
An Approach to Wound care: From Diagnosis to Dressings

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Faculty/Presenter Disclosure

- **Faculty: Mark Karanofsky**
- **Relationships with commercial interests:**
 - Advisory Board Medfar Solutions – EMR company



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Disclosure of Commercial Support

- This program has not received financial support
- This program has received in-kind support in the form of dressing supplies from various dressing companies for demonstration purposes
- **Potential for conflict(s) of interest:**
 - Products will be used for demonstration and not all available products will be handled in each class

Mitigating Potential Bias

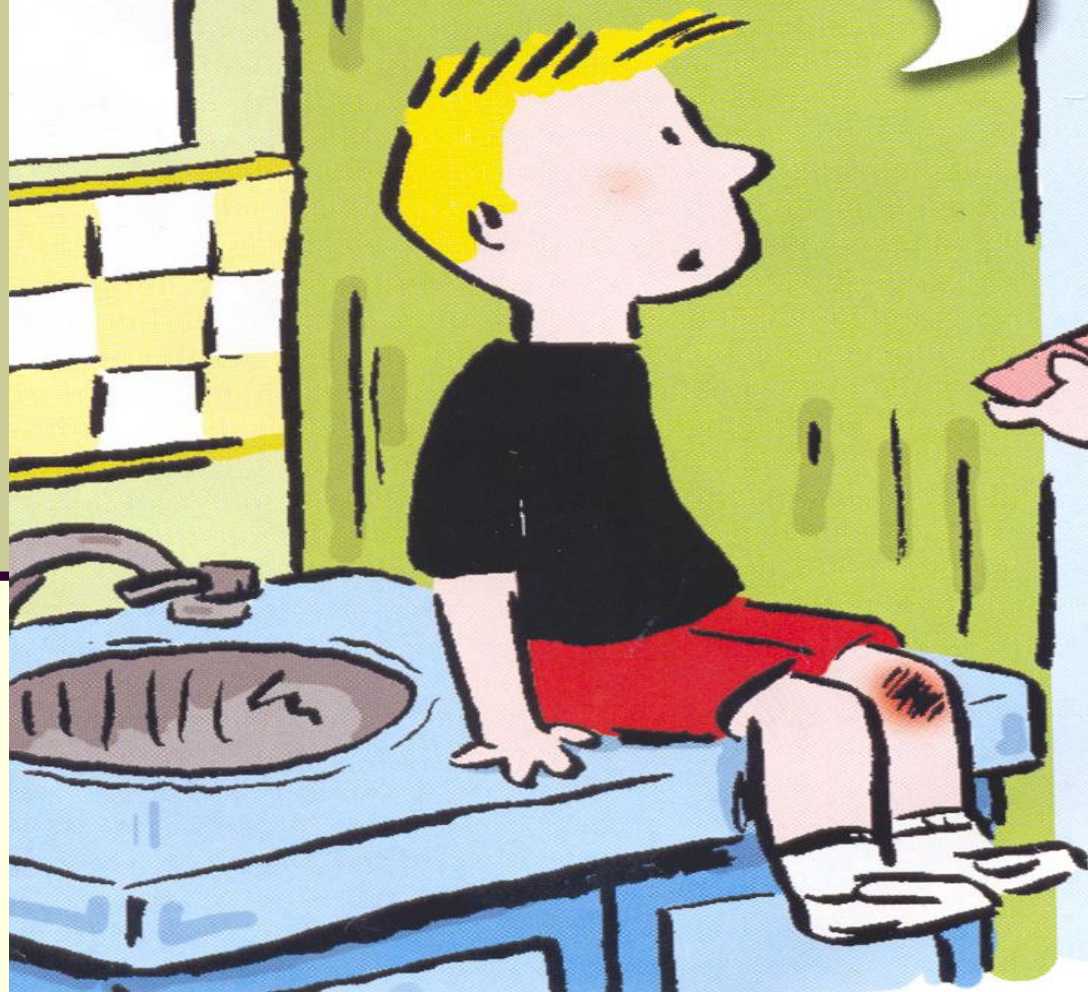
- Products used will be discussed within the context of class of dressing and alternatives will be mentioned
- The speaker has no connection to the dressing supply companies other than the request of samples of demonstration purposes
- No company has had any influence in the content of this workshop



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"I FEAR THAT THIS IS JUST A BAND-AID SOLUTION TO A MUCH DEEPER PROBLEM."



STORMS

e

Objectives

- Review the assessment of legs and ulcers
- Discuss approach to wound care
- Review common (and uncommon) dressings and their uses
- Review Strategies to prevent foot ulcers

Challenges

Evidence



Case 1 – Mr. L

- 55 year old male presents to the clinic with a two month history of an ulcer on his left leg

- PMHx:
 - Diabetes
 - PVD
 - Hypertension



- He was told he had a diabetic ulcer
- Do you agree?

