DHA TELEHEALTH CLINICAL GUIDELINES FOR VIRTUAL MANAGEMENT OF BURN – 35

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Health Policies and Standards Department

Health Regulation Sector (2024)

INTRODUCTION

Health Regulation Sector (HRS) forms an integral part of Dubai Health Authority (DHA) and is mandated by DHA Law No. (14) of the year (2021) amending some clauses of law No. (6) of 2018 pertaining to the Dubai Health Authority (DHA), to undertake several functions including but not limited to:

- Developing regulation, policy, standards, guidelines to improve quality and patient safety and promote the growth and development of the health sector;
- Licensure and inspection of health facilities as well as healthcare professionals and ensuring compliance to best practice;
- Managing patient complaints and assuring patient and physician rights are upheld;
- Governing the use of narcotics, controlled and semi-controlled medications;
- Strengthening health tourism and assuring ongoing growth; and
- Assuring management of health informatics, e-health and promoting innovation.

The DHA Telehealth Clinical Guidelines aim to fulfil the following overarching DHA Strategic Priorities (2026):

- Pioneering Human-centered health system to promote trust, safety, quality and care for patients and their families.
- Make Dubai a lighthouse for healthcare governance, integration and regulation.

- Leading global efforts to combat epidemics and infectious diseases and prepare for disasters.
- Pioneering prevention efforts against non-communicable diseases.
- Become a global digital health hub.
- Foster healthcare education, research and innovation.

ACKNOWLEDGMENT

The Health Policy and Standards Department (HPSD) developed this Guideline in collaboration with Subject Matter Experts and would like to acknowledge and thank these health professionals for their dedication toward improving quality and safety of healthcare services in the Emirate of Dubai.

Health Regulation Sector

Dubai Health Authority

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EXECUTIVE SUMMARY

Telehealth is based on Evidence Based Practice (EBP) which is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence and guidelines from systematic research.

EBP is important because it aims to provide the most effective care virtually, with the aim of improving patient outcomes. As health professionals, part of providing a professional service is ensuring that practice is informed by the best available evidence.

This guideline is presented in the format comprising of clinical history/symptoms, differential diagnosis, investigations and management. Identification of 'Red Flags' or serious conditions associated with the disease is an essential part of this telehealth guideline as it aids the physician to manage patients safely and appropriately by referrals to ER, family physicians or specialists for a face to face management.

DEFINITIONS/ABBREVIATIONS

Virtual Clinical Assessment: Is the evaluation of the patient's medical condition virtually via telephone or video call consultations, which may include one or more of the following: patient medical history, physical examination and diagnostic investigations.

Patient: The person who receives the healthcare services or the medical investigation or treatment provided by a DHA licensed healthcare professional.

ABBREVIATIONS

BPM	:	Beats Per Minute
DHA	:	Dubai Health Authority
EBP	:	Evidence Based Practice
ER	:	Emergency Room
HR	:	Health Rate
HRS	:	Health Regulation Sector
NSAIDs	:	Nonsteroidal Anti-Inflammatory Drugs
TBSA	:	Total Percentage of Body Surface Area
IV	:	Intravenous

1. BACKGROUND

1.1. Introduction

1.1.1. Burns are commonly thought of as injury to the skin caused by excessive heat. More broadly, burns result from traumatic injuries to the skin or other tissues primarily caused by thermal or other acute exposures. Burns occur when some or all the cells in the skin or other tissues are destroyed by heat, electrical discharge, friction, chemicals, or radiation. Burns are acute wounds caused by an isolated, non-recurring insult, and healing ideally progresses rapidly through an orderly series of steps.

2. SCOPE

2.1. Telehealth services in DHA licensed Health Facilities.

3. PURPOSE

3.1. To support the implementation of Telehealth services for patients with complaints of Burn in Dubai Health Authority (DHA) licensed Health Facilities

4. APPLICABILITY

4.1. DHA licensed physicians and health facilities providing Telehealth services.

4.2. Exclusion for Telehealth services are as follows

4.2.1. Emergency cases where immediate intervention or referral is required

4.2.2. Prescribe Narcotics, Controlled or Semi-Controlled medications`

5. BURN MECHANISMS

5.1. Heat

5.1.1. The depth of the thermal injury is related to contact temperature, duration of contact of the external heat source, and the thickness of the skin. Because the thermal conductivity of skin is low, most thermal burns involve the epidermis and part of the dermis. The most common thermal burns are associated with flames, hot liquids, hot solid objects, and steam.

5.2. Electrical discharge

5.2.1. Electrical energy is transformed into heat as the current passes through poorly conducting body tissues. Electroporation (injury to cell membranes) disrupts membrane potential and function. The magnitude of the injury depends on the pathway of the current, the resistance to the current flow through the tissues, and the strength and duration of the current flow.

