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Occupational Therapy in Burn Care: Evaluation and Intervention

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Los Angeles General Medical Center | Exceptional Care. Healthy Communities.

Meet the Presenters – Joann Chun, OTR/L, CHT

- Graduated from USC's Occupational Therapy Master's Program in 2012
- Worked in a private outpatient hand therapy clinic from 2012 to 2014
- Started working at LA General Medical Center in 2014 – been there since
  - Trained in:
    - Inpatient acute general/burns
    - Outpatient adults/pediatrics
    - Clinic coverage for orthopedic hand and burn

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Meet the Presenters – Areli Ota, OTD, OTR/L, CHT

- Graduated from USC's Occupational Therapy Master's Program in 2019 and Doctorate Program in 2020
    - Residency LA General Medical Center Outpatient Hand Therapy
- Worked in several outpatient hand therapy clinics between 2020 and 2023
- Returned to LA General Medical Center in 2023
        - Worked in acute and outpatient department
        - Currently working in the acute care burn unit

This presentation contains clinical images of burn injuries, wounds, and surgical interventions that some viewers may find graphic.

All patient photographs are used with written authorization for educational purposes.

Learning Objectives

- Define key burn terminology and burn classification systems
- Describe the role of Occupational Therapy (OT) across the continuum of burn care including emergent, acute, and rehabilitation phases
- Explain the OT evaluation process in burn care
- Identify key OT interventions used in burn management
- Apply knowledge of burn classification, OT evaluation, and intervention to clinical case scenarios to support functional recovery and participation

Real Life

- August 2023 - Lahaina Wildfire in Maui
- December 2024 - Āliamanu Fireworks Explosion in O'ahu
- January 2025 - Palisades Fire in LA
- January 2025 - Eaton Fire in LA



Photo by Cate Bligh on Unsplash



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Burn Centers in California

- 13 Burn Centers in California
  - 9 ABA-Verified Burn Center
    - ***Los Angeles General Medical Center – Los Angeles**
    - *Torrance Memorial Medical Burn Center
    - *UC San Diego Health Regional Burn Center – San Diego
    - *UCI Health Regional Burn Center – Orange
    - Firefighters Burn Institute Regional Burn Center – UC Davis
    - Leon S. Peters Burn Center – Fresno
    - Santa Clara Valley Medical Center – San Jose
    - Shriners Children's Northern California - Sacramento
    - UCSF Health Saint Francis Hospital-Bothin Burn Center – San Francisco

Burn Injuries

- According to the American Burn Association (ABA)'s 2018-2023 Fact Sheet:
  - 398,000 fire or burn related injuries/year in the U.S.
  - 3,800 deaths per year were from fire/burn/smoke inhalation injuries
    - 1 fire related death every 2 hours and 17 minutes
  - 97.7% of patients that were treated survived their injuries
  - Median age of a burn patient
    - Adults = 49 years old
    - Pediatric patients (<18 years old) = 3 years old

Burn Survivor Statistics

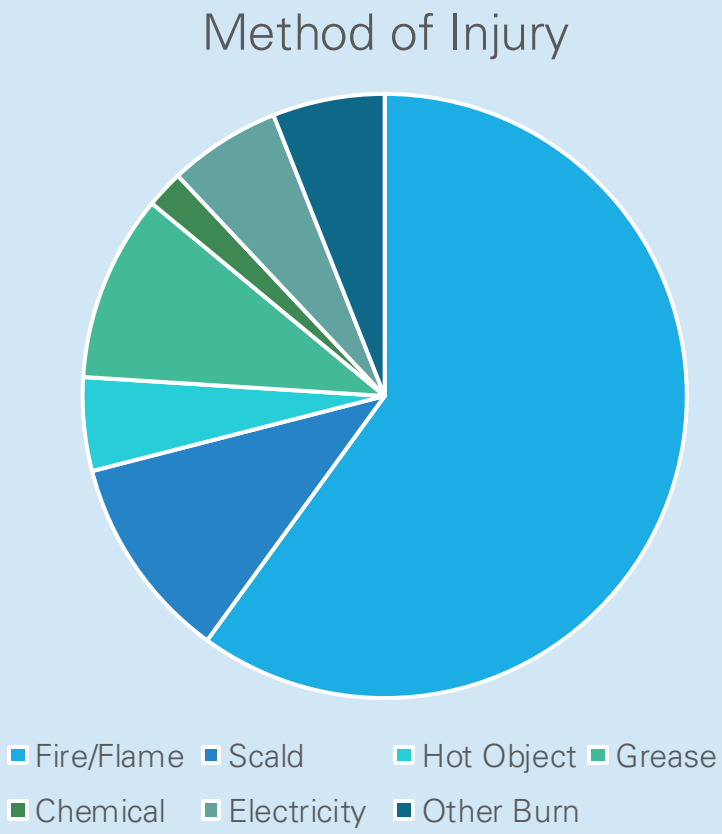


Chart created using ChatGPT (OpenAI, 2026) based on data from *MSKTC National Database Fact Sheet* (2024).

- Yearly average length of stay in a hospital ranges between 16 to 23 days
- Yearly average % TBSA for adults ranges from 11-22%
- Most common cause of burn is fire/flame
- More men than women suffer from burn injuries
  - Men = 73.2%
  - Women = 26.8%

WHO identifies Burns as a global health issue with a significant socio-economic impact

Burn Survivor Statistics

- Top 5 areas burns (frequency)
  - 1) Hands
  - 2) Lower Extremity
  - 3) Head
  - 4) Arm
  - 5) Trunk

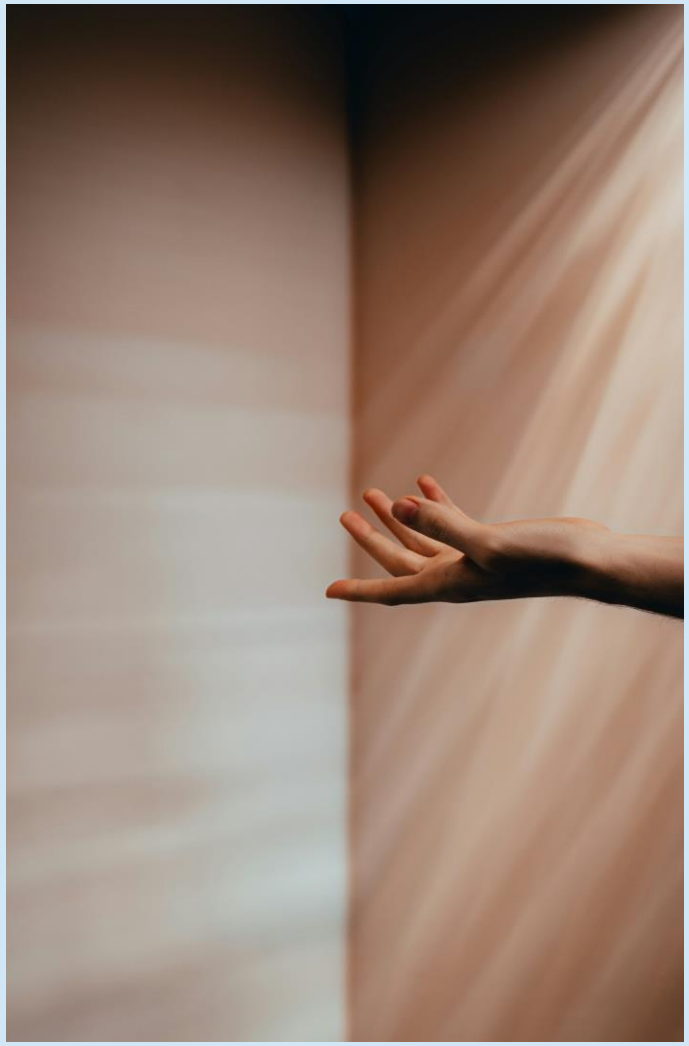


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Burn Center Admission Criteria

- Partial thickness burn that is greater than 10% TBSA
- Full thickness burns
- Deep partial or full thickness burns that involve the face, hands, feet, genitalia, perineum, or over major joints
- Burn injury in patients with co-morbidities or polytrauma
- All pediatric burns that may benefit from pain management, complex wound care, rehabilitation, patient/caregiver needs, or non-accidental trauma or neglect
- Poorly controlled pain
- All patients with a suspected inhalation injury
- All chemical injuries
- All electrical injuries
- All high voltage (>1,000V) electrical injuries
- Lightning injury

Skin Anatomy

- Largest organ of the body
- Layers
  - Epidermis
  - Dermis

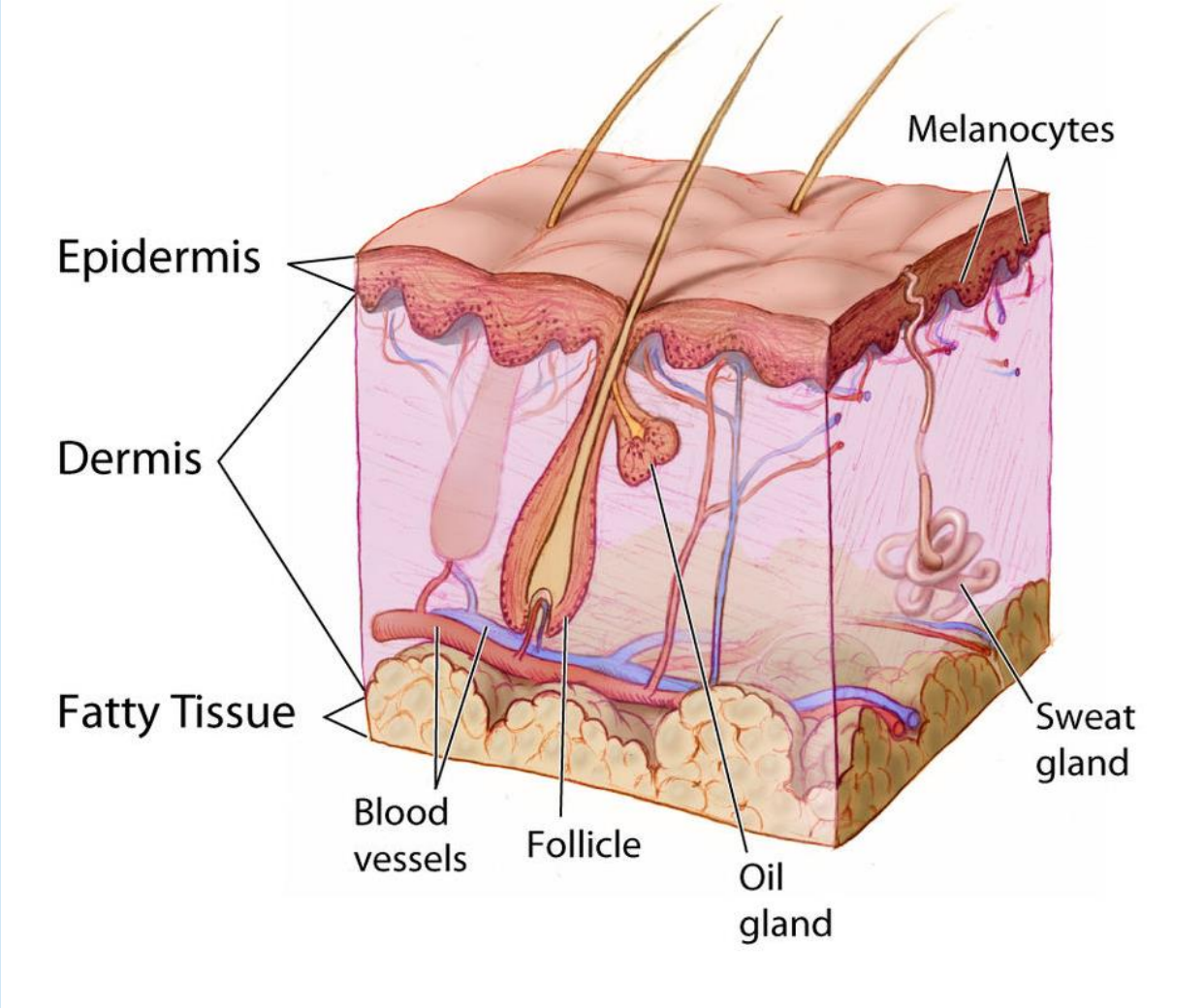
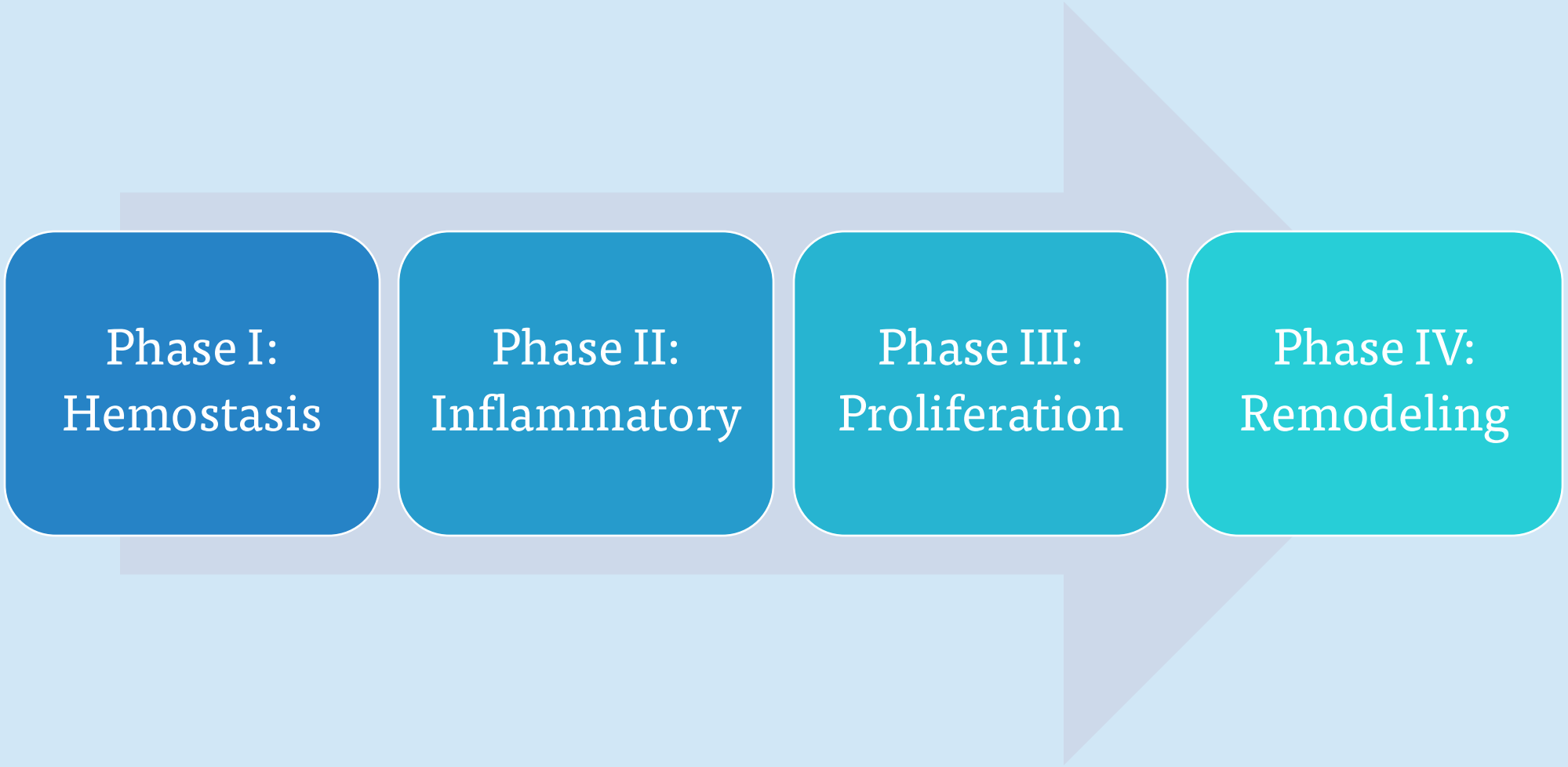


