

This decision support tool is intended primarily for front-line clinicians. It is provided for guidance only and does not replace the judgment of the clinician performing the activities reserved to him or her by law or regulation. This document has been designed on the basis of clinical recommendations developed by the INESSS using a systematic approach and supported by the scientific literature as well as by the knowledge and experience of clinicians from different specialties and areas of expertise. The content of this tool excludes newborns and young children. Tools to guide wound assessment and the determination of healing potential, as well as decision support on an optimal treatment plan based on wound etiology, vascular supply, and infectious risk, tissue type and exudate quality, are also provided, along with a reminder of dressing specifics. For further details, visit [inesss.qc.ca](http://inesss.qc.ca).

## PATHOPHYSIOLOGY

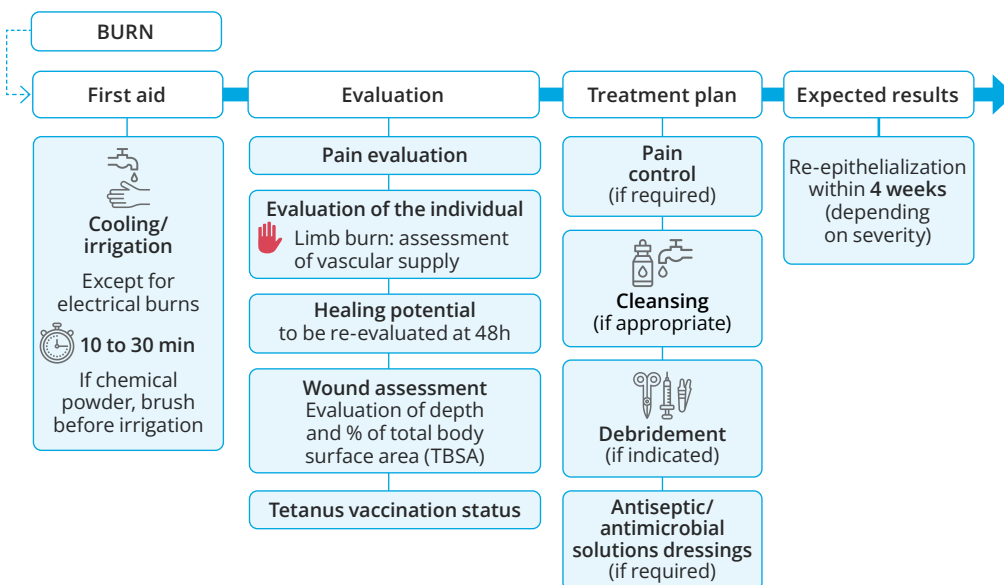
- **Burn:** injury that occurs when the skin or other tissues are damaged by contact with heat, extreme cold, electricity, radiation or chemicals.
- **Blister:** forms when the epidermis and dermis separate. It appears in partial-thickness burns, superficial or deep (2<sup>nd</sup> degree), and is often filled with a serous, translucent liquid.



## EVALUATION: POINTS TO REMEMBER

- The nature of the **causative agent** and the circumstances of the accident influence the pathophysiology of the burn and its management.
- **Cooling/irrigating** the burn under water, if indicated, limits the progression of tissue damage, cleans the wound, soothes pain and reduces inflammation.
- A thorough estimation of **burn's depth** and **percentage of the patient's total body surface area** (TBSA) is essential to determine the severity of a burn and to guide therapy.
- Any burn that meets the [criteria for transfer](#) to a burn center should be discussed with a specialist or experienced colleague.
- The management of **blisters** varies according to their size and location.

## WOUND MANAGEMENT PRINCIPLES



## SUMMARY

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## FIRST AIDS

- ⚠ **Evaluate and, if necessary, control pain.**
- Promptly remove burned or restrictive jewelry or clothing to avoid tourniquet effect.
- For evaluation and priority management of polytrauma patients, refer to the [Advanced Trauma Life Support \(ATLS\)](#).

→ Identify the causal agent (e.g., fire, hot surface contact, boiling water, steam, chemicals, electric current).

