study in your setting.
- How would you set this up OR are you already collecting this data?

Dr. Rosemary Kohr 2020

Prevention is the KEY

Dr. Rosemary Kohr 2020

Risk factors for pressure injury:

- Immobility
- Malnourishment
- Incontinence
- Dehydration
- Infection
- Chronic disease
  - eg, diabetes, renal failure

Similar to skin tear risk factors...

Standardized Assessment Tool

- Provides a 'common language' to identify and document risk
- Ensures change in status is documented
- Highlights areas of concern

Braden Risk Assessment Tool

- Most widely studied (and used) tool across the continuum of care
- Reliable & valid
- Attention needs to be on the sub-scale scores
- Interventions need to be part of the standard plan of care for anyone with an *At Risk* score.

Use of Braden Risk Assessment Tool and simple interventions:

- reduce the incidence of nosocomial pressure injury by 40-60%.
- reduce the severity of nosocomial pressure injuries
- reduce the cost of care by decreasing the inappropriate use of specialty beds
- reduce the cost of care by avoiding the excess hospital days associated with the complication of nosocomial pressure injuries.

The Braden Risk Assessment Tool (first section)

Dr. Rosemary Kohr 2020

BRADEN SCALE FOR PREDICTING PRESSURE SORE RISK

Patient's Name _____ Evaluator's Name_____ Date of Assessment

SENSORY PERCEPTION ability to respond meaningfully to pressure-related discomfort	**1. Completely Limited** Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation. OR limited ability to feel pain over most of body	**2. Very Limited** Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness OR has a sensory impairment which limits the ability to feel pain or discomfort over ½ of body.	**3. Slightly Limited** Responds to verbal commands, but cannot always communicate discomfort or the need to be turned. OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	**4. No Impairment** Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort..				
MOISTURE degree to which skin is exposed to moisture	**1. Constantly Moist** Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	**2. Very Moist** Skin is often, but not always moist. Linen must be changed at least once a shift.	**3. Occasionally Moist:** Skin is occasionally moist, requiring an extra linen change approximately once a day.	**4. Rarely Moist** Skin is usually dry; linen only requires changing at routine intervals.				
ACTIVITY degree of physical activity	**1. Bedfast** Confined to bed.	**2. Chairfast** Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	**3. Walks Occasionally** Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair	**4. Walks Frequently** Walks outside room at least twice a day and inside room at least once every two hours during waking hours				
MOBILITY ability to change and control body position	**1. Completely Immobile** Does not make even slight changes in body or extremity position without assistance	**2. Very Limited** Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	**3. Slightly Limited** Makes frequent though slight changes in body or extremity position independently.	**4. No Limitation** Makes major and frequent changes in position without assistance.				
NUTRITION usual food intake pattern	**1. Very Poor** Never eats a complete meal. Rarely eats more than ⅓ of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement OR is NPO and/or maintained on clear liquids or IV's for more than 5 days.	**2. Probably Inadequate** Rarely eats a complete meal and generally eats only about ½ of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement. OR receives less than optimum amount of liquid diet or tube feeding	**3. Adequate** Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products per day. Occasionally will refuse a meal, but will usually take a supplement when offered OR is on a tube feeding or TPN regimen which probably meets most of nutritional needs	**4. Excellent** Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.				
FRICTION & SHEAR	**1. Problem** Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures or agitation leads to almost constant friction	**2. Potential Problem** Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	**3. No Apparent Problem** Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair.					
				Total Score				

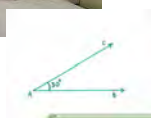
* Copyright Barbara Braden and Nancy Bergstrom, 1988 All rights reserved

Dr. Rosemary Kohr 2020

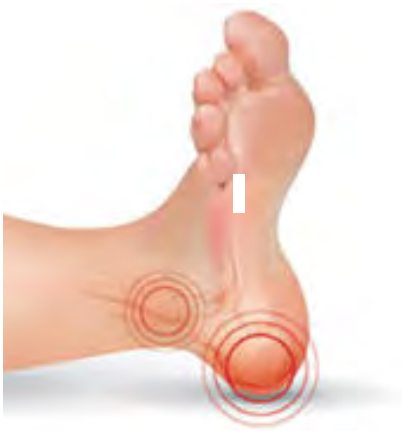
Yes, Assess risk….

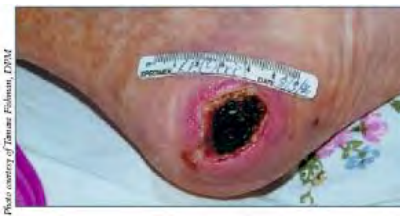
And then, do something about it.

- **SENSORY PERCEPTION:**
  - Reposition/turn;
  - 30 degree rule,
  - Pressure reduction surfaces
  - Protect heels
  - Foam wedges



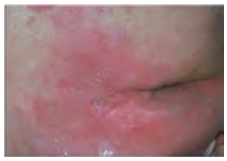
Dr. Rosemary Kohr 2020





Let's talk about heels...

Dr. Rosemary Kohr 2020



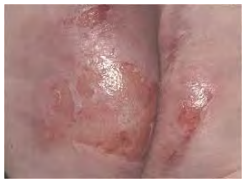
Assess risk…. And do something about it.

- **MOISTURE:**
  - Use RNAO BPG continence/constipation for recommendations
  - Use appropriate continence products
    - Correct SIZE for patient/resident
  - Appropriate soaps, barrier creams, etc.
  - Assess cause of incontinence
  - Diaphoresis (excessive sweating): cause– fever, medication or ?

Dr. Rosemary Kohr 2020

Moisture: Incontinence-Associated Dermatitis

Characteristics	Incontinence-Associated Dermatitis	Pressure Injury
Location	Often in Skin folds Diffuse	Usually over bony prominence; Well defined
Colour	Red or bright red	Red to bluish/purple
Depth	Intact skin to partial-thickness wound	Intact skin to partial or full-thickness wound
Necrosis	None	May be present
Pain & itching	May be present	Generally not present



Cavilon Advanced Protectant video

Dr. Rosemary Kohr 2020

Assess risk….
And do something about it.

- **ACTIVITY/MOBILITY:**
  - **Assess tolerance for activity/mobility**
  - Re-mobilize, involve OT, PT
  - Range of motion: passive/active
  - Incorporate into other activities (e.g., at meal-times)

Dr. Rosemary Kohr 2020

Assess risk….
And do something about it.

- **NUTRITION:**
  - Major factor in prevention of skin breakdown.
  - "Dietitian to assess"
  - Swallowing assessment may be needed
  - Fluid intake important (water)
  - Provide adequate caloric intake
    - Supplements such as Ensure, Resource, etc
    - Assistance with eating
    - Dentures that fit

Good Nutrition

- Important part of a resident's Rx.
- Make mealtimes pleasant
- Time for social interactions
- Allows time to eat with others
- Eat alone? = poor appetite
- LTC-Long term care facilities- encourage eating in dining room

Resident confined to bed

- Bedridden?
- Sit down in CHAIR (Not the Bed!) to feed the resident
- TALK to the resident!
- Eat/Feed resident while food is hot; as soon as it arrives to floor

Dr. Rosemary Kohr 2020

Assess risk….
And do something about it.

- **FRICTION & SHEAR:**
  - Use good body mechanics to move
  - Lift sheet (and lift, not slide)
  - Protect fragile skin (elbows, knees, heels)
  - Teach paraplegic individuals to lift when shifting from bed/chair

a Slide Board

Case study: Mrs. M.

- 85 years old, admitted to hospital with pneumonia
- Has been living at home (daughter visits daily)
  - Nutrition: "not the best"
  - Up to the bathroom, but in ER put in continence brief
  - Weak, in bed for past 3 days at home

What else do you need to know?

Scoring the Braden Scale:

1 2 3 4 (where 1 = 'poor')

- Sensory perception
- Moisture
- Activity
- Mobility
- Nutrition
- Friction & Shear
- (other major risk factors…advance to next level of risk)

What is your Frequency of assessment?

What changes might require a re-assessment?

ASSESSMENT TOOLS:

- Ease of use
- Consistent
- Ability to develop a plan of care
- Track changes
- Support: www.**braden**scale.com/freeproducts.htm

Dr. Rosemary Kohr 2020

Documentation:

- "Dressing dry and intact; no evidence of erythema/edema or pain. Reviewed with patient. Dressing left intact; Plan: re-assess tomorrow".

IF CHANGING THE DRESSING, DOCUMENT:

- Wound bed: describe-- % granulation, slough/debris/eschar; colour(s)
- Wound measurement (LxWxdepth)
- Drainage, pain, edema, erythema
- "Irrigate; protect peri-wound skin; dressing selection and when dressing should be changed next".

IF YOU CAN TAKE A PHOTO OF THE WOUND FOR THE CHART, EVEN BETTER!!

Dr. Rosemary Kohr 2020

Wound Measurement: why do we do it?

- Objective, observable change in wound dimensions is strongly correlated with wound healing/closure.
- **Expect 30% decrease in wound area (LxW) or volume (LxWxD) in a 3-4 week period.**
- **Wound measurement should be documented at least once/week if not at every dressing change.**
- Using a graph to plot/monitor the change is helpful.

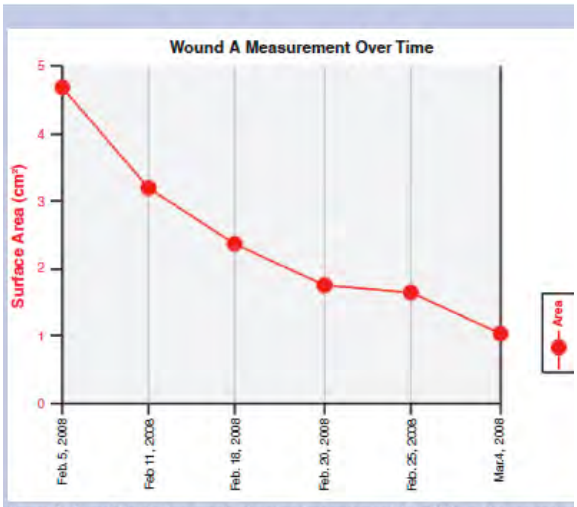
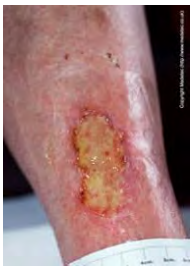
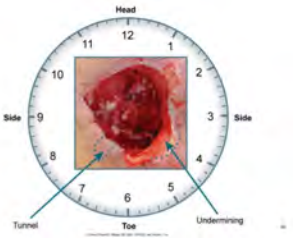


Figure 6. A mobile device graph showing improvement by 78% in the wound a over 4 weeks.

Dr. Rosemary Kohr 2020



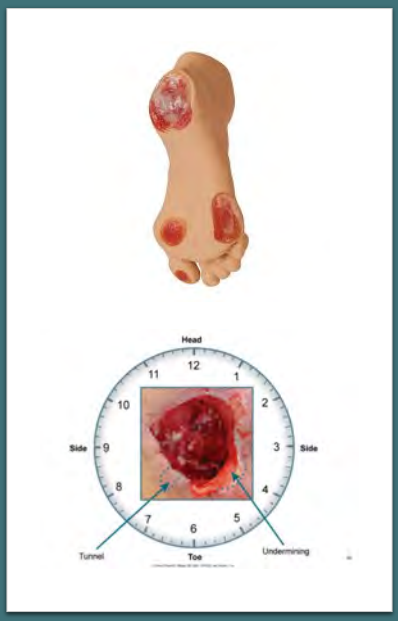


Wound Measurement

Length, Width, Depth – (LxWxD)

- Measurements must be taken in a consistent manner - "clock method"
- Ruler should be placed over the wound on the longest length using the clock face
- Head is always at 12 o'clock,
- Feet are always at 6 o'clock

Dr. Rosemary Kohr 2020



Wound Measurement

Measuring Width: (From 3 o'clock to 9 o'clock)

- Perpendicular to the length, measure the widest area of the wound

Measuring depth:

- Place a cotton-tip applicator into the deepest part of the wound bed

Measuring Heels/plantar aspect of foot:

- **Heels** always at 12 o'clock
- **The toes** are always at 6 o'clock

Dr. Rosemary Kohr 2020

Wound Measurement

Be consistent:

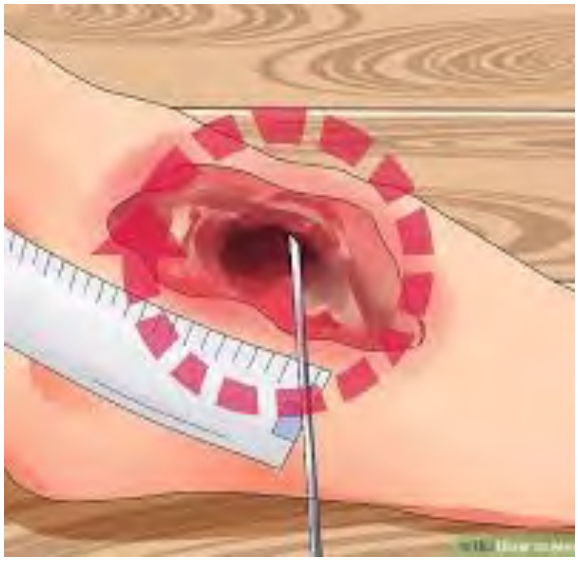
- LxW (area) or LxWxD (volume)
- Cm or Mm

Depth cannot be measured if debris or necrotic material cover the ulcer

Measuring Undermining - 1.5 cm from 12 – 3 o'clock

Measure tunneling:

- Insert a cotton-tip applicator into the tunnel and measure from the opening of tunnel



Dr. Rosemary Kohr 2020

Measuring change

Prevalence (how many, today?)

Incidence (how many, over time?)

- Which is best for your environment?
- Patient/resident
- Staff
- Administration
- Cost and quality

Dr. Rosemary Kohr 2020

Results

- Sharing the results
- Creating a report
  - Template
  - Graphs
  - Simple statistics
  - Champions

Dr. Rosemary Kohr 2020

Summary

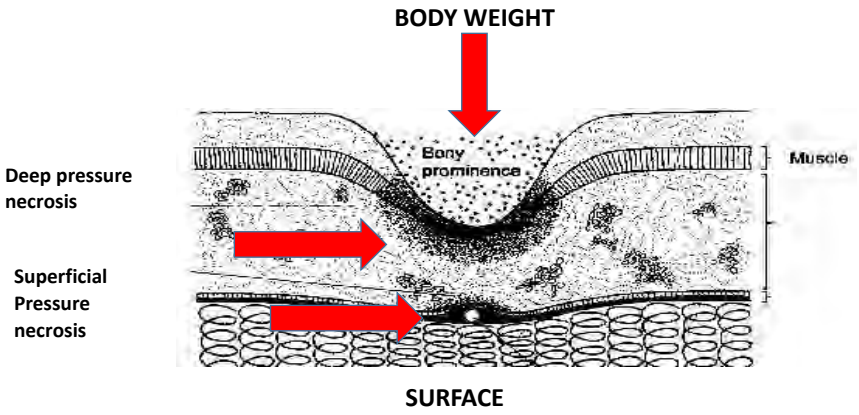
- Consistent use of validated assessment tools
- Documentation of implementation strategies
- Recording incidence/prevalence of skin breakdown
- Documenting wounds: location, measurement, treatment AND progression
- Communicating results with those who can make a difference in resource allocation.

Discussion:

- Situations in your clinical setting where patient's skin breakdown/pressure injury might occur:
- What is currently in place to manage skin breakdown?
- What could be done differently to address skin breakdown?

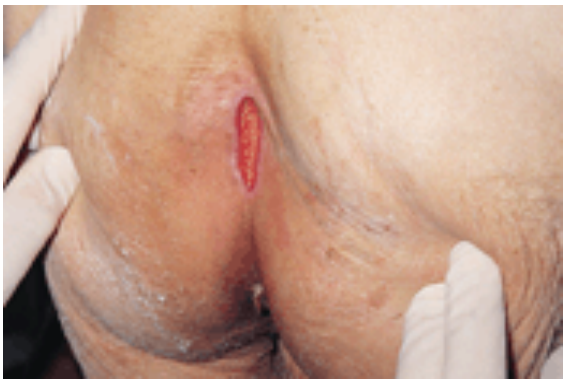
Dr. Rosemary Kohr 2020

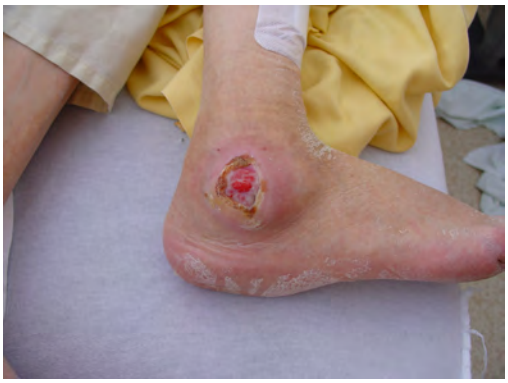
Development of a Pressure Injury



Dr. Rosemary Kohr 2020

Check pressure point locations (hidden and visible)





Pressure Injury Development

Unable to weight shift/move

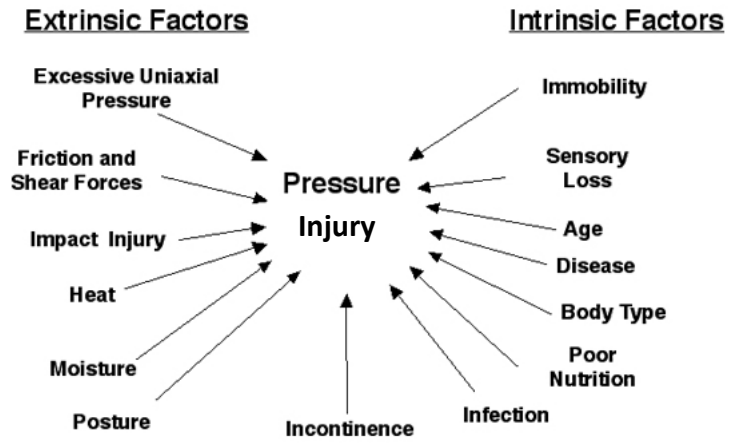
↓

Prolonged/unrelieved pressure over a bony prominence

↓

PRESSURE INJURY DEVELOPMENT

Causes of Pressure Injuries



Dr. Rosemary Kohr 2020

Factors contributing to skin breakdown/pressure injury as a result of wheelchair sitting:

Equipment factors:

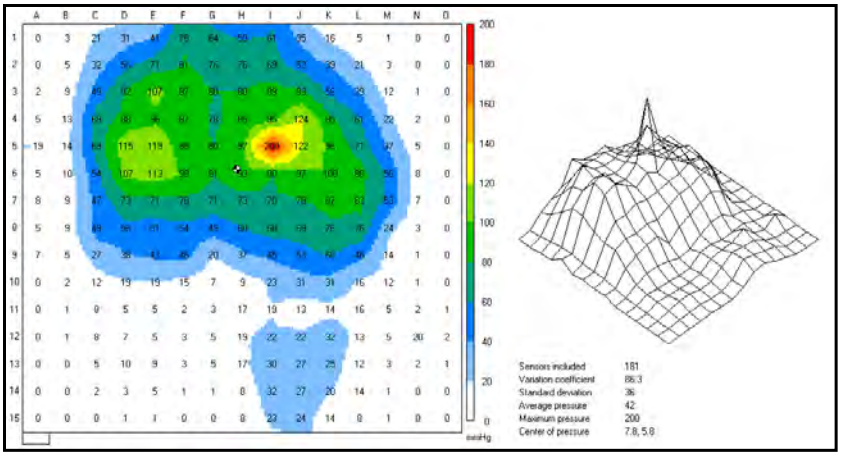
- Ill-fitting (size) of wheelchair
- Condition of wheelchair and seating
- Incorrectly set up equipment
- Inappropriate seating equipment

Patient factors:

- Poor postural alignment
- Inability to weight shift/extended periods of sitting
- Poor placement in wheelchair
- Comfort
- Balance & stability for functional activities
- Patient adherence