Photo by Don Bliss on Wikimedia Commons

Phases of Wound Healing



Types of Burn Injuries



Thermal



Chemical



Electrical



Radiation



Friction

Types of Burn Injuries

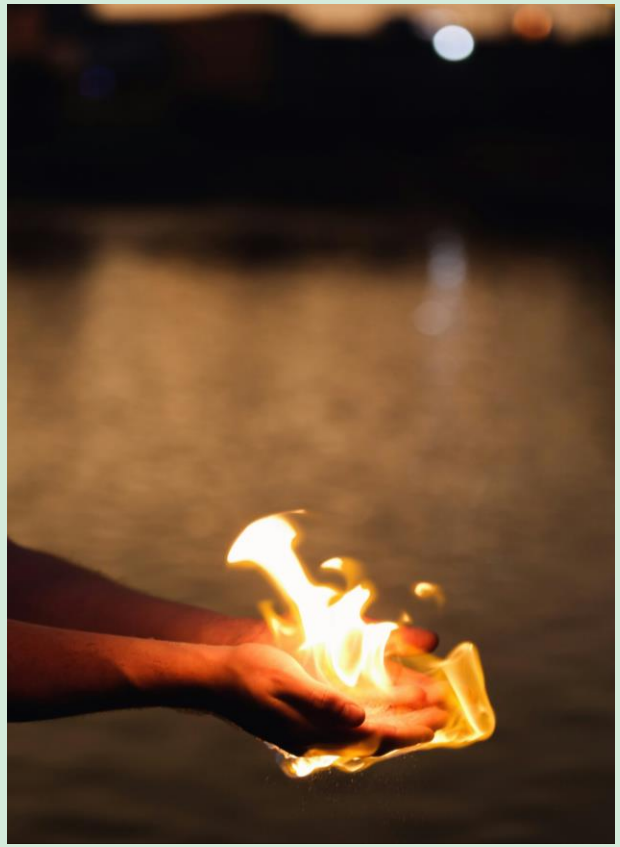


Photo by Sam Operchuck on Unsplash

Adults

- Flame
- Electrical

Children

- Scald
- Contact

Burn Classification

- Total Body Surface Area (TBSA)
  - Helps in determining:
    - Level of acuity and survival
    - Nutritional needs
    - Resuscitation needs
    - Level of care
  - 2 most common methods for estimating % TBSA
    - "Rule of Nines"
    - Lund and Browder chart

Burn Classification

- Rule of Nines
  - Technique to determine TBSA in **adults** using multiples of nine %

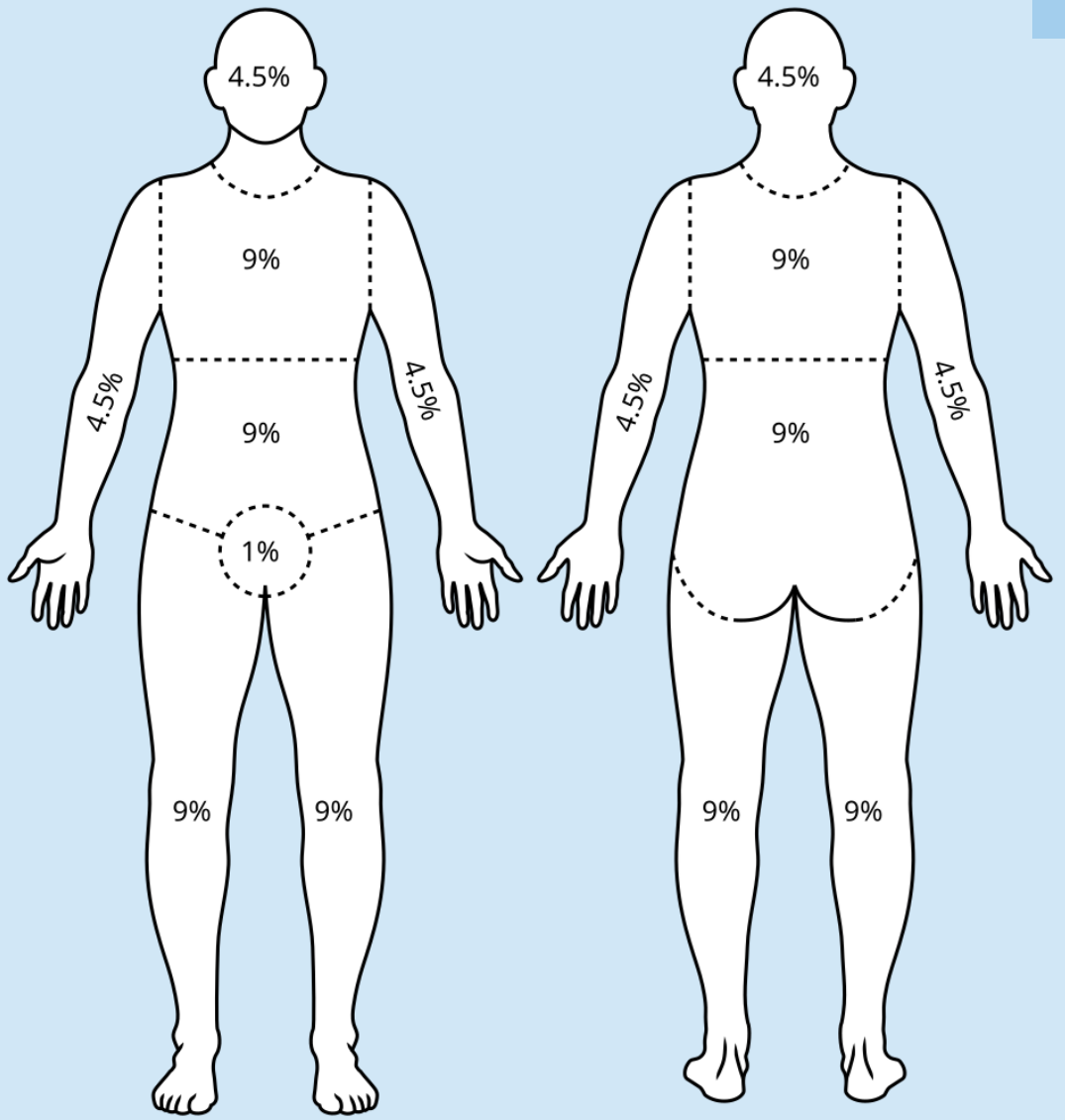
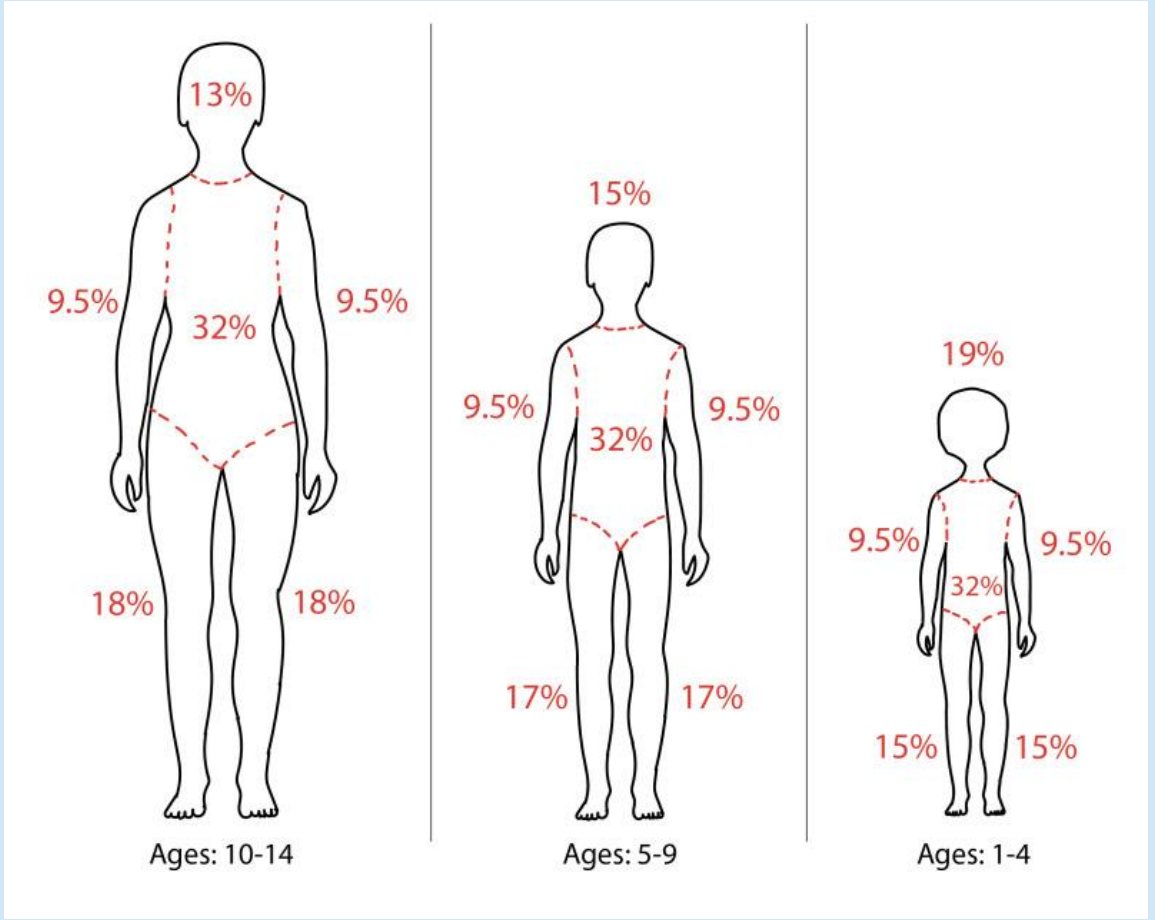


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Burn Classification

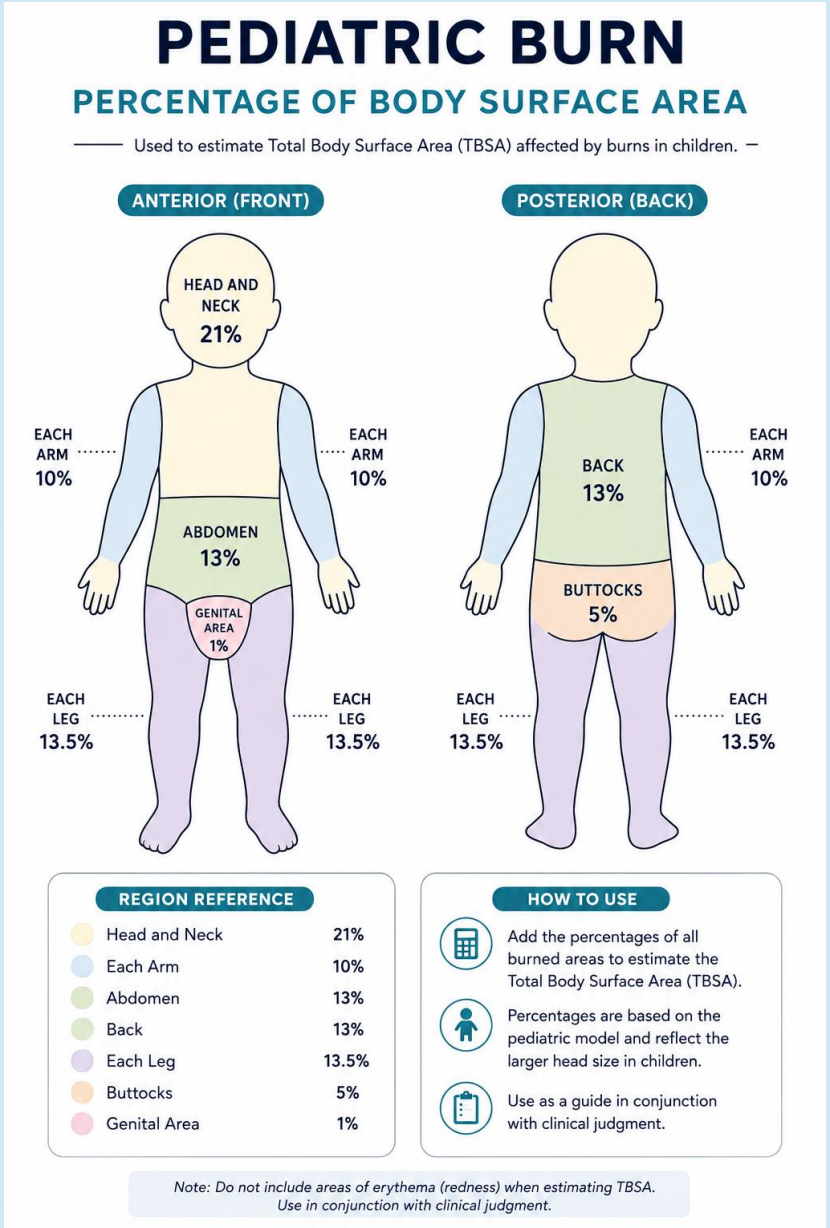
- Rule of Nines
  - Technique to determine TBSA in **children (age 1-14 years)** using multiples of nine %



Rule of 9s Modifications for Pediatric Patients. Rian Kabir, MD, in Moore et al. (2024) *StatPearls.* https://www.ncbi.nlm.nih.gov/books/NBK513287

Burn Classification

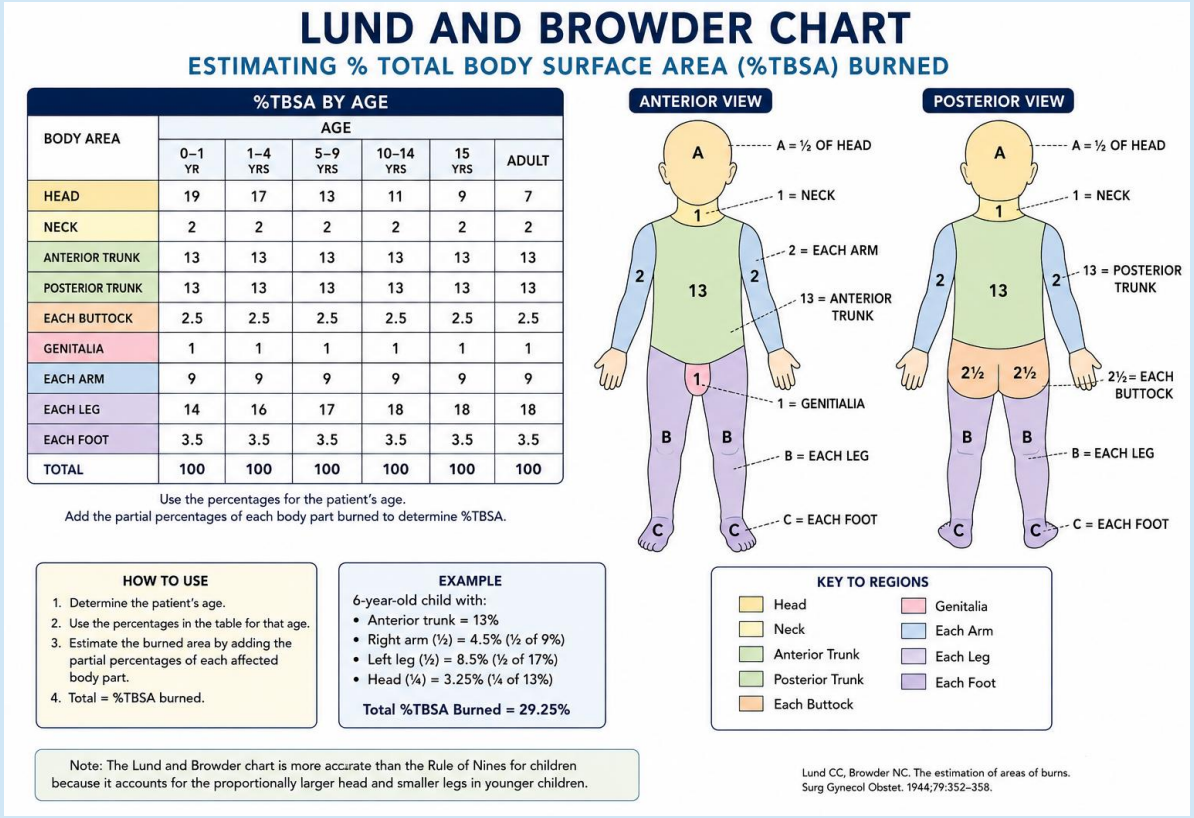
- Rule of Nines
  - Technique to determine TBSA in **infants (age <1 year)** using multiples of nine %



Pediatric burn TBSA estimation for infants (<1 year). AI-generated illustration created with ChatGPT (OpenAI), August 2026. Percentages adapted from Minnesota Department of Health, *Determining Total Body Surface Area: Wallace Rule of Nines and Palmar Method*, courtesy of the American Burn Association.

