

Wound Management & Trouble shooting dressing selection

DR ANNE PURCELL RN NP BN MN PHD
NURSE PRACTITIONER –
WOUND MANAGEMENT, CCLHD
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Wounds Australia

- STANDARD 1: SCOPE OF PRACTICE
- STANDARD 2: COLLABORATIVE PRACTICE
- STANDARD 3: CLINICAL DECISION MAKING: ASSESSMENT
- STANDARD 4: CLINICAL DECISION MAKING: PLANNING AND PRACTICE

- STANDARD 5: DOCUMENTATION
- STANDARD 6: EDUCATION
- STANDARD 7: CORPORATE GOVERNANCE

STANDARDS
FOR
WOUND PREVENTION
AND MANAGEMENT

Third Edition

Everything affects healing potential



- **Comorbidities**
- **Previous surgery**
- **BP, BSL, Pain, Weight, Mobility, Alcohol,**
- **Smoking, Anaemia, Oedema, Medications etc**
- **Blood profile, Microbiology, Nutritional status,**
- **Biopsy, Psychosocial, Environment, Vascular studies**

Medications

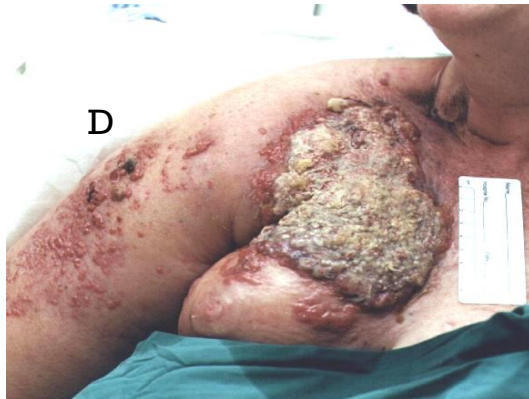
- Corticosteroids - affect every phase of wound healing
- Vasoconstrictors – nicotine, epinephrine - tissue hypoxia
- Antineoplastic drugs - impede collagen synthesis
- Dilantin - suppresses wound contraction
- NSAIDs & anticoagulants, vasodilators – affects coagulation
- Hydroxyurea – can cause leg ulcers

Antiseptics

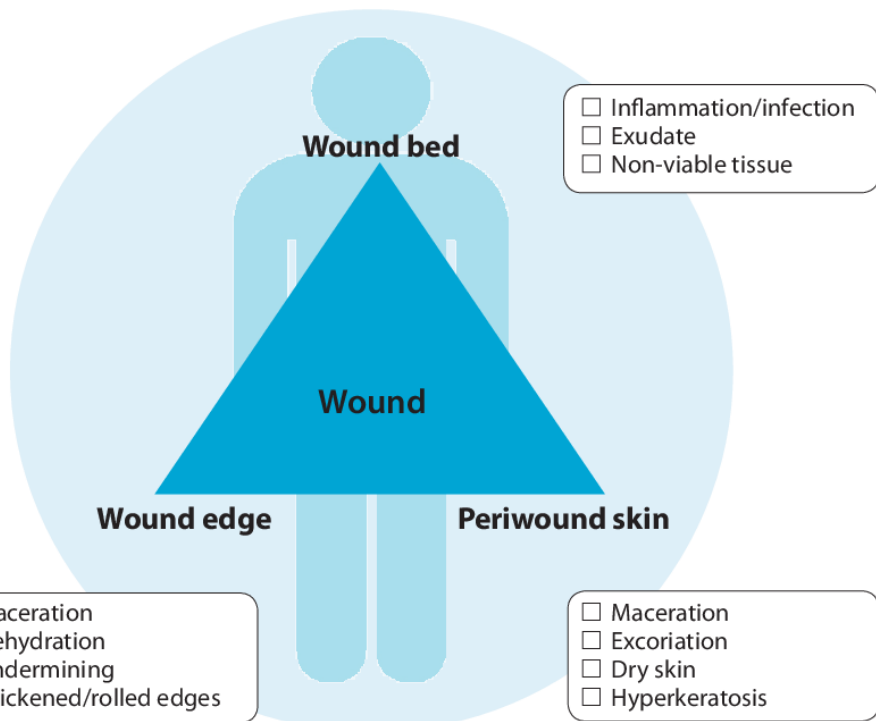
- Chlorhexidine
- Povidone iodine
- Sodium hypochlorite