Dr. Rosemary Kohr 2020

PRESSURE MAPPING: An Educational Tool

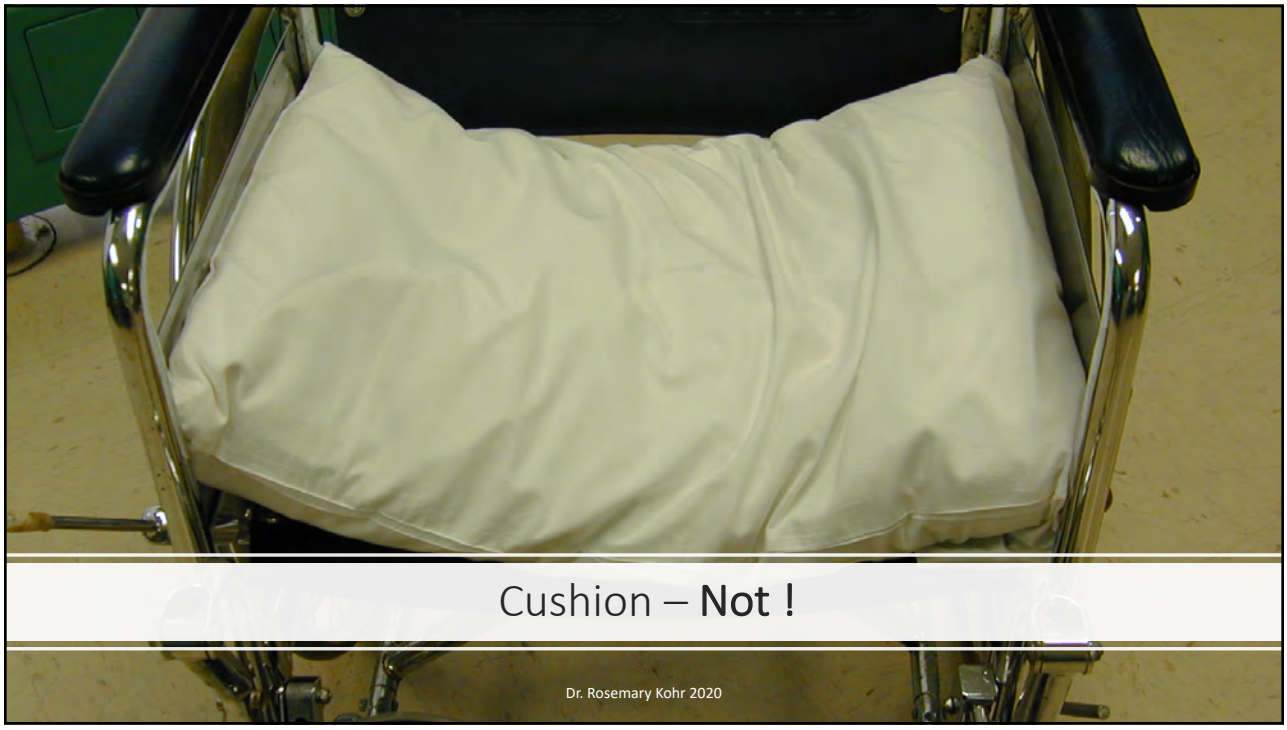


Dr. Rosemary Kohr 2020

What can you do:
Maximize Mobility and Activity
Reduce Shear/Friction

What do you notice about this patient and his wheelchair?
List the potential problems you identify.

Dr. Rosemary Kohr 2020



Cushion – **Not !**

Dr. Rosemary Kohr 2020

CUSHIONS: WHAT TO KEEP IN MIND

ARTIFICIAL SHEEPSKIN DOES **not** PROVIDE PRESSURE RELIEF!

GEL CUSHION

NO DONUTS, PLEASE!

- Orientation is critical-upside down, sideways or backwards.
- Artificial Sheepskin or folded bed linens or towels should be avoided.
- Products do not last forever-foam may become friable, gel may lose resiliency.
- Inflation of air cushions is critical.

EHOB Cushion

ROHO CUSHION

PRESSURE RELIEF SURFACES ARE IMPORTANT.

Dr. Rosemary Kohr 2020

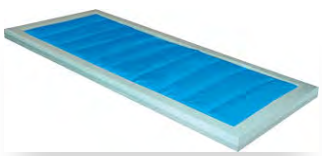
Geri-chairs & Lifts

Geri chair:

- Vinyl upholstery on seat and back for hygiene and maintenance
- Require set up for individual users
- Tilt/recline feature
- Recline not always appropriate
- Difficult to integrate commercial back supports and cushions
- Poor pressure distribution
- Difficult to push
- Uncomfortable

Mechanical Lifts:

- Improves safety for both patient and care provider
- Relatively easy to use
- Particular benefit with individuals who are unable to assist with transfers (e.g., bed to chair) or larger patients
- **Care must be taken to avoid pressure injuries**



Beds/mattress: Depends on patient's need

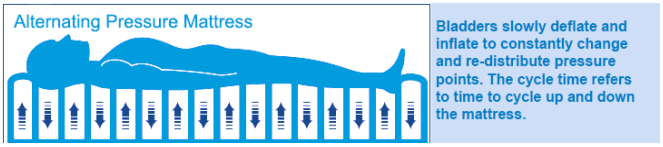
Types of surfaces:

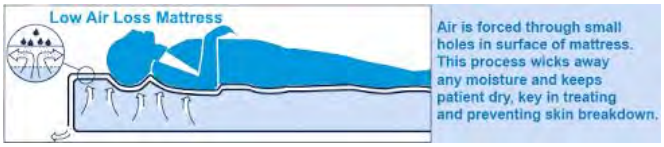
- Standard mattress/surface should have high density foam core (viscoelastic foam)
- Overlays (e.g., gel)
- Low Air Loss (LAL)
- Alternating Pressure
- Air Fluidized

Dr. Rosemary Kohr 2020

Use of Air in Bed Surfaces:

- **Air Fluidized Therapy (AFT)** provides excellent pressure redistribution and moisture management for complex wounds by creating a "bead bath". An immersive environment is created by blowing air under a thick layer of silicone beads, giving the patient an ideal healing environment.





Dr. Rosemary Kohr 2020

Support surface characteristics:

- **Pressure redistribution**. The surface should support the patient's body weight without causing pressure areas.
- **Skin moisture management**. The surface should keep skin dry.
- **Skin temperature control**. The surface should optimize patient body temperature (avoid sweat).
- **Friction**. The surface should allow for transfer, but not sliding off the surface.
- **Infection control**. The surface should not promote bacterial growth.
- **Flammability**. The surface should be flame resistant. (not ignite if lit cigarette drops on surface)
- **Product service requirements**. Clear instructions re: cleaning and maintaining surface.
- **Life expectancy**. The manual should indicate how long the surface is expected to last, so it can be replaced before problems arise.
- **Fail safety**. The manual should tell you what to do if the surface becomes unusable.

Dr. Rosemary Kohr 2020

Consider the patient…

- Prevention of skin breakdown
  - Pressure redistribution
  - Turning schedule (2-4 hours)
  - Heels 'floating' off the bed
  - Moisture management
  - Nutrition
- Characteristics of the wound
  - What type of surface is of most benefit?
- Type of patient:
  - Bariatric (how big is BIG?)
  - "tea & toaster"
- Mobility:
  - Firm perimeter (assists in getting out of bed)
  - Turn assist
  - Trapeze access (bariatric bed)

Dr. Rosemary Kohr 2020

Knowledge of how the equipment works:

Wheelchairs and geri-chairs:

- Adjustable height armrests
- Footrest hangers
- Laptrays
- Use of tilt

Bed surface functions: IS THERE A MOTOR TO TURN ON?

- Heel relief
- Surface requirements (eg, no sheets, specialty pads)
- Pulsation
- Turn-assist
- Air-fluidized
- Gel

- <u>Observation of condition of equipment</u>
  - Maintenance/cleaning
  - Cushion orientation/condition

Dr. Rosemary Kohr 2020

Staging: ONLY for Pressure Injury

Pressure injury staging demo with grapefruit

National Pressure Ulcer Advisory Panel (NPUAP) Staging System – 2016 Update

Definition: A pressure injury is a localized injury to the skin and/or underlying tissue, usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction.

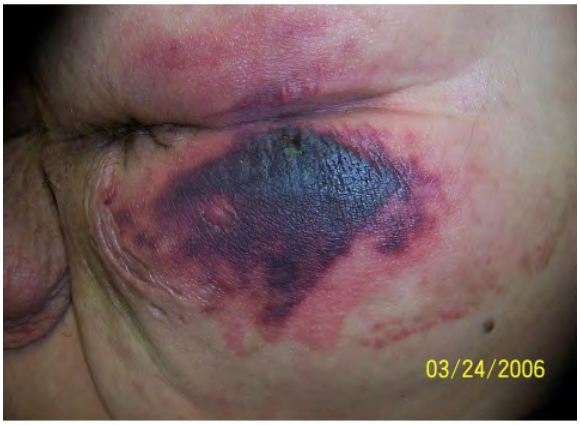
PRESSURE (ULCER) INJURY STAGES

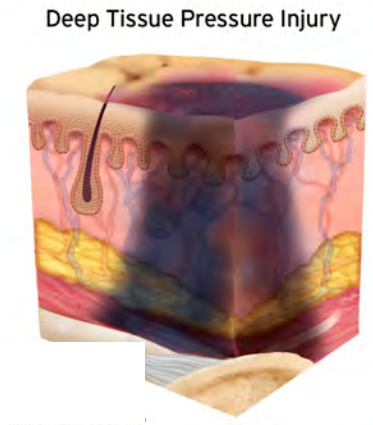
Deep Tissue Injury (DTI)
Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissues.

Further description:
Deep tissue injury may be difficult to detect in individuals with dark skin tones. Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar. Evolution may be rapid, exposing additional layers of tissue even with optimal treatment.

Dr. Rosemary Kohr 2020

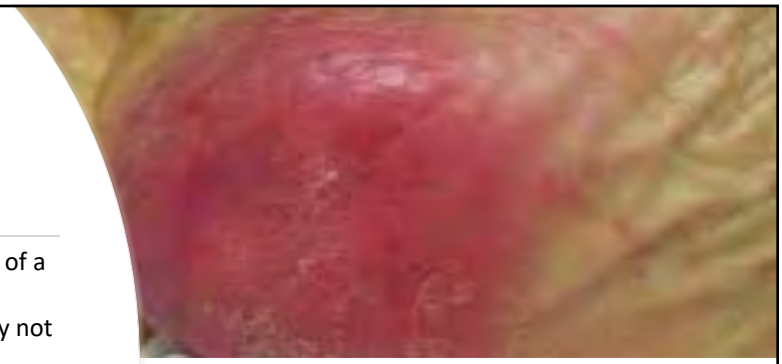
Deep Tissue Injury





Dr. Rosemary Kohr 2020

Staging: PRESSURE injury/wounds ONLY

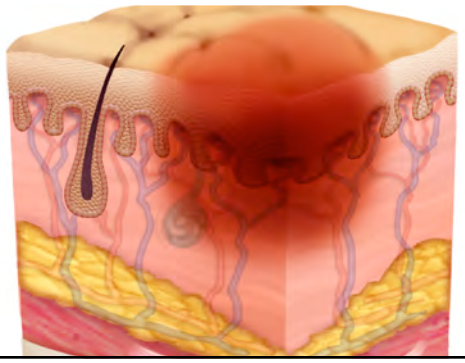


Stage I

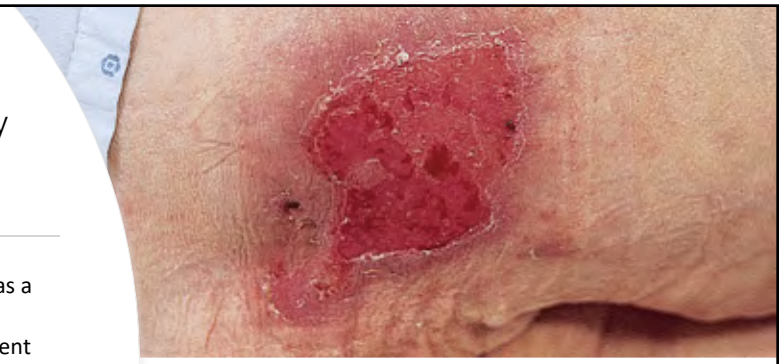
- Intact skin with non-blanchable redness of a localized area, usually over a bony
- prominence. Darkly pigmented skin may not have a visible blanching; its color
- may differ from the surrounding area.

- *Further description:*
- The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue.
- Stage I may be difficult to detect in individuals with dark skin tones. May indicate "at risk"
- persons (a heralding sign of risk).

Dr. Rosemary Kohr 2020



National Pressure Ulcer Advisory Panel (NPUAP) Staging System – 2016 Update



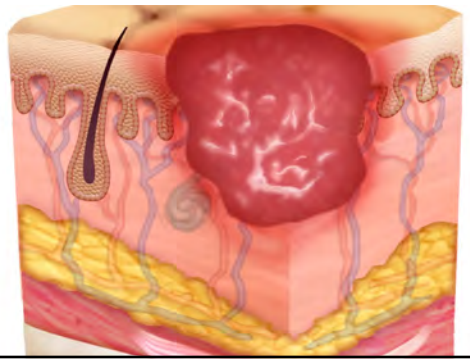
Stage II

- 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 blister.

- *Further description:*
- Presents as a shiny or dry shallow ulcer without slough or bruising*. This stage should not be
- used to describe skin tears, tape burns, perineal dermatitis, maceration, or denudement.

- *Bruising indicating suspected deep tissue injury.

Dr. Rosemary Kohr 2020



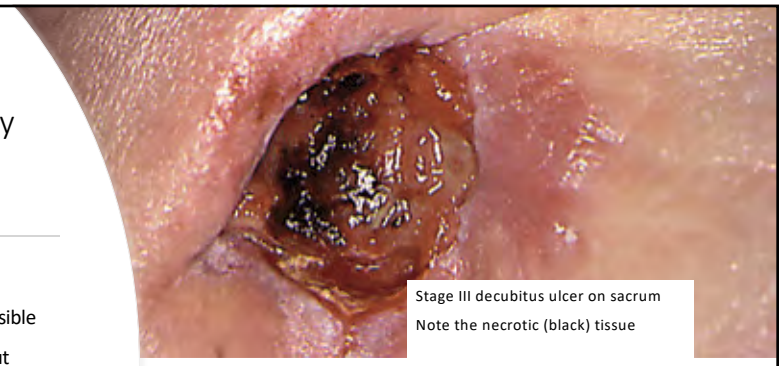
National Pressure Injury Advisory Panel (NPUAP) Staging System – 2016 Update

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 loss. May include undermining and tunneling.

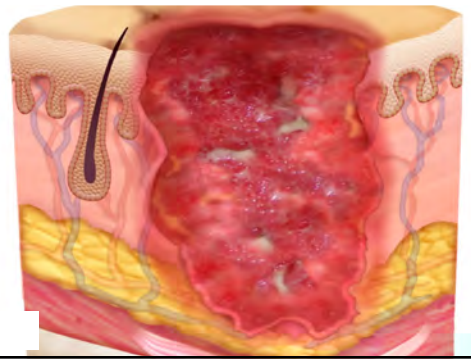
- *Further description:*
- The depth of a Stage III pressure ulcer varies by anatomical location. The bridge of the
- nose, ear, occiput, and malleolus do not have subcutaneous tissue and Stage III ulcers
- can be shallow. In contrast, areas of significant adiposity can develop extremely deep in
- Stage III pressure ulcers. Bone/tendon is not visible or directly palpable.

Dr. Rosemary Kohr 2020



Stage III decubitus ulcer on sacrum

Note the necrotic (black) tissue

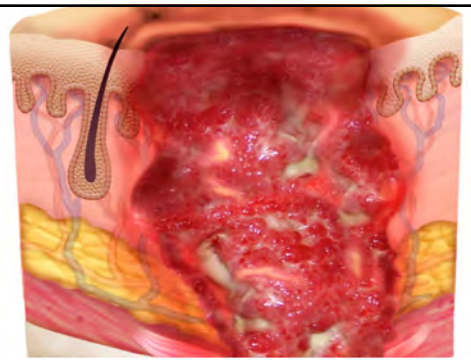


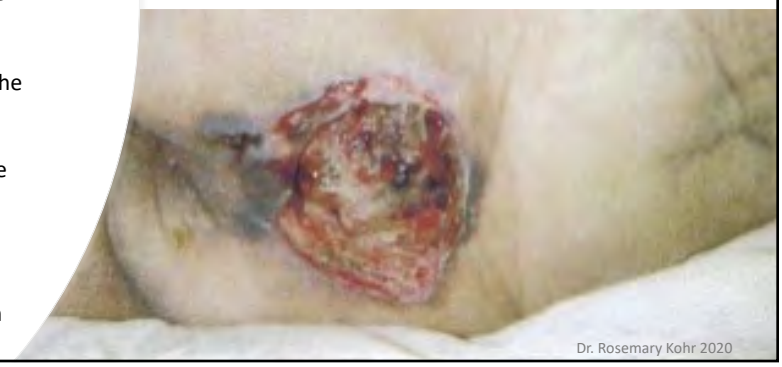
National Pressure Injury Advisory Panel (NPUAP) Staging System – 2016 Update: Stage IV

- Full-thickness tissue loss with exposed bone, tendon, or muscle. Slough or eschar
- may be present on some parts of the wound bed. Often includes undermining or tunneling.

Further description:

- The depth of a Stage IV pressure wound varies by anatomical location. The bridge of the nose,
- ear, occiput, and malleolus do not have subcutaneous tissue and these wounds can be shallow.
- can extend into muscle and/or supporting structures (for example, fascia,
- tendon, or joint capsule) making osteomyelitis possible. Exposed bone/tendon is visible or directly palpable.

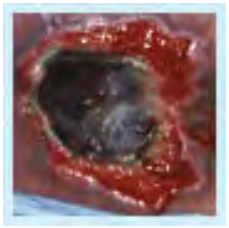


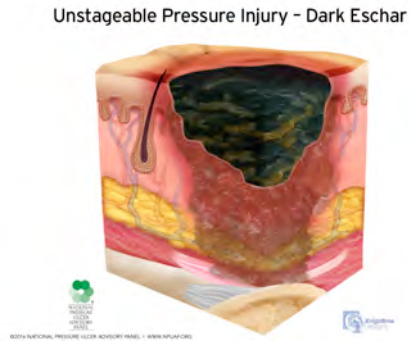


Dr. Rosemary Kohr 2020

National Pressure Injury Advisory Panel (NPUAP) Staging System – 2016 Update: **Unstageable (Stage X)**

- Full-thickness tissue loss in which the base of the wound is covered by slough (yellow,
- tan, gray, green, or brown) and/or eschar (tan, brown, or black) in the wound bed.
- *Further description:*
- Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined.
- **Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as "the body's natural (biological) cover"and should not be removed.**





Dr. Rosemary Kohr 2020

[Pressure injury staging demo with grapefruit]

Kennedy Terminal Ulcer (KTU)

NOT A PRESSURE INJURY.

KTU develops rapidly as organs shut down & death is imminent.

- **Location:** typically develop on the sacrum.
- **Shape:** often start as a pear- or butterfly-shaped bruise & may grow rapidly.
- **Colour:** similar to a bruise (purple/yellow/red/black/blue). As tissue death occurs, it will become black/edematous
- **Borders.** The edges of a Kennedy ulcer are often irregular, and the shape is rarely symmetrical. Appearance as a bruise: may be more uniform in size and shape.
- **Onset:** rapid (24 hours from start (bruise) to ulcer.

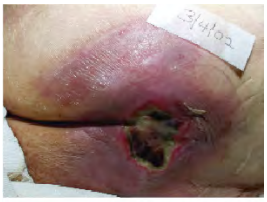


Figure 1. Long-term care resident diagnosed with a Kennedy Terminal Ulcer.

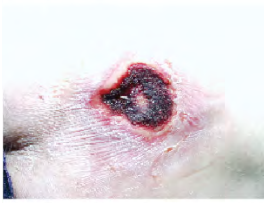


Figure 2. Kennedy Terminal Ulcer in the sacral area of a multiple sclerosis patient.