Burn Classification

- Lund & Browder
  - Provides a more accurate estimate of TBSA
  - Can provide a more reproducible estimate when clinicians are trained to use it
  - Takes into account
    - Age group
  - Most facilities use a modified Lund Browder chart to determine TBSA in children



LUND AND BROWDER CHART

ESTIMATING % TOTAL BODY SURFACE AREA (%TBSA) BURNED

%TBSA BY AGE

BODY AREA	AGE					
	0–1 YR	1–4 YRS	5–9 YRS	10–14 YRS	15 YRS	ADULT
HEAD	19	17	13	11	9	7
NECK	2	2	2	2	2	2
ANTERIOR TRUNK	13	13	13	13	13	13
POSTERIOR TRUNK	13	13	13	13	13	13
EACH BUTTOCK	2.5	2.5	2.5	2.5	2.5	2.5
GENITALIA	1	1	1	1	1	1
EACH ARM	9	9	9	9	9	9
EACH LEG	14	16	17	18	18	18
EACH FOOT	3.5	3.5	3.5	3.5	3.5	3.5
TOTAL	100	100	100	100	100	100

Use the percentages for the patient's age.
Add the partial percentages of each body part burned to determine %TBSA.

ANTERIOR VIEW

POSTERIOR VIEW

A = ½ OF HEAD
1 = NECK
2 = EACH ARM
13 = ANTERIOR TRUNK
1 = GENITALIA
B = EACH LEG
C = EACH FOOT
13 = POSTERIOR TRUNK
2½ = EACH BUTTOCK

HOW TO USE

1. Determine the patient's age.
2. Use the percentages in the table for that age.
3. Estimate the burned area by adding the partial percentages of each affected body part.
4. Total = %TBSA burned.

EXAMPLE

6-year-old child with:
- Anterior trunk = 13%
- Right arm (½) = 4.5% (½ of 9%)
- Left leg (½) = 8.5% (½ of 17%)
- Head (¼) = 3.25% (¼ of 13%)

Total %TBSA Burned = 29.25%

KEY TO REGIONS

Head, Neck, Anterior Trunk, Posterior Trunk, Each Buttock, Genitalia, Each Arm, Each Leg, Each Foot

Note: The Lund and Browder chart is more accurate than the Rule of Nines for children because it accounts for the proportionally larger head and smaller legs in younger children.

Lund CC, Browder NC. The estimation of areas of burns. Surg Gynecol Obstet. 1944;79:352–358.

Lund and Browder chart. AI-generated using ChatGPT (OpenAI, 2026); based on Lund and Browder (1944)

Burn Classification

Current and **preferred** classification system describes the level of cellular injury

These are delineated as the thickness of the burn injury

Superficial (1st degree)

Partial (2nd degree)

Superficial partial

Deep partial

Full thickness (3rd degree)

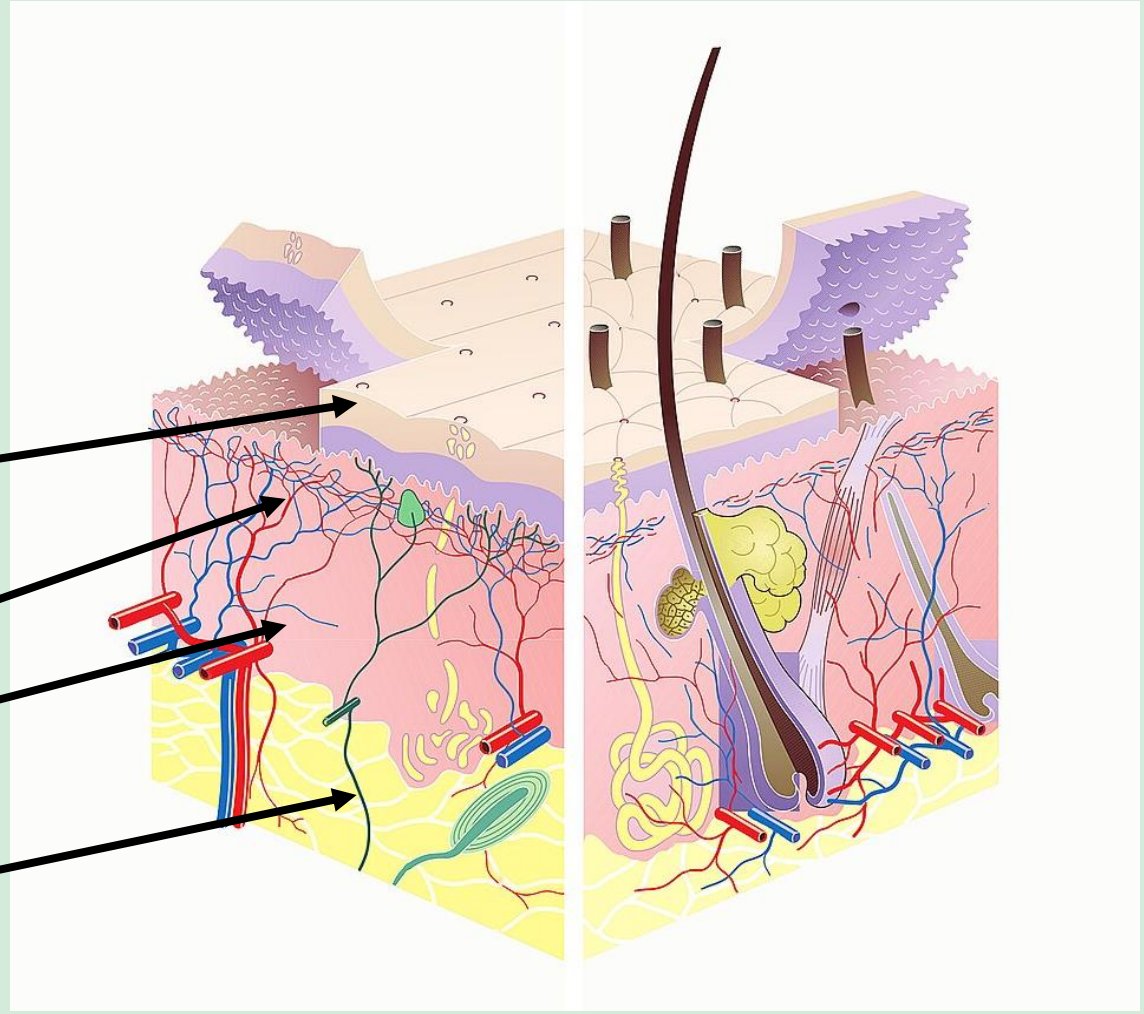


Photo by Andrew Meyerson from Wikimedia Commons

Burn Classification

- First degree burn, or "superficial burn"
  - Mildest type of burn
  - Affects the epidermis (top layer of the skin)
  - Painful but will typically heal within 7-14
  - Skin looks red or reddish-brown
  - Dry
  - No blisters
  - No visible or restrictive scar results
  - Minimal to no edema

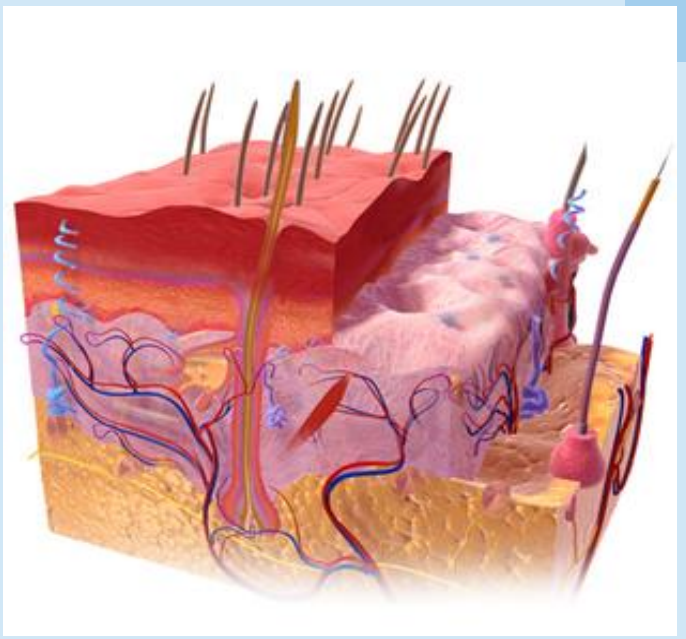


Photo by Bruce Blaus on Wikimedia Commons



Photo by Kelly Sue DeConnick on Wikimedia Commons

Burn Classification

- Second degree burn, or "partial thickness burn"
  - Affects the dermis
  - Superficial partial thickness burn
    - Skin looks red or reddish-brown
    - Very painful
    - Skin looks moist
    - Blisters
    - Typically heal within 10-14 days
    - Heal with minor color and texture changes but does not develop scarring

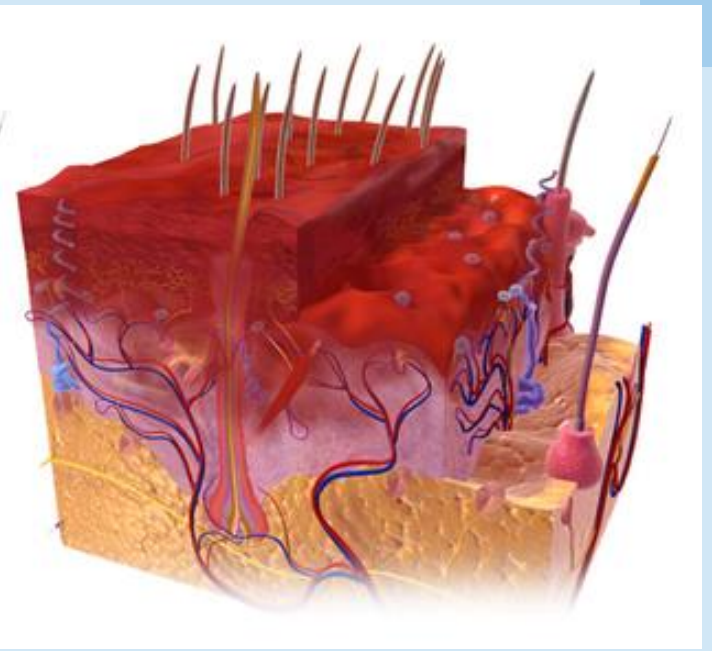


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Burn Classification

- Second degree burn, or "partial thickness burn"
  - Affects the dermis
  - Deep partial thickness burn
    - Skin looks white to yellow
    - Deeper burns may have less pain
    - Insensitive to light touch but sensitive to pressure
    - Typically requires surgery for skin grafting
    - Typically heal within 14-21 days
    - Can create severe hypertrophic scarring

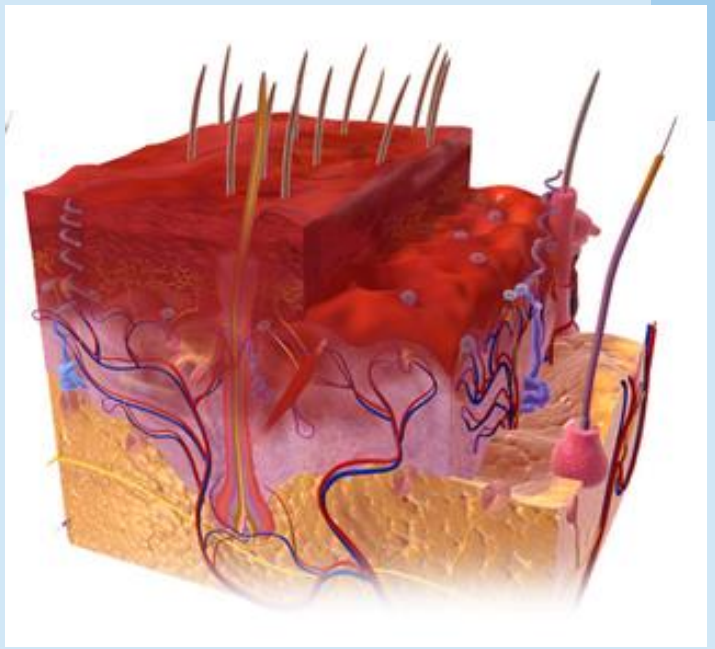


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Photo by presenter

Burn Classification

- Third degree burn, or “full thickness burn”
  - Affects epidermis, dermis, and subcutaneous tissue
  - Insensate – likely will not feel pain due to nerve damage
  - Skin may look charred, leathery, and paler than normal
  - Skin graft required
- Fourth degree burn, or "deep full thickness burn"
  - Affects subcutaneous tissue, muscle, tendon, or bone

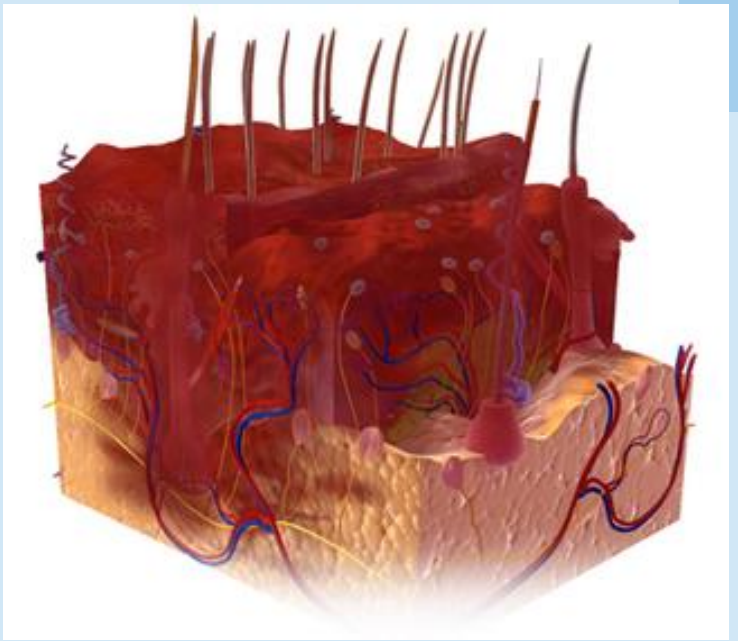


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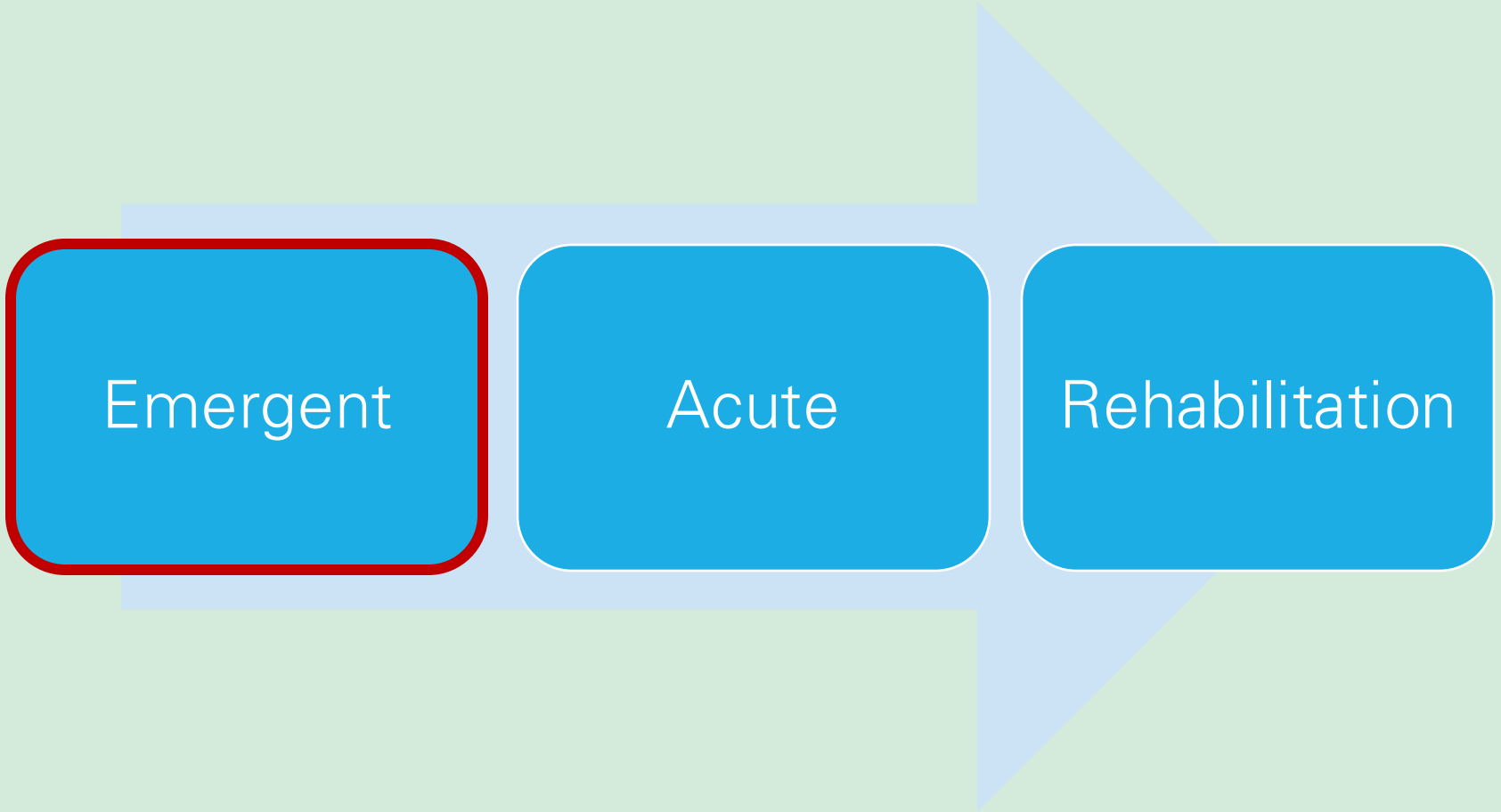
Adapted from CDC’s Public Health Image Library

