Principles of Burn Triage in Radiologic Practice

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Fundamentals of First Aid and Emergency Care for Radiography

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Fall Semester/ Lec 9

2025-2026

Student Learning Outcomes (SLOs):

By the end of this lecture, students will be able to:

1. **Define burn injury and burn triage**, and explain their significance in emergency and trauma care.
2. **Describe the types and classification of burns** based on depth, extent, and causative agents, including thermal, chemical, electrical, and radiation burns.
3. **Explain the importance of rapid burn triage**, particularly in preventing airway compromise, shock, and multi-organ failure.
4. **Identify imaging priorities in burn patients** and select appropriate imaging modalities based on injury severity and patient stability.
5. **Demonstrate an understanding of the radiologic technologist's role** in the trauma team, including patient safety, infection control, radiation protection, and effective communication.
6. **Apply principles of burn severity assessment and initial management**, including the Rule of Nines, ABCDE approach, and early fluid resuscitation, to support clinical decision-making.

Role of the Radiologic Technologist in the Trauma Team

1. Perform urgent and appropriate imaging for trauma and burn patients
2. Recognize triage priorities and imaging urgency
3. Adapt imaging techniques for unstable or critically ill patients
4. Ensure patient safety, positioning, and radiation protection
5. Maintain strict infection control precautions
6. Communicate effectively with the trauma and emergency team

Link Between Triage Decisions and Imaging Priorities

- Triage determines which patients need **immediate imaging** and which studies are most appropriate
- Imaging priorities are based on **injury severity and patient stability**
- In severe burns or unstable patients, imaging focuses on **life-threatening associated injuries**
- Imaging should **never delay resuscitation or emergency care**
- Radiologic technologists must balance **diagnostic needs, patient safety, and clinical urgency**

Basic Concepts Of Burn Injury

Definition

- A **burn** is an injury to the skin and underlying tissues caused by exposure to heat, chemicals, electricity, radiation, or friction, resulting in damage to cells, blood vessels, and surrounding structures.

Burn Triage

Burn triage is the systematic process of rapidly assessing burn patients to determine the severity of injury, prioritize treatment, and decide the urgency of medical and imaging interventions.

It aims to identify life-threatening conditions early and allocate resources effectively.

Burn Triage

The first hours after a burn injury occurs are a critical time. Decisions made and treatments rendered during this time can mean the difference between life and death.

Importance of Rapid Triage in Burn Emergencies

- Rapid triage is essential in burn emergencies because severe burns can quickly lead to airway compromise, shock, and multi-organ failure.
- Early identification of critical patients allows prompt resuscitation, timely imaging, and rapid referral to specialized burn care, thereby reducing morbidity and mortality.

Burn

Burn is a result of the effects of thermal injury on the skin and other tissues

- Human skin can tolerate temperatures up to 42-44 C but above these, the higher the temperature the more severe the tissue destruction.

- Below 45 C, resulting changes are reversible but >45 C, protein damage exceeds the capacity of the cell to repair.

• A burn injury occurs as a result of destruction of the skin from direct or indirect thermal force.

• Burn are caused by exposure to heat, electric current, radiation or chemical.

• **Scald burn** result from exposure to moist heat (steam or hot fluids) and involve superficial.

Types of burn

- Thermal burns.
- Chemical burns
- Electrical burns
- Radiation burns

Imaging Priorities in Burn Patients

Indications for Imaging in Burn Trauma

- **Suspected fractures:**
  Example: A burn patient involved in an explosion requires limb X-rays to exclude fractures.
- **Suspected inhalation injury:**
  Example: Facial burns and soot around the mouth warrant chest imaging to assess airway and lung injury.
- **Electrical burn complications:**
  Example: Minimal skin burns with muscle pain may require imaging to detect deep tissue or internal damage.

Common Imaging Modalities

- **X-ray:**
  Example: Initial trauma screening for fractures or chest injury.

- **CT:**
  Example: Polytrauma patient with extensive burns undergoing CT head and chest to identify internal injuries.