Images from Ostomy-Wound Management Clinical Advisor.

Dr. Rosemary Kohr 2020

Dr. Rosemary Kohr 2020

Pressure Injury: Things to Remember

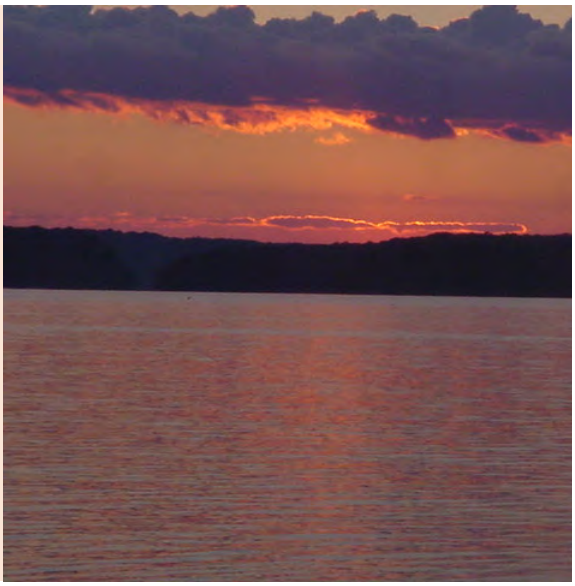
- Treat the Underlying Cause(s):
  - Off-load pressure
  - Deal with:
    - chronic disease issues (e.g., diabetes);
    - Moisture;
    - Nutrition/hydration
  - Ask yourself: HEALABLE? INFECTED?
  - Heels: look at both feet!!

Dr. Rosemary Kohr 2020

Recognizing the whole person: Pain management in wound care

"For all the happiness mankind can gain
Is not in pleasure, but in rest from pain"

-John Dryden, 1631-1700



Pain: The Fifth Vital Sign

- Pain is another vital sign like pulse, respiration, temperature, blood pressure
- We need to recognize it as part of the patient's story

  Chronic Wounds: The Patient Experience

- Pain is a subjective experience, not just a sensation
- Different people will respond differently to the same painful event
- Religion and culture greatly mediate the expression, experience and meaning of pain

What is the patient's perspective?

- Remembering past experiences;
- Today: how do I feel?
- Who has the control? patient, HCP, or?

More often than not,

- it is the caregiver who determines the pain management—

According to…

Their own temporal and relational experiences.

HEALTHCARE PROVIDER ATTITUDES & BELIEFS:

- Pre-judging patient behaviour
- "Pain is just part of this"
- Marginalize elderly/ confused patients
- Reward stoicism
- Chastise overt expressions of pain
- Pain treated as separate from the whole person

Lack of knowledge of pain management strategies;
Inconsistency of treatment plan.

Dr. Rosemary Kohr 2020

Patient/family: Health literacy:

- Explanations often use medical 'jargon' language
- Culture may impact ability to take meds (e.g., 3x day with meals)
- Fear of addictive aspect of narcotics
- Multiple medications can be confusing
- What about Cannabis?

Dr. Rosemary Kohr 2020

SOCIETY: Attitudes and beliefs

- Government policy conditions may limit access to medications
- Forms to fill out can be daunting
- Pre-judging patient: “drug dependent”
- Stress of trying to balance pain relief and ability to function in society “in a meaningful way”

Dr. Rosemary Kohr 2020

“ DOING THE RIGHT THING”

Advocate for the right of patients to have access to pain medication and treatments that minimize pain and trauma.

Recognize the intrinsic value of each individual in all dimensions: physical, psychological, social, spiritual and family.

Dr. Rosemary Kohr 2020

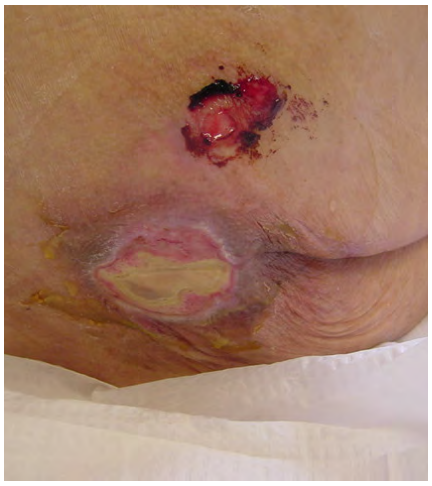
Clinical Signs and Symptoms of
Infected Wounds
and
What to do about it:
A Practical Approach.

Discussion:

- What's a chronic wound?
- The burden of bacterial load
- Infected vs colonized wounds
- Signs and symptoms of infection
- To swab or not to swab
- Cellulitis

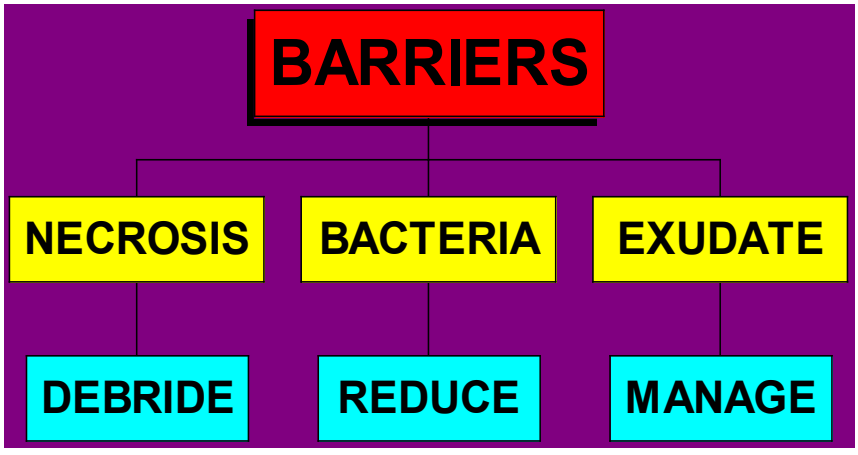
What's a chronic wound?

- Disruption of orderly sequence of repair
- Slow to heal
- Usually multiple contributing factors (e.g. pressure, poor nutrition, diabetes)



Dr. Rosemary Kohr 2020

What is the impact of bacteria?



Dr. Rosemary Kohr 2020

Wound Infection

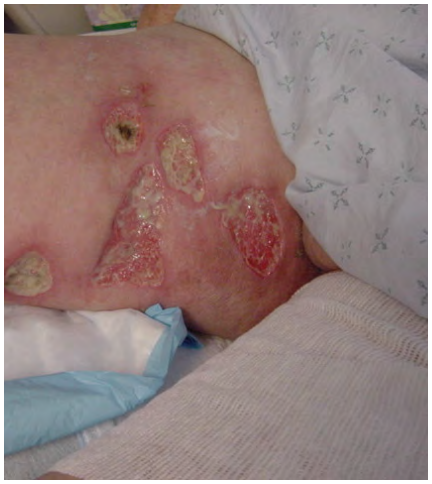
1847 : Ignaz Semmelweis noted correlation between lack of hand hygiene and the spread of fatal infections.
1857: Pasteur introduced the germ theory of disease (relationship of bacteria to diseases such as cholera).

Intact, healthy skin is a formidable physical and chemical barrier or first line of defense to bacterial invasion.

- when primary skin barrier is breached, the resident bacteria as well as bacteria from other sources have access to underlying tissues.
- Once bacteria have crossed the skin barrier, specific cells continue the defense.
- White blood cells fight bacteria, but if overwhelmed by the invading bacteria, clinical infection results.

Bacterial control.

- on intact skin: can be accomplished with a variety of antimicrobial agents such as alcohol, iodine, and mercurochrome (non-viable squamous epithelial cells).
- in the wound environment : living cells in tissue are susceptible to harm from the antimicrobial agent
- Critical issue: high-wound bioburdens can delay healing progress and in the worst case lead to infection, gangrene, and even amputation.



Bacterial continuum ranges from contamination to infection…

- Contamination: presence of non-replicating microorganisms within the wound
- Colonization: replicating microorganisms which do not cause injury to the host

  e.g., *staph epidermis,*
  corynebacterium sp.

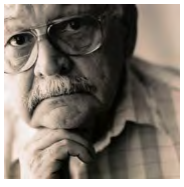
  (have been shown to increase rate of wound closure)

Dr. Rosemary Kohr 2020

Infected vs colonized wound

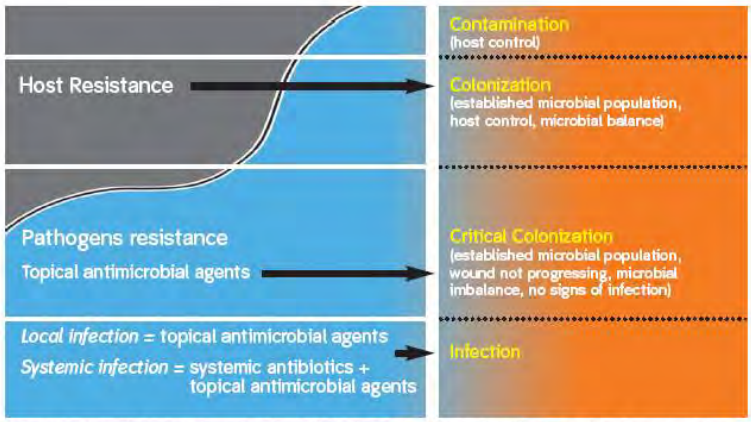
- **Colonized** : symbiotic bacterial load that does not cause tissue damage;
- **Infected** : increased bioburden that impairs wound healing.

Risk of wound infection = <u>bacterial dose X virulence</u>
Host resistance



Dr. Rosemary Kohr 2020

How infection develops in chronic wounds:

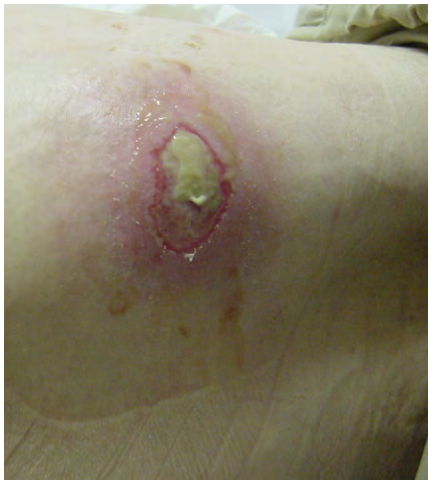


When wounds begin to show increasing signs of infection at the critical colonization stage, (e.g., increasing odour, pain, or exudate) rapid intervention to prevent infection development is necessary

Dr. Rosemary Kohr 2020

Signs and symptoms of infection

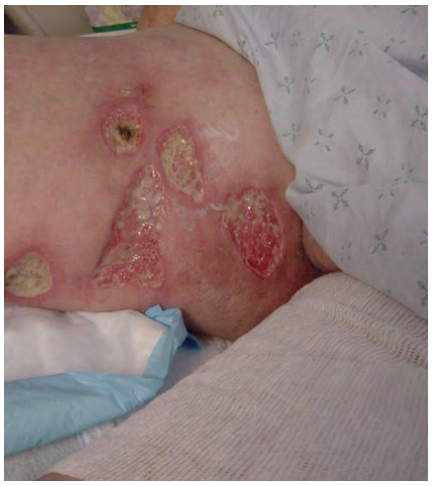
- *Critical colonization:*
  - Increasing pain/tenderness at site;
  - Increasing serous exudate;
  - Increasing friable granulation tissue;
  - Failure to heal



Dr. Rosemary Kohr 2020

Infected wounds:

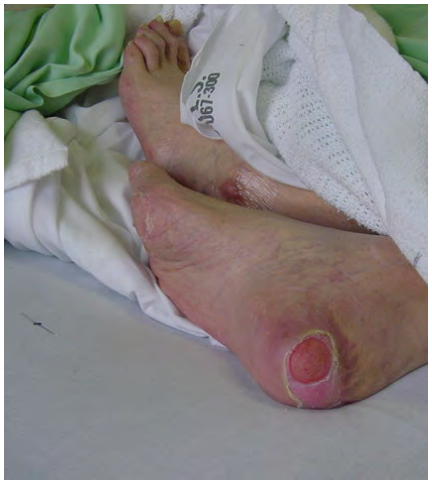
- Erythema
- Fever
- Edema
- Pain
- Odour
- Purulent discharge



Dr. Rosemary Kohr 2020

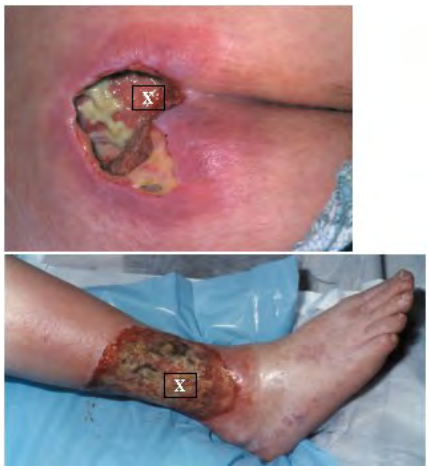
Diabetic wounds: infection

- Impaired host response (e.g., diabetes) may exhibit only subtle signs of infection
- Swab may come back "false negative"
- Raised blood sugar may be indicator of local or systemic infection



Dr. Rosemary Kohr 2020

When/how to swab a wound:



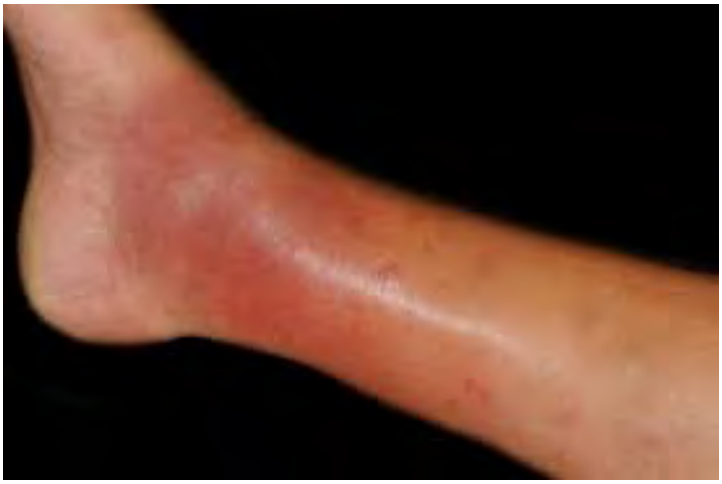
- **When:** if topical treatment is not effective or if systemic treatment required.

How:

- **cleanse wound (normal saline)**
- **Pick "cleanest" area (1cm square)**
- **Firmly swab area (press for depth)**

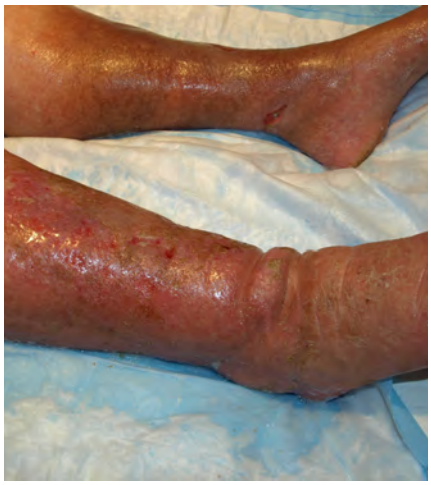
Dr. Rosemary Kohr 2020

CELLULITIS – THE GOOD, THE BAD AND THE DRAINING



Dr. Rosemary Kohr 2020

Causes of Cellulitis

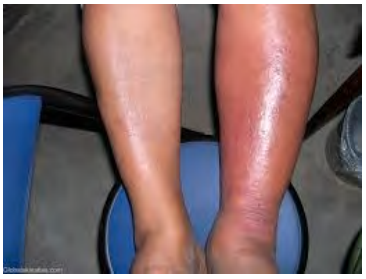


- Bacterial skin infection (strep or staph)
- Opening in the skin through:
  - Rash
  - Insect bite
  - Dry skin, eczema
  - IV drug use
  - Diabetes
  - obesity

Treatment for Cellulitis

- Oral antibiotics (commonly used):
  - Vancomycin
  - Ciprofloxacin
  - Coverage for Staph & Strep
- Manage:
  - Drainage
  - Pain
  - Edema
  - Lifestyle issues

Compression can still be applied (with ABPI done) when patient has cellulitis



Dealing with wound infection
Conclusion:

- Prevention of infection important
- Recognize bioburden continuum
- Use sensorium “clues”
- When appropriate, swab wound
- Treat with topical antiseptics (and systemic antibiotics when necessary)
- Wound needs change over time!

Dr. Rosemary Kohr 2020

Managing the “B”
Bacteria in the Wound:

Salt, Silver & Honey:
Old Treatments, Newer Modalities for
Wound Healing

Dr. Rosemary Kohr 2020

Back in history…

Dr. Rosemary Kohr 2020

SALT

Mesalt is an example.

- Sodium Chloride Impregnated

(packing ribbons or squares)

- wicking action draws fluid and debris out
- maintains a moist wound environment
- mechanism of action: creates hypertonic wound environment
  - decreases interstitial edema, allows for wound cleansing & removal of slough

Indications for Mesalt:

- Infected wounds
- Wounds with moderate to heavy drainage (exudate)
- Deep cavity wounds
- Pressure ulcers
- Surgical wounds
- **Not for dry/minimal drainage wounds**

Dr. Rosemary Kohr 2020

MESALT®

AREAS OF USE

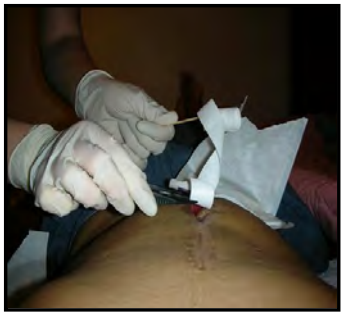
Heavily discharging and infected wounds in the inflammatory phase and deep cavity wounds:

1) Pressure sores

2) Surgical wounds.

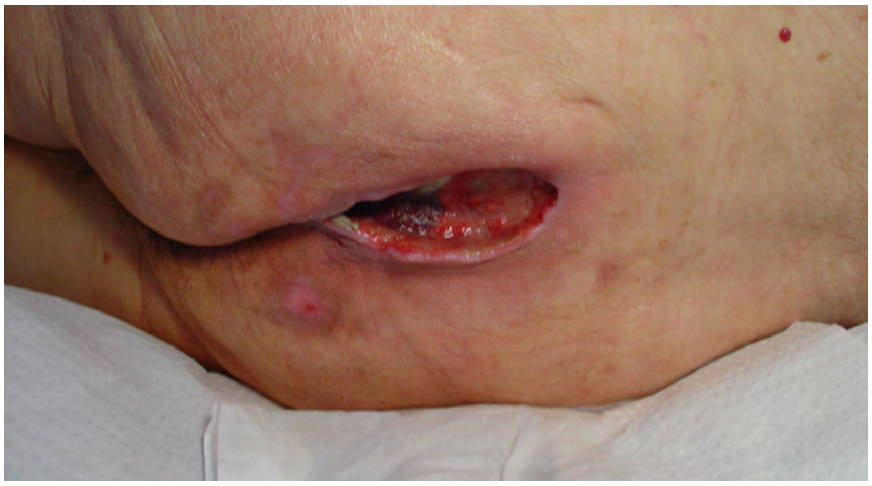
DESCRIPTION & BENEFITS

- Absorbs exudate, bacteria and necrotic material.
- Effectively supports and stimulates the cleansing of wounds.
- Easy application.
- Wound discharge releases the sodium chloride from the dressing.
- Mesalt effectively stimulates the cleansing of wounds in the inflammatory phase by absorbing exudate, bacteria and necrotic material from the wound, thus aiding the natural wound healing process.



