

Recognizing and Using Wound Products Appropriately

Sue Poiron, RN and Marina Potenza, RN
Infectious Diseases, Diabetic Foot and
Complicated Wound Clinic
Health Sciences Centre
Winnipeg, Manitoba

Conflict of Interest Disclosure

- Both speakers are employees of the Health Sciences Centre/Winnipeg Regional Health Authority
- Neither speaker has conflicts of interest
- Demonstration of products in this presentation:
 - Does not constitute an endorsement, rather, these are the products that are currently under contract at the Winnipeg Regional Health Authority

Objectives

By attending this session, the attendee will be able to:

1. Be able to state the names of different classes of wound care products
2. State when different products are appropriate
3. Have a concept of cost as it pertains to dressing products

3 Cases For Context

Case 1: Diabetic Foot Ulcer

History:

- Type 2 diabetes for 10 years
- Plantar ulcer
 - Clean,
 - Minimal exudate,
 - Absent infection,
 - Some callus

Plan of Action:



Case 2: Ulcer of Venous Insufficiency

History:

- Waxing and waning leg ulcer for years
- Prior deep venous thrombosis
- Easily palpable pedal pulses
- Significant edema
- No evidence of infection

Plan:



Case 3: Ischaemic Foot

History:

- Type 2 diabetes for 25 years
- 52 pack year smoker
- Absent femoral, popliteal and pedal pulses
- Dry gangrene of 4th and 5th toes

Plan:



Background

- There are countless dressing products.
- All have unique applications.
- There is remarkably little data to support the use of the products:
 - Some historical observations/reports
 - Some case reports/case series
 - Very few double blind placebo controlled trials
- Cost of products can be staggering, and results are uncertain

Wound Environment

- All wounds need the following to heal:
 - Adequate circulation
 - Removal of trauma/instigating event
 - Toxin free environment
 - Avoid topically applied toxins (eg: peroxide)
 - Adequate moisture, (but not too much...)
 - Absent or control of infection
 - Controlled metabolic conditions:
 - Renal failure
 - Hyperglycaemia
- Studies from the 1960s have shown that a moist environment improved wound healing with more rapid reepithelization

Goal of Wound Healing

- Skin protects tissues/structures beneath, similar to the paint on your vehicle
- Skin performs vital functions:
 - Thermal regulation
 - Barrier to moisture loss
 - Barrier to bacterial invasion
- **Goal of wound healing is to:**
 - Re-establish integrity of skin so it can resume all of its functions
 - Fluid and temperature management/regulation
 - Protection of underlying structures
 - Prevention of microbial invasion
 - Physical appearance

Dressing Characteristics

An ideal dressing or combination of dressings is considered to be one that ensures optimal healing by:

- Maintaining humidity
- Manage (remove excessive) wound exudate
- Permitting thermal insulation
- Allowing gaseous exchange
- Conforming to the wound surface
- Assists with debridement (if necessary)
- Minimizes scar formation
- Impermeable to extraneous bacteria
- Non-fibre shedding
- Non-toxic
- Non-adherent, comfortable and conforming
- Can be attached without damaging tissues

A wound dressing may be a single product or may combine two or more layers of dressing material consisting of a primary wound contact layer and a secondary retention or absorptive layer which is not in direct contact with the wound.