Diagnosis

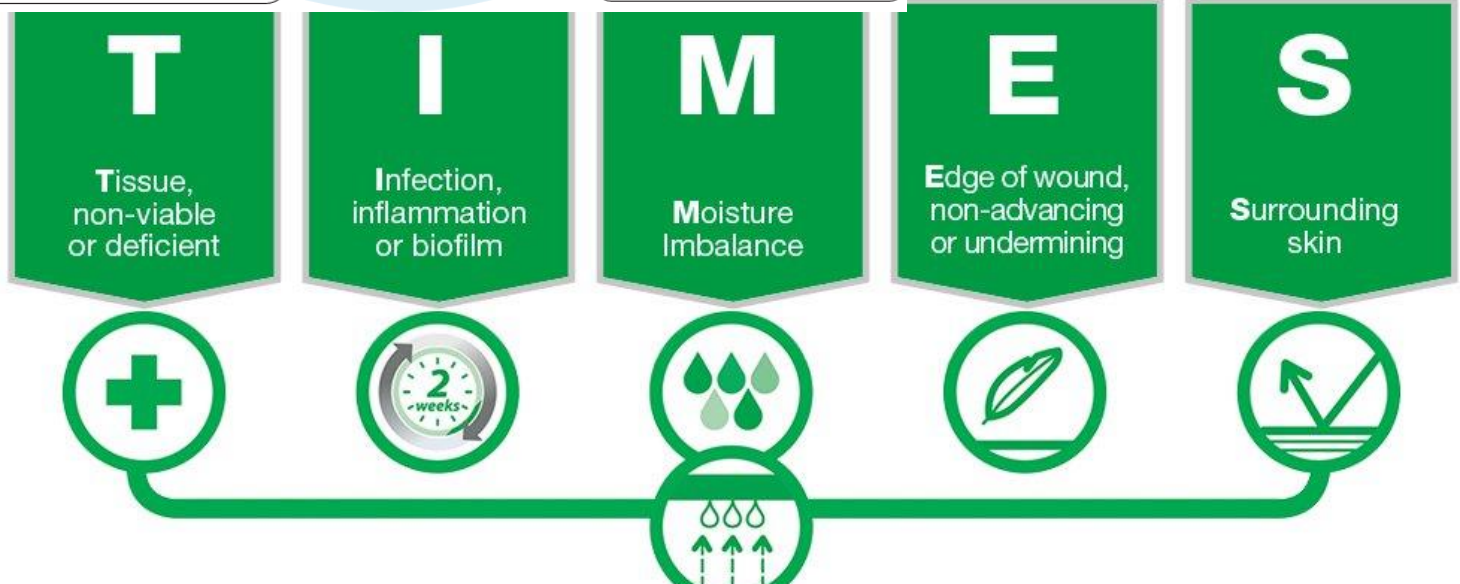


Wound Assessment



- Maceration
- Dehydration
- Undermining
- Thickened/rolled edges

- Maceration
- Excoriation
- Dry skin
- Hyperkeratosis



WUWHS 2016

WORLD UNION
OF
WOUND HEALING SOCIETIES

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WORLD UNION OF WOUND HEALING SOCIETIES
POSITION DOCUMENT

ADVANCES IN WOUND CARE: THE TRIANGLE OF WOUND ASSESSMENT

Looking beyond the wound edge with the Triangle of Wound Assessment
Using the Triangle of Wound Assessment in the management of venous leg ulcers
Using the Triangle of Wound Assessment in the management of diabetic foot ulcers

Location of Wound

- Gaiter – venous
- Sacrum, heel, greater trochanter – Pressure ulcer
- Dorsum of the foot – Arterial or vasculitic ulcer
- Shin – Necrobiosis lipoidica
- Lateral malleolus – Venous, arterial, pressures, hydra
- Planter and lateral aspect of foot & toes – diabetic ulcer
- Sun exposed areas – BCC, SCC



Excessive exudate – why?