Medical Management of Burns

Multidisciplinary Approach

- Burn care involves a team management approach
  - Physicians – Attendings, Burn Fellow, Residents, Interns
  - Nurses/Nurse Practitioners/Nursing Assistants
  - Occupational Therapists
  - Physical Therapists
  - Rehab Technicians
  - Speech Therapists
  - Respiratory Therapists
  - Pharmacists
  - Dietician
  - Social Worker
  - Child Life Specialist
  - Psychologist
  - Pressure Garment Specialists
  - Patient and/or family

Phases of Burn Injuries



Emergent Phase – first 72 hours

- Medical team attempts to stabilize the patient
  - Hypovolemia ➡ Fluid resuscitation
  - Establish airway protection
  - Provide nutritional support
- Full patient history (medical and social) should attempt to be ascertained
- Patient may have multiple injuries or co-morbidities which need to be addressed such as orthopedic or neurological injuries, diabetes, cardiac disease, substance use/abuse, etc.
- *At LA General, OT orders are generated on admission for upper extremity burn injuries

Emergent Phase – first 72 hours

- Edema
  - Edema is a natural part of wound healing
  - Gets worse in the first 72 hours after a burn
  - Excessive edema can lead to other medical complications such as compartment syndrome
  - Edema management techniques during this phase
    - Affected areas are elevated at all times
    - Active movement is encouraged (if there are no contraindications)

Emergent Phase – first 72 hours

- Compartment syndrome
  - Characterized by 5 P's: 1) Paresthesia, 2) Pallor, 3) Pulselessness, 4) severe pain on gentle passive range of motion, 5) Paralysis
  - Caused by circumferential, deep burns and/or severe edema
  - Can cause a dangerous increased internal pressure within the fascial compartments
  - Leads to death of all living tissue – muscle, bone, nerves, blood vessels, and internal organs

It is important for OTs to be aware of when patients are at risk for compartment syndrome

Emergent Phase – first 72 hours

- Escharotomy
  - An incision made completely through the depth of the burn "eschar" that usually occurs within the first day of injury
  - Serves to release the constricting tissue and allows the nerves, muscles, and organs to function as normal



Hand and forearm escharotomy following circumferential full-thickness flame burns. Reprinted from "Acute Surgical and Rehabilitation Management of Complex Hand Burns in Combat Casualties," by C. A. Cancio et al., 2024, *European Burn Journal, 5*(2), Fig. 4. Photographs courtesy of the U.S. Army Institute of Surgical Research Burn Center. Licensed under CC BY 4.0.

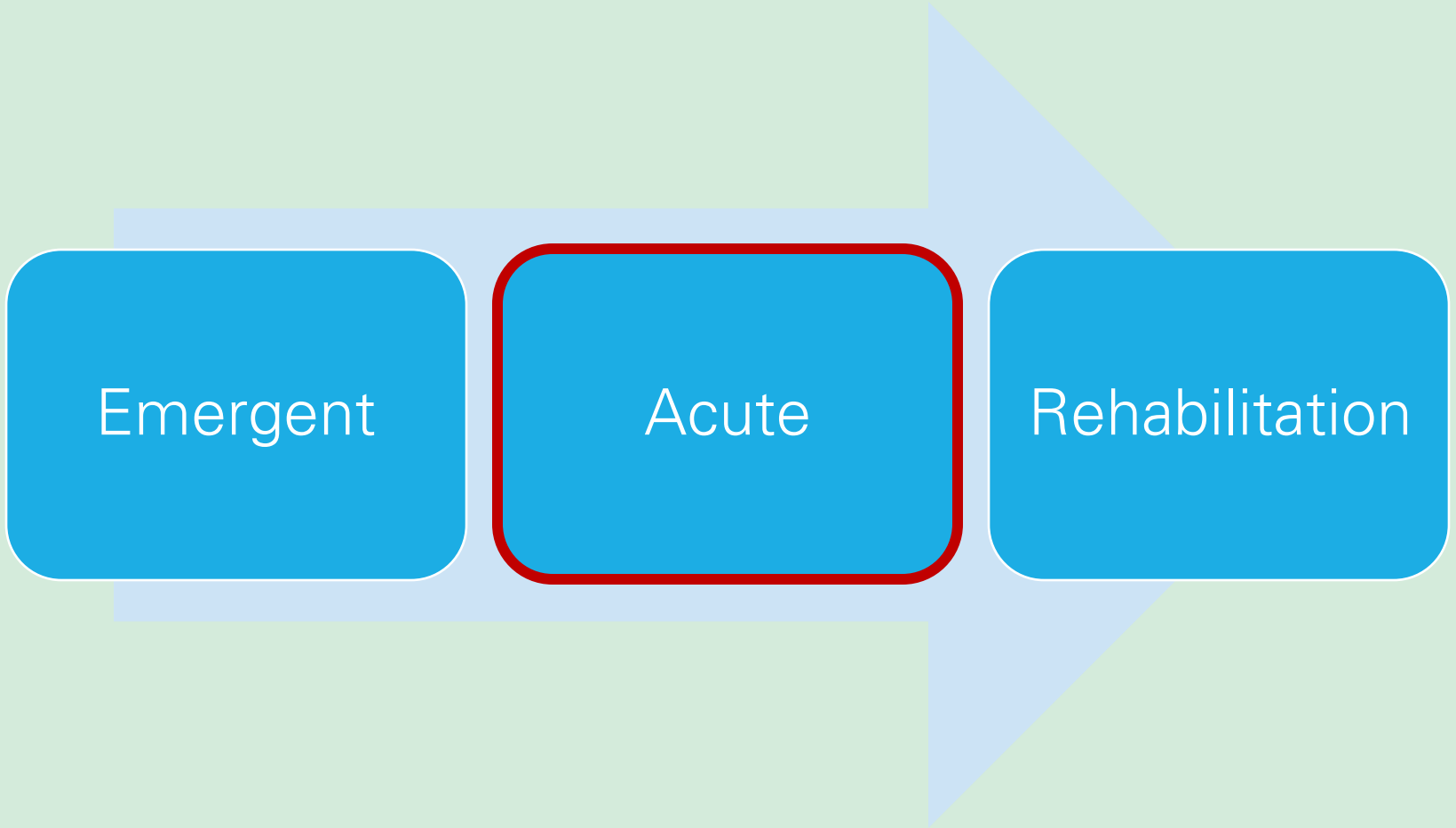
Emergent Phase – first 72 hours

- Dressings
  - Serve as temporary coverings to close a wound, prevent contamination, reduce fluid loss, and alleviate pain
- Topical Agents (Antimicrobiols)
  - Prevent development of infection



Wound Care Toolbox. AI-generated illustration created with ChatGPT (OpenAI), 2026.

Phases of Burn Injuries



Acute Phase – after 72 hours

- Begins after emergent phase and while wound healing occurs
- Continues until the wound is closed either by primary wound healing or skin grafting
- Characterized by continued monitoring and treatment of the burn wound
    - Burn injury will often *convert* or change over time
        - May become deeper or larger than initially apparent
        - Should *declare* itself in the first 72 hours

Acute Phase – after 72 hours

- Patient remains hospitalized if:
  - Wound is slowly healing
  - Wounds with a large TBSA or greater depth
  - Patient is medically unstable
  - Patient requires surgical intervention
  - Patient is unable to care for the burn injury at home

Acute Phase – Debridement

- Debridement
  - Involves surgically removing all of the dead or infected tissues
  - A healthy wound bed is essential for the new skin graft to have an adequate blood supply and nutrients to survive

Acute Phase – Biosynthetic/Synthetic Products

Integra	Biodegradable Temporizing Matrix (BTM)
• Used in large sized burn injuries or over poorly vascularized structures • Improves the wound bed for future autografting • Treated like a skin graft	
• Immobilized for **10-14** days • Biosynthetic skin substitute: Combination of synthetic & animal product (bovine collagen)	• Immobilized for **7-14** days • Synthetic skin substitute • Used if tendons are exposed

Many products out there!

Acute Phase – Skin Grafts

- **Autograft** ("auto" = self, same): own skin
  - Graft of tissue is taken from one part of the patient's body (donor site) and moved to another part





Photos by presenters

Acute Phase – Skin Grafts

1) Split thickness skin graft (STSG)
    - Harvested skin includes entire epidermis + part of the dermis
    - Used in either sheet or meshed forms
2) Full thickness skin graft (FTSG)
    - Harvested skin includes the entire epidermis + dermis
3) Re-cell
    - A small piece of donor skin is harvested and placed in an enzyme solution that separates the skin cells from each other
    - Skin cells are then harvested and placed in a buffer solution that can be sprayed onto an open wound

Acute Phase – Skin Grafts

- Intraoperative management of the skin graft
  - After the graft is applied to the open wound(s), the surgeons will apply dressings to protect the graft
    - Dressings are protected with compressive wraps to:
      - Reduce edema
      - Allow the graft to adhere to the wound
  - OT will go into the OR and apply splints to immobilize all joints adjacent to the graft site to protect it from shearing

Acute Phase – Skin Grafts

- Postoperative management of the skin graft
  - Graft sites will be immobilized for a period of time = **3-5 days**
    - Dependent on the health of the graft, wound, and patient
  - Surgical dressing takedowns occur on **POD #4**
    - MDs and team will assess the graft
    - If the grafts are healthy, can resume therapy
  - At the surgeon's discretion, a **POD #2** takedown occurs for a sheet graft
    - Graft is assessed for adherence and seromas
    - On POD #2, OTs are requested to re-dress the hand with coban and re-apply the splint

Acute Phase






Photos by presenters

Acute Phase – Skin Grafts

- Vacuum-assisted device (VAC) dressing
  - Technique of wound management that seals the wound with a foam dressing
  - Applies negative pressure to the wound
  - Can be applied continuously to the skin-grafted site
  - Supports the graft and prevents shear forces

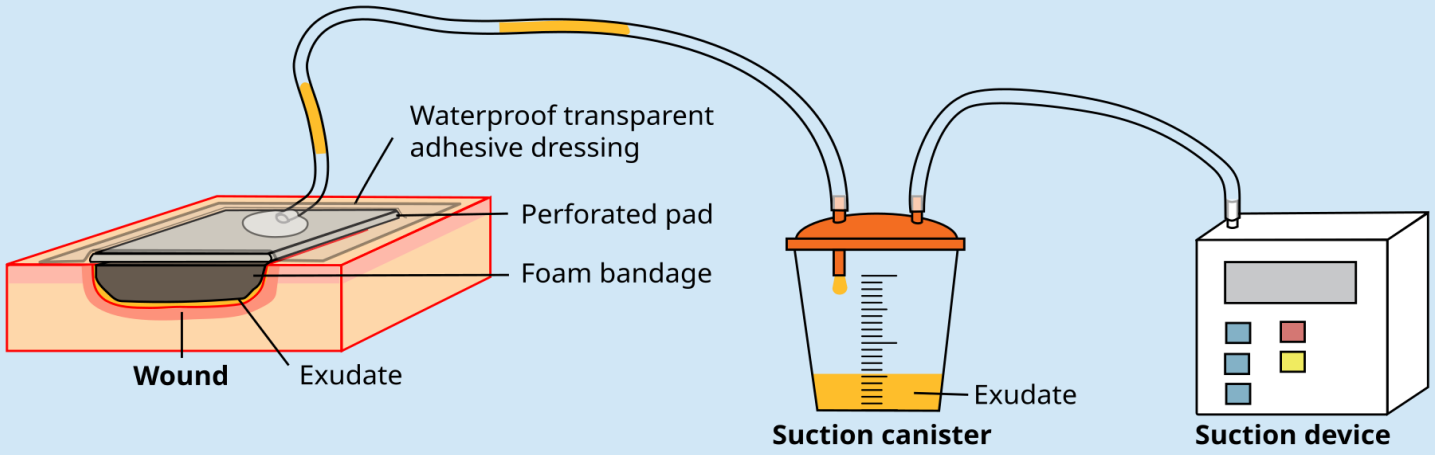
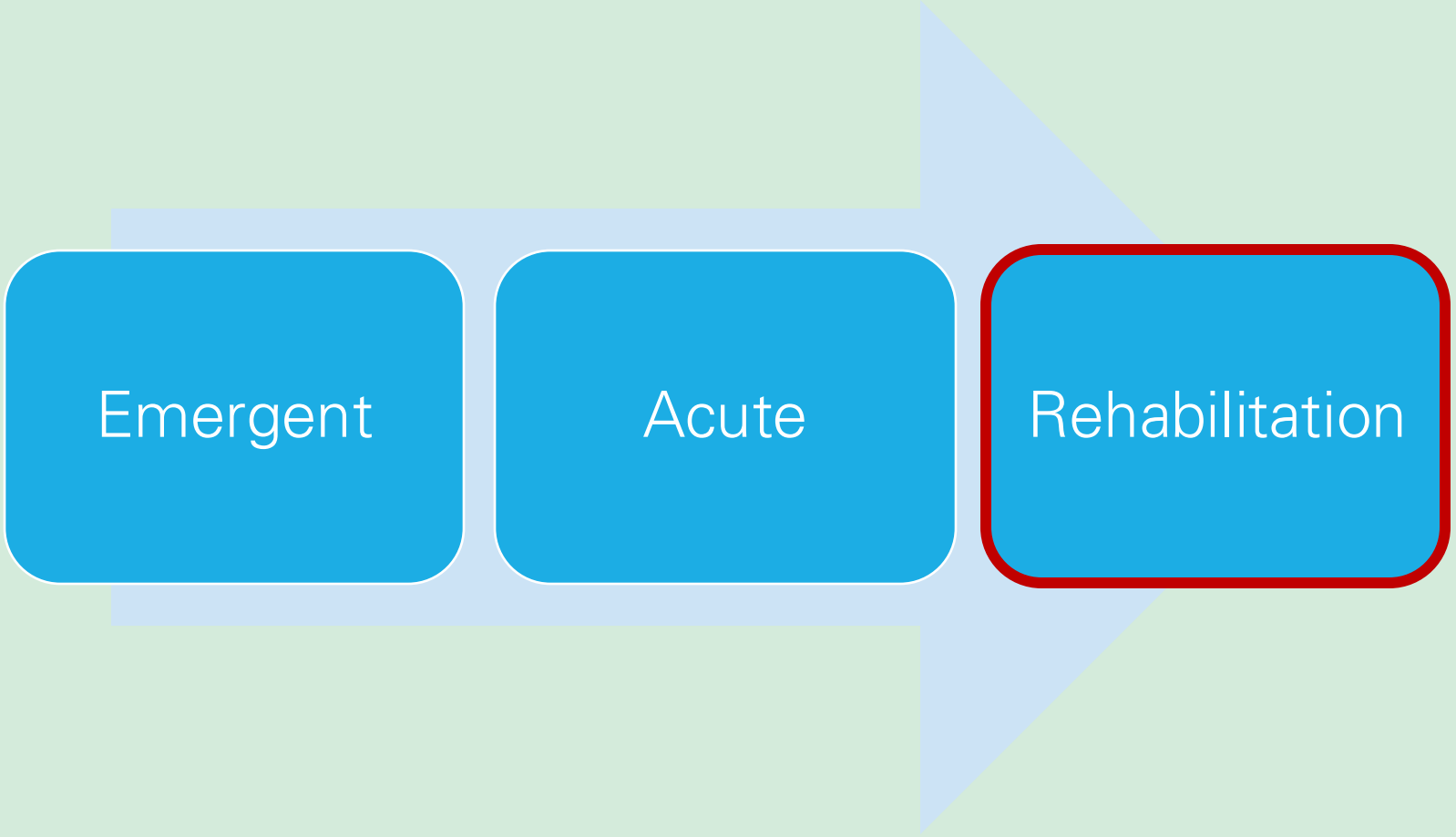


Photo by Wikimedia Commons

Phases of Burn Injuries



Role of Occupational Therapist

Role of Occupational Therapist

- OT has a very important role in the assessment and treatment of the burn patient in all phases of care
- OT is present from the very beginning of the patient's care until the patient discharges
- As soon as the patient is medically stable, OT will assess the patient

Initial Evaluation

Role of Occupational Therapist: Initial Evaluation

- Key components of our role are:
  - Compassionate care
  - Evaluation and treatment of the patient
  - Patient and caregiver education
  - Discharge recommendations
  - Recommend scar management modalities

Role of Occupational Therapist: Initial Evaluation

- Key components of our role are:
  - Consult with MDs throughout continuum of care from inpatient to outpatient
  - Participation in meetings
    - Dailly rounds
    - Morbidity and mortality rounds
    - Burn verification

Role of Occupational Therapist: Initial Evaluation

- Chart Review
  - History of injury and reason for admission – How? When? Where?
  - Diagnosis
    - Size of burn – TBSA %
    - Number of days since burn injury or surgery
    - Level of burn – superficial, partial, full
    - Type of burn – flame, flash, contact, scald (type of liquid), chemical, electrical, inhalation injury
    - Location of burn(s) – face to hands, left/right/bilateral
    - Any other injuries or trauma?