Saline Moistened Gauze

- **Product:**

- Gauze that is moistened with saline
- Applied moist allowed to dry out

- **Indications:**

- Mechanical debridement
- Packing strips fill voids

- **Advantages:**

- Mechanical debridement of necrotic tissue
- Applied moist

- **Disadvantage:**

- May be painful on removal
- May debride viable tissue



Low or... Non-Adherent Contact Layer Dressings

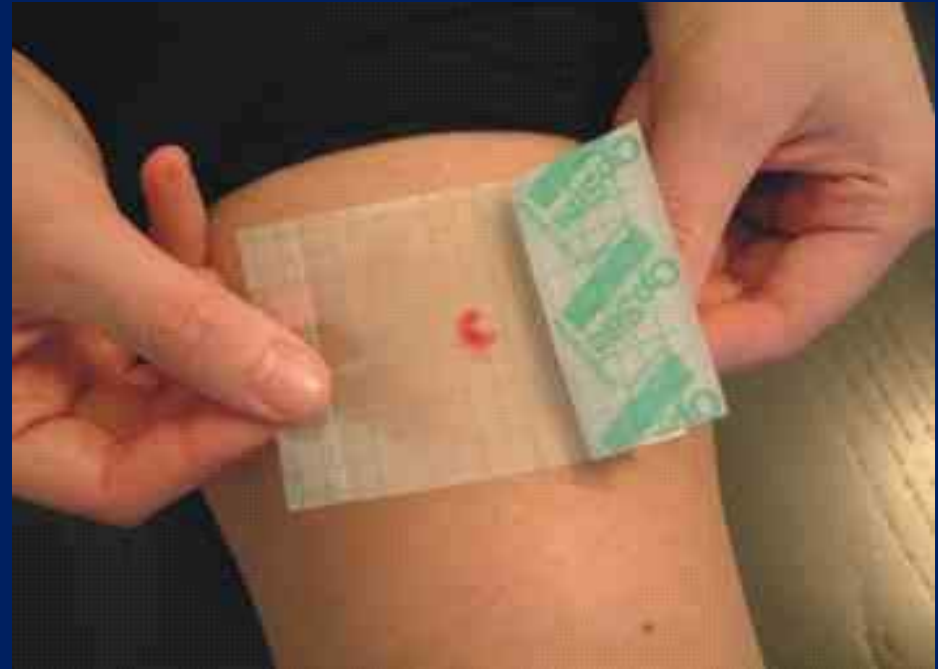
- **Product:**
 - Petroleum jelly/gauze
 - Silicone dressings
 - Teflon coated pads
- **Indications:**
 - Applied directly to wound and do not adhere
- **Advantages:**
 - Do not adhere, no trauma
 - Keep area moist

- **Disadvantage:**
 - Do not absorb
 - Need secondary dressing



Semipermeable Film Dressings

- **Product:**
 - Flexible sheets of transparent urethane with an adhesive
- **Indications:**
 - Hold dressings in place (eg dry gauze)
 - Skin tears
- **Advantages:**
 - Adhesive
 - Transparent
 - Conform
- **Disadvantage:**
 - Semi-permeable
 - Does not absorb moisture



Hydrogel Dressings

- **Product:**
 - Cross-linked polymers; polyethylene oxide; > 80% H₂O,
 - eg: Intrasite[®], Duoderm[®] gel
- **Indications:**
 - Permits/stimulates autolytic debridement
 - To maintain a moist environment
 - To help debride
 - Wounds with minimal to moderate exudate
- **Advantages:**
 - Debrides, soothing,
 - Does not adhere
 - Semitransparent
- **Disadvantage:**
 - Does not adhere, or absorb moisture
 - Cost
 - Frequent changes



Hydrofiber Dressings

- **Product:**
 - A variant of the hydrocolloid, woven fibers
 - Eg: Aquacel®
- **Indications:**
 - Highly exudative wounds
- **Advantages:**
 - Very absorbent, absorbing 25 times own weight
 - Becomes a gel as it absorbs fluid
- **Disadvantage:**
 - Cost
 - Need secondary dressing



Alginate Dressings

- **Product:**

- Highly absorbent derivative of brown seaweed
- Eg: Kaltostat®, Nuderm®

- **Indications:**

- Exudative wounds
- Post debridement wounds

- **Advantages:**

- Absorbs 20 times its own weight
- Calcium component can be hemostatic

- **Disadvantage:**

- Cost
- Needs a secondary dressing to secure in place



Hydrocolloid Dressings

- **Product:**
 - Hydrophilic colloidal particles, typically, carboxymethylcellulose
 - Eg: Duoderm[®], Coloplast[®]
- **Indications:**
 - Acute/chronic, partial/full thickness wounds, stage I-IV pressure ulcers, stasis ulcers
- **Advantages:**
 - Promotes autolytic debridement
 - Some adhere,
 - Gel creates moist environment,
 - Infrequent changes
- **Disadvantage:**
 - Cost, opaque, foul odor, leakage
 - Minimal absorption