- **Must be controlled**
- Infection/inflammation
- Dependency
- Cardiac, renal, liver
- Know your dressings
- Inability to cope with compression therapy

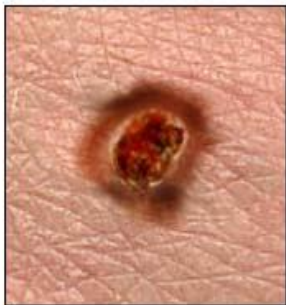


Wound Edge

- ▶ Sloping – venous ulcer
- ▶ Punched out – Arterial or vasculitic ulcer
- ▶ Rolled – BCC, chronic
- ▶ Everted - SCC
- ▶ Undermining – Infection, TB, syphilis
- ▶ Purple – Vasculitic eg PG



Squamous cell carcinoma



Basal cell carcinoma



3 27 2002

Beyond the wound



The Skin:

- Color
- Temperature
- Sensitivity
- Fragility



The limb

- Calf, ankle, foot, arm
- Oedema
- Deformity
- Shape
- Mobility of the ankle & pt
- Nails



When to assess wound-related pain (WRP)

Before dressing change

During dressing change

After dressing change



<https://www.biblestudytools.com/topical-verses/bible-verses-about-pain/>

Pain types

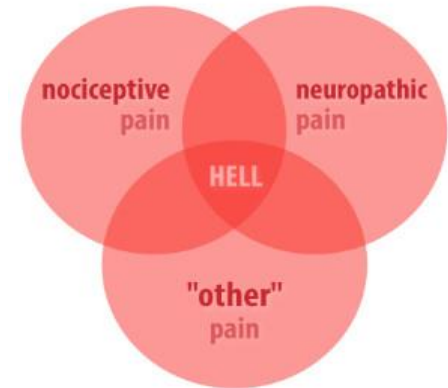
NOCICEPTIVE

Throbbing
Tender
Aching
Sharp
Gnawing

NEUROPATHIC

Burning
Stabbing
Stinging
Itchy
Shooting
Crawling
Pins and Needles
Painful Cold
Numbness
Electric shocks
Tingling or prickling

MIXED



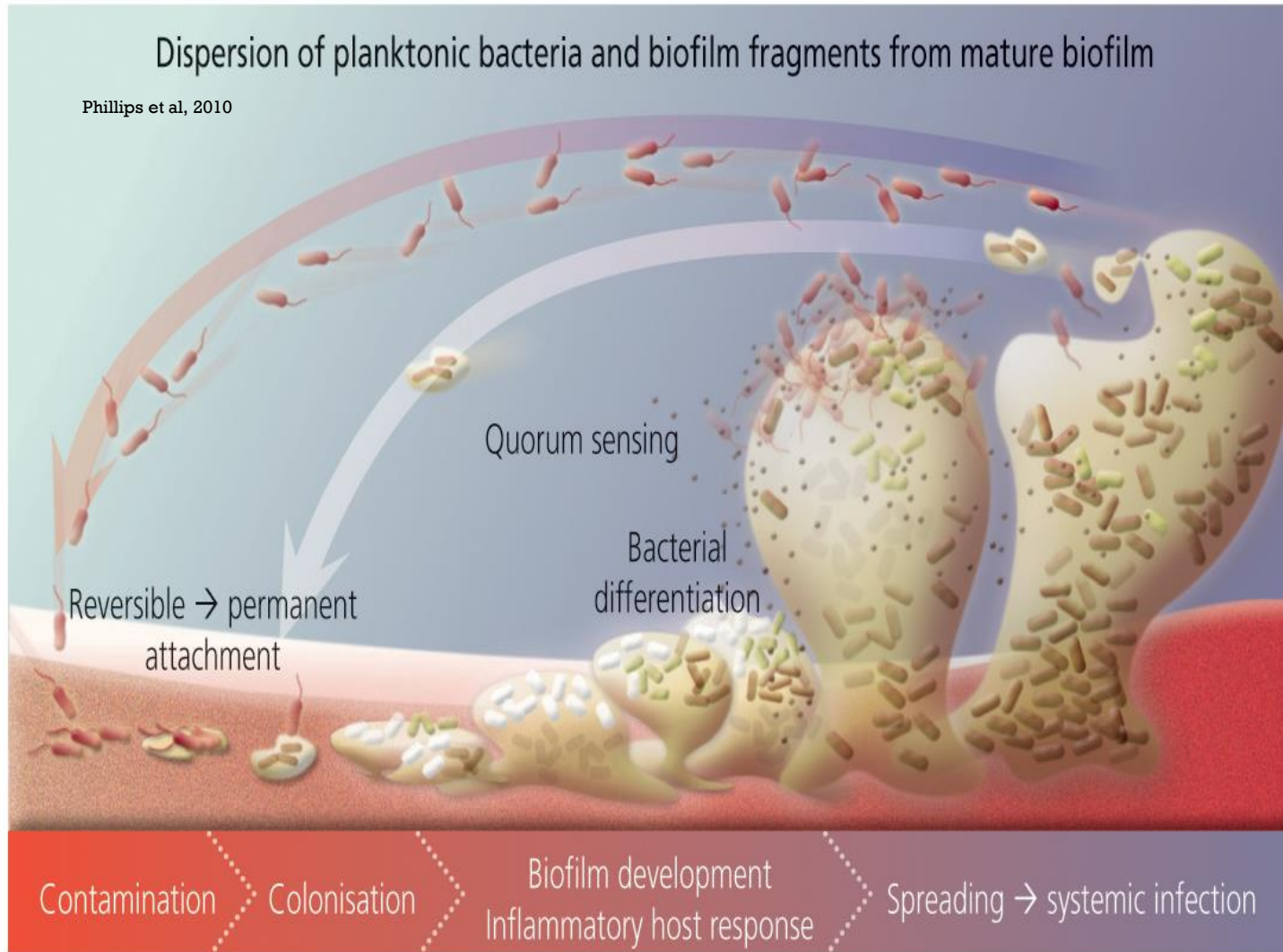
Non-viable tissue will inhibit wound healing by:

- Hindering adequate wound assessment
- Inhibiting wound granulation
- Preventing epithelial cell migration
- Encouraging bacterial growth → infection
- Possibly causing malodour
- Increase metabolic demand
- Promoting protein loss



Photo Credit: Gregory Moran, M.D.

BIOFILMS

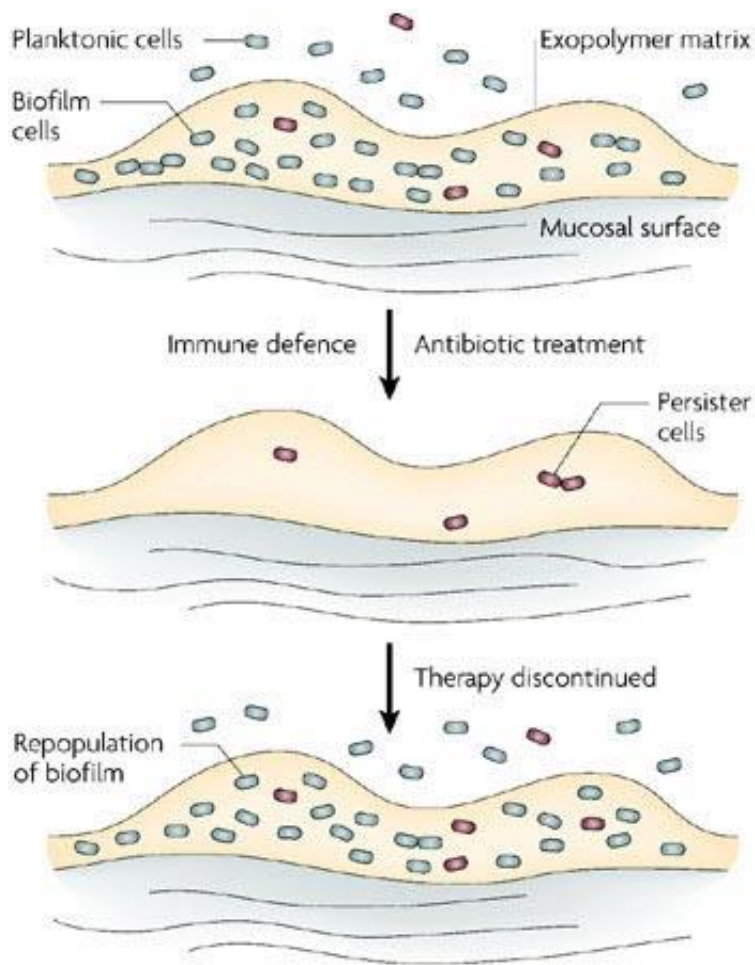


BIOFILMS



“planktonic bacteria & biofilms are as different as caterpillars and butterflies....same genotype, totally different phenotype”