Dr. Rosemary Kohr 2020

Wound debrided; + drainage; sloughy material remaining



Dr. Rosemary Kohr 2020

SILVER

- Hippocrates identified silver as useful for infection prevention
- Storage of wine in silver vessels said to prevent spoiling
- Mechanism of silver as antimicrobial not well understood: Ag+ binds with proteins rendering them inactive
- Broad spectrum (Gram-ve and Gram +ve bacteria
- Minimal development of bacterial resistance or silver toxicity

Topical dressings with silver

- "Anything with **AG**" (silver)
- Given wounds tipping into infection generally have increased drainage, it makes sense to use an **ALGINATE or HYDROFIBRE** with **SILVER**:

Tegaderm Alginate AG:

- antimicrobial silver, soft-gelling absorbency and fiber strength
- Requires a cover dressing (e.g., Mesorb)

Aquacel AG EXTRA:

- Antimicrobial silver, becomes gelled when wet;
- Comfort for patient
- Requires cover dressing

UNLESS using the Foam Aquacel version

Watch for these!
Other Topical silver treatment with cautions:

- Cream: Flamazine (silversulfadiazene)*
- Silver nitrate (stick form)**

*not for anyone with **sulfa** allergy

(best to avoid re: development of resistance)

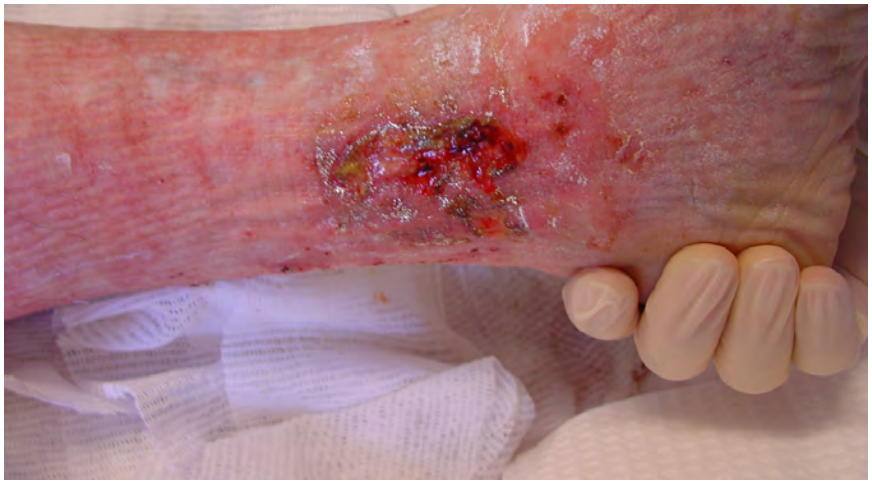
**used to cauterize– MD/NP to use– can cause damage to tissue

Topical Silver (AG) treatments

- Foam:
  - Examples: Biatain Ag, MepilexAg
- Alginates:
  - Examples: SeasorbAg, ActicoatAbsorbent, Silvercel
- Hydrofibre:
  - AquacelAg
- Contact Layer:
  - Examples: Restore contact layer with silver (Triac technology), Acticoat Flex 7
- Fabric: Acticoat
- Powder: Arglaes (with alginate)
- Gel: Silvasorb
- Cream: Flamazine (silversulfadiazene)

Dr. Rosemary Kohr 2020

Note the silver residue on periwound skin.

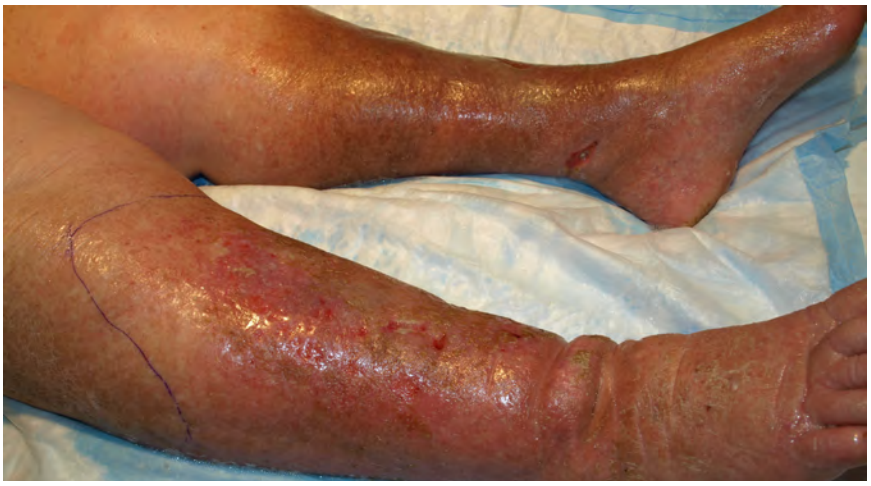


Dr. Rosemary Kohr 2020

Cellulitis: VERY painful, lots of drainage.

A + B dressing selection.

Could use a silver contact layer with absorbent pads (e.g., Mesorb or Mextra) to cover. Wrap with Kling – from toes to below knee.

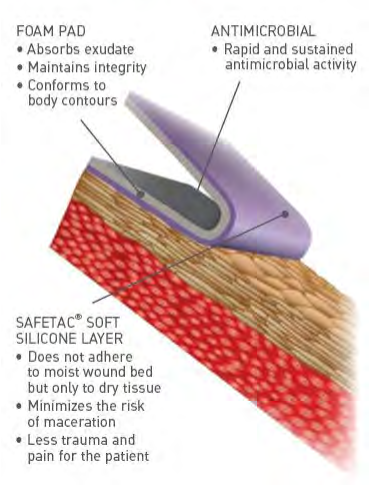


Dr. Rosemary Kohr 2020

SILVER FOAM DRESSING EXAMPLE

SafetaC® TECHNOLOGY

Less Trauma. Less Pain.



Dr. Rosemary Kohr 2020

Inter Dry Ag

- knitted polyester textile impregnated with silver complex
- designed to manage moisture, odor and inflammation in skin folds and other skin-to-skin contact areas
- effective antimicrobial action for up to five days
- wicks moisture away to keep skin dry
- provides a friction reducing surface

Dr. Rosemary Kohr 2020

Anti-microbial gauze (not silver...)

- Contains PHMB (Polyhexamethylene Biguanide) antiseptic
- E.g., “Kerlix AMD”
- Loose weave– may leave fibres in wound bed.
- Doesn’t wick away fluid (like InterDry AG does)

Dr. Rosemary Kohr 2020

Hydrofera Blue **Ready**

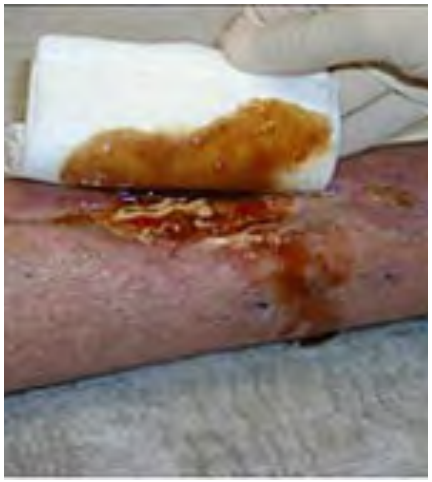
- **Ready version** does not require hydration or a cover dressing
- **Classic version** requires hydration AND a cover dressing.
- **Transfer version** acts as a medium to trap bacteria but requires a cover dressing as well.
- **When the dressing is white, it has "given up the fight" & needs to be replaced.**

Medical-grade HONEY

- Naturally antimicrobial
- Hyperosmolar: restricts fluid available to bacteria
  - pulls fluid from bacteria (re: sucrose)
- Acid pH: 3.2-4.5: inhibits bacterial growth
- Glucose oxidase enzyme: produces hydrogen peroxide (at low concentration – doesn't damage tissue)

Why not use over-the-counter honey?

- Potential for contamination from method of honey production (e.g., pesticides, spores), processing, receptacle sterility, storage
- Variable consistency of active ingredients
- Patients have developed serious bacterial infections



Medi-honey comes in form of:

- Honey Calcium Alginate (wet wounds),
- Tube (with applicator tip): warm in tube & use in cavity/tunneling wound
- HCS (Hydrogel Colloidal Sheet) & Honeycolloid: similar application to hydrocolloid, but also when critical colonization in wound bed

HCS

Honey-colloid

And

Hydrogel Colloidal Sheet (HCS) dressing

Honey Calcium alginate

Tube with applicator tip

Case examples of medical-grade honey

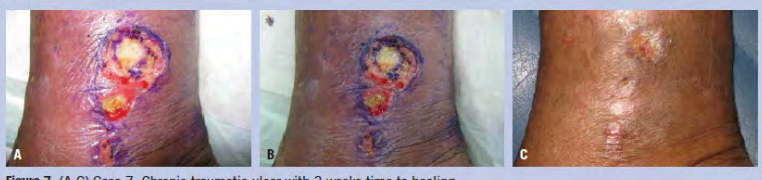


Figure 7. (A-C) Case 7. Chronic traumatic ulcer with 3 weeks time to healing.

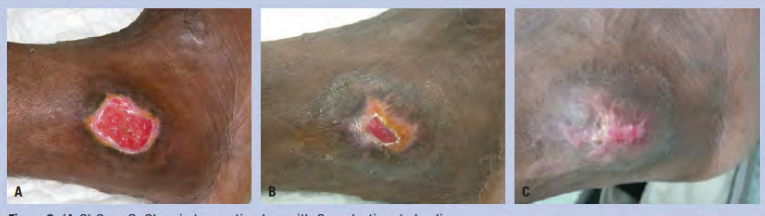
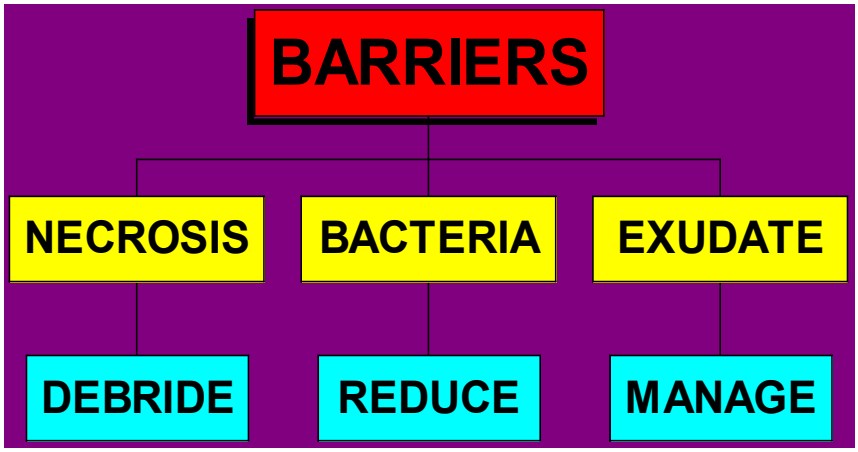


Figure 8. (A-C) Case 8. Chronic traumatic ulcer with 2 weeks time to healing.

CLINICAL MANAGEMENT



IODOSORB™ or INADINE™

AREAS OF USE

- External ulcers
- Infected wounds

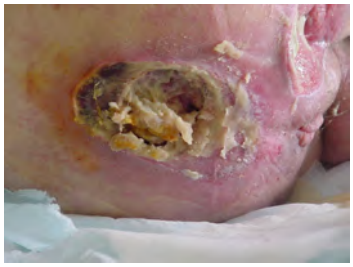
DESCRIPTION & BENEFITS

Iodosorb/Inadine is a Cadexomer Iodine based product helping to remove bacteria, slough and debris.

1. Provides sustained antimicrobial therapy for 72h.
2. Reduces bacterial load including MRSA & VRE.
3. Helps prevent new pathogen invasion.
4. Removes slough & debris.
5. Manages excess exudate.
6. Creates a moist environment.
7. Accelerates healing in leg ulcers.
8. Helps eliminate odour.
9. Biodegradable.
10. Treats infection.

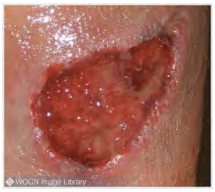
- CONTRAINDICATIONS: IODINE SENSITIVITY: ASSESS THYROID

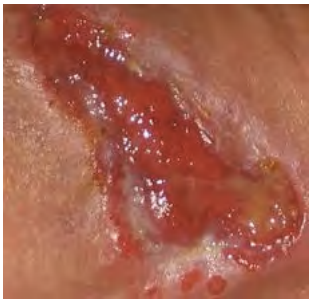
Changes colour when Iodine downloads into wound:



Dr. Rosemary Kohr 2020

Hypergranulation





- Also called “proud flesh”
- Moist, granular
- May bleed easily

Cause: ? Possibly lack of effective moisture-vapour transfer (saturation of granulating wound bed)

- Treat: hypertonic sodium or silver dressing;
  - Careful debridement
  - If qualified, silver nitrate

Dr. Rosemary Kohr 2020

Betadine or Proviodine

- Contain povidone-iodine in a 10% solution with 1% available iodine.
- Available also as detergents for surgical scrub—NOT the same thing (detergent needs to be rinsed off & is not intended for wounds, just skin/handwash surgical prep).
- Cytotoxic: not for use <u>full strength</u> on healthy, healing tissue.
- Useful for gangrenous wounds,

And/or ++ odour

- Dries wounds.

- aqueous solution of 10% povidone-iodine.
- fast-acting, broad-spectrum antiseptic
- kills gram-positive and gram-negative bacteria (including antibiotic resistant organisms), as well as most fungi/yeasts, viruses and protozoa.
- used for de-germing skin, wounds and mucous membranes, and for preoperative skin preparation of patients.

Dr. Rosemary Kohr 2020

Dr. Rosemary Kohr 2020

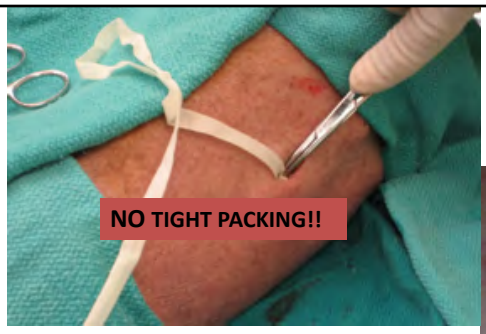
Cutaneous Abscess/Pilonidal

Less than 5 cm : I & D uncomplicated → NO packing - absorptive cover

Greater than 5 cm : I & D or pilonidal → LIGHT "packing" options

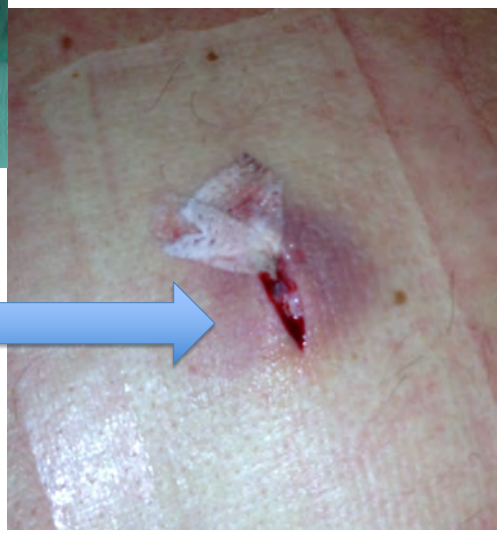
Academic Emergency Medicine 2009 May;16(5):470-3
Adv Skin Wound Care. 2013;26(1):20
Journal of the Oklahoma State Medical Association. 2017; 110(2),78.

Dr. Rosemary Kohr 2020

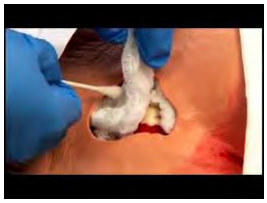


Dr. Rosemary Kohr 2020

- "KEEP THE DOOR OPEN" rather than packing the wound
- IRRIGATE WELL when changing the dressing



OPTIONS for *"packing"

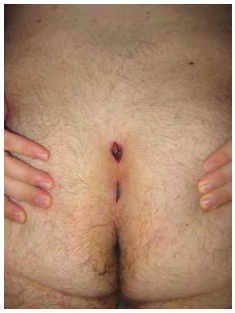


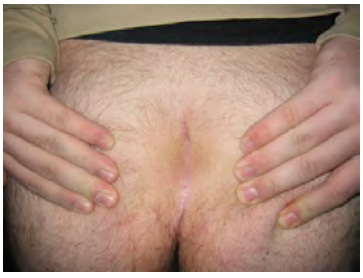
- SALT
- IODINE-Based
- SILVER
- Medical-grade HONEY
- HYDROFERA BLUE
- CALCIUM ALGINATE
- HYDROFIBRE

*** NEVER** PACK A WOUND **TIGHTLY**!!

LIQUID (gel) HONEY AT WORK...liquid in abscess cavity or down "Tracts"

Expect increased drainage BUT decreased odour





POLYSPORIN *Ointment*

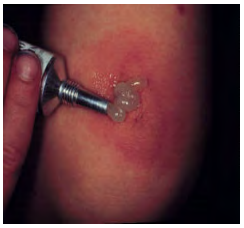
FOR SIMPLE, SUPERFICIAL WOUNDS

AREAS OF USE

- Minor cuts
- Scratches
- Burns
- Treatment of some infected wounds
- Prevention of infection in MINOR cuts and wounds

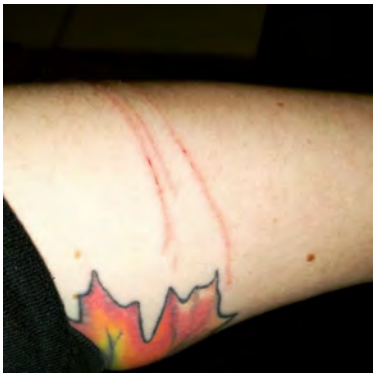
DESCRIPTION & BENEFITS

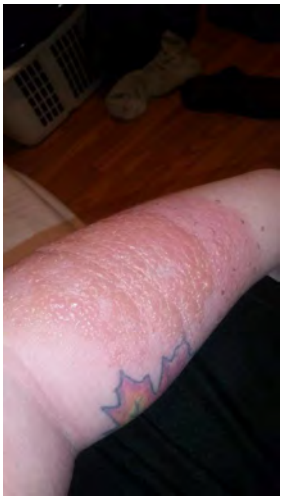
- Contains a combination of antibiotics (Polymyxin & bacitracin). Some versions also contain gramicidin and lidocaine.
- Is enriched with vitamin E to hydrate skin.
- Polysporin is non-staining, odourless and does not sting.
- It is available in 15g and 30g tubes.



Dr. Rosemary Kohr 2020

Contact dermatitis reaction to polysporin





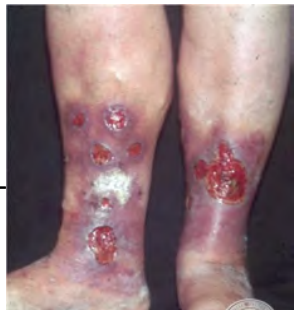
Summary

- Be aware of **increased drainage, increased pain**
  - Both are indicators of possible infection
  - Consider an absorbent cover dressing (remember MVT)
- Appropriate dressings: salt, silver, honey, Hydrofera Blue and iodine compounds
  - Iodosorb, Betadine or Poviodine
- Use according to manufacturers' directions
- Generally, the LONGER the dressing stays on, the better.

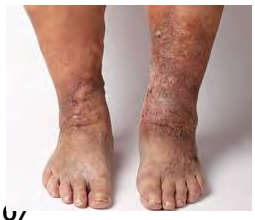
Chronic Disease = Circulatory problems= Venous/Arterial wounds

LEG ULCERS objectives:

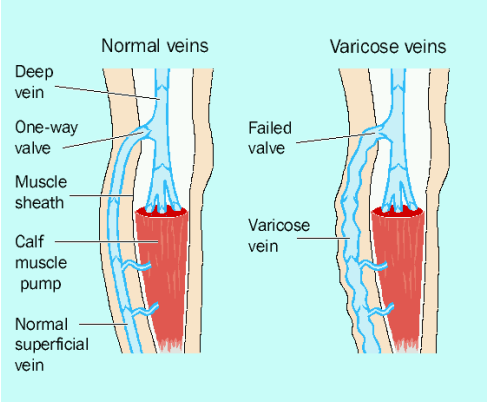
- Identify who is at risk
- Apply preventive care
- **Treat Underlying causes**
- ----------
- Treat the wound(s)



Venous leg ulcers



- Common: 80% of leg ulcers
- Recur: recurrence rate of 70%
- Venous flow is dependent on the calf-muscle pump
- Venous insufficiency results in leakage into the surrounding tissue
- Hemosiderin staining: breakdown of RBCs into tissue/skin

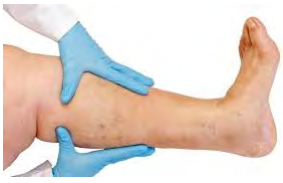


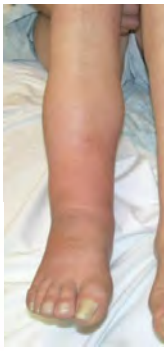
Dr. Rosemary Kohr 2020

SWOLLEN LEGS is the start...