Foam Dressings

- **Product:**

- Semi-permeable, sponge like
- Some may be self-adhesive, others are not

- **Indications:**

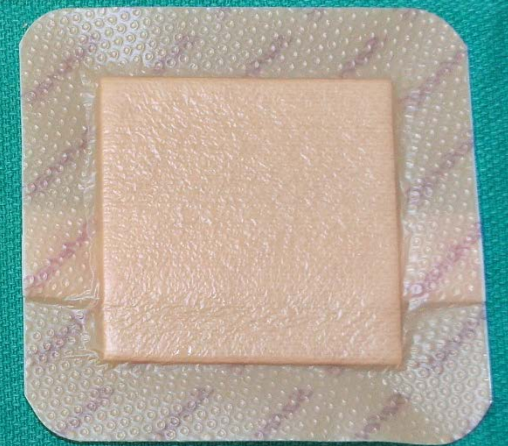
- Absorb moisture
- Can be secondary dressings with hydrogels

- **Advantages:**

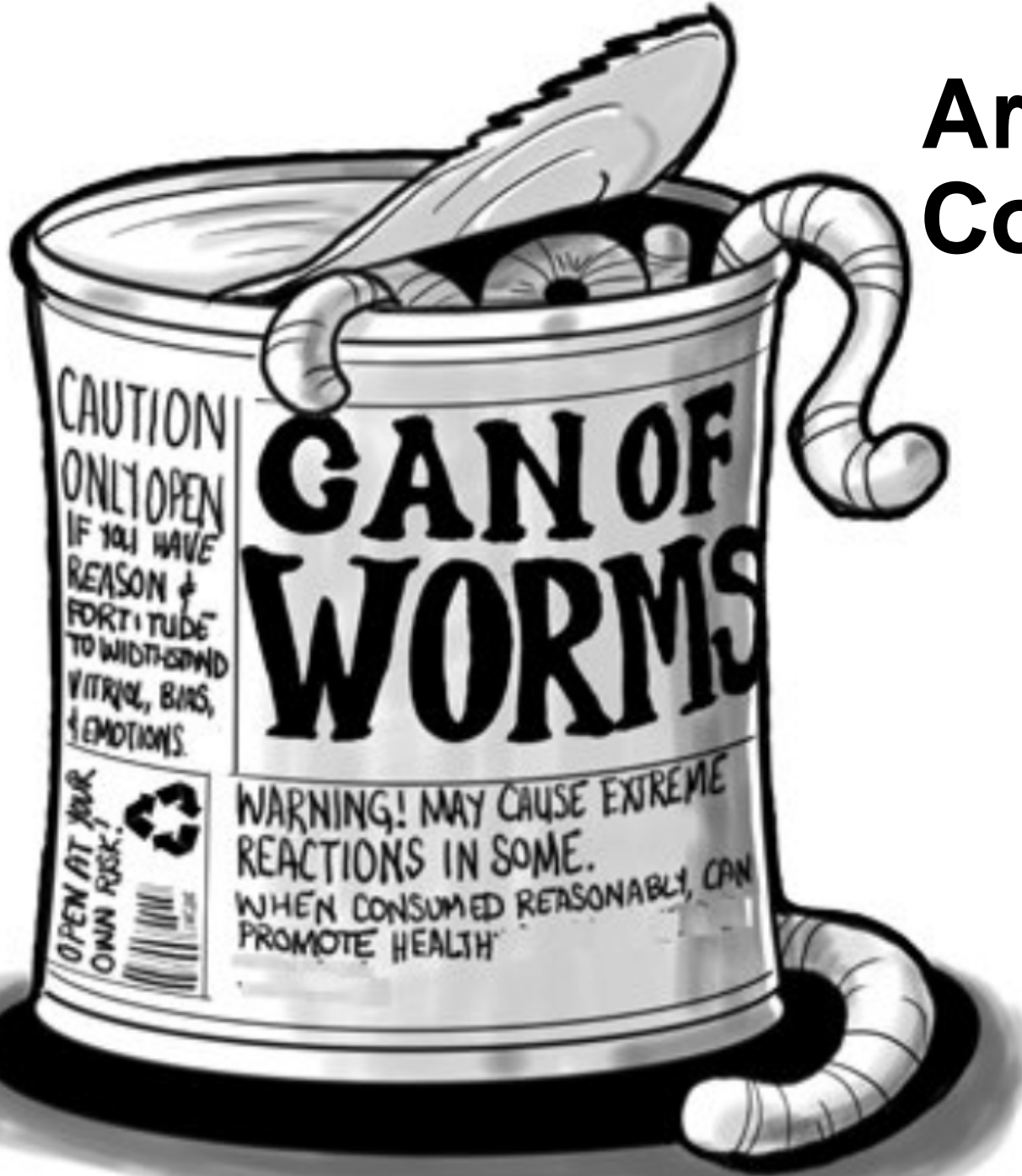
- Self-adhesive variety may conform to any contour

