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Wound management

Module 2: Overview of wound management

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Module 3 – Training outline

	Estimated time to deliver
A: Wound management, cleaning and debridement	30 mins
B: Wound Dressings	30 mins
C: Wound management and referral - practical	30 mins

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A: Wound management - cleaning and debridement

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Glossary

- **Necrosis:** Dead or dying tissue.

- **Slough:** Dead tissue that has separated from the living tissue.

- **Callus:** A thickened or harden area of skin.

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KEEP MOVING

Glossary

- **Granulation:** The process of wound healing where new cells grow from the base of a wound to fill it. Granulation tissue is good tissue and is needed for a wound to heal.

- **Exudate:** Body fluid that leaks out of the wound.
- **Debridement:** The removal of slough, callus, dead and infected matter with the aim of leaving clean, living tissue.

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A: Overview of wounds

- **Neuropathic wounds** = caused by pressure because of loss of feeling.
- **Ischaemic wounds** = caused by lack of blood supply.
- **Neuro-ischaemic wounds** = caused by loss of feeling and lack of blood supply.
- The following slides outline **recommended treatment for neuropathic foot wounds only**.

✧ Ischaemic wounds require referral to surgical services. Treating ischaemic wounds using the following treatments could cause serious complications such as infected gangrene.

✧ Do not debride a wound if pulses are not found or if the tissue is necrotic.

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Wound cleaning

Clean wounds regularly with **saline** using sterile gauze and aseptic technique.

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Sharp debridement

- Remove slough, necrotic tissue and callus with sharp debridement.

⚠ **Refer** to the general surgery ward and NDC if sharp debridement is needed.

⚠ Sharp debridement is **not recommended for ischaemic wounds (with poor blood supply)**. People with ischaemic wounds should be referred to the general surgery ward or NDC.

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Sharp debridement

- An open wound cannot be properly assessed until all the unhealthy tissue is removed.
- Dead or foreign material in a wound adds to the risk of infection and reduces wound healing.

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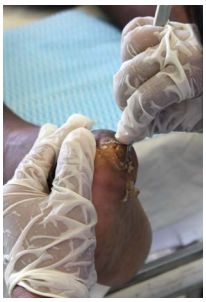
Sharp debridement

- Make note of the location of the wound, do not debride near major blood vessels.
- Remove all dead tissue and callus down to a level of living, bleeding tissue, using a scraping / shaving technique.
- Debride the wound edges as well as the base, as raised edges can prevent the new tissue from growing into the wound base.



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Sharp debridement - Benefits

- Removes necrotic/ sloughy tissue and callus
- Reduces pressure
- Allows full inspection of the underlying tissues
- Helps drainage of secretions or pus
- Helps encourage healing.

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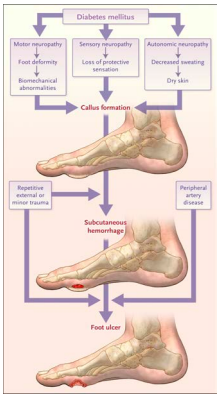

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Armstrong D et al 2017 , 'Diabetic foot ulcers and their recurrence', *New England Journal of Medicine*, < https://www.nejm.org/doi/10.1056/NEJMra1615439>.

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B: Wound dressings

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Wound management - dressings

- Moisture balance in all wounds is very important.
- Wounds should not be allowed to get too wet or too dry.

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Wound management – dressings continued..

When choosing a dressing consider:

- Where the wound is
- The size and depth of the wound
- The amount and type of exudate (blood, pus, clear)
- The main tissue type on the wound surface (open wound, granulating tissue, recently healed tissue)
- The condition of the skin around the wound (rashes, dry, thin, moist)
- If the dressing is to be used with other treatments (e.g. total contact casts)
- The risk of infection
- The chance of pain or damage when dressings are changed
- The quality of life and wellbeing of the person.

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Wound management – review of dressings

- The dressing should:
  - Stay in place for the required time
  - Prevent leaks
  - Be comfortable and able to fit in an offloading device
  - Be able to be left in place for the required time
  - Be easy to remove without damaging the wound or skin
  - Be easy to put on
  - Be cost effective.
- The dressing should not:
  - Make the skin too moist
  - Cause pain
  - Cause other skin reactions.

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Types of dressings – Povidone Iodine

- Actions:
  - Antimicrobial action (kills germs).
- Can be used:
  - On wounds at risk of infection
  - On sloughy, dry, necrotic tissue
  - On low to high exuding wounds
  - On macerated surrounding skin.
- Shouldn't be used:
  - If there is a known sensitivity / allergy to iodine
  - Long term - can cause problems.
- Does not need to be used on all people.
- Recommend for people with sloughy, yellow, brown, black or grey wounds.