Role of Occupational Therapist: Initial Evaluation

- Treatment will be geared toward occupational role(s) and must be age appropriate

Infant / Toddler	Student	Worker	Retiree	Other
• Gross and fine motor skills • Meeting age appropriate milestones? • Play skills • History of developmental delay • Birth history	• Handwriting skills • School performance • Attention • School interests • Learning disabilities	• Type of work? • Paid or volunteer? • Length of work history • Unemployed	• How does the patient occupy their time?	• Hobbies? • Sports? • Other meaningful activities?

Role of Occupational Therapist: Initial Evaluation

- Precautions
  - Burn patients in the ICU are treated as contact isolation
  - Lines, tubes, monitors
  - Weightbearing and ROM precautions
  - Activity level – Bed rest? Out of bed?

Role of Occupational Therapist: Initial Evaluation

- Pain level
  - Numeric Pain Rating Scale: 0-10
    - 0 is no pain, 5 is moderate, 10 is severe pain
  - Wong-Baker FACES Pain Rating Scale
    - Used for children (3+ years) and non-verbal patients
  - Face, Legs, Activity, Cry, and Consolability (FLACC) scale
    - Used for infants (2 months to 7 years) and non-verbal patients
- *All patients with burns have pain – it is important to know if they need to be medicated prior to treatment

Role of Occupational Therapist: Initial Evaluation

- Sensation
  - Diminished sensation to light touch, sharp vs dull, temperature?
  - Were nerves involved?
  - If sensation is diminished, be mindful when splinting and positioning to prevent pressure ulcers
- Edema
  - Typically measured grossly – minimal, moderate, or severe
  - Pitting? Weeping? Soft?
  - Is movement restricted as the result of edema?

Role of Occupational Therapist: Initial Evaluation

- Range of motion (ROM) measurements
  - Neck
  - Upper extremity active/passive ROM – shoulder, elbow, forearm, wrist, digits, and thumb
  - Best practice is to use a goniometer
  - Minimal, moderate, severe ROM deficits

Role of Occupational Therapist: Initial Evaluation

- Strength
  - Manuel muscle test (MMT)
  - Dynamometer for grip strength
  - Pinch meter for pinch strength
  - Functional strength assessment during activities

Role of Occupational Therapist: Initial Evaluation

- ADL assessment
  - What can or cannot the patient do?
  - Assess out of bed ADLs as able
  - If possible, simulate normal ADL functioning
  - *Be sensitive to the patient's emotions when using a mirror

Role of Occupational Therapist: Initial Evaluation

- Areas of difficulty in functional performance (functional limitations)
  - Identified from the assessment
  - Should have a related goal
    - Limitation – Decreased AROM of L shoulder flexion –> 0-100 degrees
    - Goal – "Patient will increase active L shoulder flexion by 20 degrees to enable patient to wash hair with increased ease."

Role of Occupational Therapist: Initial Evaluation

- Patient/Caregiver goals
  - May be difficult for patients to self-identify due to state of shock
  - Need help and guidance to re-engage in normal daily activities

Role of Occupational Therapist: Initial Evaluation

- Therapy goals
  - Must be related to the patient's goal
  - SMART goals
  - Typical goals include:
    - Improving ADLs to prior level of function
    - Improving ROM to facilitate occupational engagement
    - Patient and caregiver education
      - Independent with home program in skin care, sun protection, ROM exercises, scar and edema management, splinting, etc.

Role of Occupational Therapist: Initial Evaluation

Frequency and Duration

- Attempt to see them daily
- 3-6 times/week

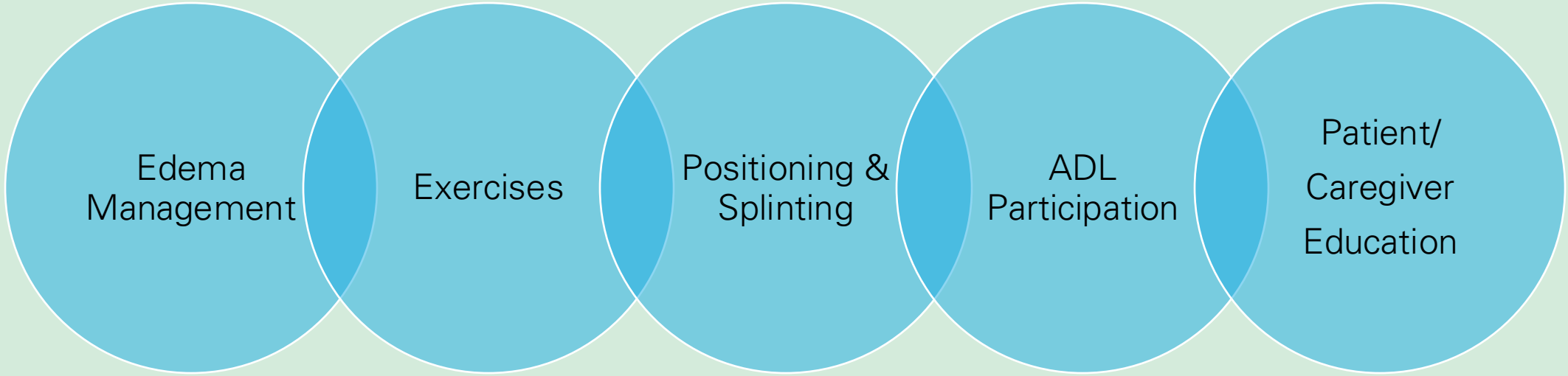
Discharge recommendations

- Preference is normalcy = HOME
- Does the patient need further OT services if discharged HOME?
  - Yes --> outpatient or home health
  - No --> home program and monitoring in burn clinic
- Acute rehabilitation unit (ARU) / Inpatient Rehabilitation Facility (IRF)
  - For patients with severe burns or for other trauma/neurological deficits
- SNF with rehab component
  - For older patients or patients who cannot tolerate 3 hours of daily rehabilitation

Interventions

Role of Occupational Therapist: Interventions

- Treatment consists of:



Role of Occupational Therapist: Edema

- Edema management
  - Elevation
  - Active range of motion exercises
  - Compression wraps/gloves
  - ADL performance







Photos by presenters

Role of Occupational Therapist: Exercises

Split Thickness Skin Graft (STSG)	Full Thickness Skin Graft (FTSG)
Post Op Day 4-7 - when patient is medically cleared to resume ROM exercises of the grafted area • Gentle AROM/AAROM/PROM is initiated to patient's tolerance • Strengthening exercises may begin around 2nd week	Post Op Day 10-14 – when patient is medically cleared to resume ROM exercises of the grafted area

Los Angeles General
Medical Center

Facial Exercises



Smile



Pucker lips



Close eyes tightly



Raise eyebrows



Open mouth fully



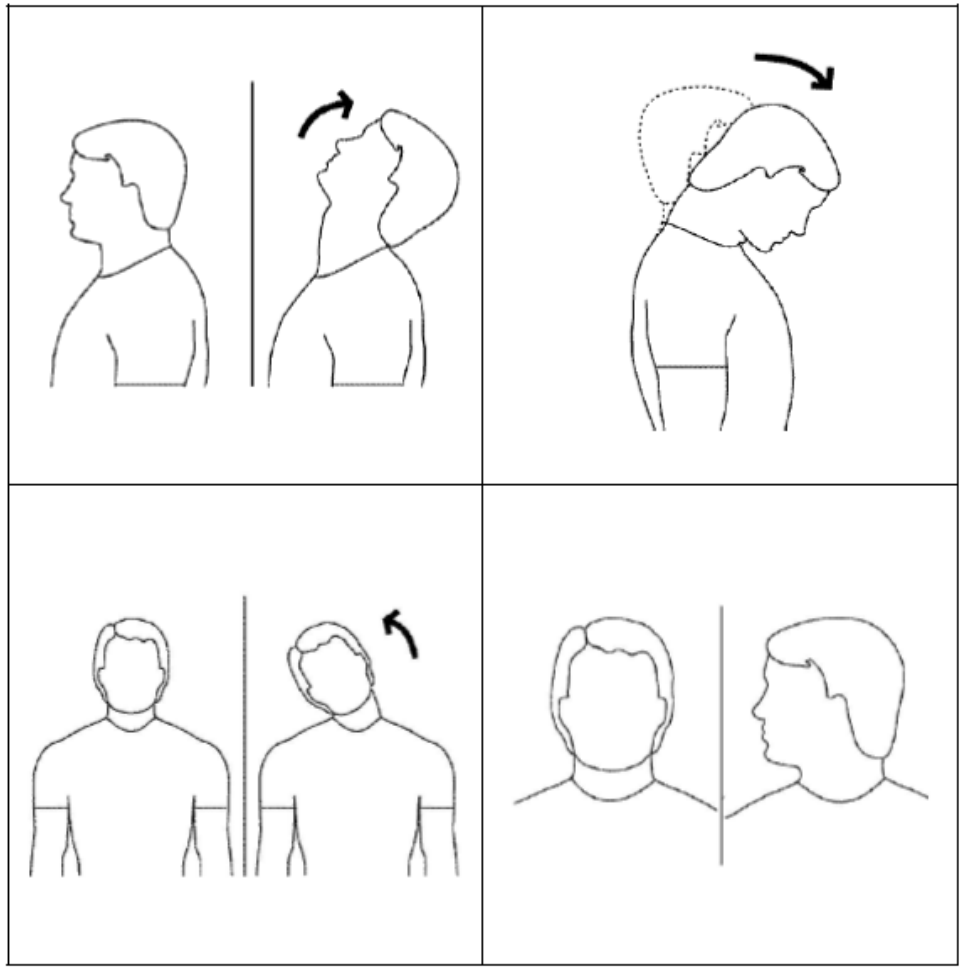
Use the back of a toothbrush to stretch the sides of the mouth

Perform 10 times every hour
(Haga 10 veces cada hora)

Neck Exercises

L.A. General Medical Center

Occupational Therapy Department

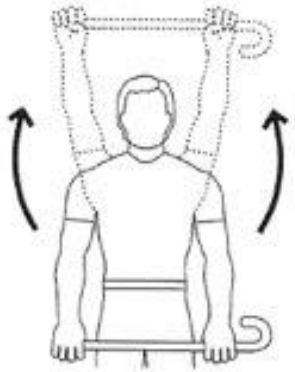


Perform 10 times every hour
(Haga 10 veces cada hora)

Shoulder Active Assistive ROM Exercises

L.A. General Medical Center
Occupational Therapy Department

Do 10 repetitions of each exercise	Haga 10 repeticiones de cada ejercicio
Hold for 10 seconds each time	Mantenga por 10 segundos cada vez
5 times a day (every 2 hours)	5 veces al día (cada 2 horas)





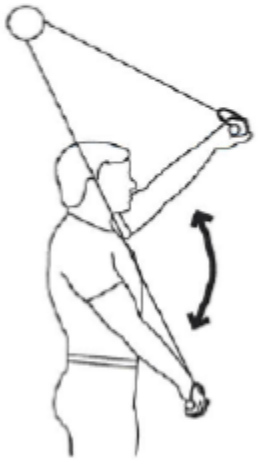
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Pulley Exercises

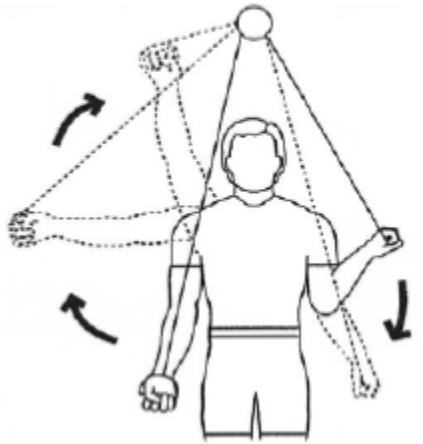
L.A. General Medical Center
Occupational Therapy Department

Do 10 repetitions of each exercise	Haga 10 repeticiones de cada ejercicio
Hold for 10 seconds each time	Mantenga por 10 segundos cada vez
5 times a day (every 2 hours)	5 veces al día (cada 2 horas)

1)



2)

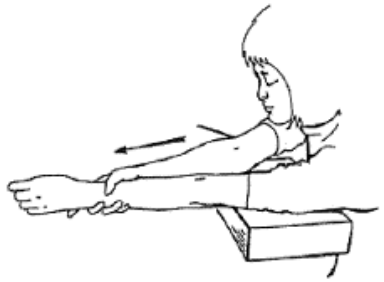


Elbow Active/Passive ROM Exercises

L.A. General Medical Center
Occupational Therapy Department







Do 10 repetitions of each exercise

Hold for 10 seconds each time

5 times a day (every 2 hours)

Haga 10 repeticiones de cada ejercicio

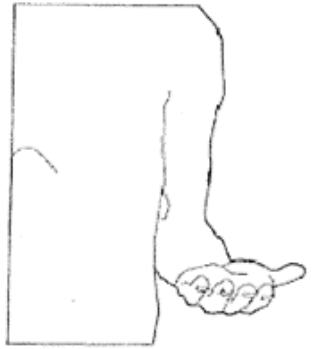
Mantenga por 10 segundos cada vez

5 veces al día (cada 2 horas)

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Forearm Exercises

L.A. General Medical Center
Occupational Therapy Department







Do 10 repetitions of each exercise

Hold for 10 seconds each time

5 times a day (every 2 hours)

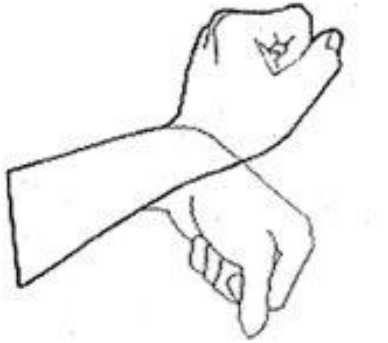
Haga 10 repeticiones de cada ejercicio

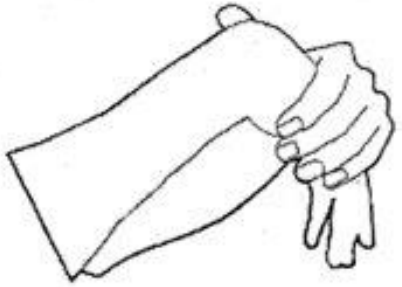
Mantenga por 10 segundos cada vez

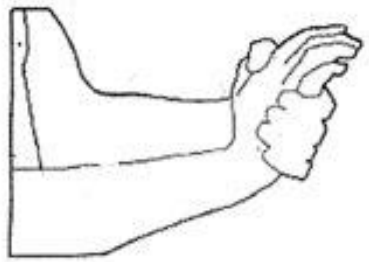
5 veces al día (cada 2 horas)

Wrist Exercises

L.A. General Medical Center
Occupational Therapy Department







Do 10 repetitions of each exercise

Hold for 10 seconds each time

5 times a day (every 2 hours)

Haga 10 repeticiones de cada ejercicio

Mantenga por 10 segundos cada vez

5 veces al día (cada 2 horas)