Wolcott, 2008 <http://bacteriality.com/2088/04/13/wolcott/>



Lewis, 2007

Persister cells:
 Dormant microbial cells that can survive antimicrobial treatments that kill the majority of their genetically identical siblings

(Stewart & Costerton, 2001)

Persister cells - estimated - 0.1 – 10% of a biofilm

Yang et al, 2015

Biofilm formation:

Stage 1

Reversible surface attachment - planktonic - **minutes**

Stage 2

Permanent surface attachment, change gene expression, more attached, quorum sensing - **2-4 hours**

Stage 3

Slimy protective matrix/biofilm - **6 – 12 hours**

Stage 4

Increasing tolerance to biocides – mature biofilm - **2-4 days**

Reformation – after debridement - **24 -72 hours** (Bjarnsholt, T. et al., 2017)

How can clinicians assess biofilm? Can biofilms be seen on a wound?



Potential clinical biofilm indicators

- Implanted medical device
- Infection lasting > 30 days
 - NB: mature biofilm can form in 24 hours
- Infections wax & wane = chronic infection
- Secondary signs of infection –
eg slow progress, exudate
- Incomplete response to antibiotics
- Build up at infection site eg slough



More clinical indicators of biofilms

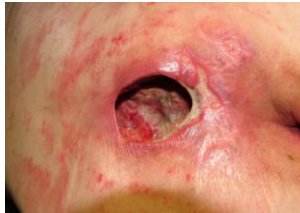
Maybe -

- Slough
- Maceration
- Tunnelling & undermining
- Edge – rolled or rim of undermining &/or pain swelling or deterioration
- Hyperkeratosis – not always due to pressure



Understanding biofilms in wounds: key statements

1. Biofilms are present in most chronic wounds – surface and deeper in wound layers – not uniform



2. Presence and response to biofilms delays wound healing

3. Biofilms in chronic wounds *are likely* more established and mature

4. Biofilm structure *may* promote presence of anaerobic bacteria



5. Biofilm may consist of a single or multiple bacterial species

6. Microbial diversity in a wound (planktonic and biofilms) can be influenced by location and wound characteristics

7. Biofilms may progress to contain fewer more dominant species over time

8. Biofilms are more tolerant to host immune response and can evade phagocytosis due to community defences

9. Microbial diversity are not necessarily influenced by wound type



Biofilm treatment strategies :

1. Biofilms should be considered in the treatment of poorly healing burns
2. Anti-biofilm strategies should continue to be used until the wound bed is visibly clean, displaying healthy granulation tissue, and/or on a healing trajectory
3. **Debridement** is one of the most important treatment strategies against biofilms, but does not remove all biofilm; cannot be used alone.....**therapeutic window**
4. Systemic antibiotics cannot eradicate a wound biofilm – antibiotic stewardship
5. Choose topical antiseptics that have known anti-biofilm properties
6. Consider biofilm Rx strategies when risk of SSI & dehiscence
7. Biofilm treatments may be aligned across different types of chronic wounds