Person With A Chronic Wound

Diagnose the Wound

Treat the cause

- Address co-factors affecting healing

Local Wound Care

Patient Centered Concerns

- Adherence to plan of care
- Quality of life
- Caregiver/family

Debridement

Inflammation or Infection Control

Moisture Balance

Edge of Wound

Active therapies

- Biological agents (acellular and cellular)
- Skin grafting
- Adjunctive therapies

Modified from: Sibbald RG, Orstead HL, Coutts P, Keast DH. Best Practice Recommendations for Preparing the wound bed: Update 2006. In: Wound Care Canada 2006;4(1)15-29

The Diagnostic Challenge



Name that wound/foot/leg ...











Different Types of Wounds

■ Acute

- Surgical
- Laceration
- Skin tears
- Burns
- Crush
- Trauma

■ Chronic

- Venous
- Arterial
- Pressure
- Diabetes
- Malignancy
- Vasculitis
- Pyoderma gangrenosum

Venous Ulcer



Arterial Ulcer



Pressure Ulcer



Staging of Pressure Ulcers

Suspected Deep
Tissue Injury



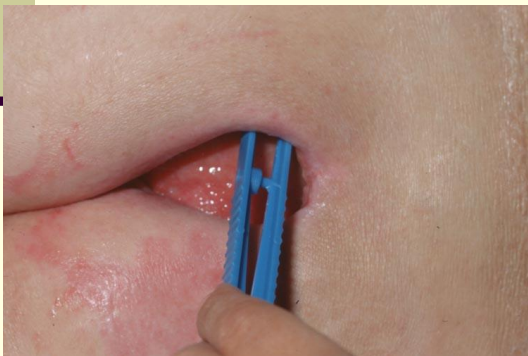
Stage I



Stage II



Stage III



Stage IV



Unstageable



Diabetic Foot Ulcers



Diagnosis

- History
- Physical examination
- Biopsy



Case 1 continued Mr. L

- You decide that this is not a “diabetic ulcer” but rather an ulcer in a diabetic patient.
- What would you look for on a lower leg assessment to help you diagnose and evaluate the patient?



Lower Leg Assessment

- Goals of a lower leg assessment
 - Presence of Ulcerations
 - Evidence of Venous Insufficiency
 - Evidence of Arterial Insufficiency
 - Evidence of Neuropathy
 - Evidence of Good Foot and Nail care

- Always look between toes for tinea and ulcers

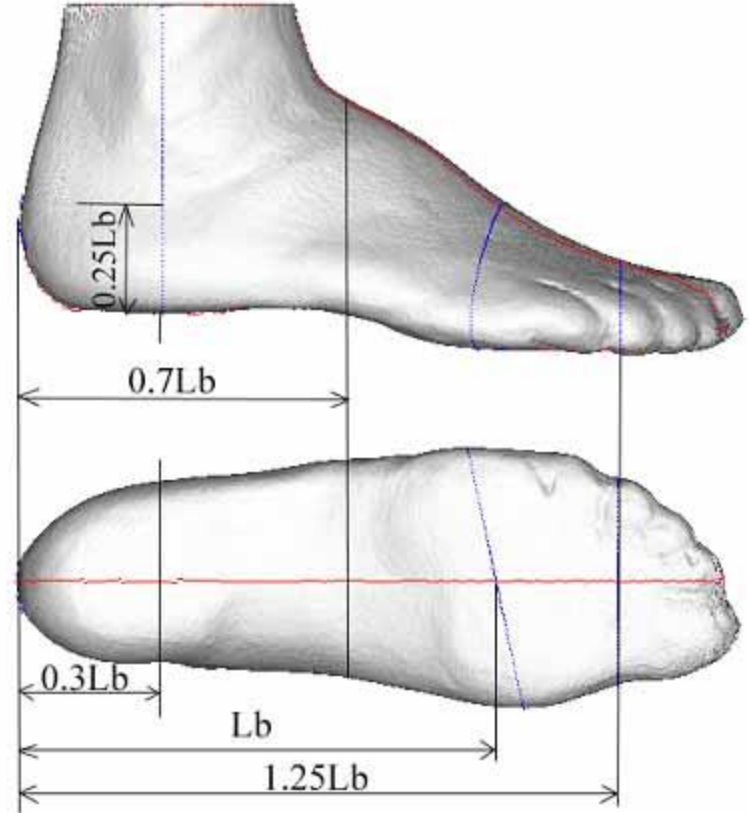
Signs of Neuropathy

- Corn/Callouses
- Claw toes
- Decreased sensation

Shoes and footwear !!!!



How to measure a foot



Shoe Fit Test

- Low cost – perfect for Quebec
- Take off Shoe
- Trace foot on a piece of paper
- Put shoe back on paper
- If foot is wider than shoe – it does not fit.

Shoe test

- Even cheaper version in shoes that have removable insoles:
- Remove insole
- Stand on Insole
- If foot hangs over edge – too small a shoe

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Treating the Cause

- Is it still bleeding?
- Where is the pressure coming from?
- Can the circulation be improved?
- Is there too much extracellular fluid?



