A pathway for
treating a person with a:

Burn

Australia Version 1.0

An evidence-based step-by-step guide
developed by clinicians for clinicians

Coloplast

Developed by clinicians for clinicians

This pathway was developed as part of a series of wound type specific pathways with feedback and input from over 2200 healthcare professionals in the field of wound care. It offers a unique evidence-based approach to managing burns and lets you put the latest evidence in wound care to use in real life.

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Coloplast ANZ acknowledges the contributions of members of the Coloplast Wound Advisory Board and ANZ Subject Matter Experts in the localisation of this document.

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Take a shorter way to wound healing

By following the steps in this pathway, you can provide an optimal healing environment for burns and reduce the risk of complications that could lead to delayed healing or worse.

Any advice included here needs to work in conjunction with your local protocols and your individual scope of practice.

Whenever a QR icon appears you can scan the correlating QR code at the bottom of the page.

To access helpful tools, scan the blue QR codes.

To dive deeper into subjects, scan the light blue QR codes.

The guidance provided in this book is best understood in combination with the detailed guidance available to you in The Wound Care Pathway. Whenever the book icon appears, you can look up further information there.

Scan to learn more about *how to appropriately engage with Aboriginal and Torres Strait Islander people and communities*

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What is a burn?

Burns are injuries to the skin that occur when the skin or other tissues are damaged by contact with heat (flame, scalds from liquids spilled, oil or steam), electricity, radiation, chemicals or friction. Burn injuries can be devastating and without appropriate treatment can result in slow healing, infection, scar formation, disfigurement, contractures, joint dysfunction, pain, and psychological and spiritual stress.[1]

The severity of a burn relates to both the depth of skin involvement and the percentage of the total body surface area involved.[2]

This pathway is focused exclusively on thermal burns, including scalds, in patients of all ages.

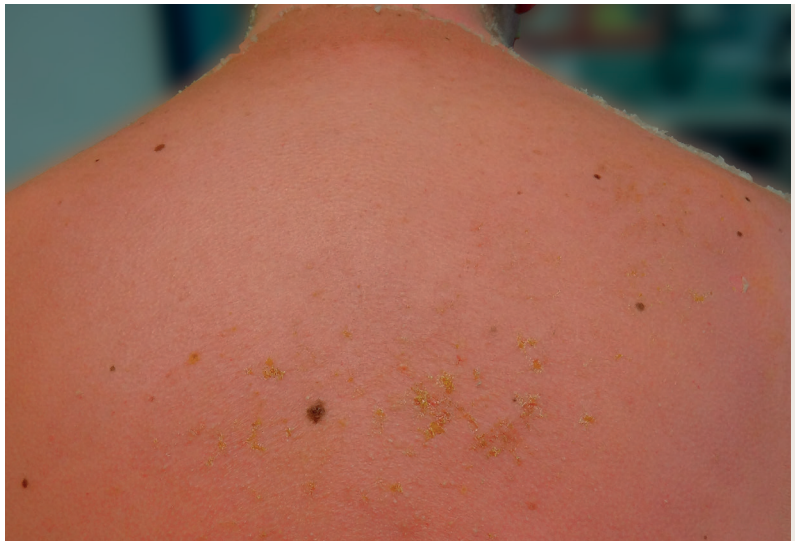
Burns are common and frequent

- During 2023/24 the most common cause of injury across all patients (ANZ) was flame burns (35%), followed by scalds (33%), and contact burns (16%)[10]
- Burns are the fourth most common trauma worldwide.[4]
- 90% of burns in the UK and USA are non-complex wounds that can be safely and effectively managed outside of specialised burns units.[4]