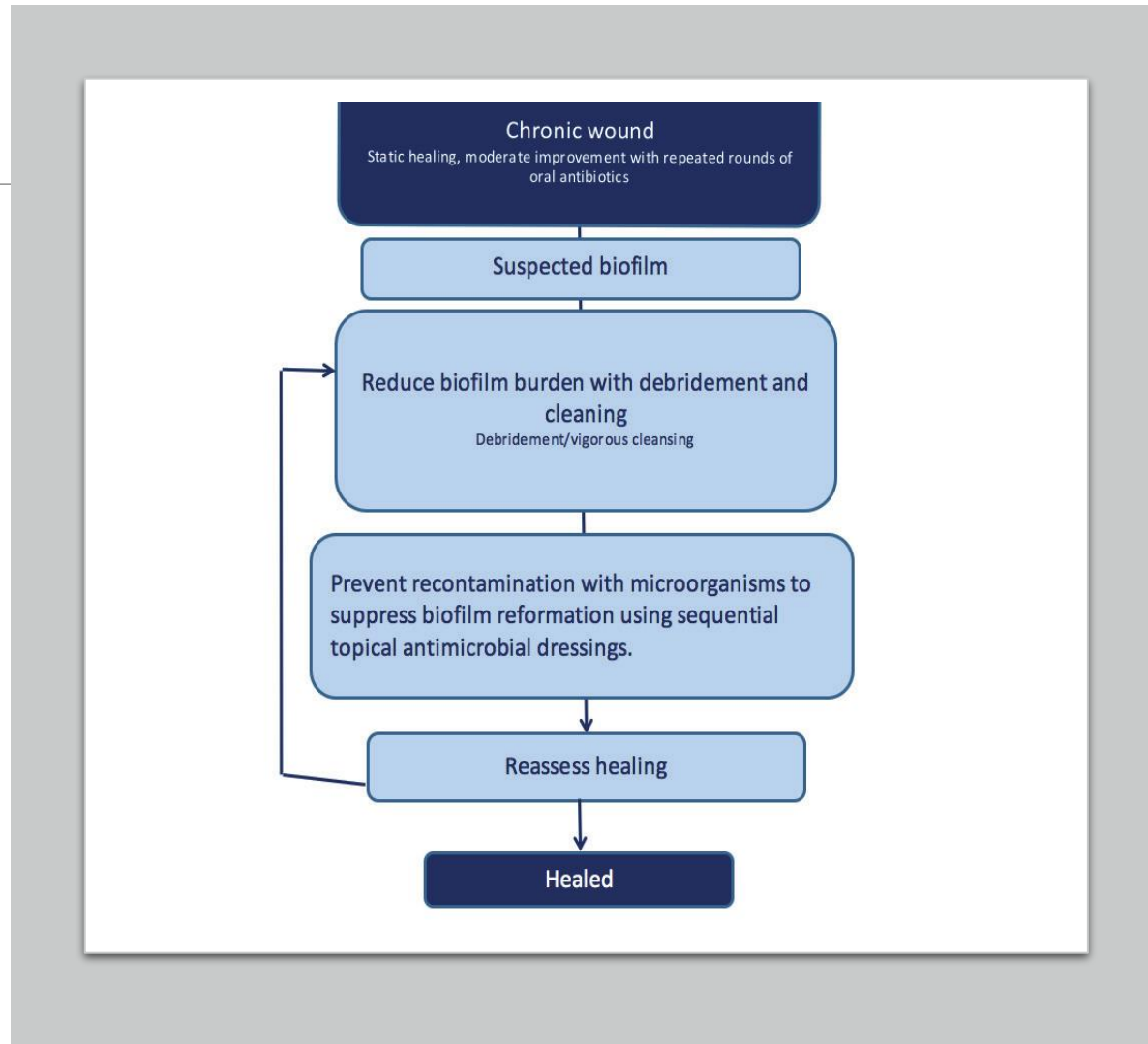
Biofilm based wound care

- If wound not responding to:
- Optimal care
 - To topical or systemic antimicrobial interventions

(Bjarnsholt et al., 2017)

Total eradication of a biofilm infection is still a treatment challenge

(Bjarnsholt et al., 2018)



Dressing Selection



Dressings

Passive – gauze, non-adherent pads, impregnated contact layers

- Can be useful as secondary dressings, protection, atraumatic removal, some absorbency

Modern interactive dressings – films, foams, hydrocolloids, hydrogels, alginates, hydrofibre/gelling fibres, silicone

Medicated dressings – silver, iodine, honey, polyhexamethylene biguanide, enzyme alinogel, isotonic, hypertonic, capillary or hydroconductive action, hydrocapillary, odour absorbing

NPWT –Negative Pressure Wound Therapy

Bioactive dressings – keratin based, growth factors, collagen matrix/protease modelling

Biological skin substitutes – skin grafts, skin substitutes,

Adjunct therapies – HBO, electrical stimulation, ultrasound

What's the goal?

- Reduce pain
- Rehydrate
- Absorb exudate
- Remove non-viable tissue
- Reduce bacterial load
- Fill dead space

The Ideal Dressing

- Maintains moist wound environment
- Protects surrounding skin at all costs
- Protects against mechanical trauma
- Removes debris
- Fills dead space
- Controls exudate
- Allows gaseous exchange if appropriate
- Is comfortable to wear

The Ideal Dressing cont...