Case 2 – Mr. D Martin

- 36 year old type I DM
- Presents with an acutely swollen, red hot left foot after twisting it at work
- X-rays normal
- Sugars elevated
- What is possibly going on?

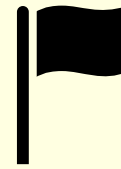


Charcot Foot



Diabetic foot offloading devices

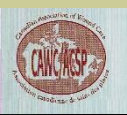




Beware

It is not always safe to fix all causes of wounds!

- Compression of legs can cause CHF
- Debriding an arterial ulcer can lead to major infection and a larger non-healable wound
- Malignant wounds can sometimes be non-healable



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GREENVILLE, SC



Local Wound Care

- D – Debridement
- I – Infection/inflammation
- M – Moisture balance
- E – The Edge effect

Case 3

45 year old man with
diabetic foot ulcers

Wound “not healing
for 2 months”

What do you see?

How would you
debride?



Debridement

- Autolytic
- Mechanical
- Enzymatic
- Biologic
- Sharp or Surgical

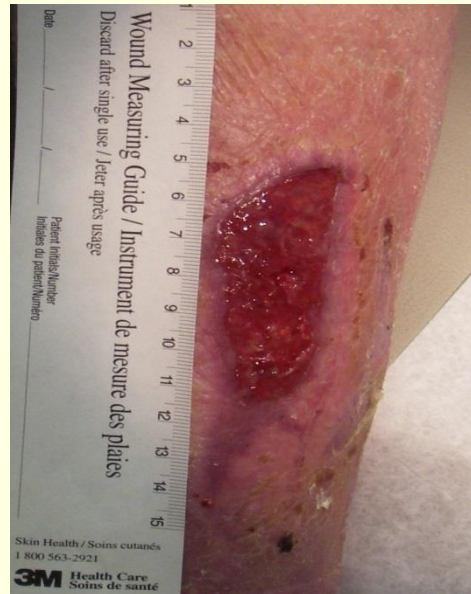


Debridement

Good sharp debridement can be the most important step in healing a wound.



Visit 1



Visit 2



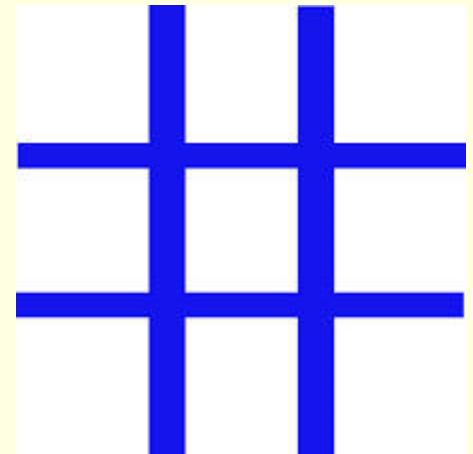
Visit 3



How to debride a wound

Debridement

- Not a sterile procedure
- Can score (tic tac toe board)
- Can fully debride – may need freezing!!
- Remove debris, necrotic tissue derroof an ulcer
- Need a scalpel



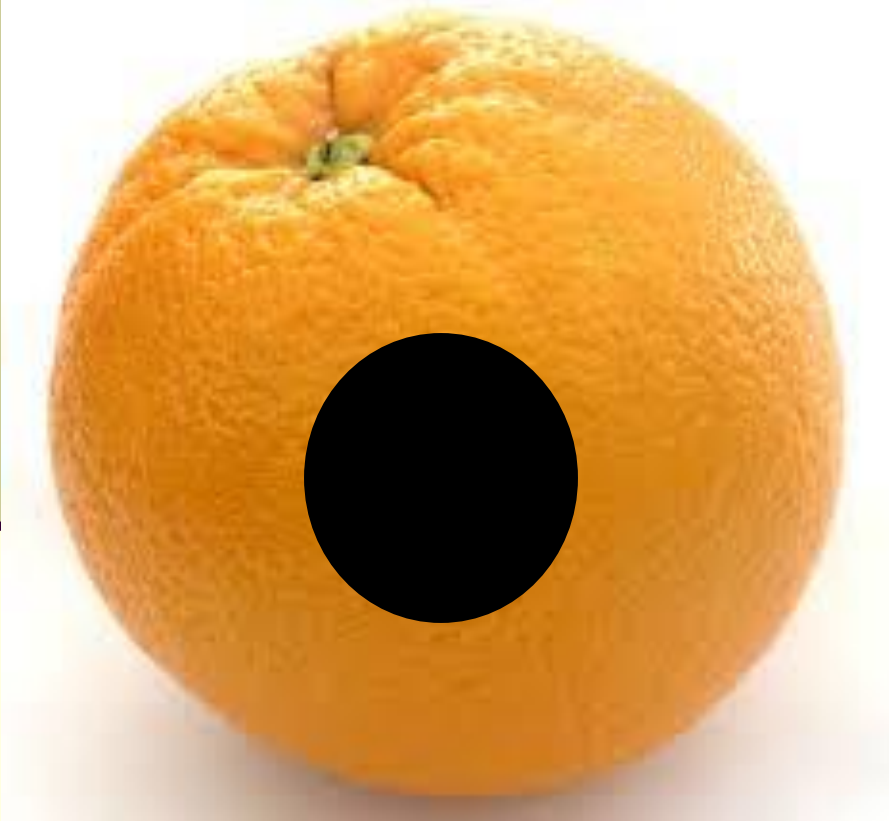
Rules of Debriding

- Cut the Patient
- Don't cut yourself

In a teaching setting:

Don't cut Me

Direct the blade at all times away from your own radial artery.