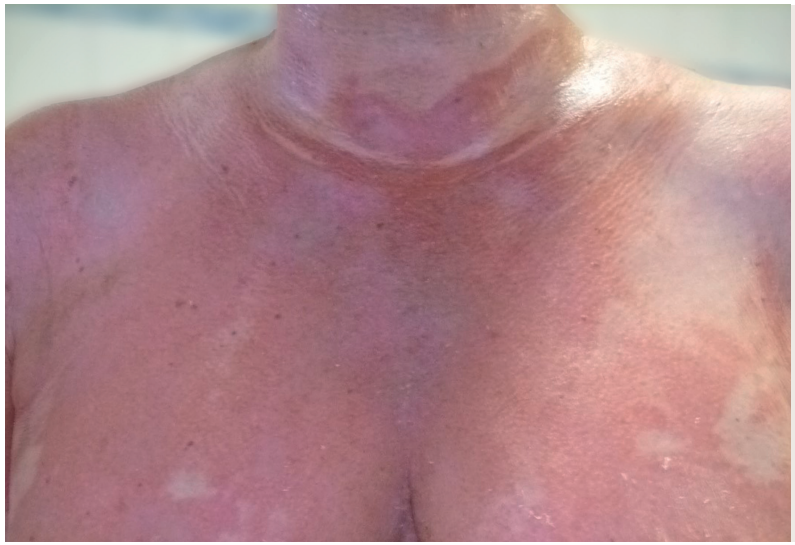
Scan to learn more about
Scan to learn more about ANZBA recommendations for the prevention and management of burns

Scan to learn more about
The Wounds International Best Practice Guidelines

What does a burn look like?



A thermal burn
eg. sunburn



A scald

Step 1

How to **assess** a burn

→ If on fire
- Stop, drop to ground, cover face & roll so fire is smothered.
- Smother flames with a fire blanket.
- Move away from heat source.
- Remove clothing and jewellery (including nappies).
  - Clothing can hold heat on burnt area.
  - If swelling occurs jewellery can stop blood flow to burnt area.

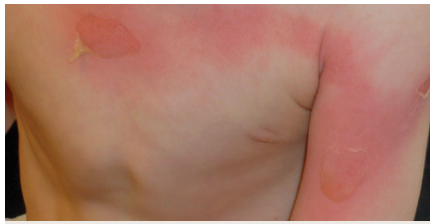
→ Immediately conduct a primary and secondary survey.

→ Apply cool running water
- For at least 20 minutes effective up to 3 hours post burn.
- If running water not available, spray water or wet 2 cloths and alternate them onto burn every 30 seconds (re-wet if needed to keep cool).
- Keep the patient warm.
- Do not use ice or frozen materials.

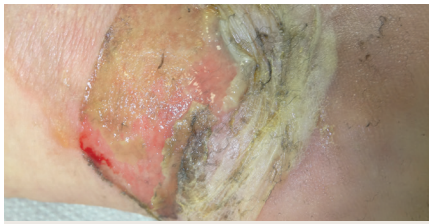
Remember: Cool the burn not the patient.

Conduct **assessments**

→ Conduct a burn assessment to determine the Total Body Surface Area of the burn (TBSA), as well as the mechanism, location, depth and size.
- The burn wound is expressed as a percentage of the total body surface area (TBSA). The most common methods used to estimate the TBSA are the Palmar Surface method, the Lund and Browder chart and the Wallace Rule of Nines.
- The palmar surface method is a simple method to estimate burn area. The patient's hand with closed fingers represents approximately 1% of the body surface area. It is effective for estimating the area of small burns or large burns. In large burns, the burnt area can be quickly calculated by estimating the area of uninjured skin and subtracting it from 100. When estimating TBSA, do not include simple erythema (reddening of the surrounding skin) in your calculation.



Superficial thickness burn



Deep thickness burn

Scan to access
Rule of Nines and Lund & Bowder chart

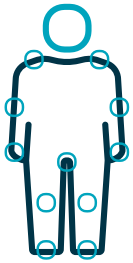
Palmar Surface

The patient's palm area (palm and digits) approximates to **1%** of the total body surface area.