Who is at risk?

- Blood clot
- Varicose veins
- Obesity
- Sedentary/immobilized
- CHF/cirrhosis/low albumin/CK

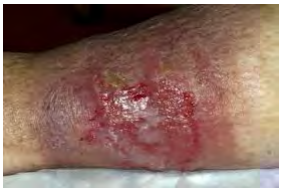


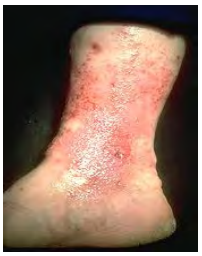


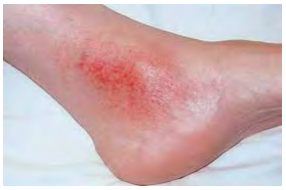
Dr. Rosemary Kohr 2020

- Swollen legs and:
  - The skin around or above the ankles looks reddish, yellowish, or a brown color
  - Varicose veins: twisted, bulging, and dark purple or blue
  - Pain
  - Itching
  - Sores that ooze, crust, or look scaly
  - Thickened skin around ankles or shins
  - Hair loss on ankles or shins

Treatment maybe a variety of creams, etc.
"Nothing seems to really work".

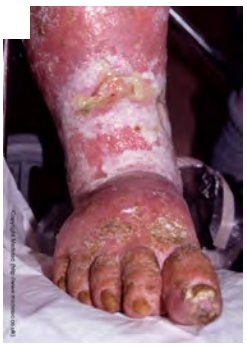


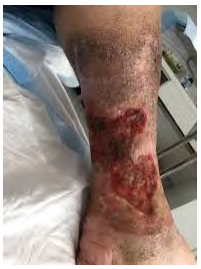


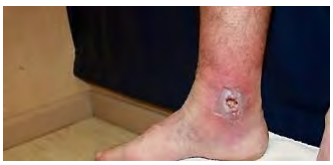


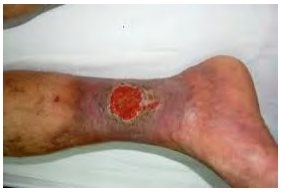
And we wonder why it's not getting any better...

We end up with this:





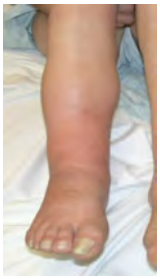
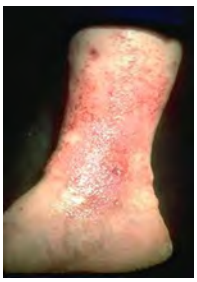
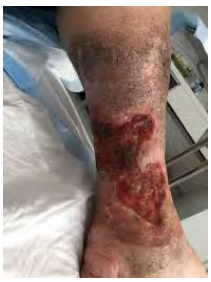
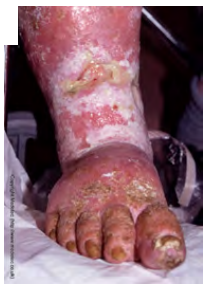




Dr. Rosemary Kohr 2020

At each step, we need to Treat the Underlying Cause

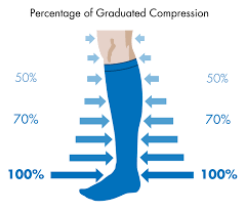
which is... ??

PREVENTION | TULC* | TULC & TREAT | TULC & TREAT

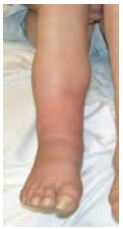
*TULC: Treat the Underlying Cause

1. PREVENTION



<u>Graded</u> compression STOCKINGS

- ABI and PAD check FIRST
- **not TEDS**
- not full leg
- toe to below knee
- Need to be properly fitted by Certified Fitter
- **TEACH TEACH TEACH**
- NEED donning and doffing devices



PREVENTION: Wearing Graded Compression Stockings

"It's for life..."

- GRADED COMPRESSION STOCKINGS FOR INTACT SKIN (no open wounds)
- Make sure:
  - Ankle-Brachial Pressure Index (ABPI) assessement
  - Ankle Brachial Pressure Index How To
- Appropriate stocking (to be worn on getting out of bed until bedtime).
  - Many types of Graded Compression stockings
    - *Sigvaris™ is one example*

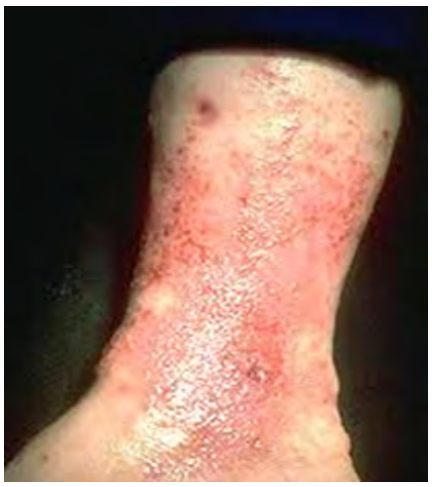
Dr. Rosemary Kohr 2020

1. Treat the Underlying cause (TULC):

Is it venous insufficiency alone,

or a combination:

- CHF/renal failure, etc
- Medications
- Nutrition
- Hygiene
- Infection
- Dermatitis



Dr. Rosemary Kohr 2020

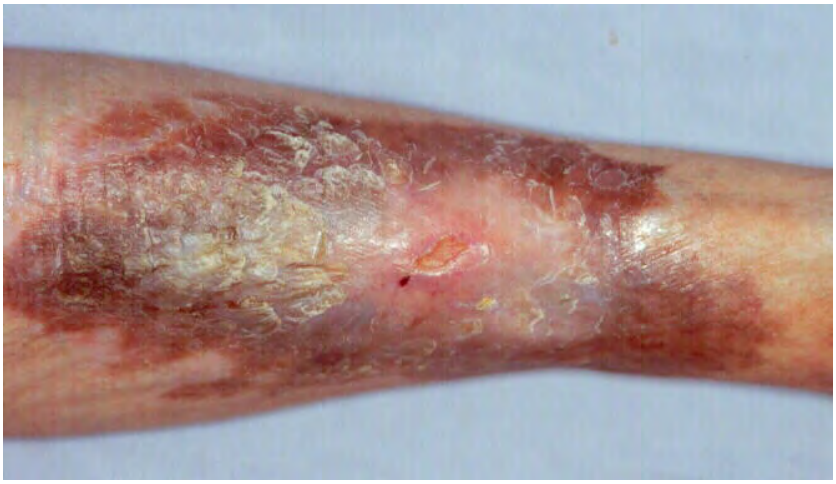
What is the BEST TULC?

Think about what CAUSES poor vascular blood flow (creating swelling in the feet/ankles, relieved by elevating above the heart)

understanding venous flow and compression

Dr. Rosemary Kohr 2020

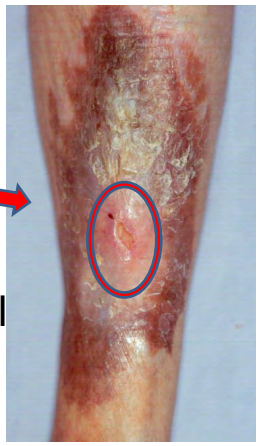
Venous leg ulcer (VLU)



Dr. Rosemary Kohr 2020

Assessing the wound

- Painful
- Shallow, irregular shape
- On shin
- Wound is draining serous fluid
- Hemosiderin staining circumferentiall
- Edema: “champagne flute lower leg”

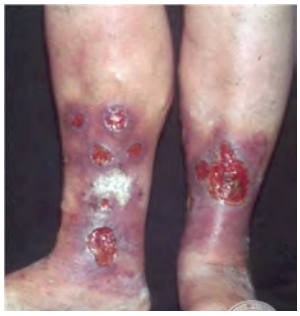


Dr. Rosemary Kohr 2020

Case Example:

58 year old woman

- legs have been like this for months
- treatments have been: fucidin ointment, cortisone cream, oral antibiotics,wet to dry gauze dressings, hydrocolloid, foam dressing...



- How did she get this way?
- What kind of ulcers are these?
- How would you treat this?

Dr. Rosemary Kohr 2020

Compression is the Gold Standard for venous leg ulcer management.
But...

- **No compression** without Ankle-Brachial Pressure Index!!!
- ABPI greater than 0.5 required for adequate arterial blood flow (to feet)
- **Compression <0.5 NOT recommended**
- If you can palpate a pedal pulse, generally, it's adequate
- If in doubt, send for vascular flow studies (particularly with diabetes…)
- ABPI should be repeated approx. every 6 months

Coban 2 Application

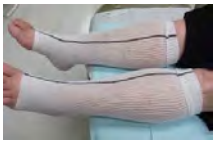
Other issues

- Compression "adherence": uncomfortable, bulky—must be willing
- Explain need to elevate legs and use compression (if warranted) for edema control
- **Wounds won't heal if edema is not managed**
- Explain in language the patient understands!

Leg Ulcers John Cleese & Dr. Rob Buckman

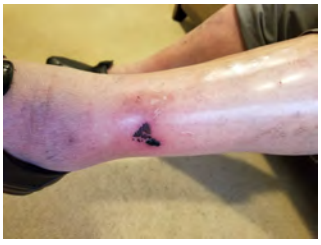
Alternative to compression wraps/stockings

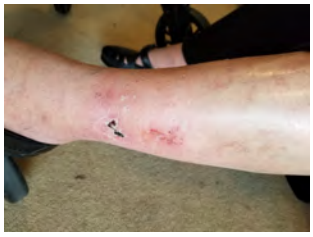
Edemawear (.39sec in)



Dr. Rosemary Kohr 2020

Compression in action





BEFORE

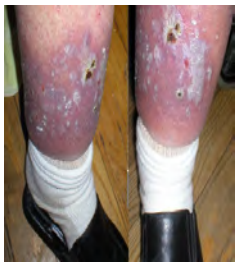
AFTER

PATIENTS NEED TO KNOW– ONCE THE WOUND IS HEALED, THEY WILL NEED COMPRESSION STOCKINGS FOR THE REST OF THEIR LIVES TO AVOID DEVELOPING ANOTHER VENOUS LEG ULCER!

Dr. Rosemary Kohr 2020

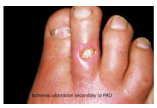
Contact dermatitis

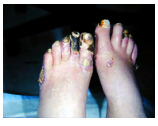
- Allergic reaction to topical treatments
- 51-85% of patients with venous leg ulcers have some form of contact dermatitis
  - Topical antibiotics
  - Lanolin in topical moisturizers
  - Chemicals in dressings
  - Preservatives
  - Fragrances

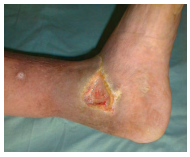


Arterial/ischemic ulcers

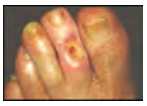
- Characteristics:
  - Often over phalangeal heads of toes
  - "punched out" appearance
  - Pale wound bed
  - Necrotic tissue
  - Legs: thin, bird-like, taut, shiny skin
  - Thickened toenails
  - Dependent rubor
  - Pain on ambulation or leg elevation
- Can have mixed etiology ulcers →







Arterial/Ischemic ulcers:



Contributing Factors:

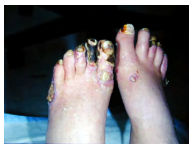
- Arteriosclerosis & Atherosclerosis
- Smoking
- Elevated cholesterol & lipids
- Hypertension
- Obesity
- Diabetes

Treatment:

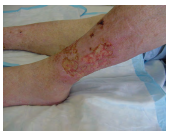
- Surgical options (eg, bypass)
- Poor prognosis re: healability
- Wound should be kept dry, clean & protected from injury
  - Betadine/Poviodine very useful in this case
- Patient/family education
  - Lifestyle modifications (eg, smoking cessation)

Things to remember…

- Arterial & venous wounds are the truly "chronic" of chronic wounds;
- Patient buy-in to treatment is essential
- Need to be aware of lifestyle issues
- Manage pain!
- **Venous ulcers: COMPRESSION**
- **Arterial ulcers: KEEP DRY**



What's the difference?
Arterial/Venous leg ulcer



	Venous	Arterial
Cause	Faulty venous return of blood TO heart from lower extremity	Occluded vessels prevent blood flow TO lower extremity
Location of wound	Usually from knee to ankle	Feet and toes
Lower limb appearance	Puffy, swollen ankles, feet, lower leg (edema); chronic : brownish colour (hemosiderin stain) circumferential at calf level and/or woody/hard edema to lower limb; Champagne flute limb: wide at calf & narrower at ankle.	Shiny, taut skin; bird-like thin limb; no/little hair on leg.
Wound appearance	Superficial, irregular shape, often multiple small wounds, painful, base: red/sloughy yellow	Punched out, pale base, not usually painful.
Treatment	With adequate blood flow to the extremity: COMPRESSION	Surgical intervention if possible; DRY UP.

Dr. Rosemary Kohr 2020

Self-directed

- Recorded lecture on Debridement
- Learning activities complete before class tomorrow

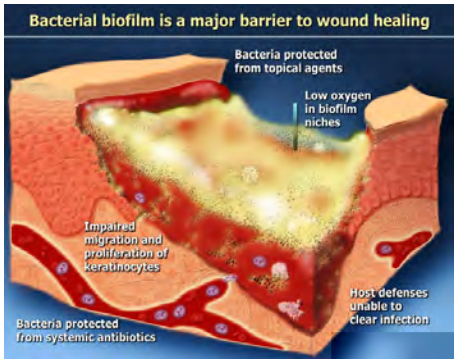
Dr. Rosemary Kohr 2020

Debridement:
Why, How, When...

The "C" in AB**C**Ds

Biofilm: the good the bad and the more bad…

- Bacteria in natural environments live in organized manner known as "Biofilms"
- Biofilm is a protective structure formed by bacterial colonies
- Serves to "hide" bacterial growth & protect from therapeutic interventions
- Once established, difficult to remove
- Can be life-threatening.



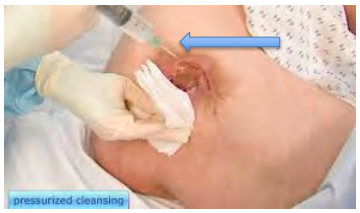
http://www.erc.montana.edu/biofilmbook/MODULE_07/IMAGES/BF-ChronicWound_bfbookSM.jpg

Effect of slough on chronic wounds:

- Provides focus for infection
  - Often multiple pathogens/critical colonization
- Prolongs inflammatory response
  - Localized thrombosis, vasoconstricting metabolites = tissue hypoxia
- Increases metabolic load
  - Competition with tissue cells for oxygen & nutrients
- Impairs visualization of the wound bed

Types of Wound Debridement

- Mechanical
- Autolytic
- Surgical
- Enzymatic
- Maggot therapy*



* Currently unavailable in Canada... Pity....

Mechanical Debridement:

- Used for decades (centuries?)in wound care.
- A saline-moistened dressing is allowed to dry overnight and adhere to the dead tissue.
- When the dressing is removed, the dead tissue is pulled away as well.
- Hydrotherapy considered mechanical debridement.

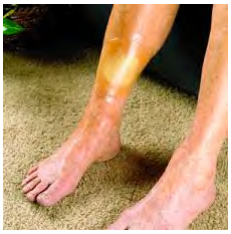
Mechanical debridement, continued

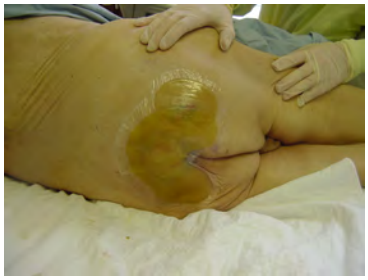
- **Advantages**:
  - Cost of the actual material (ie. gauze) is low
- **Disadvantages**:
  - Non-selective and may traumatize healthy or healing tissue
  - Time consuming
  - Can be painful to patient
  - Hydrotherapy can cause tissue maceration. Also, waterborne pathogens may cause contamination or infection. Disinfecting additives may be cytotoxic.

Autolytic Debridement:

- uses the body's own enzymes and moisture to re-hydrate, soften and finally liquefy hard eschar and slough.
- is selective; only necrotic tissue is liquefied.
- virtually painless for the patient.
- uses occlusive or semi-occlusive dressings (maintain wound fluid in contact with necrotic tissue).
- achieved with hydrocolloids, hydrogels and transparent films.

Autolytic Debridement





Dr. Rosemary Kohr 2020

Best Uses for autolytic debridement:

Stage III or IV wounds with light to moderate exudate

- **Advantages:**
  - Very selective, with no damage to surrounding skin.
  - The process is safe, using the body's own defense mechanisms to clean the wound of necrotic debris.
  - Effective, versatile and easy to perform
  - Little to no pain for the patient
- **Disadvantages:**
  - Not as rapid as surgical debridement
  - Wound must be monitored closely for signs of infection
  - May promote anaerobic growth if an occlusive hydrocolloid is used

Dr. Rosemary Kohr 2020

Key points: autolysis

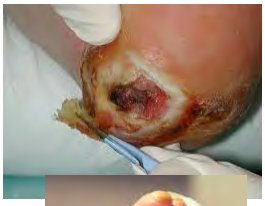
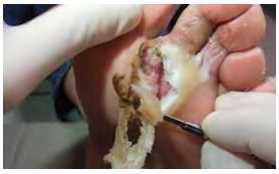
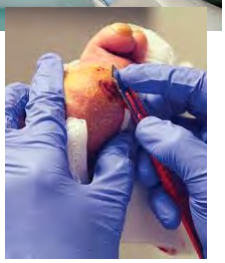
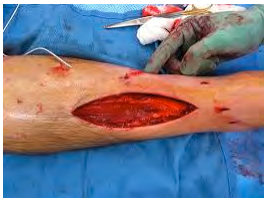
- The key to autolytic debridement is keeping the wound moist, which can be accomplished with a variety of dressings.
- Dressings (hydrocolloids, hydrogels, transparent films) help trap wound fluid that contains growth factors, enzymes, and immune cells that promote wound healing.
- Autolytic debridement is more selective than any other debridement method, but it also takes the longest to work.
- It is inappropriate for wounds that have become infected.

Surgical debridement

Description:

- Sharp surgical debridement and laser debridement under anesthesia are the fastest methods of debridement.
- Very selective-- complete control over which tissue is removed and which is left behind
- Can be performed at the bedside or in the operating room, depending on the extent of debridement required.

Surgical debridement

Dr. Rosemary Kohr 2020

Surgical debridement

- **Best Uses:**
  - Wounds with a large amount of necrotic tissue.
  - Wounds with large amounts of sloughy, infected tissue.
- **Advantages**:
  - Fast and Selective
  - Can be extremely effective--to bleeding (healing) tissue
- **Disadvantages**:
  - Painful to patient
  - Costly, especially if an operating room is required
  - Requires transport of patient if operating room is required.

Dr. Rosemary Kohr 2020

After surgical debridement:

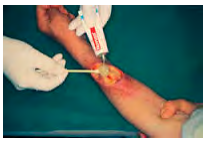
- May require packing to control bleeding-usually for 24 hours.
  - Pack with haemostatic agent (such as Kaltostat)
- Subsequently, dressings promoting moist wound healing are applied.
- NB: many factors contribute to wound healing, which frequently can take considerable time. Debridement may need to be repeated.