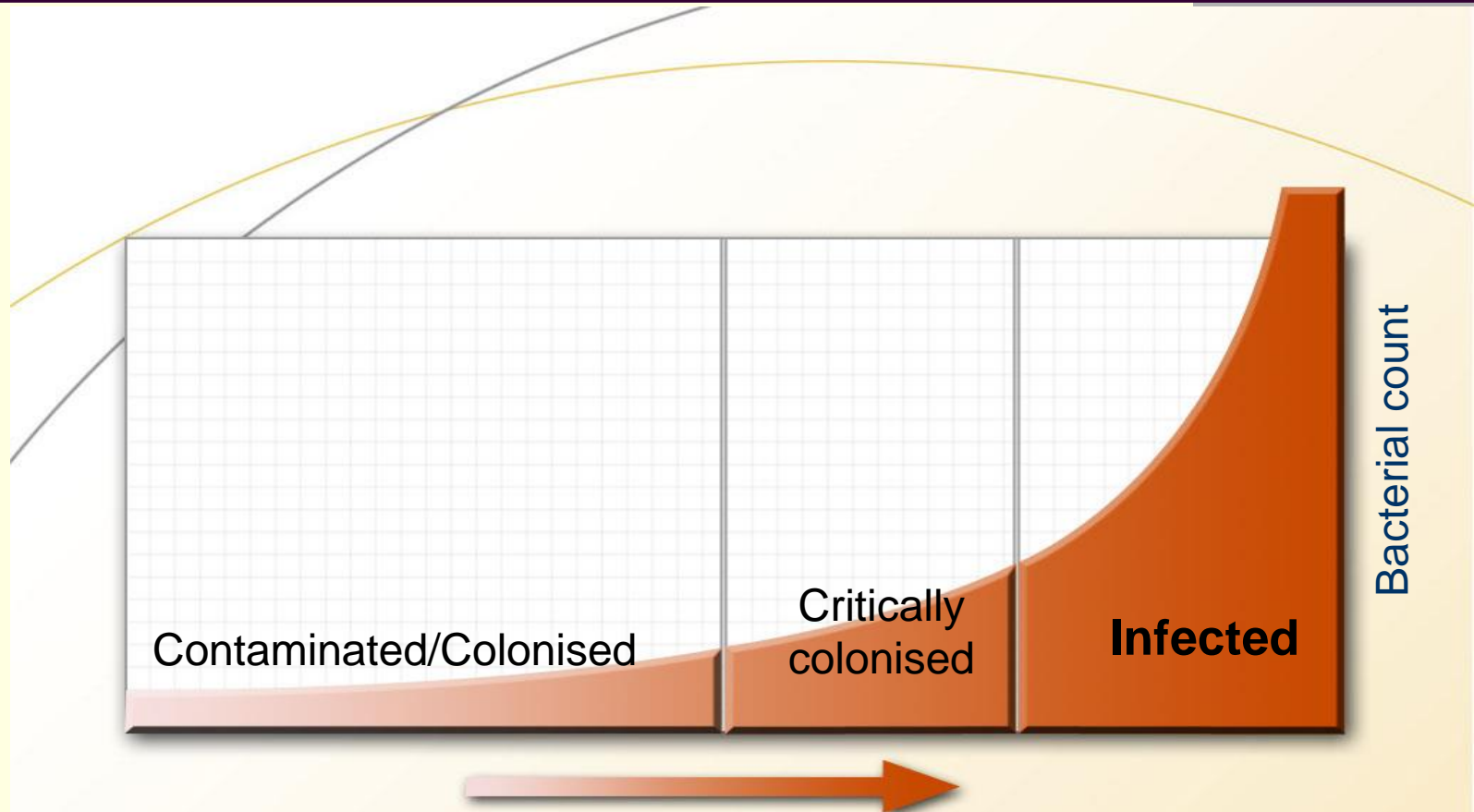
- Debride the peel without cutting the pulp



Case 4

- Is this wound infected?
- Should a topical antibiotic cream be used here?
- What dressings can be used to fight infections?