- **Disadvantage:**

- Cost
- May need securing device\secondary dressing



Areas of Controversy



- Antimicrobial Dressings
 - Silver
 - Iodine
 - Honey
- Larval Therapy
- Negative Pressure Wound Therapy

Antimicrobial Dressings

• Products:

- Iodine based (Cadexomer iodine: Iodasorb®; povidone paint; inadine)
- Chlorhexadine based (Bactigras®)
- Silver based: (silver sulfadiazine: Flamazine®; ionic silver impregnated dressings: Acticoat®)
- Honey

• Indications:

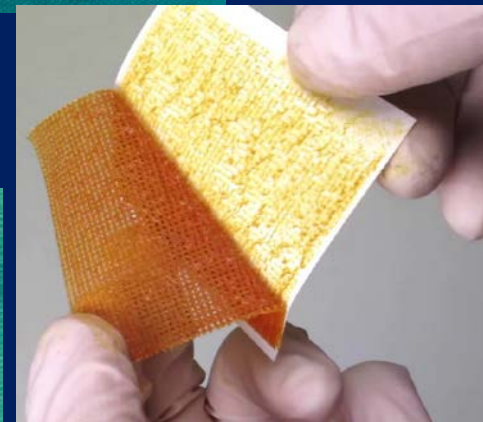
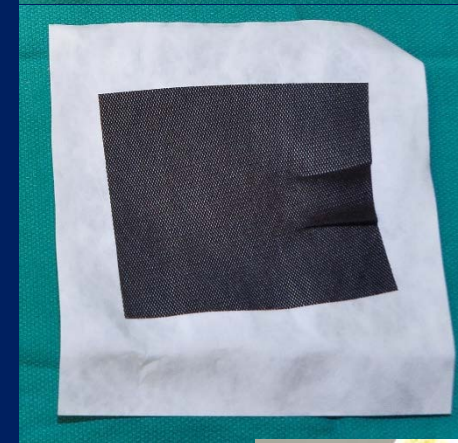
- In theory...to decrease load of microorganisms in wound

• Advantages:

- Unknown, very little to no data

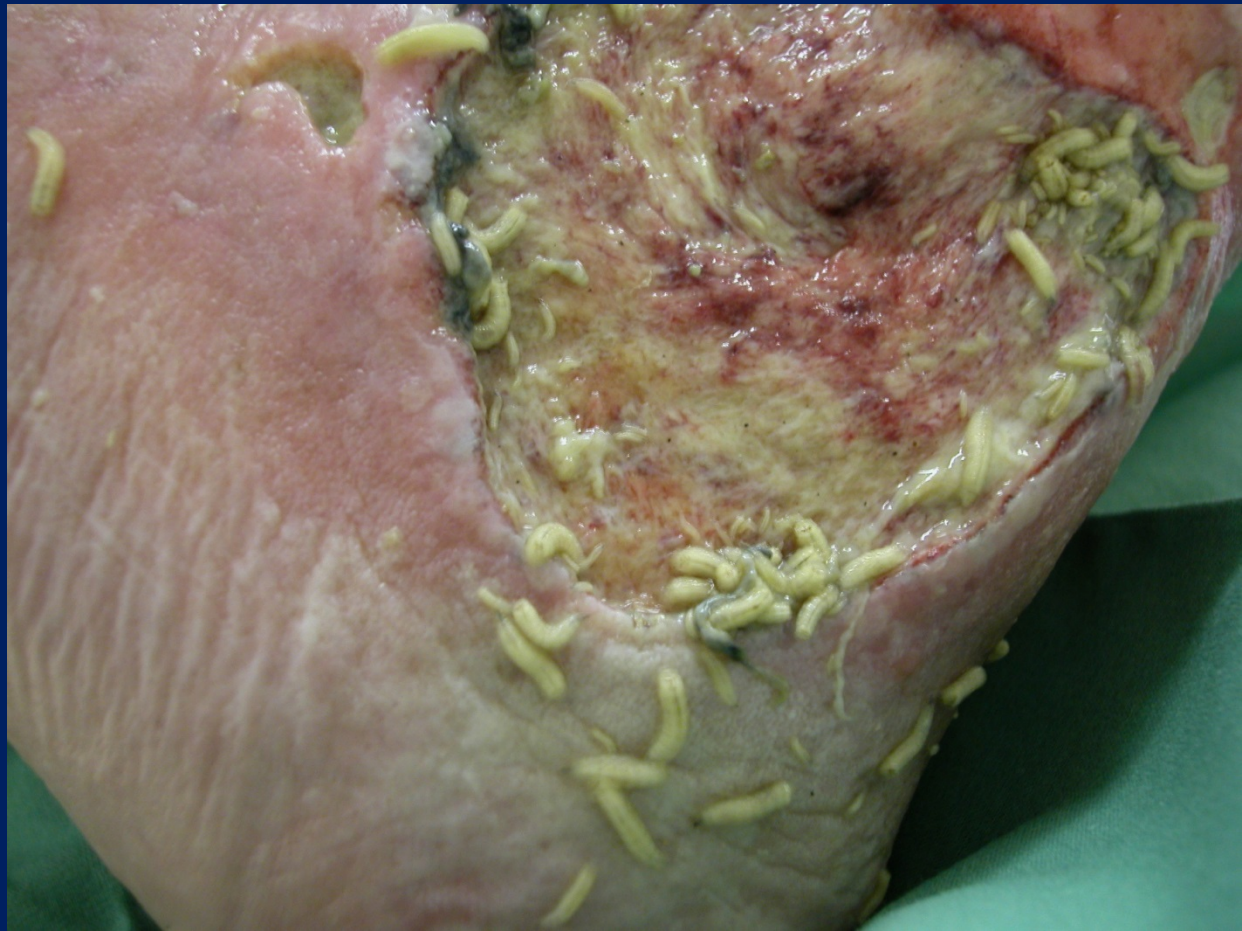
• Disadvantage:

- Cost without proven benefit
- Maybe irritate the skin



Larval Therapy

- **Product:**
 - Fly larvae (maggots)
- **Indications:**
 - Gradual gentle debridement
- **Advantages:**
 - Ideal for devitalized necrotic wounds where surgery not indicated
- **Disadvantage:**
 - Cost
 - Need to maintain maggots
 - Labor intensive



Negative Pressure Wound Therapy

- **Product:**

- Vacuum devices (eg: Pico®, V.A.C.®)