Cause, location & depth

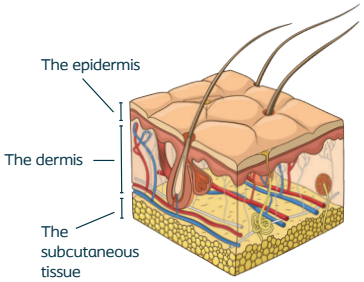
→ Document the cause of the burn, when the burn occured and what has been done so far.

→ Location of the burn:

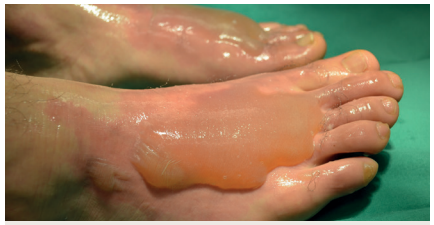


- The location of a burn can increase the complexity of the burn management.
- Burns that are over joints, on hands, feet, face, the perineum or genitalia should be referred to a Burns service.
- If the burn is on a limb, then assess for circulation/blood supply.
- Circumference burns need to be referred/discussed with the Burns service

→ Measure the depth of the burn:

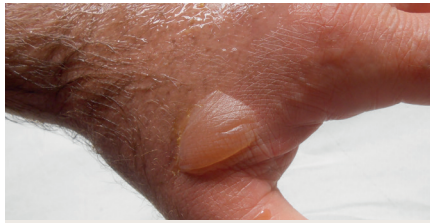


- Burn . Burn depth is classified based on the amount of tissue damage:
  - Superficial epidermal
  - Superficial dermal
  - Mid dermal
  - Deep dermal
  - Full thickness
  - Severe full thickness
- Burn depth is typically determined based on a visual assessment.
- Refer to table on page 10 for full description on how to assess burn depth
- It may be necessary to deroof blisters/debride dead skin to be able to visualise the wound bed and accurately assess wound depth[5].

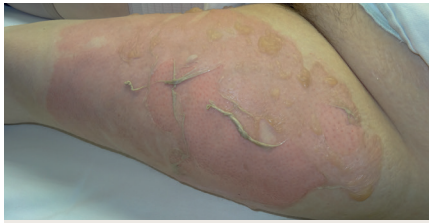


A blister requiring deroofing

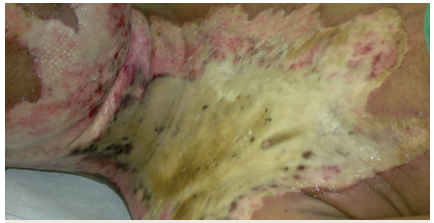
Burn depth category examples



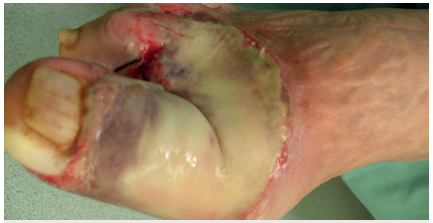
Superficial dermal



Mid to deep dermal



Full thickness burn



Severe full thickness

Classification of burn depth

Depth of burn	Layers of skin affected	Skin examination
Superficial epidermal (for example, sunburn)	The epidermis is affected, but the dermis is intact.	The skin is red and painful, but not blistered. Capillary refill* blanches then rapidly refills.
Superficial dermal (partial thickness)	The epidermis and upper layers of dermis are involved.	The skin is red or pale pink and painful with blistering. Capillary refill* blanches but regains its colour in under 2 seconds.
Deep and Mid dermal burns (partial thickness)	The epidermis and the upper and deeper layers of the dermis are involved, but not underlying subcutaneous tissues.	The skin appears dry, blotchy or mottled, red, and typically painful (due to exposed superficial nerves). There may be blisters. Capillary refill* is sluggish or does not blanch.
Full thickness	The burn extends through all the layers of skin to subcutaneous tissues. If severe, it extends into muscle and bone.	The skin is white, brown, or black (charred) in colour, with no blisters. It may appear dry, leathery, or waxy and is painless. Capillary refill* does not blanch.