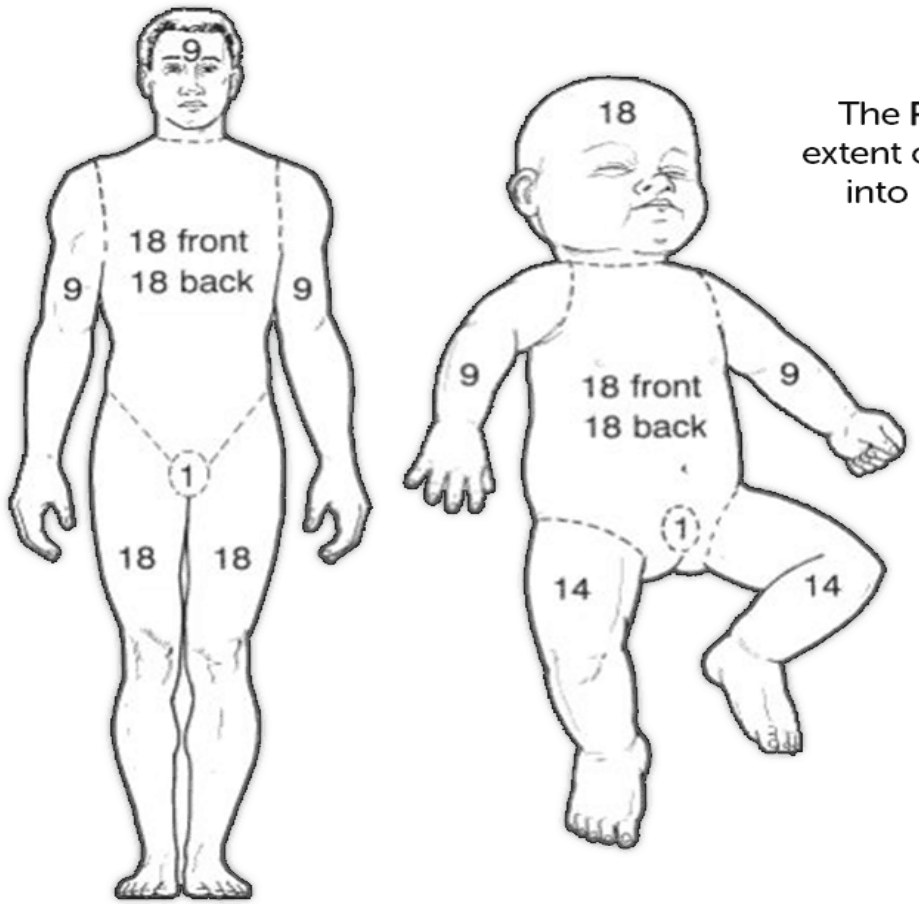
Classification of Burns

- **By depth:**
  - Superficial (first degree)
  - Partial thickness (second degree)
  - Full thickness (third degree)
- **By extent:**
  - Rule of Nines
  - Palmar method (patient’s palm = 1%)

Essential Management Points

- Stop the burning
- ABCDE
- Rule of 9s
- Obtain good IV access
- Early fluid replacement

Rule of Nines



The **Rule of Nines** is a quick way to estimate the extent of burns in adults through dividing the body into multiples of nine and the sum total of these parts is equal to the total body surface area injured.