- **Indications:**

- Deep wounds
- Post surgical wounds

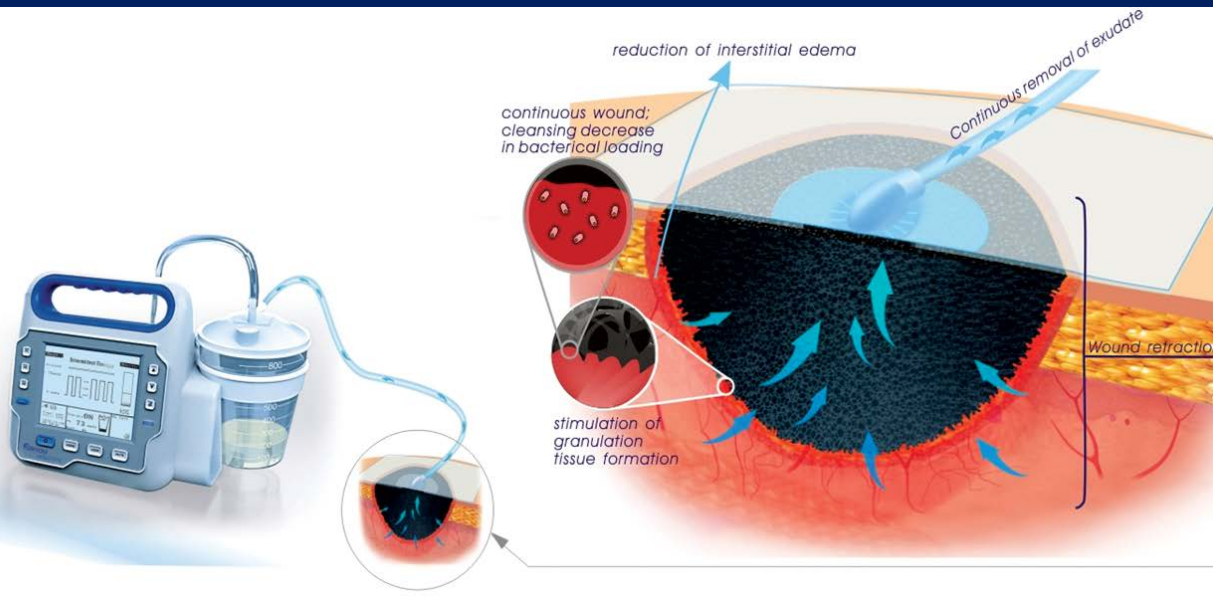
- **Advantages:**

- Ideal for exudative wounds/craters

- **Disadvantage:**

- Cost
- No benefit in chronic wounds

- Ideal results for acute post surgical wounds



Case 1: Diabetic Foot Ulcer

History:

- Type 2 diabetes for 10 years
- Plantar ulcer
 - Clean, dry, palpable pedal pulses
 - Absent infection
 - Some callus

Plan of Action:

- Callus debridement
- Dressing to maintain moisture
 - Self adhesive foam, or
 - Hydrogel, or
 - Petroleum jelly impregnated gauze
- **Pressure relief!!!!!!!**
 - Total contact cast
 - Removable cast boot
 - Footwear and orthotics



Case 2: Ulcer of Venous Insufficiency

History:

- Waxing and waning leg ulcer for years
- Prior deep venous thrombosis
- Easily palpable pedal pulses
- Significant edema

Plan:

- Control edema with compression dressing
- If moist:
 - Alginate or hydrofiber
- If dry:
 - Self adhesive foam, or
 - Petroleum jelly impregnated gauze
- Continue until healed then...
- Compression hose for life



Case 3: Ischaemic Foot

History:

- Type 2 diabetes for 25 years
- 52 pack year smoker
- Absent femoral, pulses
- Dry gangrene of 4th and 5th toes

Plan:

- Keep dry
- Paint with povidone
- Vascular assessment
 - Pressure studies
 - Surgical consultation
 - Wait for auto-amputation or surgical procedure



Conclusions

By attending this session, the attendee will be able to:

1. Be able to state the names of different classes of wound care products
 - Saline moistened gauze
 - Petroleum jelly based
 - Hydrogels
 - Hydrofibers and alginates
 - Foams (self-adhesive, non-adhesive)
 - Antimicrobial dressings
 - Silver
 - Iodine based
 - Honey

Conclusions

By attending this session, the attendee will be able to:

2. State when different products are appropriate
 - One of the basic principles of dermatology is...
“if it is dry wet it, and if it is wet, dry it”
 - Ensure optimal moist wound healing environment
 - **Product does not heal the wound!**
 - Addressing the underlying factors (eg: repetitive trauma) heals the wound, the product is an adjunct

Conclusions

By attending this session, the attendee will be able to:

3. Be able to state the names of different classes of wound care products

- Saline moistened gauze is least expensive
- Foams, hydrofibers/alginate and most expensive

Wound Characteristics	Objective	Example	Cost
Healthy, superficial, granulation tissue	Protection, keep clean, remove excessive moisture	<ul style="list-style-type: none"> • Petroleum jelly-gauze • Self adhesive foam 	<ul style="list-style-type: none"> • \$ • \$\$
Necrotic tissue/slough	Debridement	<ul style="list-style-type: none"> • Saline moistened gauze • Hydrogel and gauze • Cadexomer iodine 	<ul style="list-style-type: none"> • \$ • \$\$ • \$\$\$
Excessive exudate	Moisture balance	<ul style="list-style-type: none"> • Dry gauze • Foam • Alginate, or hydrofiber 	<ul style="list-style-type: none"> • \$ • \$\$ • \$\$\$
Post surgical	Protection	<ul style="list-style-type: none"> • Dry gauze 	
Eschar (ischaemic)	Protection	<ul style="list-style-type: none"> • Dry gauze or no dressing required • Povidone paint 	<ul style="list-style-type: none"> • \$ • \$

Cost: We are not permitted to divulge exact cost due to contact

- \$: least expensive; \$\$: somewhat expensive; \$\$\$: very expensive