*Assess capillary refill by pressing with the back of sterile scissors, forceps or with a sterile cotton bud (such as a bacteriology swap).

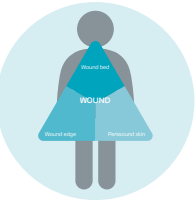
Modified from NICE Clinical Knowledge Summaries burns and scalds, Lloyd 2012, Wounds International Best Practice Guidelines 2014 and Douglas 2017.

Keep in mind: It is common to find all types of burns within the same wound and the depth may change with time, especially if infection occurs.

Keep in mind: Burns are dynamic. Burn depth may increase over time. Therefore, reassessment after 24–72 hours is important in establishing accurate burn depth.

→ Conduct a wound assessment using a validated wound assessment tool.

→ Conduct a holistic patient assessment to determine comorbidities, allergies, etc.



→ Check for tetanus vaccine status.

→ Conduct a pain assessment.

→ Conduct a complete physical exam to check for other injuries, including inhalation injuries.

→ It is important to remove jewellery or clothing which may have a tourniquet effect if edema becomes an issue or can be a source of thermal insulation preventing the burn from cooling.

→ Also evaluate the burn pattern for consistency with the history of injury to evaluate for Non-Accidental Injury. If this is suspected, it should be reported in accordance with local laws and regulations.

Complications with even small burns in children can be fatal (toxic shock syndrome) and should be referred.[6] If the child is febrile with a burn they should present immediately to their local emergency department.

Scan to access
The Triangle of Wound Assessment

Step 2

How to develop a treatment & care plan

→ A treatment or care plan should be developed in partnership with all members of the care team and the patient.

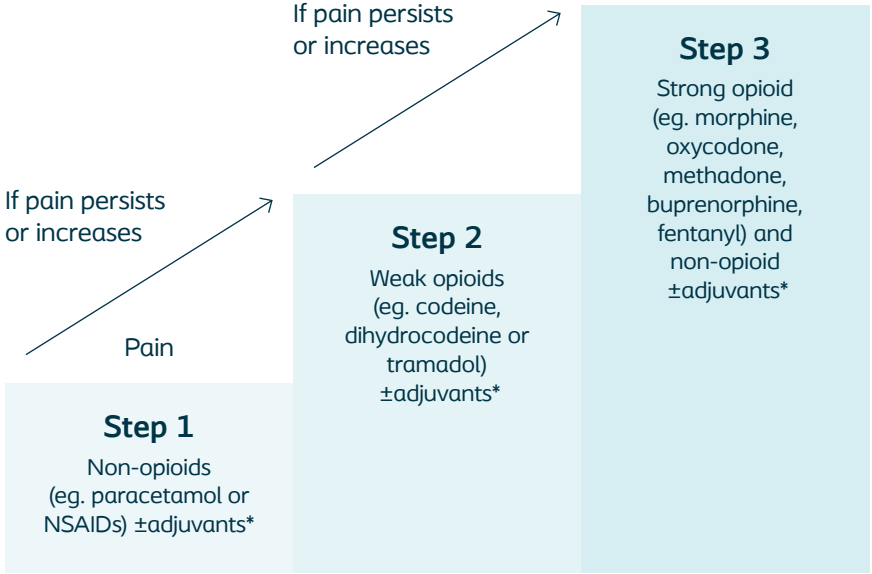
→ When developing a treatment plan consider the following:

- Mitigate factors that delay healing including wound infection, presence of hypergranulation tissue, wound desiccation and systemic issues.
- Superficial burn injuries can be extremely painful. All burns patients should have an individualised pain management plan. If pain is unresolved and persistent, refer.
  - Burn itching, especially nighttime itching can be long lasting and very intense.
  - Burn wound itching often begins at wound closure and peaks at 2-6 months after injury and can be exasperated by heat, stress and physical activity.
  - Treatment for burn itch includes skin moisturisers, adequate hydration, topical antihistamines, oral antihistamines and analgesics.
- A patient's nutritional status can affect how well the burn wound heals. Encourage patients to:
  - Eat a high-calorie/high-protein diet.
  - Maintain hydration – drink 6–8 glasses of water a day and avoid caffeine and alcohol.
  - Stop smoking.
  - Attend to basic principles of cleanliness and good personal hygiene and keep fingernails short.
  - Rest and elevate with gentle mobilisation/exercises to prevent swelling and oedema.

Scan to access
The IIWI Wound Infection in Clinical Practice 2022

- Burn injuries – even minor ones – can have a devastating impact on the psychological health of a patient. Depression has a significant prevalence in burns patients as a consequence of their injury and the impacts on their lives.
- Refer for dietician and counselling support if there are concerns about a patient's nutritional or psychological status.

→ WHO Analgesic Ladder[11]



*Adjuvants can be used along any step of the ladder, these may include antidepressants, anticonvulsants, corticosteroids and anxiolytics.

Step 3

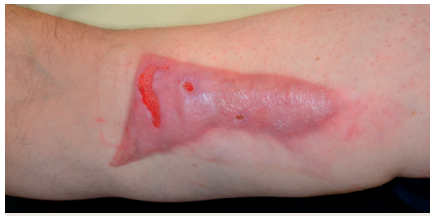
How to manage a burn

Remember: To promote the goal of a shorter time to wound healing it is important to prevent the desiccation of viable tissue and control bacteria by choosing a dressing that promotes moist wound healing.

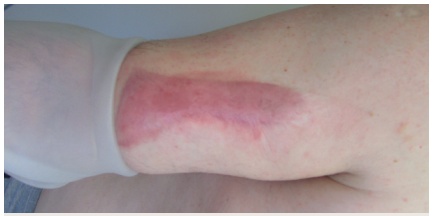
→ The first dressing change should be 48 hours after injury and then every 3–7 days thereafter, depending on how healing is progressing.

- Cleansing, debridement, deroofing, dressing changes and physiotherapy can be very painful. If not already given, analgesia should be provided well before any interventions are performed, ensuring the pain relief has reached its full effect prior to the procedure.
- All burns should be cleansed to remove foreign bodies, soluble debris, necrotic tissue or slough.
- Irrigation is the preferred method for cleansing burn wounds. Irrigate the wound using copious amounts of normal saline or warm tap water, mild soap and water or wound irrigation solutions containing topical antiseptics. Cleansing wipes and pads may also be used.
- Debride the wound and wound edges to remove necrotic tissue, reduce the risk of infection and encourage epithelialisation. The method of debridement should be appropriate to the location of wound, the amount of tissue to be removed and the skill of the practitioner.
- Blisters greater than 1cm^2 should be deroofed.[1,5,7] Blisters that are tense over a joint should be deroofed. Blisters filled with cloudy serous fluid or blood should be deroofed. Blisters in locations that are prone to breakage should be deroofed. Remove all blistered skin at 48-72 hours- this may need to be staged if the burn is superficial dermal. In darker skin pigmentation blisters may need to be removed to assist in assessment.
- Analgesia should be given well before any deroofing procedure. After deroofing any remaining dead skin should be removed with sterile scissors.
- Giving routine prophylactic antibiotics for burns is NOT recommended. If infection is suspected consider taking a swab for microbiology, using the Levine Method. Topical antiseptics/antibiotics can be used empirically to prevent infection.