6 Pack Finger Exercises

L.A. General Medical Center
Occupational Therapy Department

Do 10 repetitions of each exercise

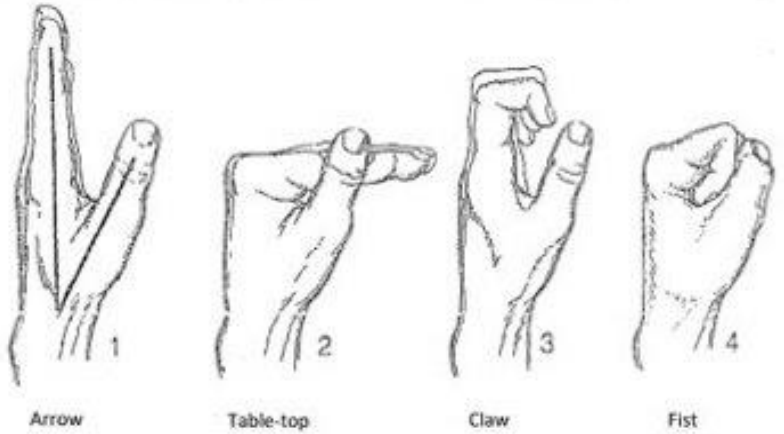
Hold for 10 seconds each time

5 times a day (every 2 hours)

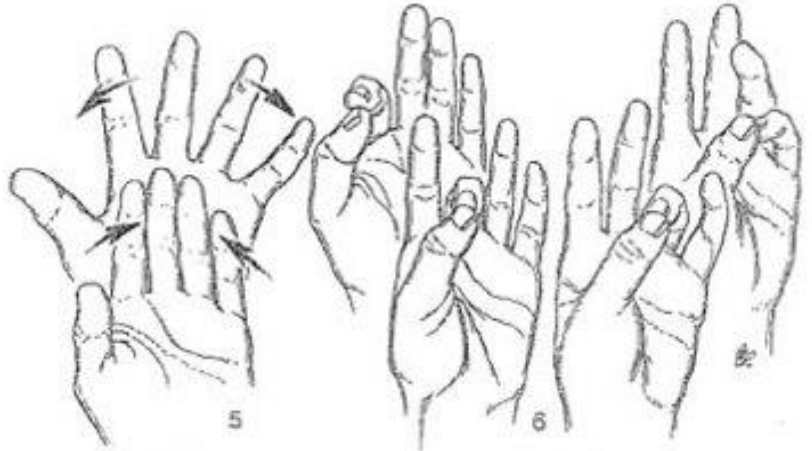
Haga 10 repeticiones de cada ejercicio

Mantenga por 10 segundos cada vez

5 veces al día (cada 2 horas)



Arrow Table-top Claw Fist



In-and-Out Thumb-to-Tip

Finger Passive ROM Exercises

L.A. General Medical Center
Occupational Therapy Department

Do 10 repetitions of each exercise	Haga 10 repeticiones de cada ejercicio
Hold for 10 seconds each time	Mantenga por 10 segundos cada vez
5 times a day (every 2 hours)	5 veces al día (cada 2 horas)





Thumb Active ROM Exercises

L.A. General Medical Center
Occupational Therapy Department

Do 10 repetitions of each exercise	Haga 10 repeticiones de cada ejercicio
Hold for 10 seconds each time	Mantenga por 10 segundos cada vez
5 times a day (every 2 hours)	5 veces al día (cada 2 horas)

1)



2)



3)



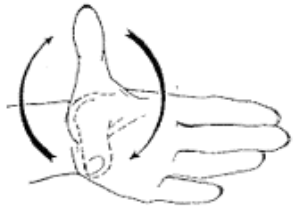
4)



5)



6)



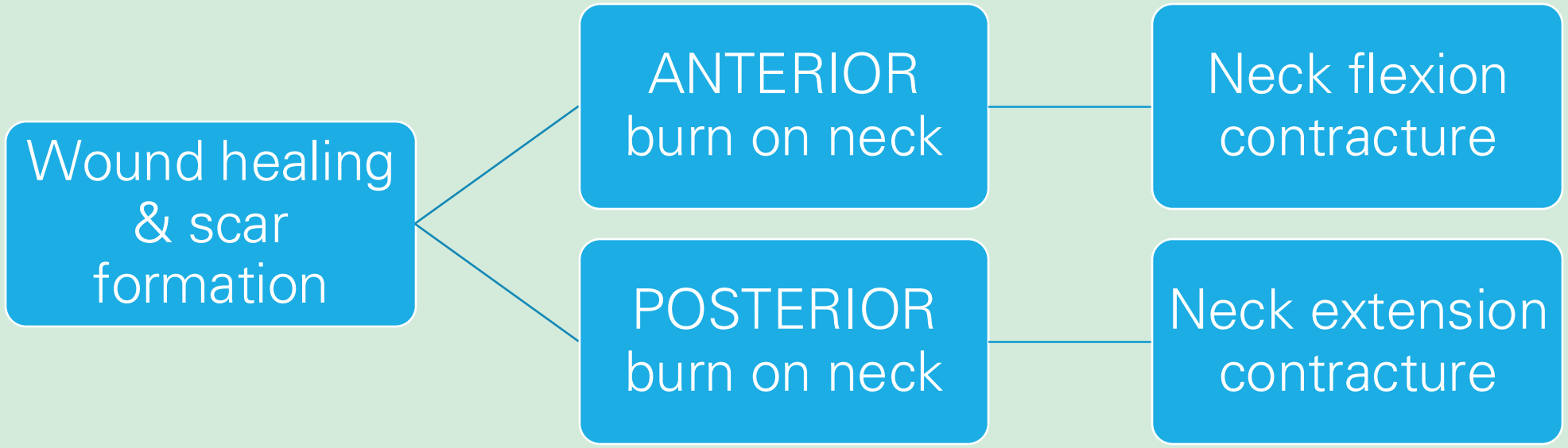
Role of Occupational Therapist: Positioning & Splinting

- Purpose of positioning and splints/orthoses
  1) Reduce edema during the acute phase (0-72 hours post injury)
  2) Protect healing skin grafts/flaps and exposed tendons/joints
  3) Prevent and correct contractures
  4) Remodel and shape the formation of scar tissue
  5) Improve or maintain range of motion

Role of Occupational Therapist: Positioning & Splinting

- Positioning and Splinting
  - Wounds over joints are particularly susceptible to contractures
    - 1) On the dorsum of the hand – MCP joints into hyperextension
    - 2) Over the antecubital fossa – elbow flexion
    - 3) In the axilla – minimal shoulder flexion and abduction

Role of Occupational Therapist: Positioning & Splinting for the Neck



Role of Occupational Therapist: Positioning & Splinting for the Neck

- How to PREVENT neck contractures
  - Custom pressure garment
  - No pillows during sleep (for anterior burns to the neck)
  - Splints
    - Soft collar
    - Watussi collar
    - Aspen collar (C-collar)



Neck flexion contracture following burn injury. From Procter, F. (2010), *Rehabilitation of the burn patient*, *Indian Journal of Plastic Surgery, 43*(Suppl), S101–S113. https://doi.org/10.4103/0970-0358.70730. CC BY.

Role of Occupational Therapist: Positioning & Splinting for the Neck



Soft Collar



Watussi Collar

Photos by presenters

Role of Occupational Therapist: Positioning & Splinting for the Shoulder

Wound healing & scar formation

ANTERIOR burn on shoulder

Shoulder adduction contracture



Axillary contracture following burn injury. From Procter (2010), *Indian Journal of Plastic Surgery, 43*(Suppl.), S101–S113. https://doi.org/10.4103/0970-0358.70730. CC BY.

Role of Occupational Therapist: Positioning & Splinting for the Shoulder

- How to PREVENT shoulder contractures
  - Position the shoulder in **~90-110 degrees of shoulder abduction**

Airplane Splint



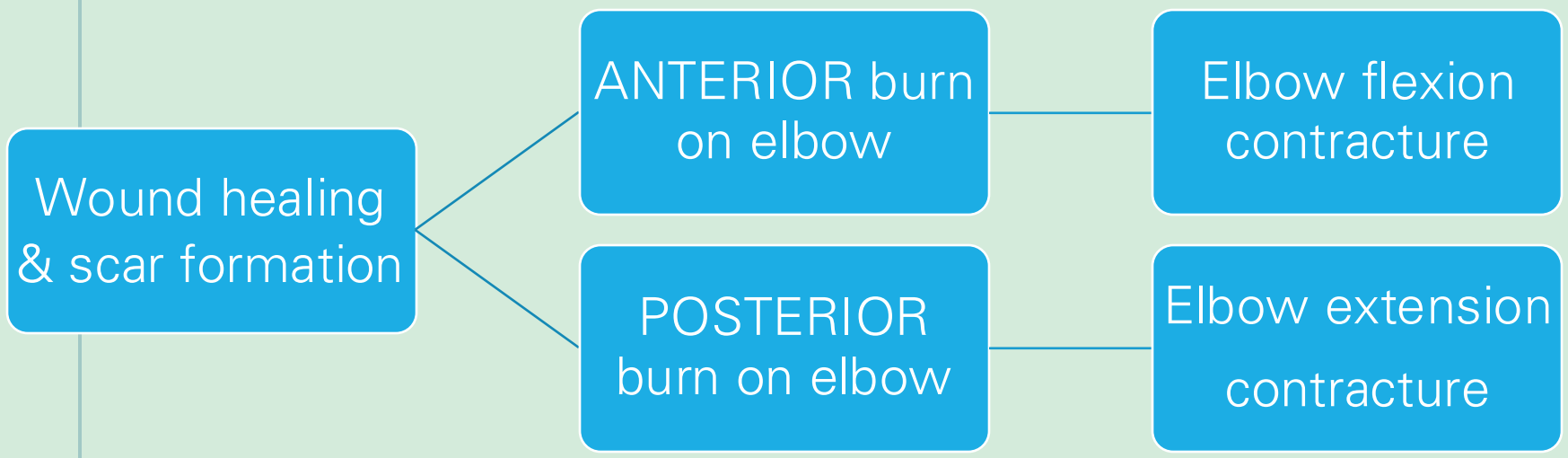
Airplane splint used to maintain shoulder abduction and prevent axillary contracture. Reprinted from "Simple, Self-Adjustable Airplane Splint for Axillary Contractures," by R. Gorka, A. K. Gupta, S. Prakash, I. Bakthavachel, S. Lamba, and A. J. Gohil, 2017, *Burns Open, 1*(2), 54–58. Copyright 2017 by the authors. Licensed under CC BY-NC-ND 4.0.

Modified Hip Abductor Pillow



Photo by presenters

Role of Occupational Therapist: Positioning & Splinting for the Elbow





Elbow flexion contracture following burn injury. From Procter (2010), *Indian Journal of Plastic Surgery, 43*(Suppl.), S101–S113. https://doi.org/10.4103/0970-0358.70730. CC BY.



Post-burn anterior elbow scar with full elbow extension and limited flexion (105°). Reprinted from Fanstone and Karim Khan (2024), *Scars, Burns & Healing*, 10, under a Creative Commons Attribution-NonCommercial 4.0 license.

Role of Occupational Therapist: Positioning & Splinting for the Elbow

- How to PREVENT elbow contractures
  - Elbow extension = protective position for the elbow
    - Fabricate **elbow extension splint**

*Be careful of heterotrophic ossification







Photos by presenters

Role of Occupational Therapist: Positioning & Splinting for the Wrist





Post-burn extension contracture of the wrist. Reprinted from "Treatment of a Twenty-Year Case with Extension Contracture of the Wrist," by R. Özbey, 2021, *Selcuk Medical Journal, 37*(1), p. 78, Fig. 1. CC BY-NC 4.0.



Photo by presenters

Role of Occupational Therapist: Positioning & Splinting for the Wrist

- How to PREVENT wrist contractures
  - Fabricate **wrist extension splint**
    - Wrist extension = **20 degrees**



Photo by presenters

Role of Occupational Therapist: Positioning & Splinting for the Hand





Photo by presenters

Role of Occupational Therapist: Positioning & Splinting for the Hand

- How to PREVENT hand/digit contractures
  - Fabricate **forearm based intrinsic plus splint**
    - Wrist = 30 degrees of extension
    - Digit MCP joints = 70-80 degrees of flexion
    - Digit IP joints = 0 degrees (full extension)
    - Thumb = mid palmar/radial abduction



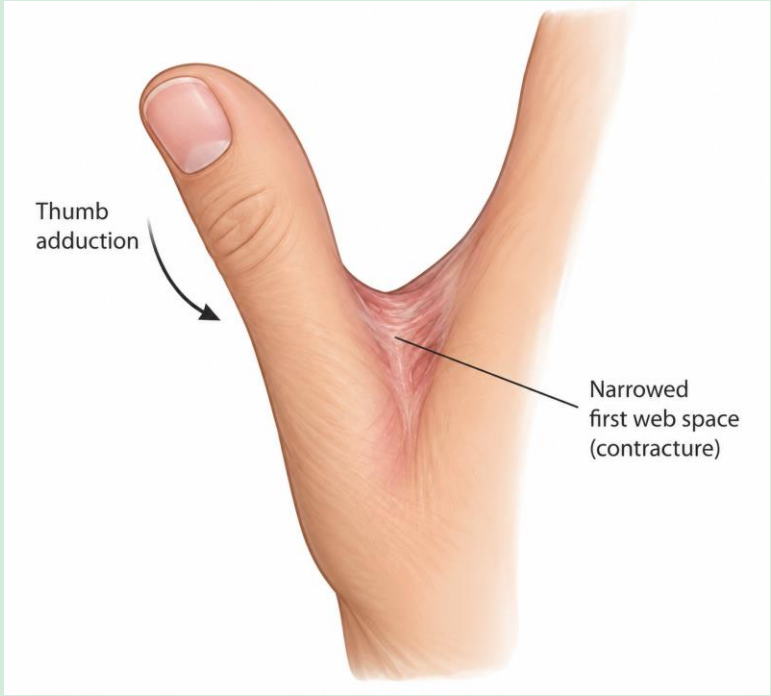
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Role of Occupational Therapist: Positioning & Splinting for the Thumb

Wound healing & scar formation

Burn on thumb

Thumb webspace contracture



Thumb web-space contracture. AI-generated illustration created with ChatGPT (OpenAI), 2026.

Role of Occupational Therapist: Positioning & Splinting for the Thumb

- How to PREVENT thumb webspace contractures
  - Fabricate **C-bar splint** or **conformer/brace**
    - Thumb in palmar abduction (as much as possible)



C-bar splint for maintaining thumb abduction and first web-space opening. AI-generated illustration created with ChatGPT (OpenAI), 2026.

Role of Occupational Therapist: Positioning & Splinting for the Mouth

- Microstomia
  - Characterized by an abnormal small mouth opening, often causing difficulties with eating, speaking, and oral hygiene due to scarring (or congenital factors)
  - Treatment
    - Mouth splints – as a last resort
    - Low load horizontal mouth splint
    - Encourage eating without modifications
    - Encourage mouth ROM exercises



Severe microstomia secondary to bilateral oral commissure contractures following burn injury. Reprinted from "Management of Severe Burn Microstomia," by M. Zak, O. Means, B. Cason, and R. Brooks, 2016, *Eplasty, 16*, Fig. 1. Licensed under CC BY.