→ Treat according to burn type:

Thermal burn	Chemical burn	Electrical burn
<ul style="list-style-type: none"> <li>Cool for <b>10 to 30 minutes</b> with water (effective for up to <b>3 hours</b> post-burn)</li> </ul>	<ul style="list-style-type: none"> <li>Remove dry powder before irrigation</li> <li>Irrigate under water for at least <b>30 minutes</b></li> <li>Consider the systemic effects of the product</li> <li>☞ Promptly contact <a href="#">Centre antipoison du Québec</a> or dial 1-844-POISON-X</li> </ul>	<ul style="list-style-type: none"> <li>⊗ Do not cool or irrigate</li> <li>☞ Refer to a specialized service</li> </ul>
<ul style="list-style-type: none"> <li>Use water ideally at room or body temperature.</li> </ul>		
<ul style="list-style-type: none"> <li>Avoid hypothermia (stop cooling if body temperature falls below 35°C)</li> </ul>		
<ul style="list-style-type: none"> <li>⊗ <b>Avoid</b> <ul style="list-style-type: none"> <li>Very cold water and ice may increase pain/depth or cause vasoconstriction or hypothermia.</li> <li>Wet towels or hydrogel dressings, as they do not adequately cool the wound.</li> </ul> </li> </ul>		

## HOLISTIC EVALUATION OF THE INDIVIDUAL

### ANTI-TETANUS VACCINATION STATUS

→ If necessary, administer tetanus prophylaxis within 3 days of the burn.

→ Consult the [MSSS decision tool for tetanus prophylaxis](#).

### BURN HISTORY AND LOCATION

→ Determine - if possible - the duration of exposure to the causal agent, the symptoms experienced (e.g., breathing difficulty, headache, vomiting) and the first aid received.

→ Check whether the burn was accidental or intentional (e.g., signs of abuse, maltreatment or domestic violence).

#### 👉 Burn on a limb:

- Perform a [complete vascular supply assessment](#).

#### **If vascular supply inadequate or uncertain:**

☞ Refer promptly for vascular assessment by a qualified professional or specialized service.

### RISK FACTORS AND COMORBIDITIES

→ Identify uncontrolled medical conditions/comorbidities (e.g., diabetes, immunosuppression, malnutrition, dehydration) that may delay or complicate the healing process.

→ Review current and past medications (prescription and non-prescription).

→ Identify psychosocial and environmental factors (e.g., living conditions, cognitive function, social support).

## DETERMINATION OF WOUND HEALABILITY

→ Consult [Wound assessment and determination of wound healability decision support tool](#) to determine whether the wound is **curable**, **under maintenance**, or **incurable**.

# WOUND PREPARATION PRIOR TO EVALUATION

❗ Evaluate and, if necessary, control pain.

## Burn located in a very hairy area (e.g., scalp):









→ Remove hair (2 to 5 cm beyond the edge of the wound) to facilitate evaluation and cleansing (e.g., with scissors/trimmer/razor), ideally after discussion with the individual.

❗ Whatever the cutting technique used, it's important to clean the wound thoroughly with water or a physiological solution to ensure that no hair gets in (which can increase the risk of infection).

# WOUND ASSESSMENT

→ [Wound assessment](#) should consider the following:

1	Identify tissue type and exudate type	Area and appearance of wound, surrounding skin and presence of blister	Identify symptoms and signs of infection/biofilm	
	<ul style="list-style-type: none"> <li>Burns are often most exudative in the first <b>48 hours</b> after the incident</li> </ul>	<ul style="list-style-type: none"> <li>Burn appearance may change over time, especially in the <b>first 7 days</b>.</li> <li>☞ If in doubt, contact an experienced colleague, specialist doctor, or burn unit.</li> </ul>	<ul style="list-style-type: none"> <li>The appearance of blisters corresponds to a partial-thickness burn (2<sup>nd</sup> degree, superficial or deep).</li> <li>❗ <i>The size and location of blisters determine whether or not they need to be debrided.</i></li> </ul>	<ul style="list-style-type: none"> <li>⚠ Wound culture is generally not recommended. <i>The risk of infection is generally low in superficial burns (if well dressed).</i></li> </ul>