- Scar Management:
  - Healed burns can be sensitive, develop dry, scaly skin and have irregular pigmentation and are also vulnerable to re-injury.
  - The area should be moisturised 3-4 times a day with a water soluble and non perfumed moisturiser for a minimum of 3 months and up to 12 months in some cases.
  - Scars are less pliable than normal skin and may limit mobility.
  - Treatment can include, moisturising, massage, pressure garments, physiotherapy and surgery.
  - Keloid scarring is a risk factor, especially for patients with brown or dark skin tones.
  - Hypertrophic scarring is a risk factor for deep burns or burns with delayed healing and can negatively affect patient Quality of Life (QoL).
  - If hypertrophic or keloid scarring is suspected, refer.



Hydrotrophic scar



Hydrotrophic scar

Scan to learn more about
Taking a wound swab

Step 4

How to choose dressing & additional therapy

→ A burn dressing should:
- Maintain a moist wound environment.
- Remove exudate and protect against infection.
- Contour easily and retain close contact with the wound bed.
- Be easy and painless to apply and remove.
- Not adhere to wound bed and protect new skin.
- Reduce frequency of dressing changes.
- Where a burn injury is a mixture of depths, choose a dressing based on the predominant depth.
- Avoid alginate, paraffin gauze dressings and adhesive tapes as they tend to adhere to the skin.
- There is evidence that silver dressings promote healing in burn wounds. Follow local guidelines on the use of silver dressings

Dressing selection should be based on patient needs and preferences and local policy/ protocol/formularies. The following chart breaks down some of the basic theory around dressing types and how they can help manage symptoms for patients with burn wounds.

Burn Type/ Depth	General treatment options	Expected healing times
Superficial burns	Moisturiser 4 times a day or covered with silicone foams	1 week
Superficial and Mid dermal burns	Hydrogels with secondary dressings such as hydrophilic or silicone foams, superaborbents can be considered for highly exuding burn wounds	1 week
Deep Dermal burns	Cleansing, debridement and secondary dressings such as hydrophilic or silicone foams, superabsorbents and dressings that are atraumatic upon removal. Topical Antimicrobials could be considered.	2 weeks
Deep dermal burns	More difficult to treat as may require surgical intervention. Requires dressings that provide a close fit to the wound bed, supports a moist wound healing environment and protects against infection. Topical antimicrobials should be considered.	3 – 6 weeks

→ Always use an aseptic or non-touch application technique on application and removal.

→ Ensure dressings do not impede patient mobility, that patients can move and exercise joints and dressings are secured to avoid slippage.

→ Advise patients to keep dressing dry and clean.

→ Dressing should be changed within 24–48 hours after initial injury and every 3–7 days thereafter, depending on how healing is progressing.

→ Dressings should be changed immediately if they become painful, odorous, or saturated. It is important to remind patients to contact their care provider if any of these complications occur.

Step 5

How to monitor progression

- Taking photos of the wound will help monitor healing progress and may be useful if specialist advice about assessment and treatment needs to be sought.
- If a non-complex burn wound has not healed in 2-weeks, refer.
- Monitor for complications, such as spreading infection or toxic shock syndrome, if suspected refer immediately to their local emergency department.
- Provide patients and caregivers with written information about the key stages of their management including wound care, pain & itch management and clear warnings signs as to when to seek additional care.

When to refer or contact a specialist

- All full thickness burns.
- Burns where the TBSA is:
  - >10% in adults
  - >5% full thickness burns
  - Older frail adults
  - > 5% in children
  - All burns in children under 2
- Burns over Face, Hands, Feet, Genitalia, Perineum, Major Joints, Circumferential Limb or Chest.
- Burns with inhalation injury.
- Electrical burns.
- Chemical burns.
- Burns associated with major trauma.
- Burn injury in pregnant women.
- When systemic or spreading infection is suspected or present.
- When healing is not progressing.
- In patients with complicated or complex comorbidities.
- If pain is not adequately controlled with oral analgesia.
- If contractures occur or are expected to occur after wound healing.
- If hypertropic or keloid scarring is suspected or present.
- If signs of toxic shock symptoms are present.
- Where non-accidental injury is suspected

Glossary of burn wound terms

Burn Conversion – the interval worsening or deepening of the depth of burn wounds over time, often seen in children due to their thinner dermis.