Infection

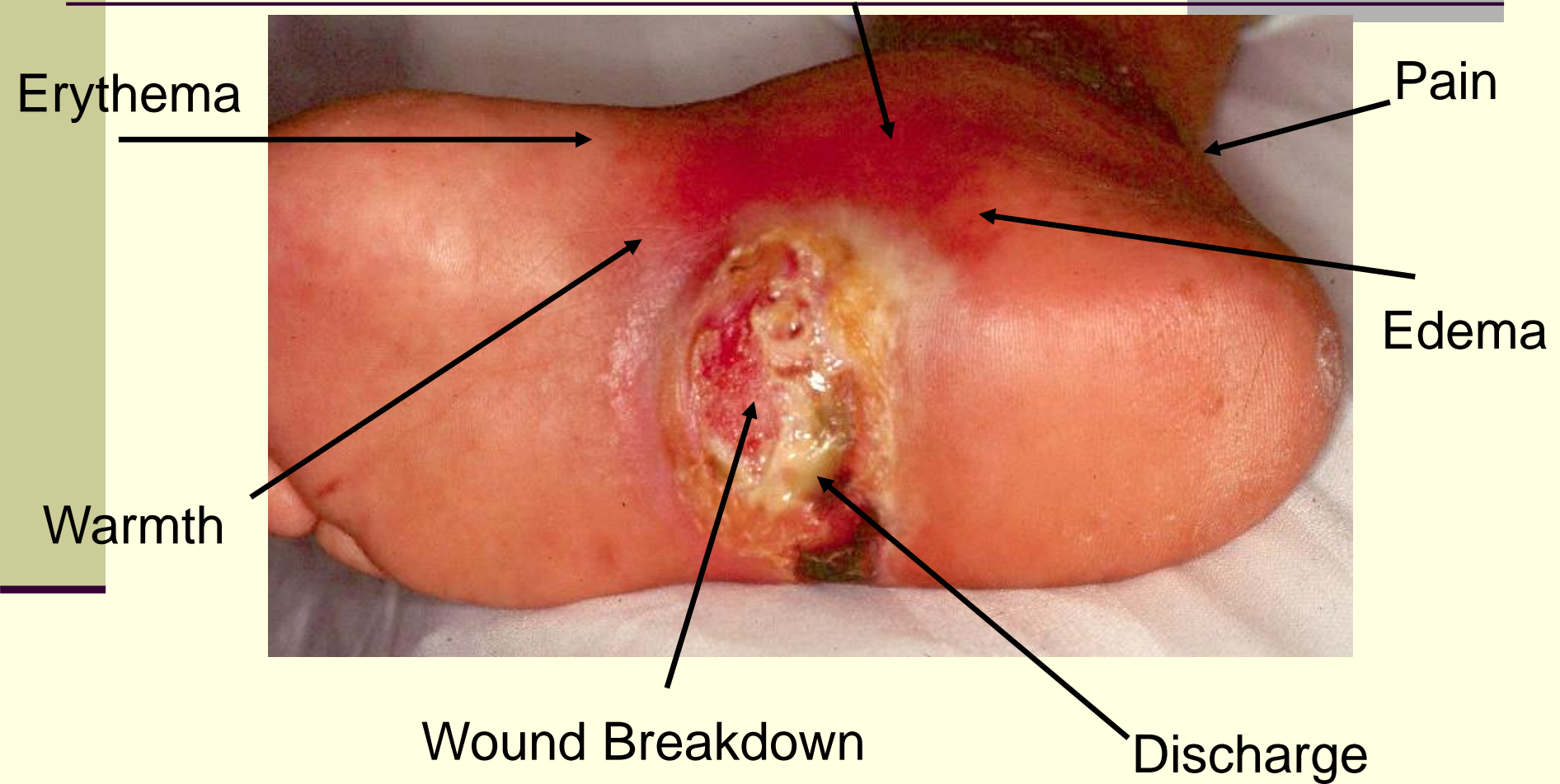


Bacterial count rising = signs of infection increase

Adapted from Flanagan 2003

Classical Signs of Overt Wound Infection

Lymphangitis/Cellulitis





99 1



Dressings that Fight Infection

■ Silver Dressings

- Aquacel Ag
- Acticoat
- Silvercel
- Biatain Ag
- Prisma
- Mepilex Ag



■ Iodine

- Iodosorb Paste
- Iodosorb Mesh
- Inadine



Case 5

- 74 year old diabetic male
- 3 month history of ulcer on right leg
- CLSC applying dry dressing and fucidin every 2 days



Case 6



What would you do?

Inflammation

- Is the tissue swollen or edematous?
- How do you control excessive edema?



Ankle/Brachial Index (ABI) Results

(Note: Use the higher arm pressure for both the left and right ABI calculations.)