2				Burn Depth Assessment Based primarily on histological definitions	
	Burn depths		Clinical aspects		
Superficial (1 <sup>st</sup> degree)			<ul style="list-style-type: none"> <li>Damage to epidermis only</li> <li>Dry, pink-red skin, sometimes painful</li> <li>Bleachable erythema and mild edema</li> <li>Rapid capillary refill</li> <li>No blisters</li> <li>Unaffected tactile sensations</li> </ul>		
Superficial partial thickness (2 <sup>nd</sup> degree)			<ul style="list-style-type: none"> <li>Deeper involvement that does not extend to muscles or bones</li> <li>Pink, painful, moist skin</li> <li>Bleachable erythema</li> <li>Rapid capillary refill (under blisters)</li> <li>Presence or absence of blisters</li> <li>Hair follicles and sweat glands intact</li> <li>Tactile sensations intact</li> </ul>		
Deep partial thickness (2 <sup>nd</sup> degree)			<ul style="list-style-type: none"> <li>Burn extends into the deeper layers of the dermis, but not through the entire dermis</li> <li>Dark pink or mottled red/white skin</li> <li>Non-bleachable erythema and slow capillary refill</li> <li>Less sensation or total loss (variable pain)</li> <li>Blisters are pierced or have a thick, intact wall</li> </ul>		
Full thickness (3 <sup>rd</sup> degree)			<ul style="list-style-type: none"> <li>Complete destruction of dermis, hair follicles and sweat glands</li> <li>Non-bleachable erythema</li> <li>Underlying structures not exposed</li> <li>White, mottled, cherry-red, mottled red, brown or black skin</li> <li>Pressure ulcer may be present</li> <li>Without blisters or with a thin wall</li> <li>Slow or absent capillary refill</li> <li>Total loss of sensation and painlessness</li> <li>Thrombosed vessels visible</li> </ul>		

3		Determining Total Body Surface Area (TBSA) in Burns
		<ul style="list-style-type: none"> <li>Use tools such as <a href="#">Wallace Rule-of-Nines</a> or <a href="#">Palmar Method</a>.</li> <li>For children, use tables to adjust percentages according to age.</li> </ul>

## CONTINUUM OF CARE ACCORDING TO SEVERITY OF BURN

Superficial burn (1 <sup>st</sup> degree)	Partial-thickness burn (2 <sup>nd</sup> degree)	Partial-thickness burn (2 <sup>nd</sup> degree) and full-thickness burn (3 <sup>rd</sup> degree) corresponding to transfer criteria
<ul style="list-style-type: none"> <li>Self-management should be encouraged by the application of moisturizing cream</li> <li>Information should be provided to the patient.</li> </ul>	<ul style="list-style-type: none"> <li>Can be managed in an outpatient service if:                             <ul style="list-style-type: none"> <li>- the burn <b>does not involve the face, hands, feet, genitals, perineum, or major joints</b></li> <li>- <b>the burn is accidental</b></li> <li>- <b>the burn is not in a young child</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Any burn that meets the <a href="#">criteria for transfer</a> to a burn center should be discussed with a specialist.</li> </ul> <p>⚠ <i>Depending on clinical judgment and level, some burns may be managed on an outpatient basis.</i></p>
<p>🗨️ If in doubt, consult an experienced colleague or specialist physician, or contact the nearest pediatric center or burn unit.</p>		

## TREATMENT PLAN FOR PARTIAL THICKNESS BURNS (2<sup>nd</sup> DEGREE)

### ⚠ Control pain as needed

- The determination of a treatment plan for a partial-thickness (2<sup>nd</sup> degree) burn must take into account tissue perfusion, the risk of infection and the type of tissue and exudate.
- For more information, consult the [decision support tool](#) for a treatment plan based on wound etiology, vascular supply, infectious risk, tissue type and exudate quantity, as well as the dressing specifics [reminder](#).

### CLEANSING

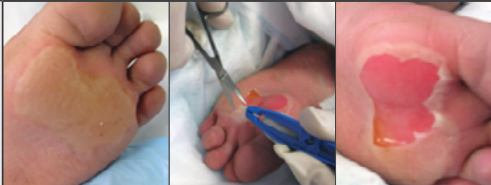

- With aqueduct water or physiological solution (NaCl 0.9%).
- Solutions applied in large quantities at room or body temperature.