Wound Desiccation – drying of the wound bed which delays healing or ceases healing altogether.

Burn Eschar – composed of necrotic skin destroyed by the burn, coagulated protein from the exudated plasma, and bacterial exudates which have begun developing. Normally the eschar loosens about the second or third week, and underneath the eschar the granulation base appears.

Contractures – occur when the burn scar matures, thickens, and tightens, preventing movement. Requires a surgical review early.

Oedematous – swollen with an excessive accumulation of fluid.

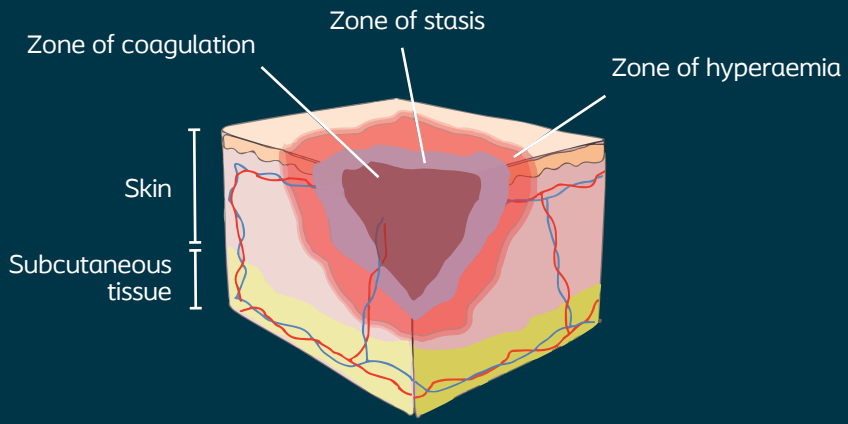
Hypertrophic Scarring – the post-burn hypertrophic scar is thicker, firmer and more vascular than a normal scar. It can persist for several years and can be associated with itching and pain and contraction. Hypertrophic scars stay within the injury site.

Keloid Scarring – thick, irregular scarring that forms months to years after the inciting injury. Often shiny, hairless, lumpy, raised skin that is itchy and causes discomfort.

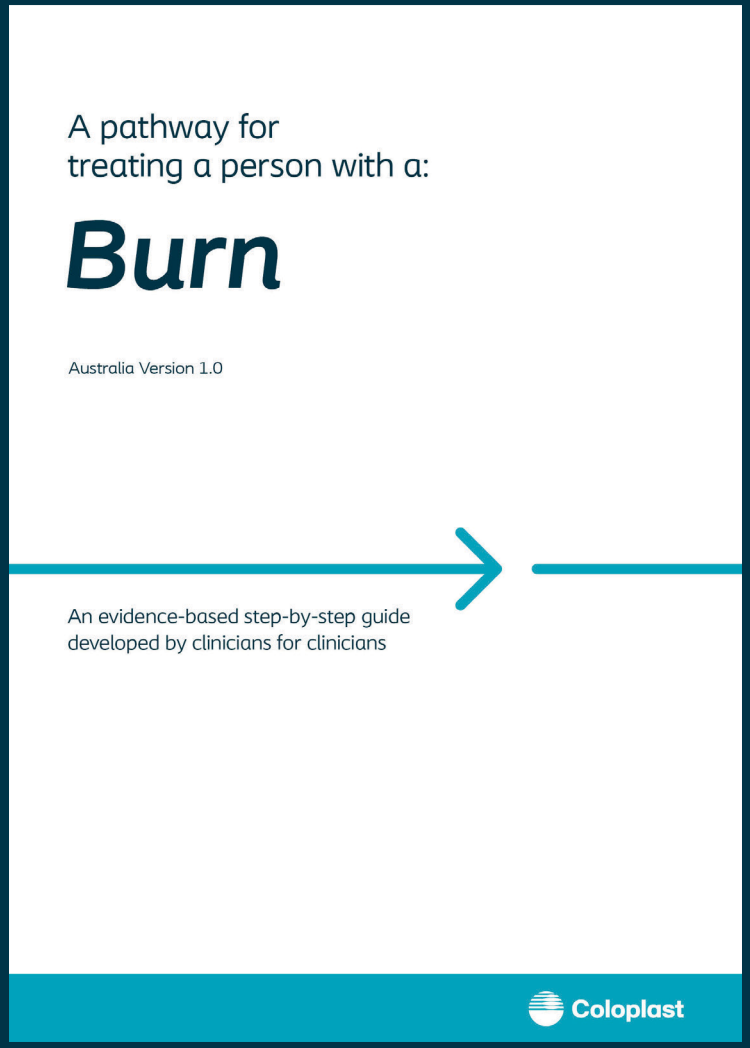
Systemic Manifestation – An infection that is in the bloodstream is called a systemic infection. An infection that affects only one body part or organ is called a localised infection.