- Is easy to apply
- Provides a barrier to pathogens
- Provides thermal insulation of wound
- Does not promote infection
- Does not shed fibres or leak out toxic substances
- Does not cause a sensitivity or allergic reaction
- Is adaptable to body parts
- Does not interfere with body function
- Is cost effective

How to measure success?

Patients and clinicians perspective

- By the number of wounds healed
- Wound free days
- Decreased wound size
- Decreased pain, odour, exudate
- Eradication of infection
- Increased HRQoL.



















Calciphylaxis



Pyoderma gangrenosum

PAIN



Vasculitis



Vasculitis













Antiseptics, Disinfectants, Antibiotics

Antiseptics – topical agents prevent growth & reproduction

DO NOT usually kill

Disinfectants – kills however harmful to humans

Antibiotics – slow the growth or kill microbes

**NO CONFLICT OF INTEREST
TO DECLARE**



Antiseptics



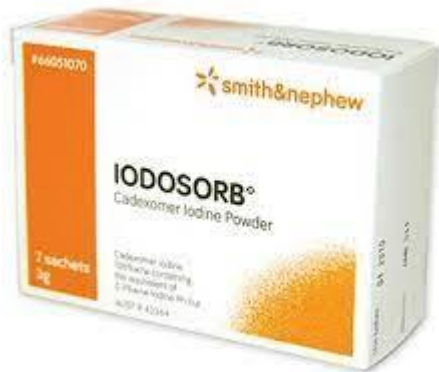
Polyhexamethylene biguanide (PHMB)
& betaine



Silver dressings



Iodine products





DACC (dialkylcarbamoylchloride)



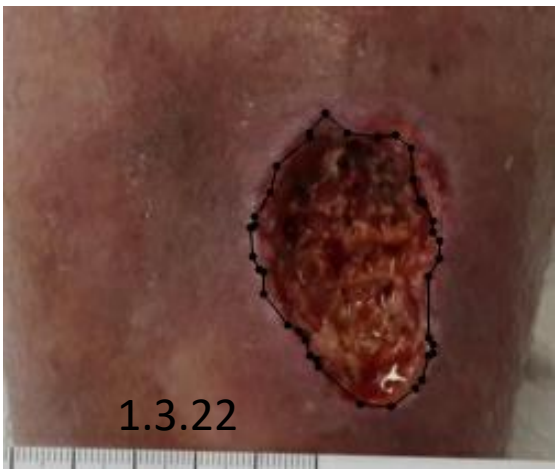


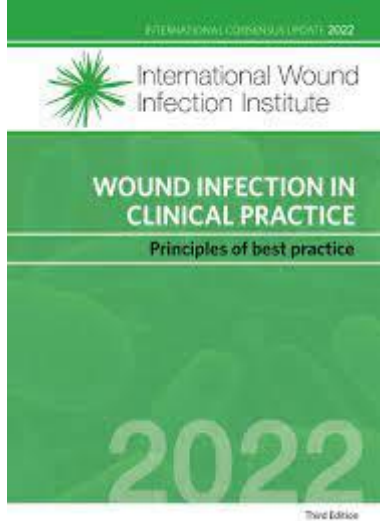
Case Study –

consent given by pt

- Female
- 54 yrs
- HTN, Thromboplebitis, anxiety, smoker
- Medications – coversyl, escitalopram
- Fall onto dirt – minor graze - left pretibial area
- Swelling, good pedal pulses, pain minimal
- Oral Antibiotics –Fluclox, Cipro, diclox. - not effective.
- ED – 1 x dose cefazolin IVI. Discharged on Keflex.

Consent given by pt





<https://www.woundsaustralia.com.au/>

www.wuwhs.org

www.ewma.org

<http://www.woundinfection-institute.com/>

<https://www.woundsinternational.com/>

Take home message



- Know and adhere to the Standards
- Think holistically
- Multi-D team
- Know your dressings
- If in doubt consider:
 - Wound-related pain
 - Exudate
 - Non-viable tissue
 - Microorganism burden
 - Wound specialist input



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