Photos by presenters

Role of Occupational Therapist: Splinting

- Decreased passive composite flexion of digits (at MCP/PIP/DIP joints)
  - Flexion gloves
    - Provides gentle low-load stretch
    - 30 minutes, 3 times a day, daily



Photos by presenters

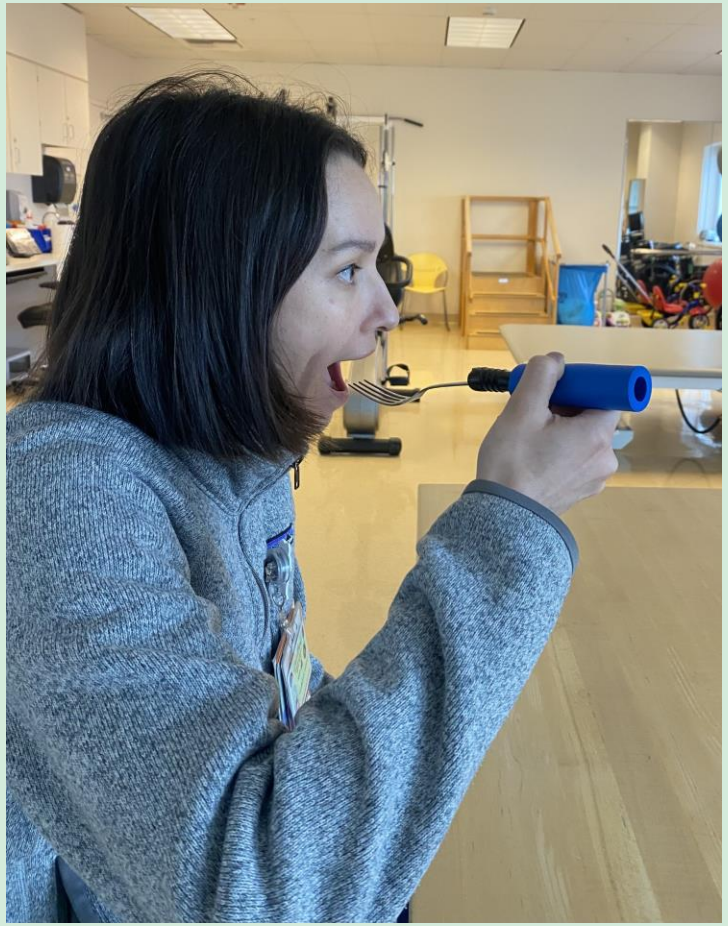
Role of Occupational Therapist: Splinting

- Decreased passive composite flexion of digits (at MCP joints)
  - Static progressive splint
    - Provides gentle low-load stretch
    - 30 minutes, 3 times a day, daily



Photos by presenters

Role of Occupational Therapist: ADL Participation







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Role of Occupational Therapist: Scar Management

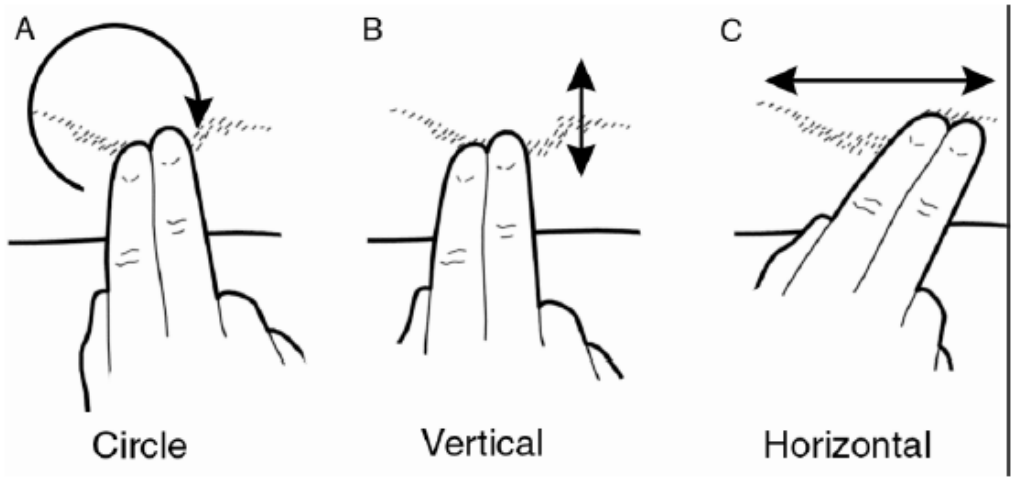
- Scarring is the end result of wound healing
- Educate the patient that scarring will occur but the degree of appearance and deformity is unknown in the initial phase of the injury
  - Need to try to prevent scars from becoming thick, hard, and tight
- OT will begin scar management
  - Moisturize scars
  - Perform and teach scar massage/mobilization
  - Use pressure to flatten scars
  - Use silicone gel sheet to soften and flatten scars

Scar Massage

L.A. General Medical Center

Occupational Therapy Department

Scar massage is important to prevent scars from "sticking" to the underlying tissue. It also helps to flatten and desensitize scars.



1. Apply Aquaphor or an un-perfumed moisturizing cream or lotion to the scar
2. Begin with a light pressure, progressing to deeper and firmer pressure, as you can tolerate.
3. Start with small circles along the length of the scar either with your thumb or first two fingers.
4. Massage up and down along the length of the scar
5. Massage side-to-side across the scar
6. Perform for at least 5 minutes, 3 times a day

Role of Occupational Therapist: Scar Management

- Silicone gel sheet



Photos by presenters

Role of Occupational Therapist: Scar Management

- Silicone gel digit sleeves

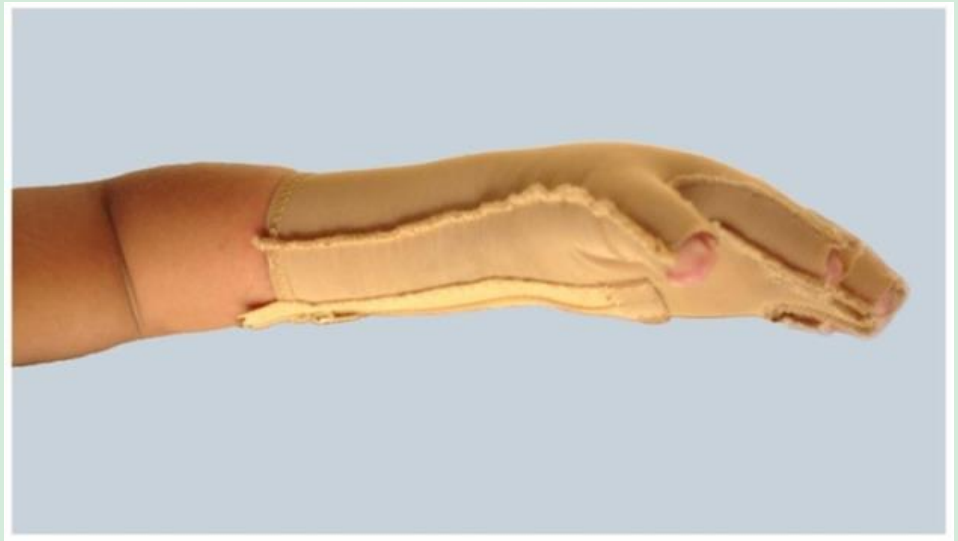




Photos by presenters

Role of Occupational Therapist: Scar Management

- When wounds are completely healed and closed
  - Custom made compression garments are measured and fitted if patient demonstrates good ROM and no edema
    - Worn for 23 hours daily
    - Used to reduce edema and the appearance of scars



Pressure garment used by the patient during the day. From Prasetyono and Caroline (2017), *Annals of the Royal College of Surgeons of England, 99*(6), e185–e187. CC BY 4.0.

Role of Occupational Therapist: Education

- Patient and caregiver education
  - Very important that they both understand and demonstrate good carryover of instruction and educational materials
- Education and instructions include:
    - ROM exercises – handouts are provided and therapeutic exercises are reviewed
    - Splint(s) wear and care schedules/application/precautions
    - Edema management
    - Scar management
    - Sun protection and skin care

Rehabilitation Phase (Wounds are Healed)

- Patient is nearly completely healed
- Patient leaves the acute care setting and goes to their next level of care
    - Inpatient rehabilitation
    - Home
        - Patient continues OT services as an outpatient or within the outpatient burn clinic
- Focus of care turns to scar management, deformity prevention, and reintegration into normal daily activities such as work, school, and home
- Patients in this phase of healing may be ready for burn survivor support groups or introduction to the burn foundations

Case Presentation: A.B.

Case Presentation: A.B. (Acute Care Unit)

- **Age/hand dominance/gender**: 63 years old RHD male
- **Date of injury:** 7/29/26
- **Admitted to LA General:** 7/29/26
- **Method of injury:** Flame ignition while working on his car
- **Diagnosis:** 2.5% TBSA mixed superficial and deep partial thickness (2nd degree) burns to bilateral hands
- **Past medical/surgical history**
  - (R) thumb fracture repair







Photos by presenters

Case Presentation: A.B. (Acute Care Unit)

- Initial Evaluation: 7/30/26
  - **PLOF:** Independent with ADLs, IADLs, and functional mobility
  - **Home Environment:** Lives with family – has great social support
  - **Job:** Self employed as a car mechanic
  - **Cognition/Vision:** WNL
  - **Precautions:** Maintain (R)UE elevated in skyhook sling but can remove for OT
  - **Pain Level:** 9/10 pain at rest, 10/10 pain with ROM to (R) hand
  - **Edema:** Minimal in (L) hand and moderate in (R) hand
  - **Sensation:** Intact in (B)UEs
  - **Current ADL Status:** Required set up assist for OOB ADLs due to limited (R) hand ROM and fine motor control deficits

Case Presentation: A.B. (Acute Care Unit)

- Initial Evaluation: 7/30/26
  - ROM: (B)UE ROM WNL except...
    - Approximately 80% of (R) active composite fist
    - Approximately 90% of (R) passive composite fist
    - Limited due to pain, moderate edema, and bulky dressings
  - Patient/Family Education
    - Edema management techniques
    - Incorporating (B) hands with light ADLs
    - (B) wrist/hand A/AAROM exercises to be completed every 2 hours
  - Discharge Recommendations
    - Home with family care
    - Follow patient in outpatient burn clinic

Case Presentation: A.B. (Acute Care Unit)

- Acute Care Unit Stay: 7/29/26 - 8/11/26
  - Surgery: 8/4/26
    - Tangential debridement of (R)UE mixed superficial and deep partial thickness burn wound
    - Myriad application (10x20 cm)
      - Biological skin substitute placement





Photos by presenters

Case Presentation: A.B. (Acute Care Unit)

- Acute Care Unit Stay: 7/29/26 - 8/11/26
  - Updated Precautions
    - Resting hand splint for (R)UE
    - No (R) hand/wrist ROM until POD #2





Photos by presenters

Case Presentation: A.B. (Acute Care Unit)

- Acute Care Unit Stay: 7/29/26 - 8/11/26
  - Treatment
    - POD #2
      - Discontinue resting hand splint for (R)UE
      - Cleared for unrestricted ROM
  - OT
    - Ther-ex to maximize (B) hand/wrist ROM
    - Functional mobility/ ADLs
    - Patient/family education



Photo by presenters

Case Presentation: A.B. (Acute Care Unit)

- Acute Care Unit Stay: 7/29/26 - 8/11/26
  - Discharge: 8/11/26
    - ROM
      - ~70% of (R) digits active composite flexion
      - ~90% of (R) digits passive composite flexion
      - Limited due to pain, minimal edema, and bulky dressings

Case Presentation: A.B.

- Burn Clinic Visit: 8/17/26







Photos by presenters

Case Presentation: A.B.

- Burn Clinic Visit: 8/17/26 and 8/19/26
  - In both visits, patient was seen by an OT
    - Patent states he is "waiting until everything heals to move hand more."
    - Reviewed A/PROM exercises to (R) wrist/digits with patient and patient's daughter who was present
    - Reviewed retrograde massage and importance of elevation at night and periodically during the day for edema management
  - Outpatient OT evaluation scheduled for 8/21/26

Case Presentation: A.B. (Outpatient)

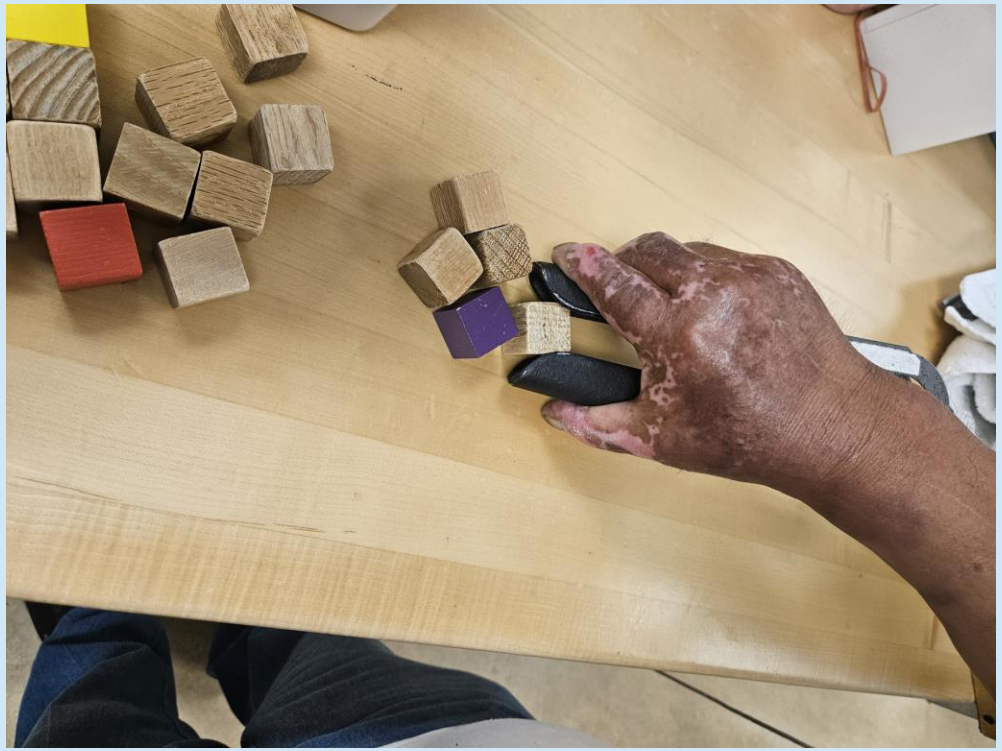
- Initial Evaluation: 8/21/26
  - PLOF: Independent with ADLs, IADLs, and functional mobility
  - Home Environment: Lives with family – has great social support
  - Job: Self employed as a car mechanic
  - Cognition/Vision: WNL
  - **Precautions**: Standard
  - **Pain Level**: 0/10 pain at rest, 7/10 intermittent pain in (R) hand (especially thumb) with activity
  - **Current ADL Status:** Modified independent (extra time required, uses other hand, etc.)
  - **ROM:** (B)UE ROM WNL except R digits
    - Distance of fingertip from DPC in cms: IF 5.0, MF 7.0, RF 5.0, SF 5.0

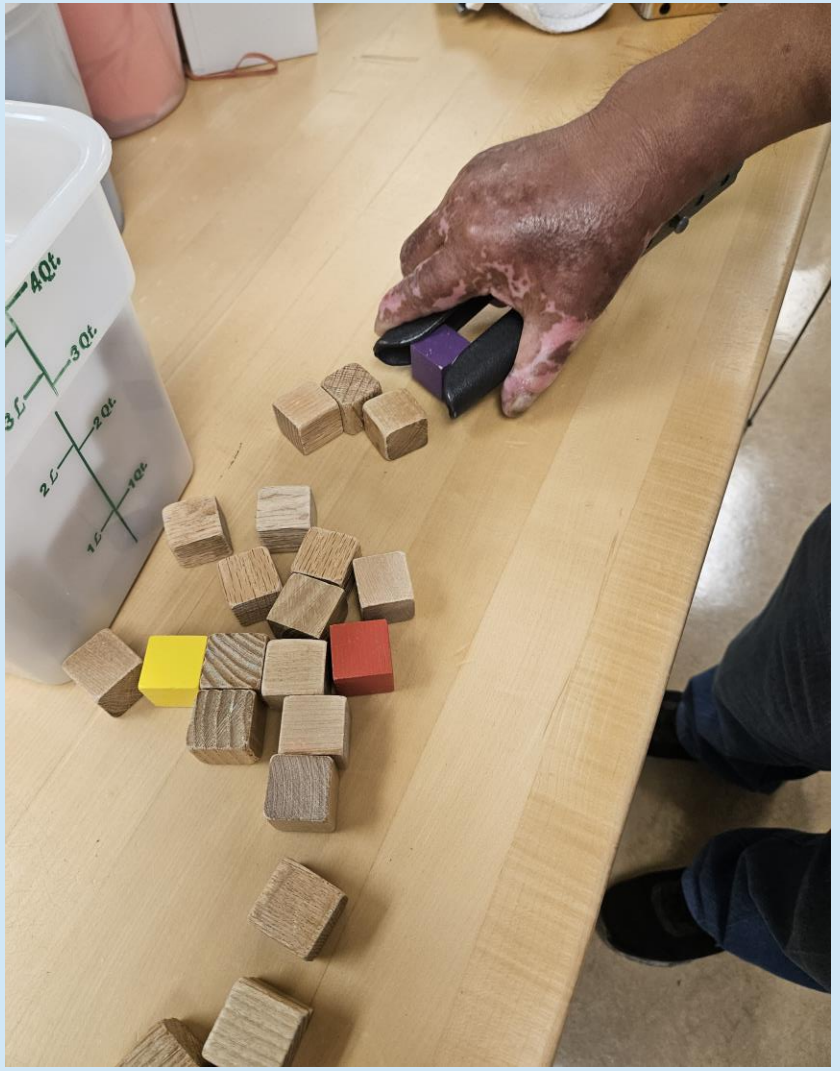
Case Presentation: A.B. (Outpatient)

- Initial Evaluation: 8/21/26
  - Patient/Family Education
    - Reviewed wrist/digit/thumb A/AAROM exercises (10 repetitions, 10 second holds, 5 times a day, every 2 hours)
  - Plan
    - 1x/week for 4 weeks --> reassess

Case Presentation: A.B. (Outpatient)

- Treatment





Photos by presenters

Case Presentation: A.B. (Outpatient)

- Recent Treatment Session on 9/28/26






Photos by presenters

Case Presentation: M.H.