Image via: wikimedia.org

nurseslabs.com
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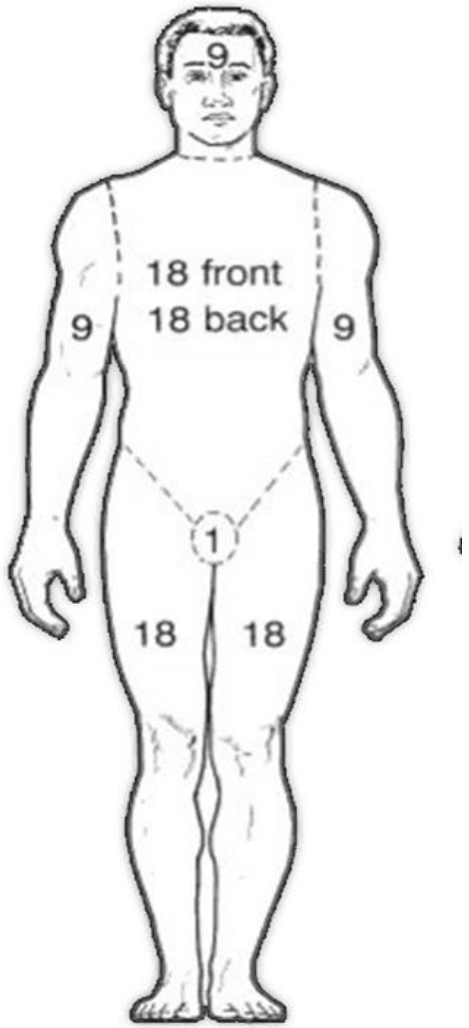
Rule of Nines for Burns

Body Part	Body Surface Area
Entire Head & Neck	9%
Entire Right Arm	9%
Entire Left Arm	9%
Entire Trunk	36%
Groin	1%
Entire Right Leg	18%
Entire Left Leg	18%



BURN MANAGEMENT

World Health Organization

The burn patient has the same priorities as all other trauma patients

Assess:	Considerations:
AIRWAY	Rapid airway compromise
BREATHING	Beware of inhalational injury
CIRCULATION	Fluid replacement
DISABILITY	Compartment Syndrome
EXPOSURE	Percentage area of burn

Burn severity is determined by

- Surface area
- Depth
- Other considerations

- Morbidity and mortality rises with increasing burned surface area and the patient’s age. Even small burns may be fatal in elderly people.

Burns greater than 15% surface area (adult), greater than 10% (child) or any burn occurring in the extremes of age are considered serious

STOP

- In the context of burn first aid, "STOP" is often used as an acronym to remember the steps to take when treating a burn:

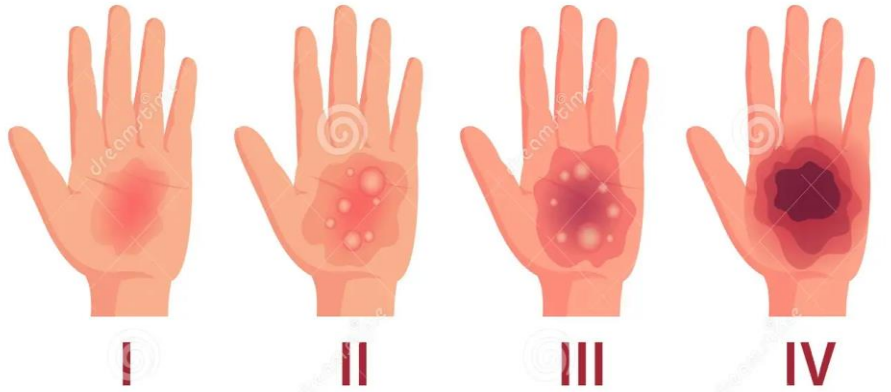
- **S - Stop the burning process:** Remove the person from the source of the burn or remove the burning material from the person.

- **T - Take off clothing and jewelry:** Remove any clothing or jewelry near the burned area to prevent further injury if swelling occurs.

- **O - Observe the burn:** Assess the severity of the burn and determine if medical attention is needed based on factors such as the size, depth, and location of the burn.

- **P - Protect the burn:** Cover the burn with a sterile dressing or clean cloth to prevent infection and reduce pain.

DEGREE OF SKIN BURNS



✓ DO

Cool the burn

Apply aloe vera

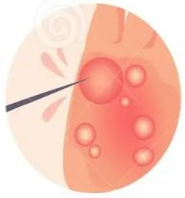
Bandage the burn

Take a pain reliever

✗ DON'T

Don't use oils

Don't use egg



Don't pop blisters

Don't use ice

FIRST AID

FORBIDDEN

First aid treatment R OR W

cool burns immediately with cool water

put cool, clean, wet clothes on burns

put oil on burns

cool burns with ice or icy water

cover the burn with a dry, clean bandage