### DEBRIDEMENT

Burn without blisters	Burn with blisters
<ul style="list-style-type: none"> <li>✘ Do not debride</li> <li>🗨️ Consult a specialist or experienced colleague if necessary</li> </ul>	<ul style="list-style-type: none"> <li>✔ Blisters should be debrided if:                             <ul style="list-style-type: none"> <li>• filled with clear fluid (serous blisters) and &gt; <b>6 mm</b> in diameter OR</li> <li>• located in a friction area (e.g., joints, hands, feet)</li> </ul> </li> </ul>

### PROCEDURE FOR DEBRIDING SEROUS BLISTERS

- Debridement accelerates re-epithelialization, reduces the risk of infection, and protects the dermis from fluid pressure.

<p><b>Mechanical debridement/ preservative (de-roofing)</b></p>		<ul style="list-style-type: none"> <li>Remove detached epidermis with sterile forceps or scissors</li> <li>Cleanse with water or physiological solution</li> <li>Cover with a semi-occlusive, absorbent dressing</li> </ul>
<p><b>Puncture drainage</b></p>	 <p>Image from <a href="https://litfl.com/minor-burn-management/">https://litfl.com/minor-burn-management/</a></p>	<ul style="list-style-type: none"> <li>Drain fluid with a sterile needle, leaving the roof intact</li> <li>Cleanse with water or physiological solution Cover with a semi-occlusive, absorbent dressing</li> </ul> <p>⚠ <b>Warnings</b></p> <ul style="list-style-type: none"> <li>Less effective, but less painful than de-roofing.</li> <li>Once drained, the blisters, if not punctured, may refill with fluid.</li> </ul>

## APPLICATION OF AN ANTISEPTIC/ANTIMICROBIAL SOLUTION

Local infection or presence of biofilm	
Therapeutic use	Prophylactic use
<ul style="list-style-type: none"> <li>✓ Indicated if local infection is confirmed or the presence of biofilm is clinically suspected</li> </ul> <p>Consult <i>antiseptic/antimicrobial solutions</i> for <a href="#">details</a></p>	<ul style="list-style-type: none"> <li>⚠ Not generally recommended unless one of clinical situations described above applies.</li> </ul> <p>Consult <i>reasons</i> for prophylactic use of <i>antiseptic/antimicrobial solutions</i>.</p>

## DRESSING CHOICE

<ul style="list-style-type: none"> <li>✗ <b>To be avoided</b></li> </ul>	<ul style="list-style-type: none"> <li>• Silver sulfadiazine<sup>1</sup></li> <li>• Fatty substances (e.g., ointments or creams) if the patient is transferred to a specialized service</li> </ul>
<ul style="list-style-type: none"> <li>✓ <b>Preferable</b></li> </ul>	<ul style="list-style-type: none"> <li>• Non-adherent, semi-occlusive dressings that require minimal change.</li> </ul>

1. To be avoided on burns, unless otherwise indicated (e.g., pseudomonas infection), as this type of product often causes pseudo-scarring.

### Choice of dressing according to wound characteristics

Light 🔹 to moderate 🔹🔹 exudate	Moderate 🔹🔹 to high 🔹🔹🔹 exudate	Blisters	Local infection
<ul style="list-style-type: none"> <li>• Bioactive</li> <li>• Hydrocolloid<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Absorbent acrylic dressing</li> <li>• Hydrocellular foam<sup>3</sup></li> <li>• Alginate<sup>4</sup></li> <li>• Hydrofiber<sup>4</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Acrylic absorbent dressing</li> <li>• Hydrocellular foam<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Antimicrobial dressings</li> </ul>

2. May be used mainly during the first 48 hours after the incident. If necessary, change regularly to avoid maceration.

3. Silicone dressings without adhesive edges are preferable. If necessary, the fixation dressing can be added to the edges only, or fenestrated to maintain the semi-occlusivity of the primary dressing.

4. In the presence of abundant exudate, could create an environment conducive to biofilm or other infection. In that case, consider adding an antimicrobial agent.