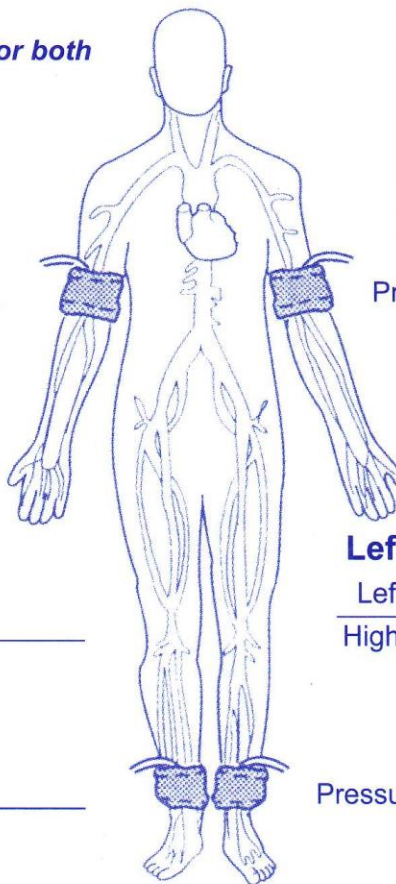
Ankle/Brachial Index Interpretation*

- 0.96 or Above - Normal
- 0.71 - 0.95 - Mild Obstruction
- 0.31 - 0.70 - Moderate Obstruction
- 0.00 - 0.30 - Severe Obstruction

*Buchbinder & Flanigan, "Arterial Disease of the Lower Extremities"

Pressure: _____

Pressure: _____



Right ABI

$$\frac{\text{Right Ankle Pressure}}{\text{Highest Arm Pressure}} = \frac{\text{mmHg}}{\text{mmHg}} = \underline{\hspace{2cm}}$$

Left ABI

$$\frac{\text{Left Ankle Pressure}}{\text{Highest Arm Pressure}} = \frac{\text{mmHg}}{\text{mmHg}} = \underline{\hspace{2cm}}$$

Pressure: _____

Pressure: _____

$$\text{Example} = \frac{\text{Ankle Pressure}}{\text{Brachial Pressure}} = \frac{125 \text{ mmHg}}{114 \text{ mmHg}} = \underline{1.09} \text{ (See ABI chart on back)}$$

ABPI

ABPI	Interpretation	Treatment
0.8-1.1	Normal	High Compression
0.5-0.8	Moderate impairment	Modified/low Compression
< 0.5	Severe impairment	No compression
>1.1	Usually calcified vessels (eg DM)	Consider alternative Dx techniques

Compression



- 30-50 mmHg compression dressings
- Can modify to get less pressure
- Must be used prior to stockings
- After healing – stockings for life



Moisture

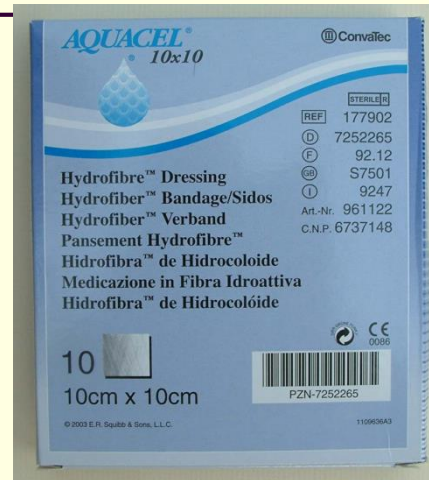
- A balancing act

If it's dry - wet it
If it's wet – dry it



Absorbent dressing

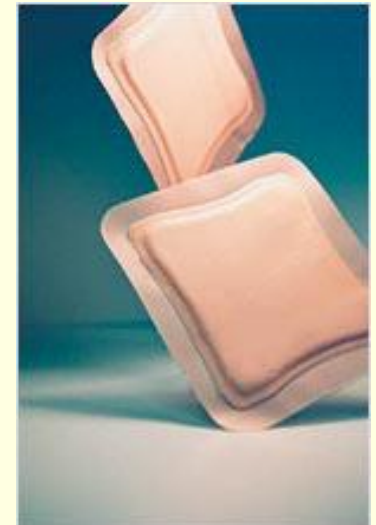
- Foam
- Hydrofiber
- Alginate
- Mesalt
- Semi-permeable membrane