Case Presentation: M.H. (Acute Care Unit)

- **Age/hand dominance/gender**: 43 years old RHD female
- **Date of injury:** 7/29/26, ~10 pm
- **Admitted to LA General:** 8/3/26
- **Method of injury:** Scald burn secondary to hot water
- **Diagnosis:** 1.5% TBSA mixed partial thickness burn (2nd degree) to (L) hand
- **Past medical/surgical history:**
  - Complex partial seizures since 9 years old due to malformation of cortical development



Photo by presenters

Case Presentation: M.H. (Acute Care Unit)

- Initial Evaluation: 8/4/26
  - **PLOF:** Independent with ADLs and functional mobility, needs assistance from aunt with IADLs such as meal preparation and transportation due to seizures
  - **Home Environment:** Lives with 17 year old son, Aunt lives nearby to assist as needed
  - **Job:** Used to work at a courthouse but stopped working due to frequent seizures
  - **Cognition/Vision:** WFL
  - **Precautions:** Seizures precaution, Elevate (L) UE
  - **Pain Level:** 5/10 constant pain in (L) hand/wrist, increases to 8/10 pain with ther-ex, decreases with pain medications
  - **Edema:** Moderate in (L) hand
  - **Sensation:** Impaired in (L) hand
  - **Current ADL Status:** Modified independent with ADLs as patient primarily uses (R) hand, required minimal verbal cues to incorporate (L) hand in functional tasks

Case Presentation: M.H. (Acute Care Unit)

- Initial Evaluation: 8/4/26
  - ROM: (B)UE ROM WNL except (R) digits/thumb
    - Distance of fingertip from DPC in cms
      - Thumb 5.0 from opposition
      - IF 5.0, MF 3.0, RF 2.5, SF 2.5
  - Patient/Family Education:
    - Edema management techniques
    - Incorporating (L) hand in functional tasks
    - (L) thumb/digit A/PROM exercises – 10 repetitions, 10 second holds, 3 times a day
  - Discharge Recommendations:
    - Home with family care
    - Follow patient in outpatient burn clinic





Photos by presenters

Case Presentation: M.H. (Acute Care Unit)

- Acute Care Unit Stay: 8/4/26 - 8/13/26
  - Surgery: 8/7/26
    - Debridement of burn in (L) hand
    - Split thickness skin graft to L hand from L thigh (donor site)
  - Updated Precautions
    - Resting hand splint for (L) UE
    - No (L) hand/wrist ROM until POD #4
    - Seizure precautions





Photos by presenters

Case Presentation: M.H. (Acute Care Unit)

- Acute Care Unit Stay: 8/4/26 - 8/13/26
  - Treatment
    - POD #4
      - Discontinue resting hand splint
      - Cleared for unrestricted ROM except **gentle** AROM to (L) hand
      - Coban to (L) hand for edema management
    - POD #6
      - Cleared for unrestricted ROM including PROM to (L) hand
      - Resting hand splint at night only to prevent deformity/contractures

Case Presentation: M.H. (Acute Care Unit)

- Acute Care Unit Stay: 8/4/26 - 8/13/26
  - Discharge: 8/13/26
    - ROM
      - ~50% of (L) digits active composite flexion
      - Thumb able to oppose to (L) IF/MF/RF

Case Presentation: M.H.

- Burn Clinic Visit: 8/17/26
  - Patient with significant pain which is limiting her ability to do exercises at home
  - MDs were concerned about the skin graft which appeared to have minimal graft take



Photo by presenters

Case Presentation: M.H.

- Burn Clinic Visit: 8/19/26
  - (L) hand debridement



Photos by presenters

Case Presentation: M.H.

- **Burn Clinic Visit: 8/17/26 and 8/19/26**
  - In both visits, patient was seen by an OT
    - Reviewed A/PROM exercises to (L) thumb/digits
      - Patient still had difficulty demonstrating exercises correctly
    - Reminded patient to continue wearing resting hand splint at night
  - Outpatient OT evaluation scheduled for **8/27/26**

Case Presentation: M.H. (Outpatient)

- Initial Evaluation: 8/27/26
  - PLOF: Independent with ADLs and functional mobility, needs assistance from aunt with IADLs such as meal preparation and transportation due to seizures
  - Home Environment: Lives with 17 year old son, Aunt lives nearby to assist as needed
  - Job: Used to work at a courthouse but stopped working due to frequent seizures
  - Cognition/Vision: WFL
  - **Precautions**: Standard, WBAT (L)UE, Seizure precautions
  - **Pain Level**: 0/10 pain at rest, 5-6/10 pain in (L) digits during digit flex PROM exercises
  - **Sensation:** Intact
  - **Current ADL Status:** Modified independent (extra time required, uses other hand, etc.)

Case Presentation: M.H. (Outpatient)

- Initial Evaluation: 8/27/26
  - ROM: (B)UE ROM WNL except (L) digits
    - IF: MCP 0-15, PIP 0-70, DIP 0-35
    - MF: MCP 0-25, PIP 0-85, DIP 0-60
    - RF: MCP 0-20, PIP 0-80, DIP 0-60
    - SF: MCP 0-15, PIP 0-80, DIP 0-60



Photo by presenters

Case Presentation: M.H. (Outpatient)

- Initial Evaluation: 8/27/26
  - Splints
    - Adjusted hand-based resting hand splint





Photos by presenters

Case Presentation: M.H. (Outpatient)

- Initial Evaluation: 8/27/26
  - Splints
    - Fabricated static progressive L digits MCP passive flexion splint





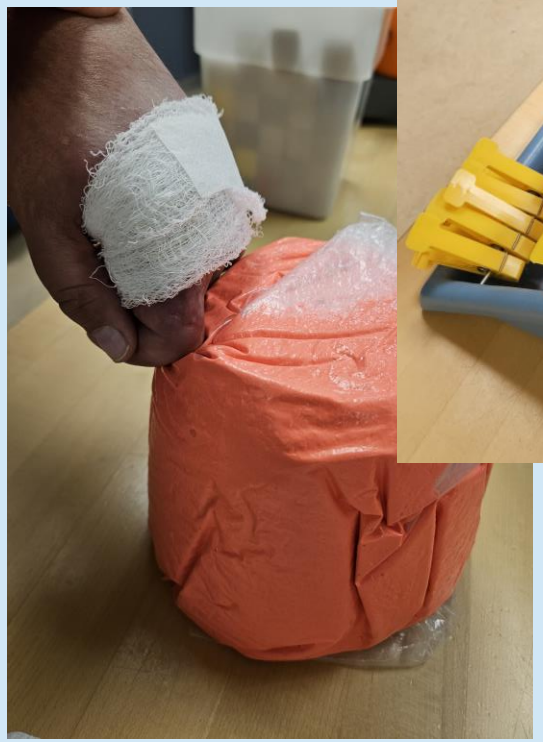
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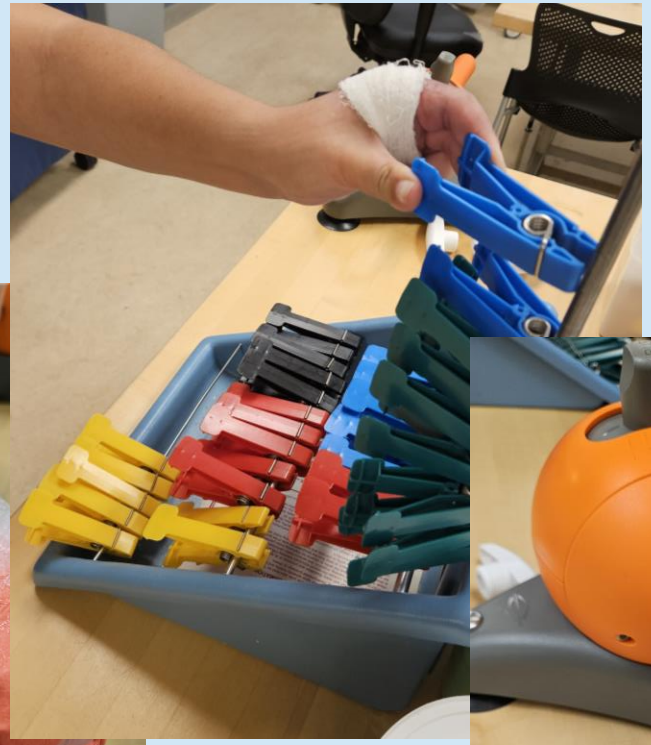
Case Presentation: M.H. (Outpatient)

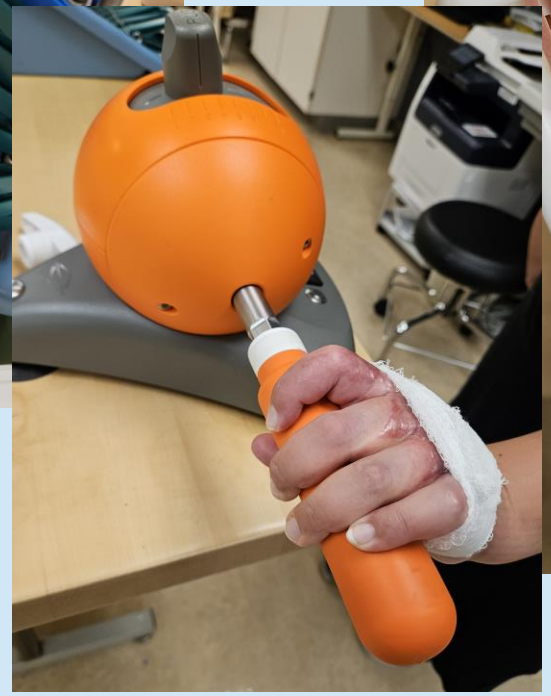
- Initial Evaluation: 8/27/26
  - Patient/Family Education
    - Purpose and wear/care schedule of splints
    - Reviewed digit A/PROM exercises (10 repetitions, 10 second holds, 5 times a day, every 2 hours)
  - Plan
    - 1x/week for 4 weeks --> reassess

Case Presentation: M.H. (Outpatient)

- Treatment











Photos by presenters

Case Presentation: M.H. (Outpatient)

- Burn Clinic Visit: 9/14/26
  - Blister formed on top of IF after walking around in the sun



Photo by presenters

Case Presentation: M.H. (Outpatient)

- Treatment on 9/22/26





Photos by presenters

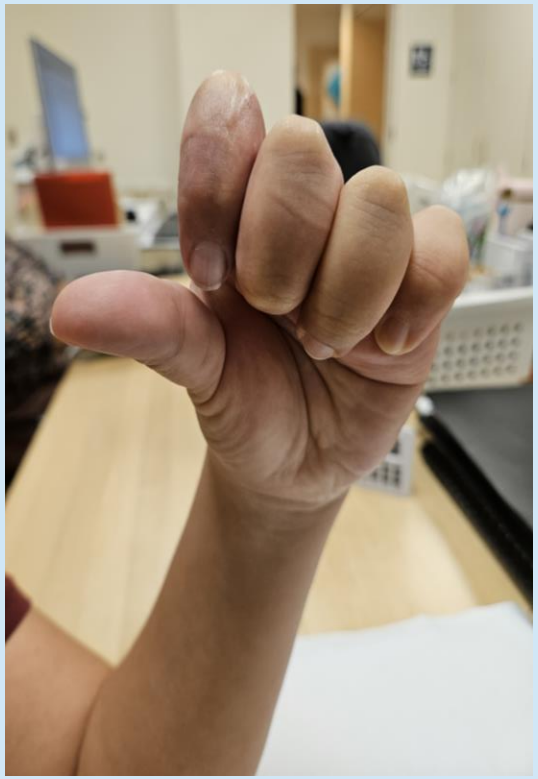
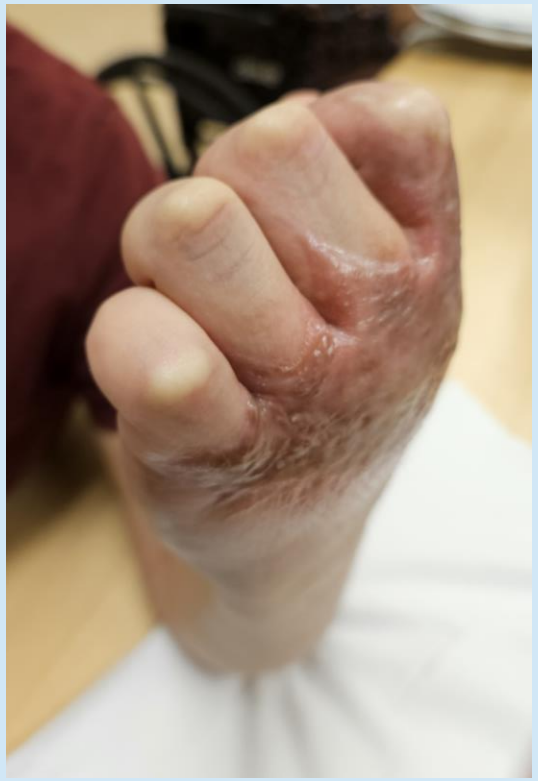
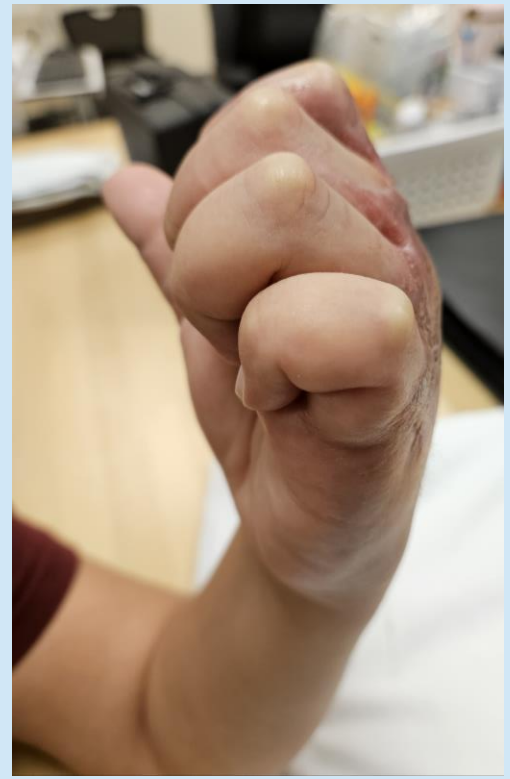
Case Presentation: M.H. (Outpatient)

- Most Recent Treatment on 9/29/26

	8/27/26	9/22/26
AROM	IF: **MCP 0-15**, PIP 0-70, DIP 0-35 MF: **MCP 0-25**, PIP 0-85, DIP 0-60 RF: **MCP 0-20**, PIP 0-80, DIP 0-60 SF: **MCP 0-15**, PIP 0-80, DIP 0-60	IF: **MCP 0-20**, PIP 0-85, DIP 0-60 MF: **MCP 0-45**, PIP 0-90, DIP 0-80 RF: **MCP 0-35**, PIP 0-90, DIP 0-65 SF: **MCP 0-20**, PIP 0-80, DIP 0-70
Passive MCP Flexion	IF: **45** degrees MF: 35 degrees RF: 35 degrees SF: 30 degrees	IF: **45** degrees MF: 50 degrees RF: 45 degrees SF: 40 degrees
Grip strength	Unable	***L hand: 15, 15, 15 / 15#** R hand: 66, 65, 55 / 62#

Case Presentation: M.H. (Outpatient)

- Most Recent Treatment on 9/29/26

Photos by presenters

Case Presentation: M.H. (Outpatient)

- Most Recent Treatment on 9/29/26





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"...despite persistent physical deficits, mental health and life satisfaction can return to near pre-injury levels even after the most expensive injuries" (Grobowski et al., 2026, p. 1009)



Photo by Austin Schmid on Unsplash

Questions?
Thank you!

Resources

- Alisa Ann Ruch Burn Foundation (www.aarbf.org)
- American Burn Association (www.ameriburn.org)
- AOTA (www.aota.org)
- Model Systems Knowledge Translation Center (www.msktc.org/burn/model-system-centers)
- Phoenix Society (www.phoenixsociety.org)
- www.firefightersquest.org

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