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Types of dressings – Non-adherent (Melolin)

- Actions:
  - Protect new tissue growth
  - Reduced trauma to new cells during removal.
- Can be used:
  - For superficial clean wounds
  - For recently healed wounds.
- Shouldn't be used:
  - On fragile surrounding skin
  - For wounds with medium to high exudate.
- Recommend for people with superficial wounds.
- May dry out if left in place too long.

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Types of dressings – Foams

- Actions:
  - Absorb fluid
  - Control moisture
  - Protects wounds and new tissue.
- Can be used:
  - On medium to high exuding wounds
  - For people with fragile or macerated skin (non-adherent version).
- Shouldn't be used:
  - On dry, necrotic wounds
  - Wounds with low exudate.
- Recommend for people with medium to high exuding wounds.

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Types of dressings – Paraffin Gauze

- Actions:
  - Protect new tissue growth
  - Assist with providing moist wound environment
  - Reduced damage to new cells during removal.
- Can be used:
  - For superficial clean wounds
  - For red, pink healing wounds with new skin.
- Shouldn't be used:
  - On dry, necrotic wounds
  - For wounds with exudate.
- Recommend for people with superficial wounds.
- May dry out if left in place too long, and the dressing could stick to the wound.

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Types of dressings – Combine

- Actions:
  - Absorb exudate.
- Can be used:
  - On top of another dressing to absorb excess exudate.
- Shouldn't be used:
  - Directly on a wound.
- Recommend use for people with highly exuding wounds on top of foam dressing.

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Other dressings

- What other dressings are available in your clinic?
- What are their actions?
- What can they be used for?
- What should they not be used for?
- Other recommendations?

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Further resources:

A variety of resources have been made available on the Motivation Australia website to complement these dressing details. Access resources online such as:

- DFC dressing table
- DFU dressing guideline
- Wound dressing guide

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DFC dressing table

Dressing type	Description	Action	Wound characteristics			Do not use
			Wound base	Exudate level	Surrounding skin	
Povidone Iodine	A broad spectrum topical antiseptic liquid.	Antimicrobial action (kills germs)	Sloughy Dry, necrotic	Low to high	Macerated (moist)	• Long term (can be toxic) • Should be avoided in: clients with thyroid or renal problems, pregnant or breastfeeding women, or if there are known Povidone Iodine allergies • On granulating or epithelial tissue
Inadine	A non-adherent antimicrobial dressing	Antimicrobial action for infection Protects wounds	Sloughy Dry, necrotic	Low to medium	Fragile, macerated	• Long term (can be toxic) • Should be avoided in: clients with thyroid or renal problems, pregnant or breastfeeding women, or if there are known Povidone Iodine allergies • On granulating or epithelial tissue
Non Adherent	An absorbent cotton pad, coated with a low stick film. The film side of the dressing is placed on the wound. Eg. Melolin (Smith & Nephew), Mediam 210 (Sentry Medical), Leukomed LA (BSN medical), Poren lite (Livingstone), Interpose (Multigate), Telfa (Convidien) Paraffin, Xeroform	Protects wound	Epithelial tissue Granulation tissue	Low to none	Fragile skin Dry	• Wound with medium to high exudate

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DFC dressing table

Dressing type	Description	Action	Wound characteristics			Do not use
			Wound base	Exudate level	Surrounding skin	
Combine (non adherent)	A thick layer of fleece enclosed in a soft and comfortable non-woven fabric. For use as secondary dressing to absorb excess fluid. Eg. Mesorb (Molnlycke Healthcare)	Absorbs exudate (fluid)		High	Macerated (moist)	• Should not be used directly on wound, but in addition to foam dressing for highly exuding wounds.
Foam / absorbent	Foam dressings contain hydrophilic polyurethane foam and are designed to absorb wound exudate and maintain a moist wound surface. Can be used as a secondary dressing. Eg. Askina (Braun), Allevyn (Smith & Nephew), Biatin (Coloplast), Lyofoam (Molnlycke), ActivHeal (Sutherland Medical), etc.	Absorbs exudate (fluid) Protects wound	Slough Granulation tissue	Medium to high	Fragile Macerated (moist)	• Dry, necrotic wounds • Wounds with low exudate
Alginate	Primary dressing made from seaweed to absorb excess fluid. Can be packed into wound cavities. Alginate dressings form a gel when in contact with exudate. This helps the exudate to be absorbed. Eg. Algisite M, Kaltostat	Absorbs exudate	Slough Granulation tissue	Medium to high	Fragile Macerated (moist)	• Dry, necrotic wounds • Wounds with low exudate • When bone or tendon is exposed. • If person has an allergy to alginate • Must be used with a secondary dressing to hold it in place