Week 1



Week 10



Moisture donors

- Hydrogels
- Hydrocolloid
- Composite dressings



Edge

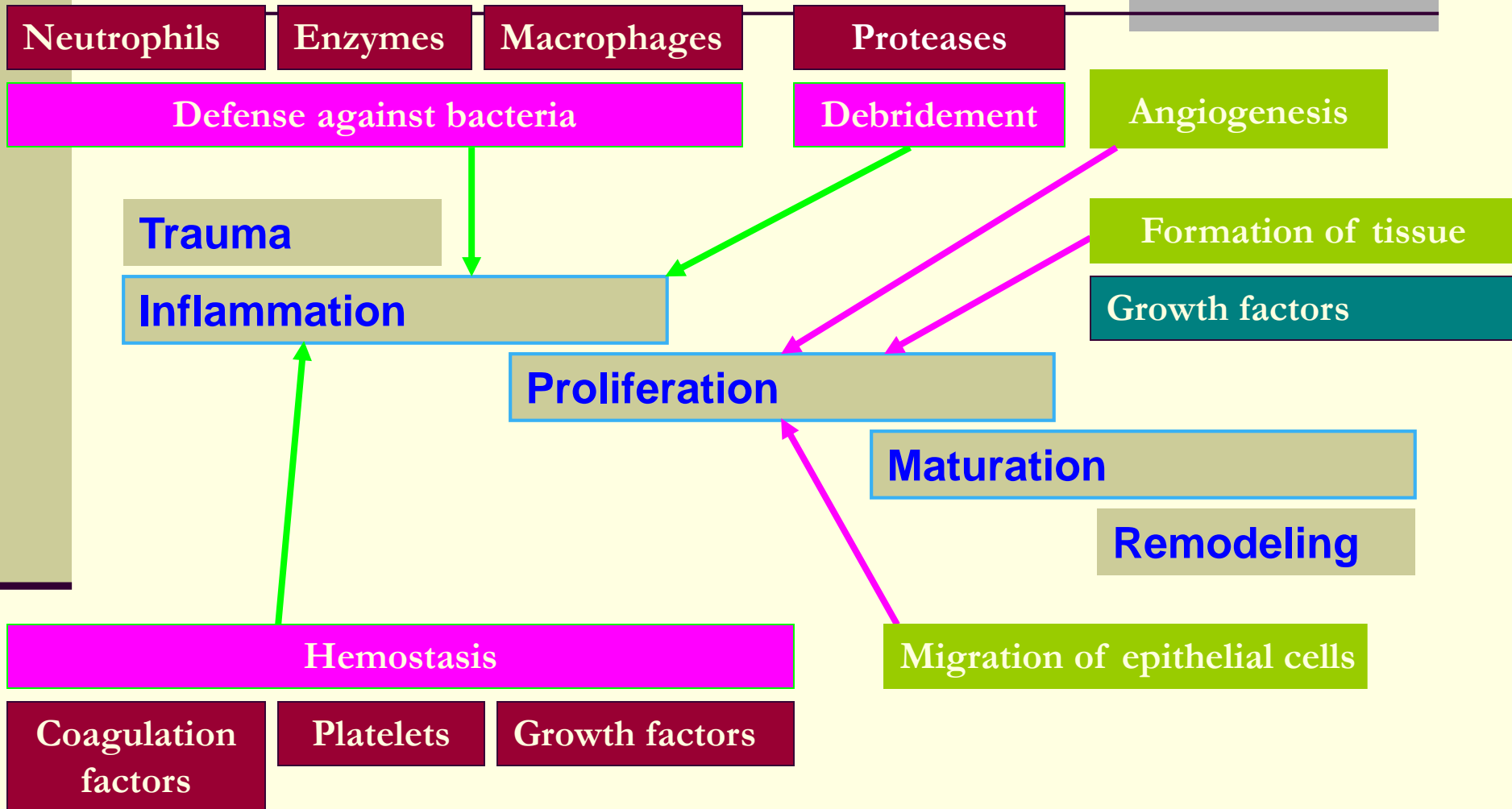
- Consider novel treatments when despite optimal wound care, the wound still does not heal
- A 20% to 40% reduction of wound area in 2 and 4 weeks is likely to be a reliable predictive indicator of healing weeks. (Flanagan 2003)



Major Pitfall



Normal Healing Process



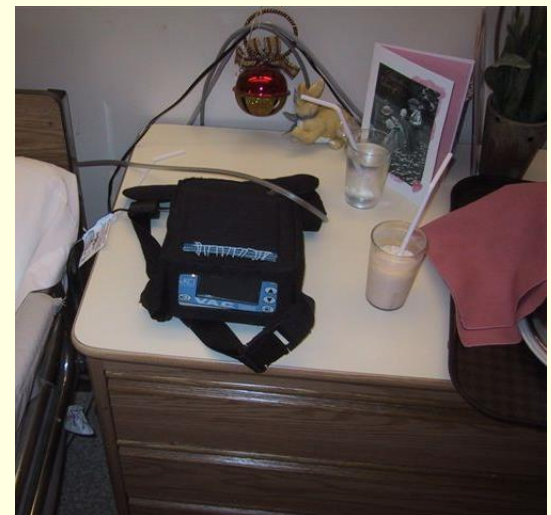
Matrix Metalloproteases

- Cause wound degredation
- Elevated more so in chronic wounds
- Dressings modulate and re-balances the wound environment
- Binds and inactivates matrix metalloproteases
Protects growth factors



Negative Pressure Wound Therapy

- Can be used in acute and chronic wounds
- Establishes moisture balance
- Removes debris and excess moisture
- Promotes contraction of the wound