Chemical/enzymatic Debridement (Santyl®)

- Makes use of certain enzymes and other compounds to dissolve necrotic tissue.
- More selective than mechanical debridement
  - the body makes its own enzyme, collagenase, to break down collagen, one of the major building blocks of skin.
  - pharmaceutical version of collagenase (Santyl®) is available on Rx
  - highly effective as a debridement agent.

Chemical/enzymatic (Santyl®) Debridement Method:

- Crust of eschar is etched in a crosshatched pattern to allow the enzyme to penetrate.
- A topical antibiotic may also applied to prevent introducing infection into the bloodstream.
- Appropriate dressing to cover (e.g. Mesorb pad)



- **Best Uses:**
  - On any wound with a large amount of necrotic debris.
  - Eschar formation
- **Advantages**:
  - Fast acting
  - Minimal or no damage to healthy tissue with proper application.
- **Disadvantages**:
  - Expensive
  - Requires a prescription
  - Application must be performed carefully only to the necrotic tissue.
  - May require a specific secondary dressing
  - Inflammation or discomfort may occur

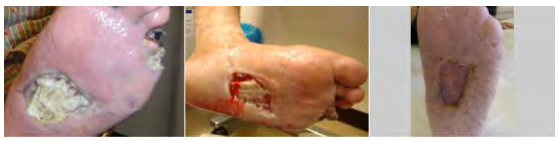
Maggot Therapy:

currently unavailable in Canada

- Medicinal maggots have three actions:
  1) debride wounds by dissolving the necrotic, infected tissue;
  2) disinfect the wound, by killing bacteria;
  3) stimulate wound healing.

Maggot therapy

Fig. 9: Use of a BioBag® to apply maggots to a wound



Before treatment During treatment After treatment

Maggot Therapy

Advantages:

- Efficient debriding action;
- Excellent safety record;
- Does not require advanced level of skill to use;
- Provides surgical quality debridement as an outpatient or at home;
- Low cost of treatment.

Disadvantages:

- "cultural" attitudes towards maggots;
- Takes about 15-30 minutes to apply a secure dressing to keep the maggots in place;
- Maggots are currently unavailable in Canada
- highly perishable: use within 24 hours of arrival.

Making the Decision to debride:

- the nature of the necrotic or ischemic tissue and the best debridement procedure to follow (if at all);
- the risk of spreading infection and the use of antibiotics;
- the presence of underlying medical conditions causing the wound;
- the extent of ischemia in the wound tissues;
- the location of the wound in the body;
- the type of pain management to be used during the procedure.

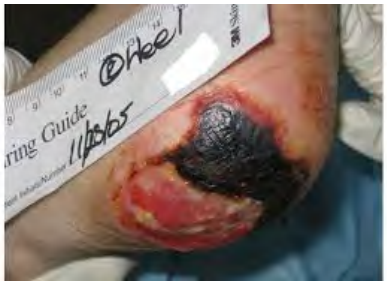
Alternatives

- Adjunctive therapies include electrotherapy and low laser irradiation.
- Not all wounds require debridement.
  - Sometimes it is better to leave eschar than to remove it and create an open wound
    - if the crust is stable and the wound not inflamed.

Prior to debridement:

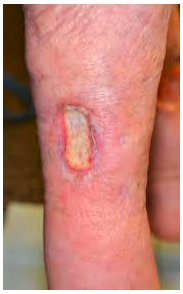
- take a medical history with attention to factors that might complicate healing, such as medications being taken and smoking.
- Identify the cause of the wound and treatment history.
- If blood flow is impaired (eg, foot ulcers resulting from diabetes),decision may be made to NOT debride wound since blood flow may be insufficient for proper healing.

To Debride or not to debride…

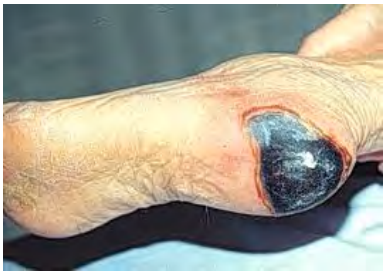


Dr. Rosemary Kohr 2020

Dr. Rosemary Kohr 2020

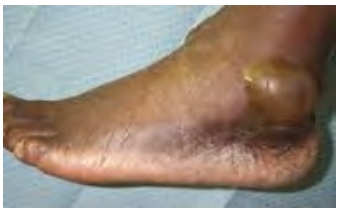


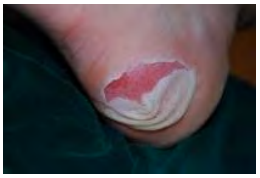
Dr. Rosemary Kohr 2020



Dr. Rosemary Kohr 2020

Blister (bulla)





Putting it all together:

When and what to use
in
Chronic Wound Management

What is required for best practice?

- Information
- Knowledge
- Practice
- Expertise
- Consultation

Information

How do we need to access information?

- "point of care"
- "I need this NOW"
- What is my patient's history?
  - Health/illness
  - Medications, treatments
  - Dressings: what's worked in the past.

Who are the members of this patient's team?

- Family, allied health (PT, OT, RD, MD, Pharmacist)

Dr. R. Kohr 2020

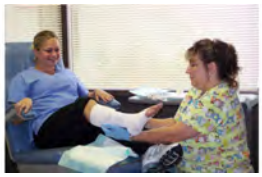
Knowledge

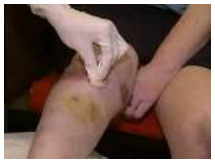
- How do you obtain knowledge?
  - Educational resources: books, articles, product monographs;
  - Workshops
  - Courses
  - In-services
  - Web-based information
- Is it reliable? "best practice"?

Dr. R. Kohr 2020

Practice.

- Do it. Then, do it again.
- Don't be afraid.



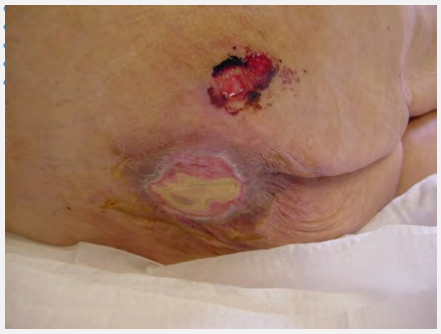


Summary:

- Who is at risk?
  - Consider: moisture, mobility, nutrition, friction/shear, impaired sensation, chronic conditions, age, environment...
- What is in place to prevent wounds from happening?
- Always consider the whole person, "not the hole in the person"

Dr. R. Kohr 2020

Treat the underlying cause (TULC)



PREVENTION

Mobility / positioning for OFF LOADING

- **Moving techniques**
- **Surfaces**
- **Mattresses and cushioning (low air loss /Roho®)** ***– requires minimum 6" high- density foam for effective pressure relief***

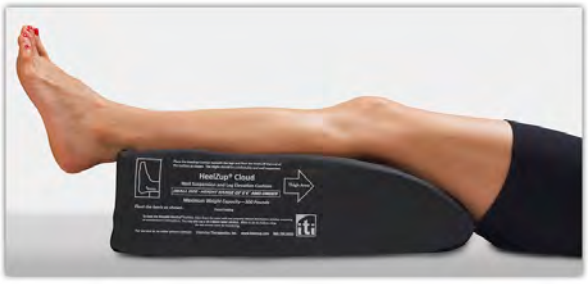
Continence

?? Protective dressings

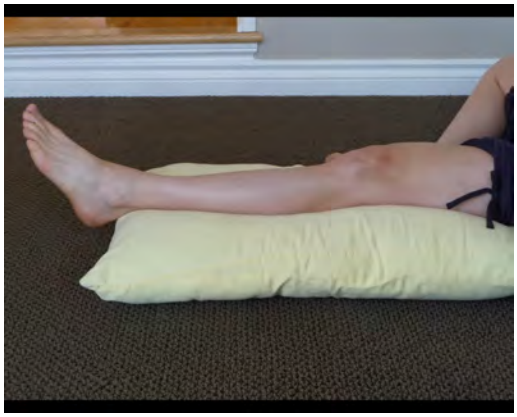
INSPECT routinely (pressure points) and

OFF-LOAD PRESSURE

Dr. R. Kohr 2020



EXAMPLE OF INAPPROPRIATE OFF-LOADING DEVICE: NOTE PRESSURE POINTS & ANGLE OF HIP LEADING TO SACRAL PRESSURE.



CORRECT APPROACH TO USING PILLOW UNDER THE LEG TO OFF-LOAD PRESSURE TO HEEL

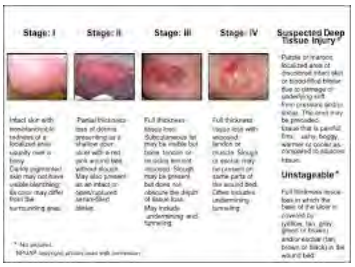
Dr. R. Kohr 2020

Staging: Pressure Injuries ONLY

National Pressure Ulcer Advisory Panel (NPUAP) Staging System

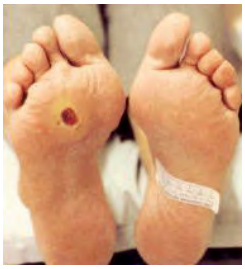
Definition:

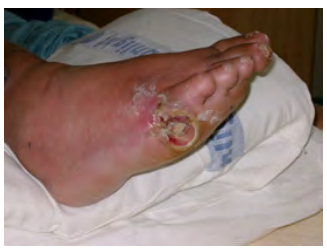
- a localized injury to the skin and/or underlying tissue
- usually over a bony prominence
- as a result of pressure or pressure in combination with shear and/or friction



STAGES 1 THRU 4 (or unstageable) plus Deep Tissue Injury

Dr. R. Kohr 2020

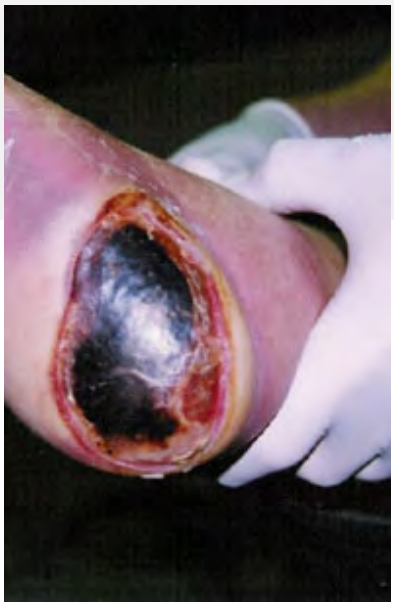


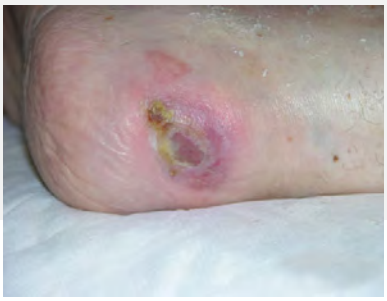


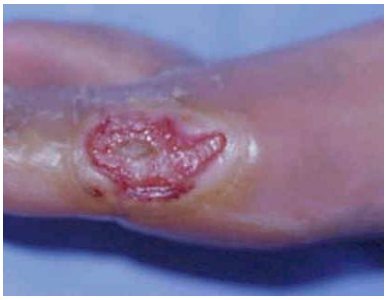
"Diabetic Feet" : 30% of DM2 have pressure injury→ remember AMPUTATION→ DEATH.

- Vascular changes & neuropathy re: disease process of diabetes;
- Susceptible to foot ulceration and infection;
- May progress to tissue necrosis requiring amputation.

Dr. R. Kohr 2020



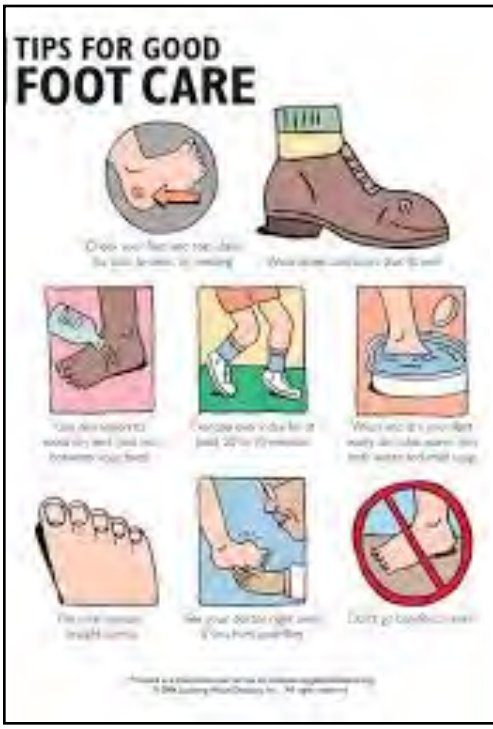




"Diabetic Feet"

- Impaired function of nerves & blood vessels supplying the feet.
- Feet are dry--callus, dry skin.
- Prone to fissures, cracks & pressure ulcers--leading to infection which can enter and spread through the foot.

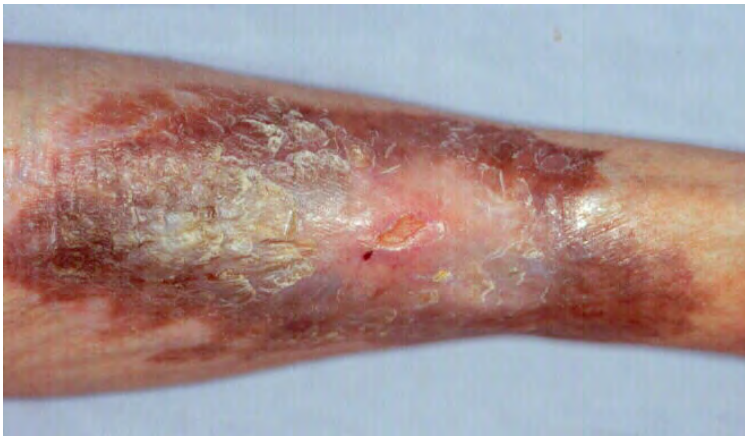
Dr. R. Kohr 2020



Prevention:

- EDUCATE EDUCATE EDUCATE
  - Daily foot inspection
  - Daily footwear inspection
  - Proper hygiene
    - drying / fungal powder / moisturize
  - Proper footwear

Dr. R. Kohr 2020

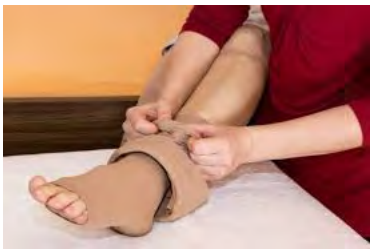


Venous Leg Ulcer : the "chronic" of chronic wounds...

- Painful
- Shallow, irregular shape
- On shin
- Wound is draining serous fluid
- Hemosiderin staining circumferentially
- edema

Dr. R. Kohr 2020

PREVENTION (no open wound)



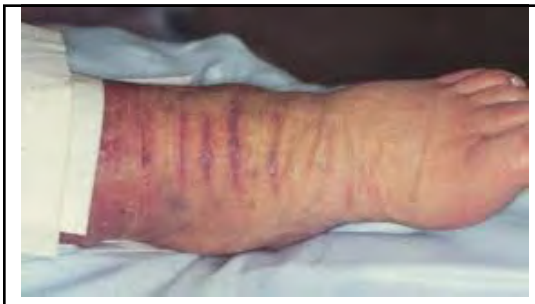
Ankle exercises
Walking more
Standing less
Reduced salt diet
Weight loss

Not "DIURETICS"...!

Graded compression STOCKINGs

- ABI and PAD check FIRST
- **TEACH TEACH TEACH**
- NEED donning and doffing devices

Dr. R. Kohr 2020

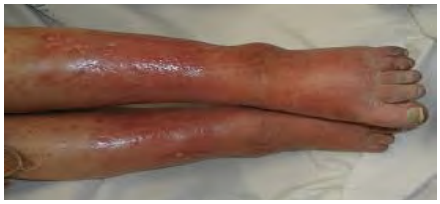


COMPRESSION “WRAPS”
when there IS a wound:
(ensure ABPI / PAD check FIRST)

- **Proper technique is essential.**
- **Know the correct way to apply the compression wrap you are using!**

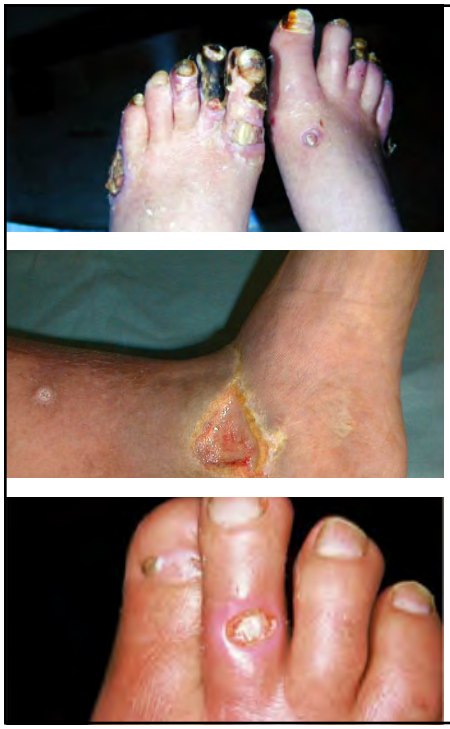
Dr. R. Kohr 2020

Treatment of Cellulitis:



- Infection:
  - systemic antibiotics if required
  - Topical treatment with antimicrobial properties (salt, silver, honey, etc)
- Pain management: analgesics and/or anti-inflammatory meds if tolerated
- Drainage (often significant): super-absorbent dressings & wrap with Kling (gauze) until compression can be applied (check ABPI first)
- If open wounds, use dressings with absorptive/antimicrobial properties.

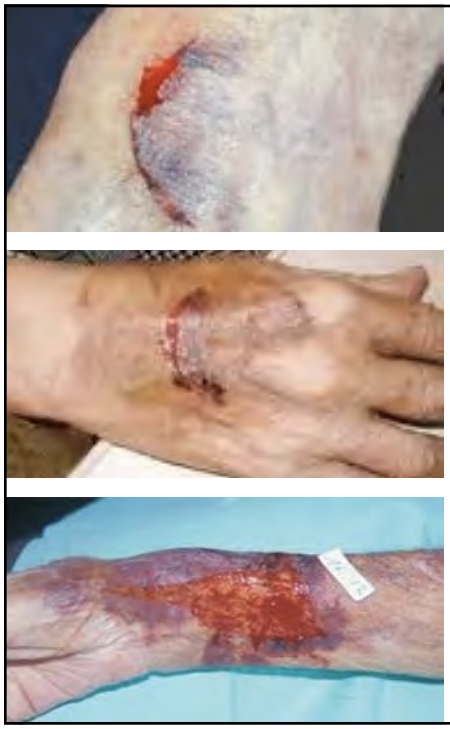
Dr. R. Kohr 2020



Arterial/ischemic ulcers

- Characteristics:
  - Often over phalangeal heads of toes
  - "punched out" appearance
  - Pale wound bed
  - Necrotic tissue
  - Legs: thin, bird-like, taut, shiny skin
  - Thickened toenails
  - Dependent rubor
  - Pain on ambulation or leg elevation

Dr. R. Kohr 2020



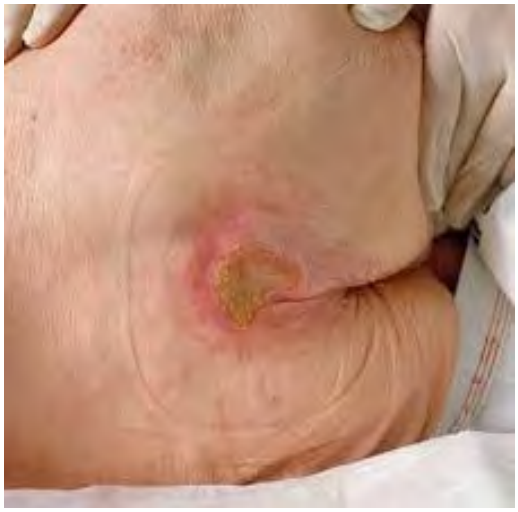
Skin tears: prevention/treatment

- Be aware of **Fragile** skin
- Arms, hands and shins most common
- Protection/padding
- Communicate "At Risk" status to other care providers & family

Treatment: (the "s" in ABCDs for dressing selection)

- Viability of damaged skin
- Avoid adhesive dressings
- Consider dressing re: Moisture Vapour Transfer ability
- Contact layer with cover dressing or Absorbent Acrylic dressing

Dr. R. Kohr 2020



1. TULC:
off-load pressure

2. PREPARE:
Cleanse, irrigate

3. PROTECT
peri-wound skin

4. DRESSING:
choose according to A, B, C or D…

Dr. R. Kohr 2020

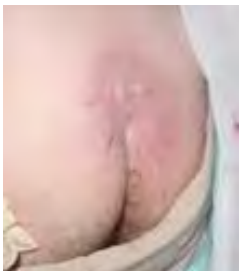
A: absorb (how much drainage?)
B: Bacteria (how much bio-burden?)
C: Clean up the Crust (debridement?)
D: Dry, healing wound?