⚠ **Interface dressings and gauze can be used, but semi-occlusive dressings are often preferable.**

## INFORMATION TO BE GIVEN TO THE PATIENT AND FAMILY

### HYDRATATION

- Moisturize burned skin daily with an emollient for **12 months** after healing.
- Use pH-balanced, fragrance-free products

### SUN PROTECTION

- Protect scarred tissue from the sun for at least **12 months**, wearing appropriate clothing or sunscreen with an **SPF factor of at least 50** to avoid hyperpigmentation, which can be permanent.

### ITCHING

- Itching is common and can be aggravated by heat, stress, and physical activity.
- To reduce itching, we recommend keeping the tissues hydrated and the area cool.
- Pharmacological and non-pharmacological techniques (e.g., massage) can also be used.

## MONITORING AND FOLLOW-UP

### Dressing change/Frequency

⚠ *Change - ideally - any dressing that has become detached or more than 50% soiled<sup>1</sup>*

Non-infected wound	<ul style="list-style-type: none"> <li>Wear dressing according to manufacturer's maximum recommended duration<sup>2</sup> or clinical judgment.</li> </ul>
Infected wound	<ul style="list-style-type: none"> <li>Regular changes according to wound properties, individual condition and, above all, the action mechanism of the dressing/antimicrobial product.</li> </ul>

- If necessary, change frequency should be increased.
- Use beyond the recommended wearing time may reduce dressing efficacy and increase the risk of infection.

### RE-EVALUATION FREQUENCY

- Ideally after **24 to 72 hours**, as burn depth may increase over time.
- Once a week or more frequently, depending on:
  - the risk of wound deterioration or complications/the person's condition (if necessary, reassess [healing potential](#));
  - the type of dressing used - e.g., at least once every 2 weeks if using an antimicrobial dressing.

### TO REMEMBER DURING FOLLOW-UP

- Look for [clinical indicators](#), including symptoms and signs of infection (local, deep soft tissue or systemic).

Superficial burn (1 <sup>st</sup> degree)	Superficial partial thickness burn (2 <sup>nd</sup> degree)	Deep partial thickness burn (2 <sup>nd</sup> degree)
<ul style="list-style-type: none"> <li>Rapid healing (generally <b>3 to 7 days</b>)</li> <li>Usually leaves no scar</li> </ul>	<ul style="list-style-type: none"> <li>Healing generally takes <b>7 to 10 days</b></li> <li>Leaves little or no scarring (colour difference)</li> </ul>	<ul style="list-style-type: none"> <li>Healing generally takes <b>2 to 3 weeks</b></li> <li>More or less discreet scarring</li> </ul>

⚠ **Full-thickness burns (3<sup>rd</sup> degree) generally require treatment and follow-up in a hospital or specialized centre.**

## RELATED CARE

- Metabolic management: assessment of nutritional status and hydration (especially for highly exudative wounds).
- Pain management.
- Identification (as required and depending on the clinical situation) of psychosocial problems, such as anxiety and post-traumatic stress disorder (PTSD), which can sometimes arise in the case of severe burns.
- Daily (or more frequent) cleansing and moisturizing with an emollient.

## CONSULTATION WITH SPECIALIST

- Consult a specialist or experienced colleague:
  - if vital functions are affected (state of consciousness, breathing, blood circulation);
  - if the burn occurs in a young child;
  - if in doubt or if the burn has been intentionally inflicted;
  - if the burn requires debridement;
  - if bloody blisters are present;
  - if the burn requires management or treatment beyond the professional's knowledge or skills;
  - if the burn shows no noticeable improvement after 14 days (increased risk of hypertrophic scarring within the first 3 weeks).

⚠ **If in doubt, burn units can be contacted for a telephone consultation.**

## MAIN REFERENCES

- References are presented in the INESSS [report](#) associated with this tool.