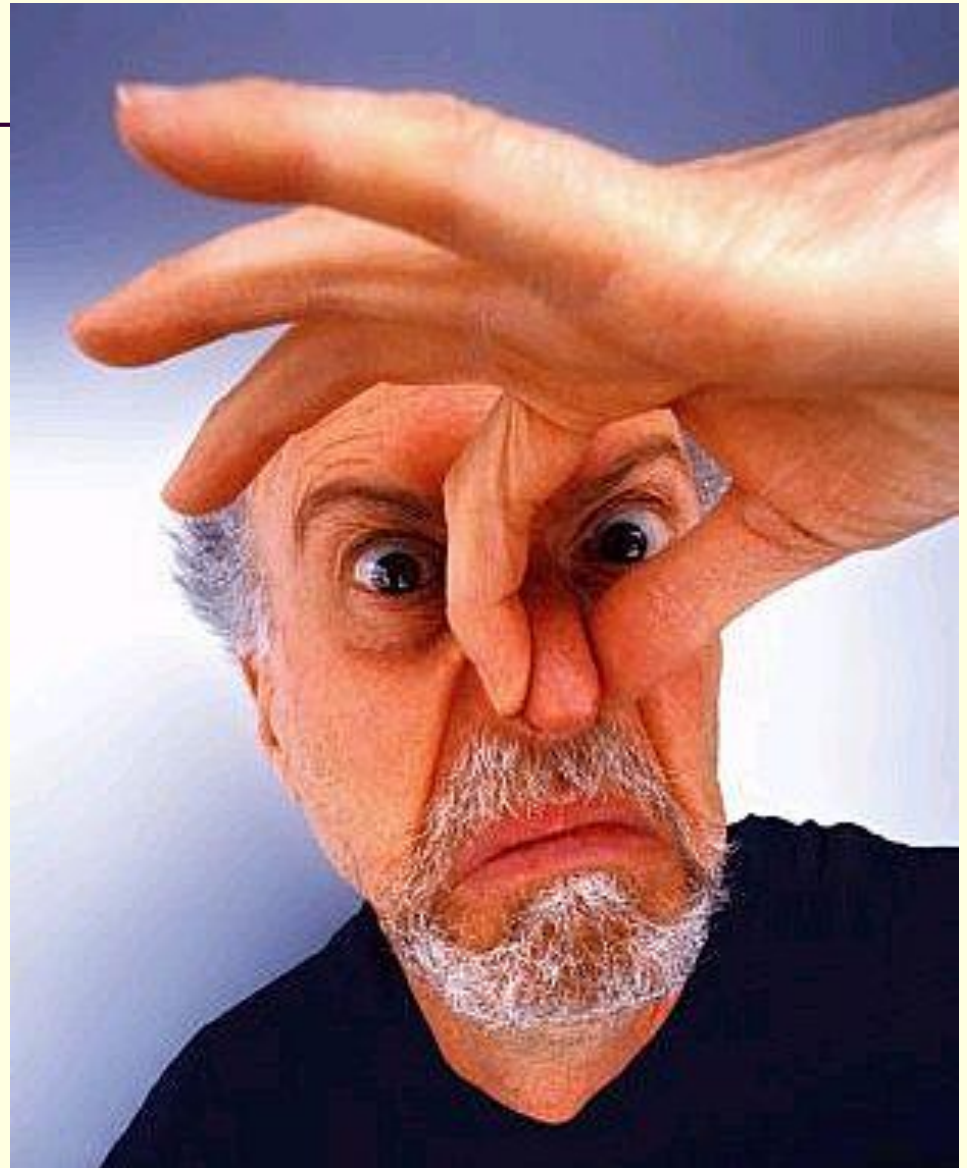
Other treatments

- Ibuprofen containing dressings
- Silicon dressings
- Skin grafts
- UV light therapy
- Maggots
- Hyperbaric oxygen therapy
- Electrical stimulation



Last Case

- The wife of your patient complains that a wound smells really bad and she is thinking about divorce
- The nurses also complain with dressing changes they need to double mask
- What is your approach?



“Smelly” Wounds



Off label Use



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Online resources:

www.cawc.net

www.diabeticfootcommunity.ca

Footwear Advice for Patients

- Shake out your shoes before you put them on.
- Wear shoes at all times, indoors and out.
- Buy shoes with closed toes as they protect your feet from injury.
- Change your socks everyday.
- Buy shoes late in the day as feet tend to swell.
- If you do not have feeling in your feet, have your shoes professionally fitted by a footwear specialist.

Advice for patients

- Look for signs of redness or blisters on your feet. This may show that your shoes do not fit properly or that your feet are not protected from injury.
- Wash your feet daily. Dry well, especially between your toes. Apply a moisturizing lotion to your feet but not between your toes.
- Do not soak your feet.
- If you are unable to reach your toes, do not have feeling in your feet or have problems seeing, have a healthcare professional care for your calluses and trim your toenails regularly.

Education for Physicians

International Interprofessional Wound Care Course (IIWCC)

CAWC

Introductory course offered by the
Canadian Association of Wound Care

Articles to read

- Wound Care Canada – review articles
- NEJM - **Diabetic Foot Ulcers and Their Recurrence** David G. Armstrong, D.P.M., M.D., Ph.D., Andrew J.M. Boulton, M.D., and Sicco A. Bus, Ph.D.
- June 15, 2017
N Engl J Med 2017; 376:2367-2375
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Questions?