Dressing selection:

ABC: "Best bets" ? Leave on for how long?
C: " Best bet" ? Leave on for how long?

Dr. R. Kohr 2020

DRESSING CHOICES: along with the ABCDs, consider:

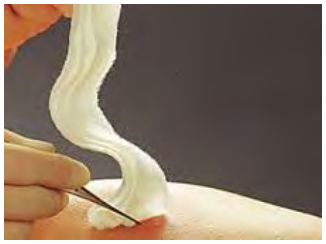


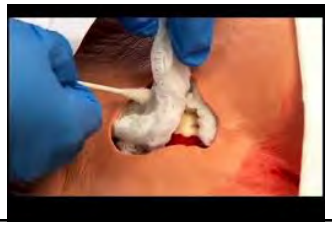
- Superficial → up to (and including Stage II Pressure Injury):
- Option 1: Barrier Cream
- Option 2: Light dressing, based on wound location, amount of drainage, etc.

- Always ask yourself, "REALISTICALLY, HOW LONG WILL THIS DRESSING STAY ON?"

- REMEMBER: location of the wound and friction, moisture—urine/feces or damp/sweating skin, may all decrease the ability of the dressing to stay in place.

Dr. R. Kohr 2020



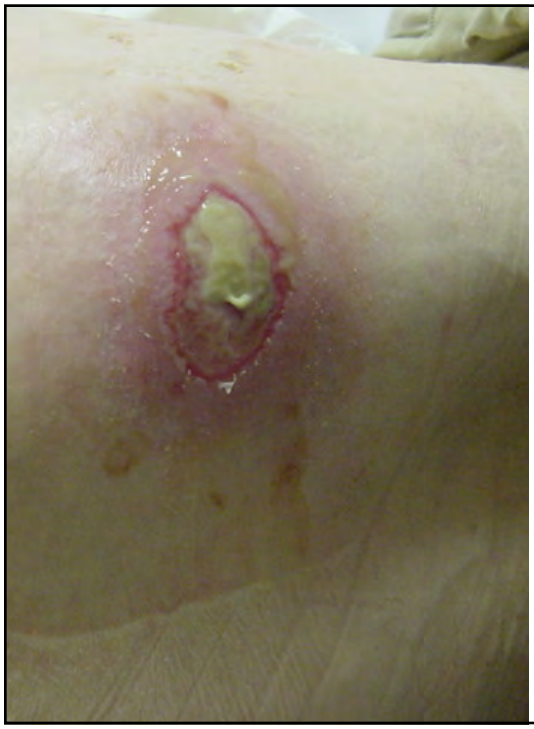


OPTIONS for"packing"

- SALT
- IODINE-Based
- SILVER
- Medical-grade HONEY
- HYDROFERA BLUE
- CALCIUM ALGINATE
- HYDROFIBRE
- AMD Gauze Ribbon

NEVER PACK A WOUND **TIGHT**!!

Dr. R. Kohr 2020



Wound infection: signs/symptoms

Dr. R. Kohr 2020

SALT

Sodium Chloride Impregnated Dressing
(packing ribbons or squares)

- wicking action draws fluid and debris out
- maintains a moist wound environment
- mechanism of action: creates hypertonic wound environment
  - decreases interstitial edema, allows for wound cleansing & removal of slough

Mesalt is an example.

Dr. R. Kohr 2020

Medical-grade HONEY

- Naturally antimicrobial
- Hyperosmolar: restricts fluid available to bacteria
  - pulls fluid from bacteria (re: sucrose)
- Acid pH: 3.2-4.5: inhibits bacterial growth
- Glucose oxidase enzyme: produces hydrogen peroxide (at low concentration –doesn't damage tissue)

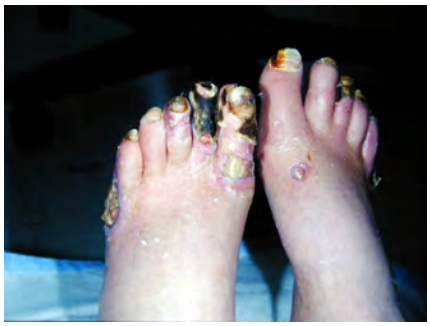
Why not use over-the-counter honey?

- Potential for contamination from method of honey production (e.g., pesticides, spores), processing, receptacle sterility, storage
- Variable consistency of active ingredients
- Patients have developed serious bacterial infections

Dr. R. Kohr 2020

First question: "Is this wound healable?"

•If the answer is "no", then what are the options for dressing selection/management?

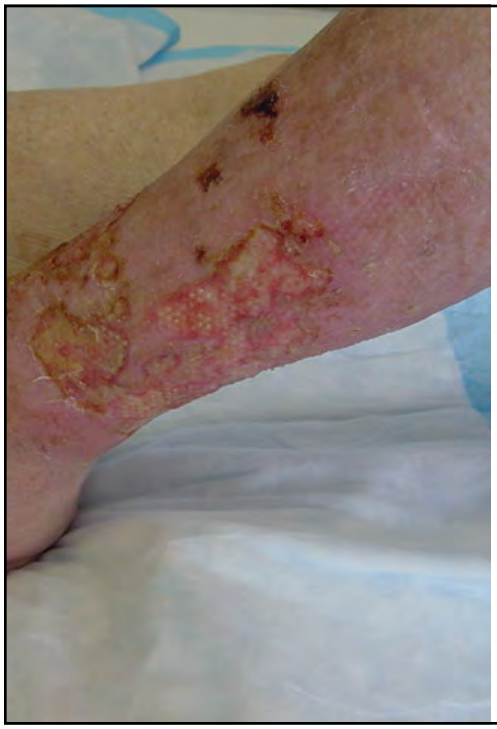


Dr. R. Kohr 2020

When you are looking at the wound:

- Treat the underlying cause(s)
- Prepare
- Protect
- Dressing: ABCD
- **E**ducate the patient/family

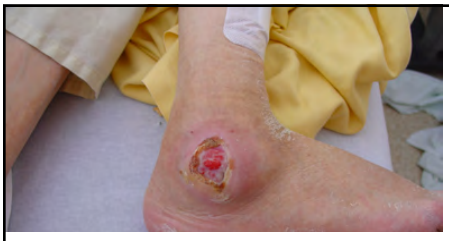
Dr. R. Kohr 2020

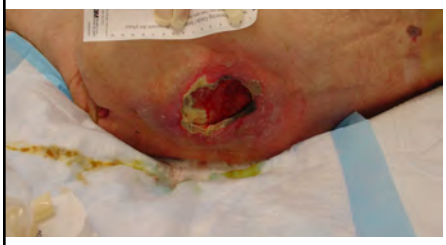


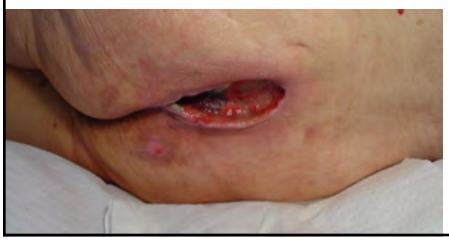
Treat the wound

- **PREPARE & PROTECT** first:
- Use warmed NS or (treated) tap water to cleanse;
- **Irrigate** the wound to get rid of loose debris
- Gently cleanse with dampened gauze

Dr. R. Kohr 2020





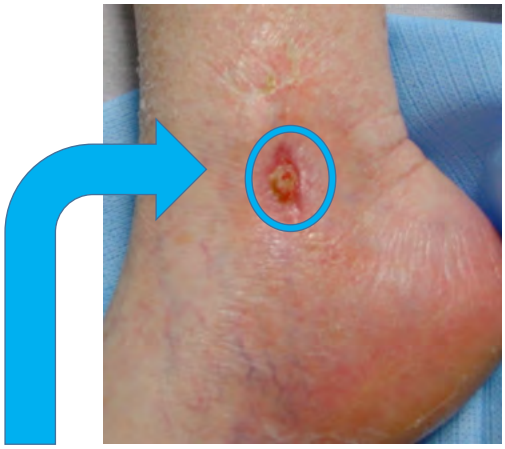


Irrigate, and then irrigate again…

- **APPROPRIATE PSI: 8 – 15 .**
- **USE WARMED IRRIGANT;**
- **POSITION BODY TO PROVIDE PASSIVE DRAINAGE OF IRRIGANT SOLUTION**
- **WEAR PROTECTIVE EYE/FACE SHIELD!!**

Dr. R. Kohr 2020

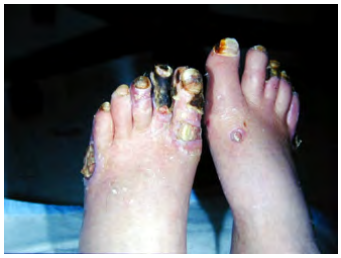
PROTECT the PERI-WOUND SKIN

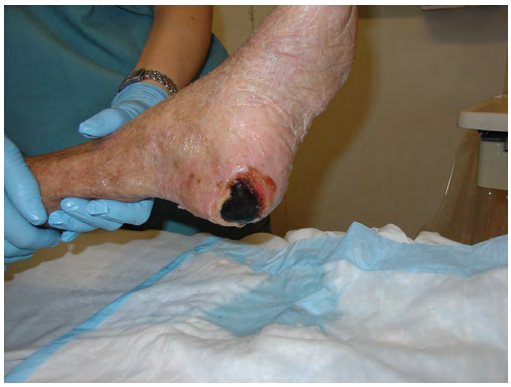


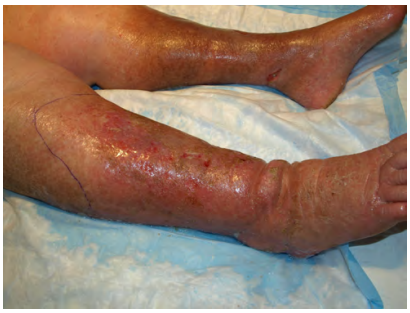
BARRIER FILM/WIPE AROUND THE PREPARED WOUND, ONLY ON PERI-WOUND SKIN.
IF USING A SILICONE DRESSING, NO NEED FOR ADDITIONAL BARRIER/SKIN PREP.

Dr. R. Kohr 2020

Dressing selection:
Is the wound healable?
Is it infected?







Dr. R. Kohr 2020

Manage the WOUND

	BARRIERS	
Exudate (Amount)	Bacteria	Necrosis (CRAP)
Moisture Balance	REDUCE	DEBRIDE

Dr. R. Kohr 2020

How to choose a dressing: A B C D s

A AMOUNT (of fluid)
B BACTERIA
C CRUST
D DRY
S Skin Tears

Dr. R. Kohr 2020

ABCDs promote healing as well as protect non-healing wounds:

- Maintain optimal environment for healing
- Decrease trauma to the fragile granulating tissue of wound bed
- Decrease frequency of dressing change
- Decrease patient pain at dressing change
- Cost effective

Dr. R. Kohr 2020

Dressing Selection: ABCDs A = Absorption, B = Bacteria, C = Crap, D = Dry, S= SkinTear	Dressing option(s)
A	
A + B	
A + C	
A + B + C	
B	
B + C	
C	
D	
S	

Dressing type (generic):

- ❑ Contact Layer,
- ❑ Polymer (bead) fibre,
- ❑ Foam,
- ❑ Absorbent Acrylic,
- ❑ Hydrocolloid,
- ❑ Hydrofibre,
- ❑ Calcium Alginate,
- ❑ Hypertonic Sodium,
- ❑ Island Dressing,
- ❑ Barrier,
- ❑ Silver,
- ❑ Iodine,
- ❑ Honey dressings,
- ❑ Gentian Violet/Methylene Blue,
- ❑ PHMB-impregnated gauze.

Dr. R. Kohr 2020

AMOUNT of FLUID

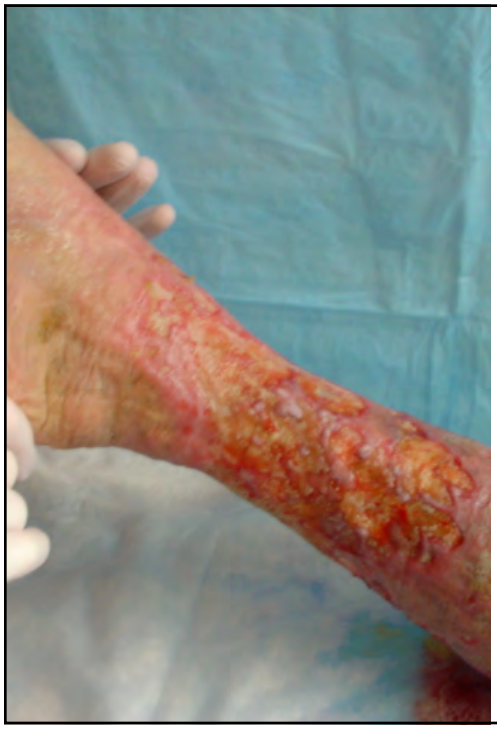
VERY HEAVY – soaks through pads requiring frequent dressing changes (O.D. +)

HEAVY to *moderate* – dressing requires changing q 1-2 days)

Light – dressing change q 5-7 days

***Minimal* or *DRY* – protective dressing (stays on as long as possible)**

Dr. R. Kohr 2020



DRESSING selection DEPENDS ON: bacteria

- **Goal: decrease the bacterial burden**
- **Unless systemic infection, treat with topical antimicrobial dressings**
- Topical options:
  - Salt, silver, honey, iodine, Hydrofera Blue®, PHMB

Compression is possible while infection present.

Dr. R. Kohr 2020

B: Bacteria

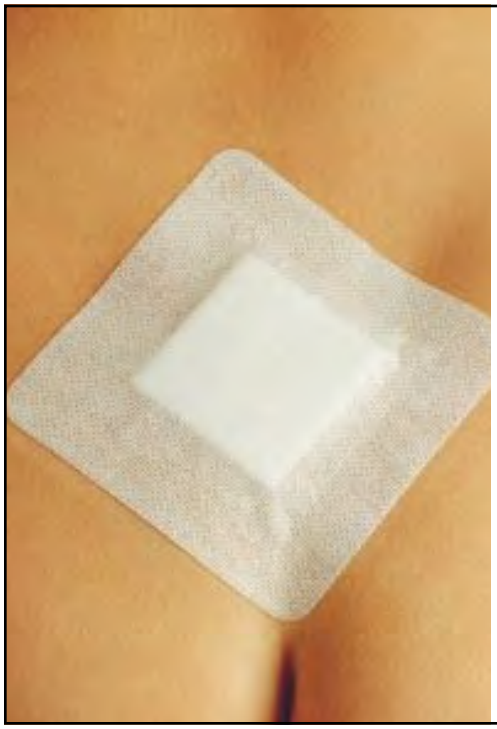
- **In wounds, often drainage increases w bacterial load:**
- TOPICAL DRESSING OPTIONS:
  - Silver –any dressing with "AG"
  - Medical-grade Honey
  - Hypertonic sodium (eg: Mesalt: **daily**)
  - "Iodine"in slow-release form
    - (eg: Iodosorb®/Inadine®) **q 3 days**
  - Hydrofera Blue ®
  - PHMB

Dr. R. Kohr 2020

C: Dressing depends on Cleaning up the Crust

- Use an "autolytic" debrider component
- Key: leaving the dressing intact as long as possible to allow autolytic debridement to occur.
- Examples:
- hydrocolloid (e.g., Comfeel ®, Tegaderm®)
- Medical-grade honey (paste/patch with colloid)
- foam (Mepilex®, Biatain®)
- And sometimes hypertonic salt (Mesalt®)

Dr. R. Kohr 2020



D = DRY WOUND

- When you don't need a dressing for **"A, B, or C"**
- Just need something to cover, protect:
  - Virtually no drainage
  - Healing well
  - Moving towards closure
- Choose something "cheap & cheerful" (e.g., an Island dressing – gauze with gentle tape)

Dr. R. Kohr 2020

Summary of common chronic wounds

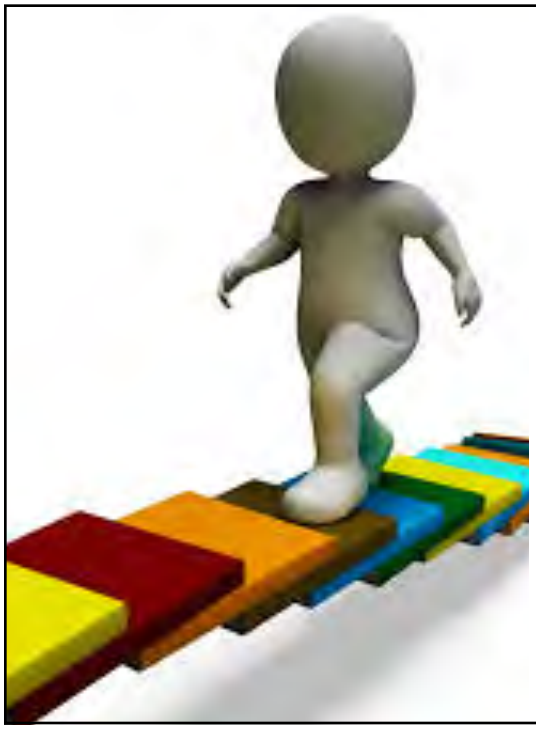
Chronic Wound type	Location	"need to know/do"
PRESSURE ULCER/INJURY	Bony prominence Coccyx, heel, back of head, etc	OFF-LOAD THE PRESSURE TULC
DIABETIC FOOT ULCER	Foot (ankle, sole of feet, toes, heel)	PRESSURE-RELATED Lack of sensation to extremities MONO-FILAMENT TEST
VENOUS LEG ULCER	Lower limb: from ankle to knee	COMPRESSION (but only after ABPI/flow study) "compression for life"
ARTERIAL/ISCHEMIC	Lower limb, feet, toes	Poor healability (poor blood flow) KEEP DRY (e.g., Betadine)
SKIN TEARS	Arms, legs, back	Avoid adhesives (tape, transparent film) Wrap to protect

Dr. R. Kohr 2020

Dressing selections:

Type of Dressing	What does it do/special features
Barrier (cream, film, wipe, spray)	Protects skin & peri-wound skin Allows moisture vapour transfer Reapply q 24 hours or prn
Absorbent Acrylic	Protects skin & peri-wound skin Allows moisture vapour transfer Stays on 3 weeks +
Foam	Absorbs, wicks away drainage Stays on 5 + days
Hydrocolloid	Occlusive (not for infected wounds) Stays on 5-7 days
Calcium Alginate/hydrofibre	Wicks away drainage Needs a cover dressing (unless in pad format)
Hydrogel	Donates moisture to wound bed Scant amount required Cover dressing (e.g., Medipore w pad)

Dr. R. Kohr 2020



Let's see what we've learned!!!