# APPENDIX I

## EVALUATION OF PERCENTAGE OF TOTAL BODY SURFACE AREA

### Wallace rule of nines

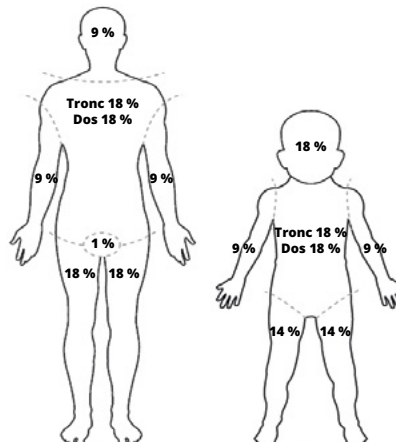
Target population and objectives
<ul style="list-style-type: none"> <li>Standardized burned skin surface assessment scale - % total body surface area (TBSA).</li> <li>Enables rapid assessment of the extent of body surface damage in a burn victim.</li> <li>Used for <b>2<sup>nd</sup> and 3<sup>rd</sup> degree burns only</b>.</li> <li>Mainly used on adults.</li> </ul>

Advantages
<ul style="list-style-type: none"> <li>Simple to use</li> <li>Easy to memorize</li> <li>Rapid evaluation</li> </ul>

Limitations
<ul style="list-style-type: none"> <li>Approximate evaluation</li> <li>Mainly used in emergency or pre-hospital settings</li> <li>Does not take age-related morphological variations into account</li> <li>Less accurate in children and the obese</li> </ul>

Operating principles
<ul style="list-style-type: none"> <li>Divides the body surface into zones of 9% or multiples of 9 to determine the damaged body surface.</li> <li>The perineum or genitalia account for 1%</li> <li>In children, this rule is modified, notably because of the importance of the cephalic segment.</li> </ul>

Body part	Area affected (%)	
	Adult	Child
Head and neck	9	18
Anterior chest	18	18
Posterior chest	18	18
Each leg	18 (x 2)	14 (x 2)
Each arm	9 (x 2)	9 (x 2)
Genitalia and perineum	1	1
<b>Total</b>	<b>100</b>	<b>100</b>



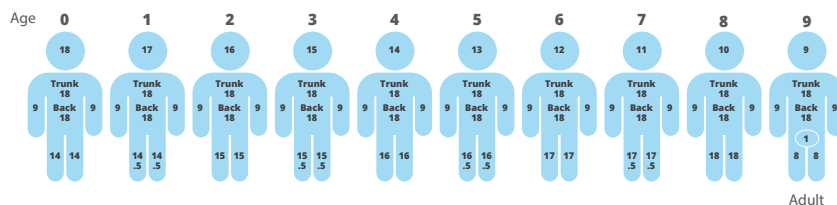
### Other pediatric version

Target population and objectives
<ul style="list-style-type: none"> <li>Allows rapid evaluation of the extent of body surface damage in a burn victim.</li> <li>Used for <b>2<sup>nd</sup> and 3<sup>rd</sup> degree burns only</b>.</li> </ul>

Advantages
<ul style="list-style-type: none"> <li>More precise method for children</li> <li>It takes into account variations in surface area as a function of age</li> </ul>


Limitations
<ul style="list-style-type: none"> <li>Approximate evaluation</li> </ul>

Principes et fonctionnement
<ul style="list-style-type: none"> <li>Adjust for age by removing 1% of TBSA from the head and adding 0.5% of TBSA to each leg for each year of life up to &gt; 8 years.</li> <li><b>At age 9.1% is added to the perineum.</b> The proportions are then the same as for an adult.</li> </ul>



## EVALUATION OF PERCENTAGE OF TOTAL BODY SURFACE AREA

### Palmar method

Target population and objectives	
<ul style="list-style-type: none"> <li>• Can be used to calculate burn size</li> <li>• Use for <b>small burns or 1<sup>st</sup> degree burns</b></li> </ul>	
Advantages	Limits
<ul style="list-style-type: none"> <li>• Simple, fast and easy to use</li> </ul>	<ul style="list-style-type: none"> <li>• Approximate evaluation</li> <li>• Less accurate for estimating the size of large burns</li> </ul>
Operating principles	
<ul style="list-style-type: none"> <li>• The palmar surface area of the burn victim's hand (including fingers) represents 1% of the total body surface area (TBSA) and can be used to calculate the size of the burn.</li> </ul>	
<p>⚠ Always use the burn victim's palmar surface, not the clinician's.</p>	