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Wound dressing guide

Wound tissue	Therapeutic goal	Role of dressing	Treatment options		
			Wound bed preparation	Primary Dressing	Secondary dressing
Necrotic, black, dry	• Remove dead tissue. • Do NOT attempt debridement if insufficient blood flow suspected. • Keep dry and refer for vascular assessment.	• Hydration of wound bed • Autolytic debridement	• Sharp debridement	• Hydrogel • Medi-Honey • Betadine	• Non adherent dressing
Sloughy, yellow, brown, black or grey *Dry to low exudate*	• Remove slough • Provide clean wound bed for granulation tissue.	• Rehydrate wound bed • Control moisture balance • Promote self-debridement	• Sharp debridement • Wound cleansing (consider antiseptic wound cleansing solution)	• Hydrogel • Medi-Honey • Inadine • Betadine	• Non adherent dressing
Sloughy, yellow, brown, black or grey *Moderate to high exudate*	• Remove slough. • Provide clean wound bed for granulation tissue • Manage exudate.	• Absorb excess fluid • Protect surrounding skin to prevent maceration • Promote self-debridement	• Sharp debridement • Wound cleansing (consider antiseptic wound cleansing solution)	• Medi-Honey • Inadine • Betadine	• Absorbent dressing (combine/ foam/ alginate) • Retention bandage

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Wound dressing guide

Wound tissue	Therapeutic goal	Role of dressing	Treatment options	Wound tissue	Therapeutic goal
Granulating, clean, red *Dry to low exudate*	• Promote granulation • Provide healthy wound bed for epithelisation.	• Maintain moisture balance • Protect new tissue growth.	• Wound cleaning	• Hydrogel • Non adherent dressing	• Pad and or retention bandage. • Avoid bandages that may cause occlusion and maceration.
Granulating, clean, red *Moderate to high exudate*	• Exudate management • Provide healthy wound bed for epithelisation.	• Maintain moisture balance • Protect new tissue growth.	• Wound cleaning • Consider barrier products.	• Absorbent dressing (combine/ foam/ alginate) • For deep wounds consider alginate.	
Epithelising, red, pink *No to low exudate*	• Promote epithelialisation	• Protect new tissue growth	• Clean epithelial tissue	• Low adherent dressing	
Infected *Low to high exudate*	• Reduce bacteria • Exudate management • Odour control.	• Antimicrobial action • Moist wound healing • Odour absorption.	• Wound cleansing • Consider antiseptic wound cleansing solution • Consider barrier products.	• Antimicrobial dressing (E.g. Inadine, betadine, Medi-honey)	

Adapted from: Wounds International 2013, 'Best practice guidelines: International Best Practice Guidelines: Wound Management in Diabetic Foot Ulcers', *Wounds International*, <www. woundsinternational.com>.

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C. Wound management and referral – practical

- You are working in a community health center.
- For the following people, suggest what you would do if they came to your service.

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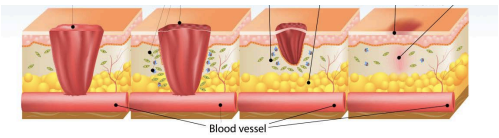
Wound Healing



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Wound healing

- Blood can be viewed as the fuel which flows throughout the body to different organs and tissues carrying oxygen and nutrients in order for them to function and survive
- Reduced blood flow is a major risk factor for foot wound development
- Wound healing has four phases.
- Each phase of wound healing is dependent factors including blood flow.

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Wound healing:

- Wound healing is complex and dynamic. As the person's health status changes, so does the wound environment.
- We can compare wound healing to rebuilding a house in a natural disaster
- We must consider the person's health and all factors involved rather than only looking at the wound itself.
- One of the factors which plays a major role in effecting wound development and healing ability is vascular compromise.

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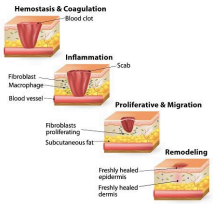
Four stages of wound healing

1. Haemostasis (Blood clot)
2. Inflammatory (Inflammation)
3. Proliferative
4. Maturation

Wound healing can be compared to the analogy of repair to a damaged house.