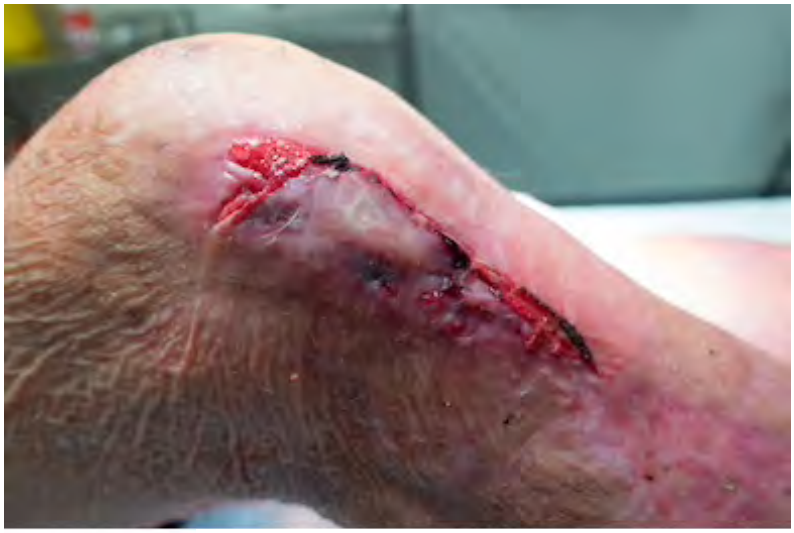
See Clinical Examples

Dr. R. Kohr 2020

Clinical Examples

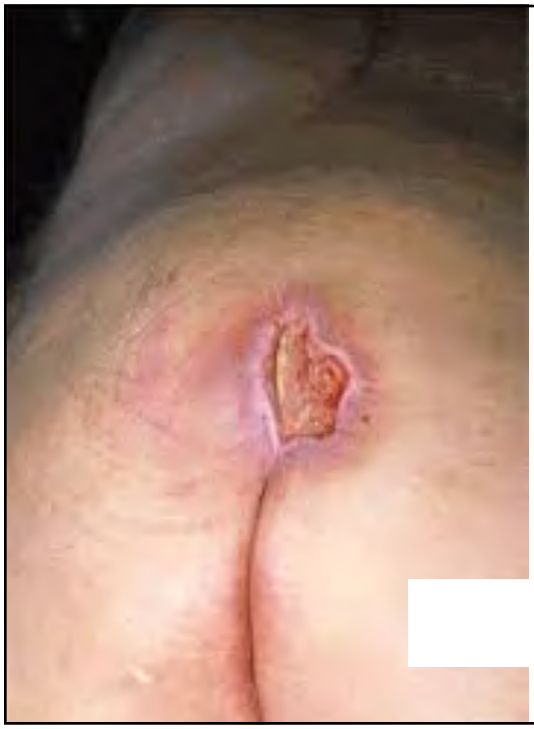
1. Treat the underlying cause (TULC)
2. Prepare & Protect (P & P)
3. ABCDs of wound dressing selection

Dr. R. Kohr 2020



1.Knee

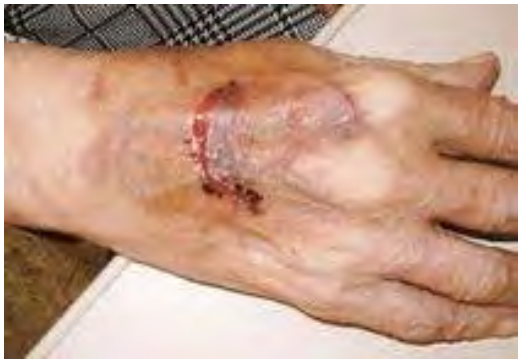
Dr. R. Kohr 2020



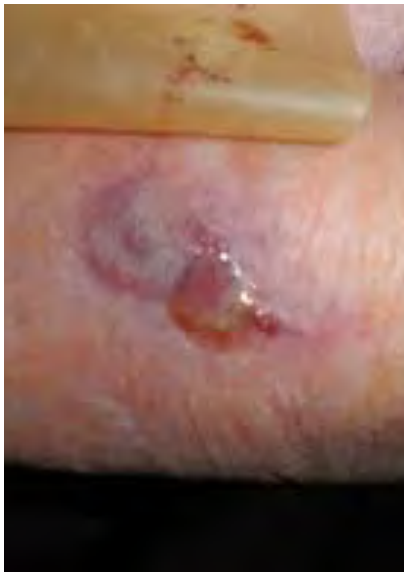
2. Sacrum

Dr. R. Kohr 2020

3. Hand

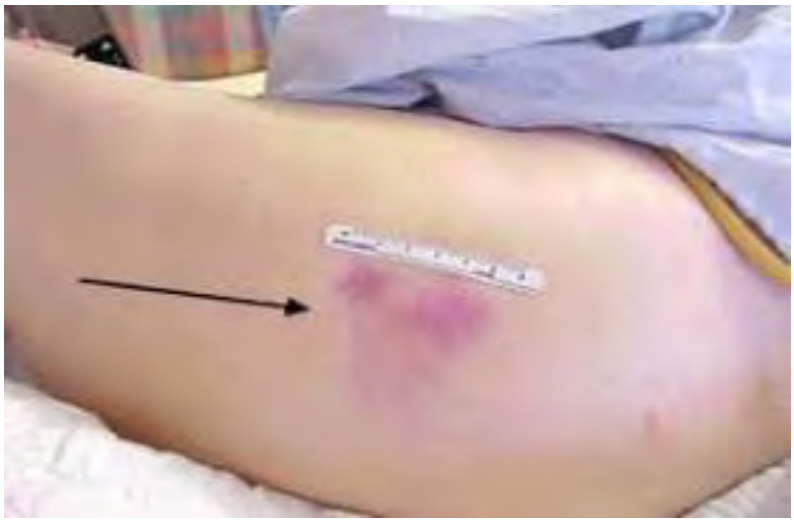


Dr. R. Kohr 2020



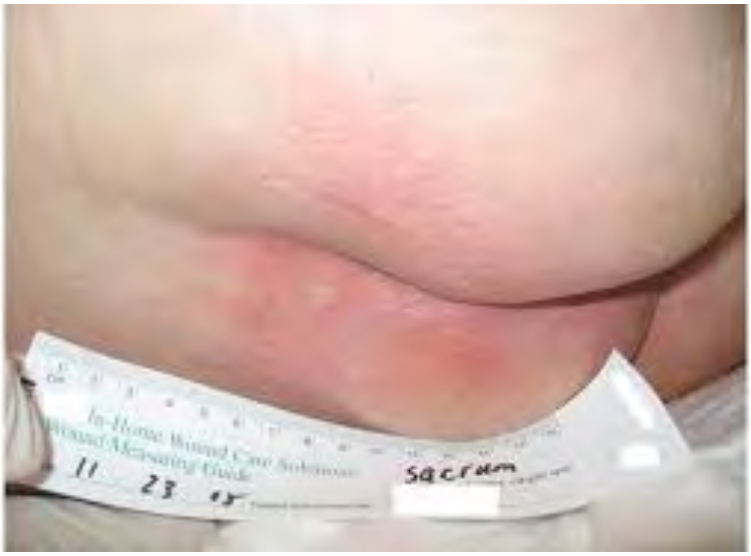
4.Is a hydrocolloid the appropriate dressing?

Dr. R. Kohr 2020



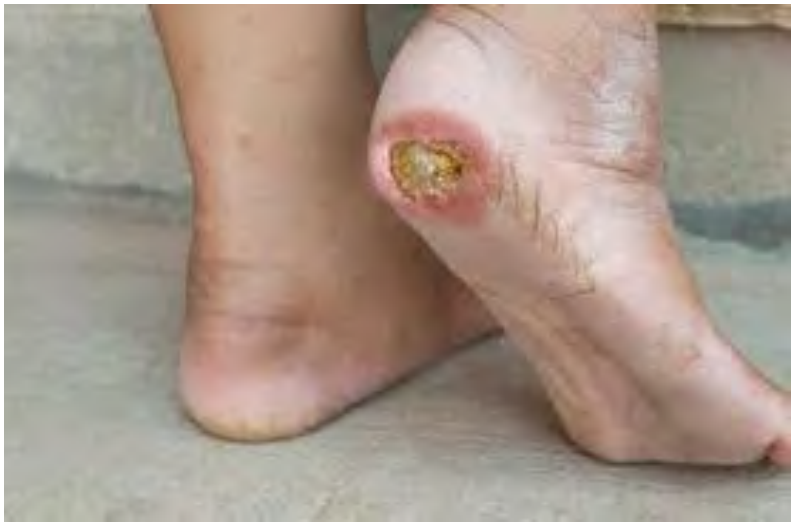
5. Hip: what's going on here?

Dr. R. Kohr 2020



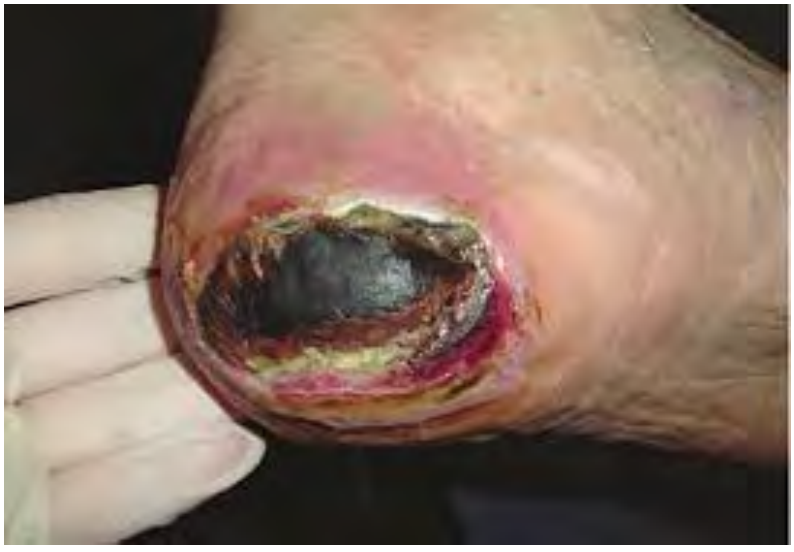
6. Sacrum/buttocks

Dr. R. Kohr 2020



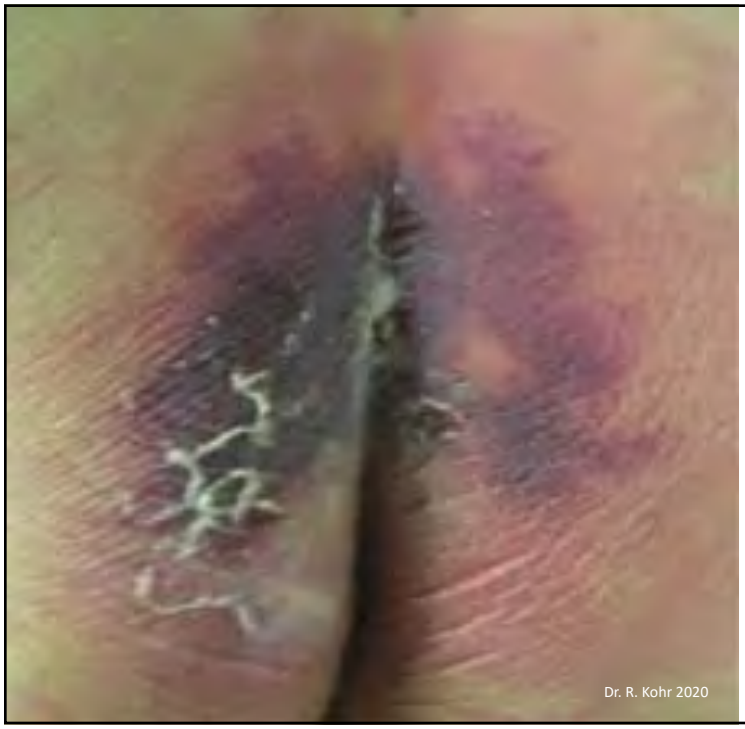
7. Heel

Dr. R. Kohr 2020

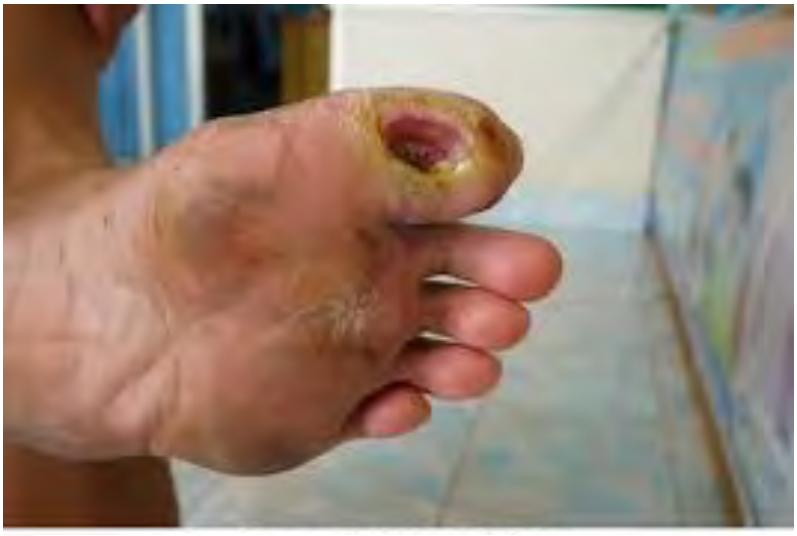


8. Heel

Dr. R. Kohr 2020

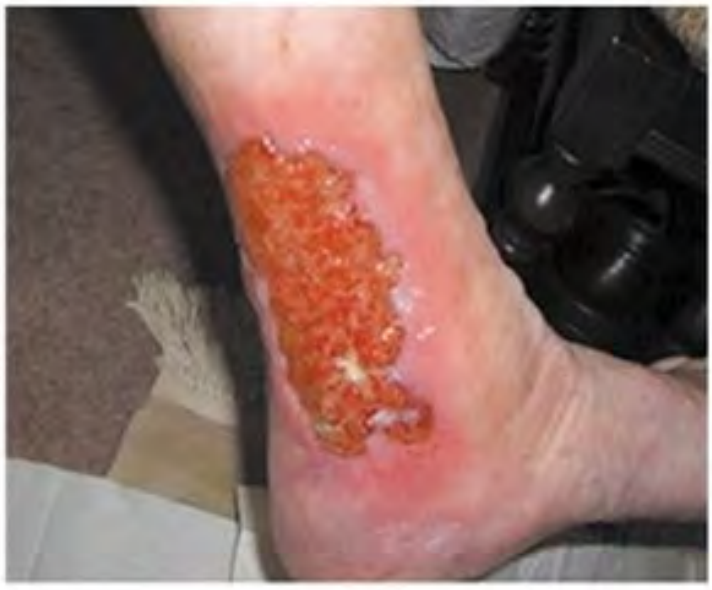


9. Sacrum



Dr. R. Kohr 2020

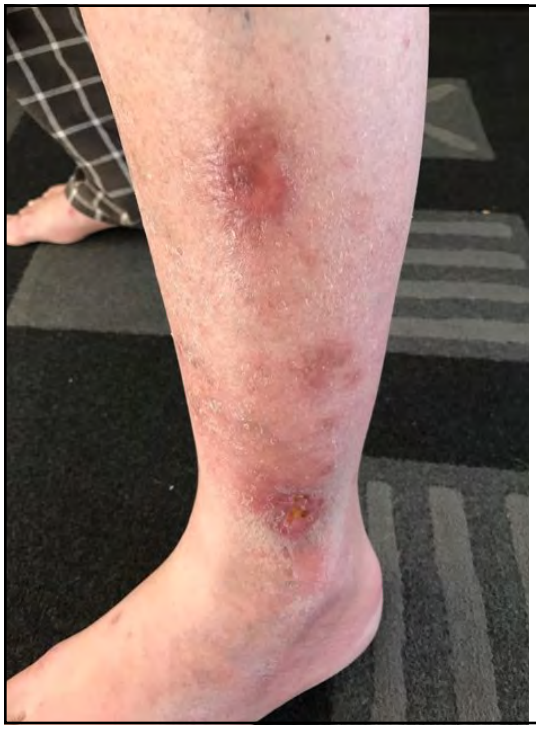
10. Foot



11. Lower leg

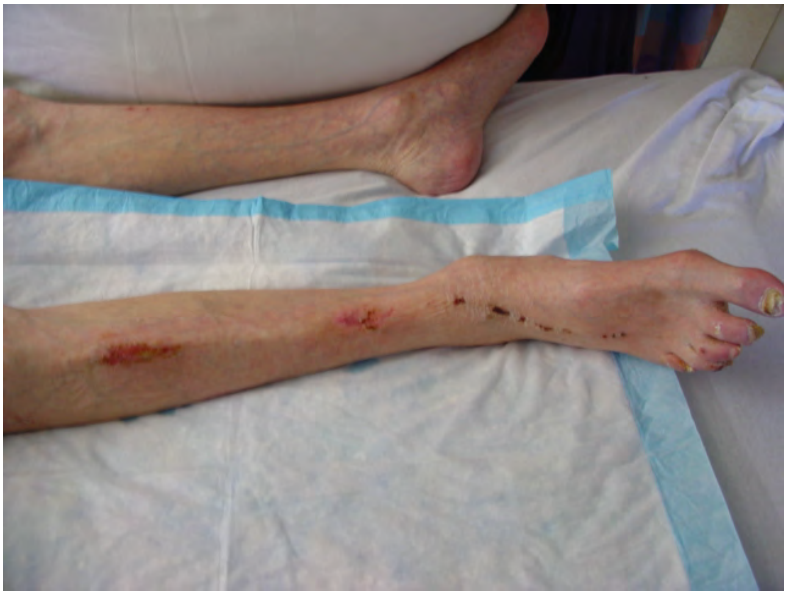
12.

Dr. R. Kohr 2020



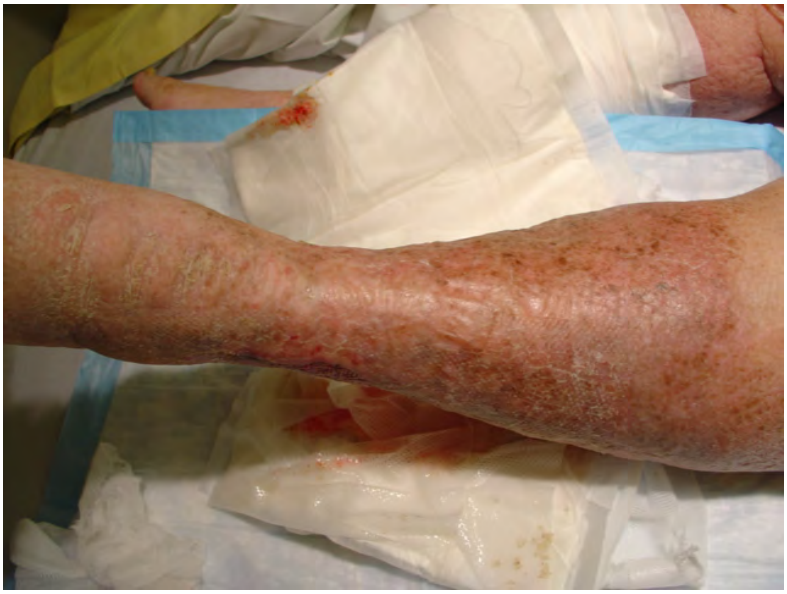
13. Lower leg

Dr. R. Kohr 2020



14.

Dr. R. Kohr 2020



15.

Dr. R. Kohr 2020

Good to go...

- Next steps:
  1. Complete self-assessment (test)
  2. Complete course evaluation

  - These are both located on the course page
  - Send **both** in to HLLN in order to receive your certificate of completion

  - Must be submitted by the end-of-day tomorrow.

  - You will receive the certificate as well as the answer-key to the test (it may take several weeks to receive the certificate
  - If you are applying for reimbursement through the Nurses Education Fund, ask HLLN to send you a letter (required along with your receipt).

Dr. R. Kohr 2020

And finally...

Interested in more on wound care?

- Advanced (Level 2) Wound Care course
- Like/join the Kohr Consulting Facebook page
- Join Wounds Canada (get on their mailing list)
- Check out the wound care companies' websites for up-coming webinars, etc

Always ask yourself: What is this wound telling me it needs?