Zone of Injury – there are 3 zones in injury in burns. The zone of coagulation is the tissue that was destroyed at the time of injury. The zone of stasis has a compromised blood supply, inflammation and tissue injury. The zone of hyperaemia sustains the least damage, where microvascular perfusion is not impaired. Often the area of stasis will progress and become a zone of coagulation and a deeper burn within 48 hours following the injury.

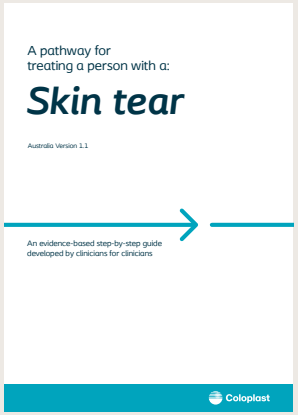
Zone of injury

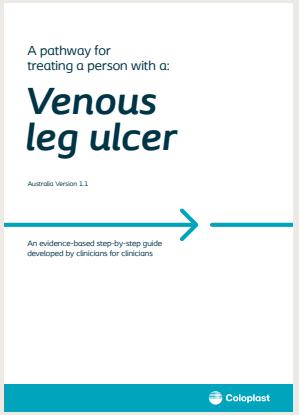


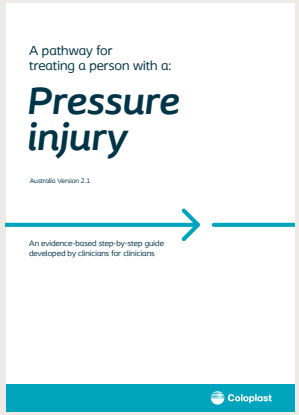
For a glossary of general wound care terms consult The Wound Care Pathway

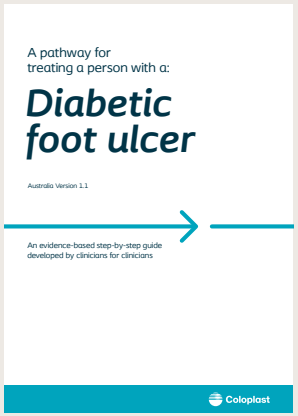


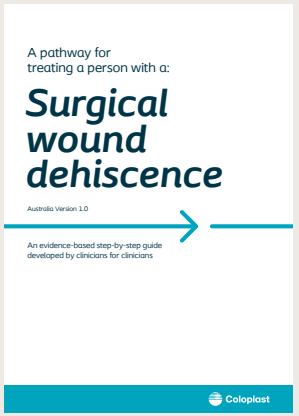
Hope you found this pathway useful!











Scan the QR code to access guidance on other wound types.

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