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Four stages of wound healing

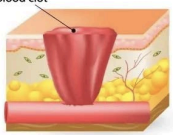
1. **Haemostasis:** The process of wound being closed by clotting (immediately)

House

- If a house has been damaged, workers must block damaged gas and water lines before repair

1. Hemostasis

Blood clot



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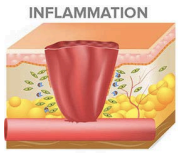
Four stages of wound healing

2. **Inflammatory:** Presents as swelling, warmth and pain (Day 1-4)

House
- Once the gas leaks have been capped, the next job is to clean the debris
- This requires simple labour work



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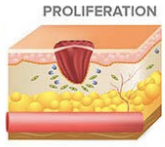
Four stages of wound healing

3. **Proliferative:** The phase of rebuilding new tissue with the help of oxygen and nutrients (Day 4-21)

House
- Once the debris has been removed, the contractor directs new specialized workers to build the framework of the new house and install new plumbing and wiring



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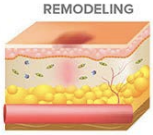
Four stages of wound healing

4. **Maturation (Remodelling):** In which the wound fully closes, tissue is remodelled and fuelled by a healthy blood supply (Day 21 – 2 years).

House
- once the structure has been completed, interior finishing may begin



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Phases of wound healing

Phase of wound healing	Time post injury	Function of activity	Analogy to house repair
1	Immediate	Blood clot (stop bleeding)	Workers block gas leaks
2	Day 1 - 4	Clean up bacteria	Clean up the site and direct further work
3	Day 4 - 21	Skin healing and wound closure	Specialists work on • Framing • Plumbing • Electricity • Roofing
4	Day 21 – 2 years	Regain tissue strength	Finish the interior

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Wound healing

- *Acute wounds:* Heal in a normal, orderly sequence of repair as described
- *Chronic wounds:* Fail to progress through a normal, orderly and timely sequence of repair, usually because of unresolved factors interfering with healing
- The person must be assessed for all factors which may effect wound healing, not only the appearance of the wound itself
- A clinician must act like a detective to determine why a wound is chronic and what factors may be disrupting the stages of wound healing with a patient centred approach

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Wound healing

The wound healing approach must be:

1. Patient centred: Remember you are treating a person who happens to have a wound. Without patient buy in, the wound plan will not be effective.
2. Holistic: Best practice requires assessment of the 'whole patient' not just the 'hole in the patient'
3. Interprofessional: Wound care is complex and involving many disciplines is crucial for best outcomes: nurses, podiatrists, rehabilitation, diabetes educator, prosthetists, orthotists, dietician, doctor and occupational therapists should be included.
4. Evidence based: The more knowledge and experience with best available evidence the more likely to achieve a positive outcome.

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Wound healing

The person's environment in which they live also impacts:

- Mobility
- Cleanliness
- Family support
- Access to care

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Always remember:

1. Vascular health (Blood flow)
2. Neurological health (Sensation)
3. Biomechanical (Pressure/ offloading)

Blood flow

Sensation

Offloading

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Wound management – practical

Mrs M is 60 years old and lives with her husband and extended family. She enjoys weaving. She had her right little toe amputated 3 years ago after she got a cut on her foot from some broken glass.

She attends the local health clinical every 6 months for a check up. At this check up, the nurse noticed a wound on the lateral side of her foot near the previous amputation site.

She has good pulses but signs of neuropathy. She came in without wearing shoes. Her wound has been classified as Stage A :grade 1

What would you do for this woman?

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Wound management – practical

- Mr P had a wound 6 months ago that healed within 3 months.
- He has attended clinic appointments every 3 months and has been controlling his diabetes well.
- He has good support of his family and is not working.
- He has returned to the clinic today as he feels that the skin is breaking again.
- He has good blood supply but poor sensation.
- He is wearing sports shoes but they are very tight.
- His wound is classified as Stage A, grade 0.

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Wound management – practical

Mr T is 35 years old and a primary school teacher. He has come to the hospital with an wound that started as a coral cut 8 weeks ago while he was out fishing.

He is the main breadwinner for the family with 4 children. Mr T lives 1 km from his work. He travels to work on the work transport.

He wears flip-flops and does not have other footwear.

He has strong pulses but poor sensation. His wound has been classified as stage B: grade 2

What would you do for this man?

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Wound management – practical

Mrs L is a mother of 3 children. She is 40 years old.

She has come to the diabetes clinic for the first time in 1 year and has a large wound on her foot.

She lives 5 km from the hospital and has to take public transport to come to the hospital.

She wears flip flops when out and walks barefoot at home.

She has good pulses but poor sensation
The wound is classified as stage A: grade 3.

What would you do for this woman?

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