5.3. Friction

5.3.1. Injury from friction can occur due to a combination of mechanical disruption of tissues as well as heat generated by friction.

5.4. Chemicals

5.4.1. Injury is caused by a wide range of caustic reactions, including alteration of pH, disruption of cellular membranes, and direct toxic effects on

metabolic processes. In addition to the duration of exposure, the nature of the agent will determine injury severity. Contact with acid causes coagulation necrosis of the tissue, while alkaline burns generate liquefaction necrosis. Systemic absorption of some chemicals is life-threatening, and local damage can include the full thickness of skin and underlying tissues.

5.5. Radiation

5.5.1. Radio frequency energy or ionizing radiation can cause damage to skin and tissues. The most common type of radiation burn is the sunburn. Radiation burns are most commonly seen today following therapeutic radiation therapy and are also seen in patients who receive excessive radiation from diagnostic procedures

6. CLASSIFICATION OF BURNS

Burn depth and size are important factors in determining whether a burn can be classified as minor and are crucial in dictating the initial steps of burn assessment and management. Superficial burns can often be managed via teleconsultation by video call and/ or high-resolution photograph sent by the patient.

Full-thickness burns must be evaluated by a specialist for possible excision and grafting.

Determination of burn depth can be complicated by the conversion of burns to a higher burn category within the first several days. Conversion occurs when the damaged skin continues

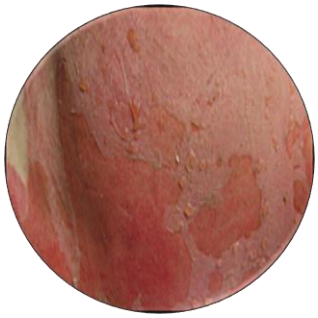
to spread and burn depth increases because of thermal injury that did not fully present on initial assessment; therefore, frequent evaluation and reassessment are necessary for all categories of burns

6.1. Superficial (first-degree) burns – managed via teleconsultation

6.1.1. First-degree burns involve only the epidermis; like a sunburn, they are erythematous, painful, and dry. They are most often the result of severe ultraviolet exposure or minor thermal injury. First-degree burns usually heal in five to 10 days

6.2. Superficial partial-thickness (superficial second-degree) burns - managed via teleconsultation but may require referral

6.2.1. Second-degree burns involve all the epidermis and part of the underlying dermis. Superficial partial-thickness burns damage the upper layers of the papillary dermis; they are identified by clear blisters and weeping, wet, erythematous skin, and they blanch painfully when touched. These burns heal within 2 weeks and generally do not cause scarring; however, scarring and pigment changes are possible



6.3. Deep partial-thickness (deep second-degree) burns – needs referral

6.3.1. Deep second-degree burns involve the deeper layers of the dermis (i.e., reticular dermis). They appear white and do not blanch. These burns do not heal in less than 3 weeks and often result in scarring and contractures.

6.4. Full-thickness (third-degree) burns – needs referral

6.4.1. Third-degree burns destroy all skin layers, including underlying subcutaneous fat. They are dark brown or tan and have a leathery feel with no sensitivity to touch. These wounds often require skin grafts and can result in contractures.

6.5. Fourth-degree burns – needs referral

6.5.1. Fourth-degree burns destroy all skin layers and extend into muscle, tendon, or bone.

6.6. Refer to APPENDIX 1 for the Classification of Burns by Depth of Injury

7. ASSESSMENT OF BURNS

All burns are considered trauma and therefore, the initial evaluation should include a primary evaluation via video call or high-resolution photograph

7.1. Primary assessment

Primary assessment of patients with acute burns starts with airway patency, vital signs and

7.1.1. Airway

Airway assessment includes history of breathing difficulty and visualizing the upper airway for signs of obstruction

7.1.2. Vital signs

If possible, monitoring vital signs and the color of unburned skin can help you assess the patient's circulatory and cardiac status. Heart rate (HR) in most adult burn patients will be elevated to 100 to 120 beats per minute (bpm) because of increased circulating catecholamines and hypermetabolism; HR higher than that may indicate hypovolemia from trauma, inadequate oxygenation, or uncontrolled pain and anxiety. Blood pressure and other vital signs in early stages of burn resuscitation should be the same as the patient's baseline.

7.1.3. Neurologic assessment

In most cases, neurologic status won't be altered in the early stages of burn injury. Determine if the patient is alert, responsive to verbal and pain stimuli, or unconscious. If the patient isn't alert and oriented, consider an associated injury, carbon monoxide poisoning, substance abuse, hypoxia, or pre-existing medical conditions and refer immediately.

7.2. Secondary assessment:

7.2.1. History

a. If you can't gather a history from the patient, interview family members, friends, or those who were at the scene.

b. Ask about the patient's medical history

c. Record detailed information about the circumstances and mechanism of the injury.

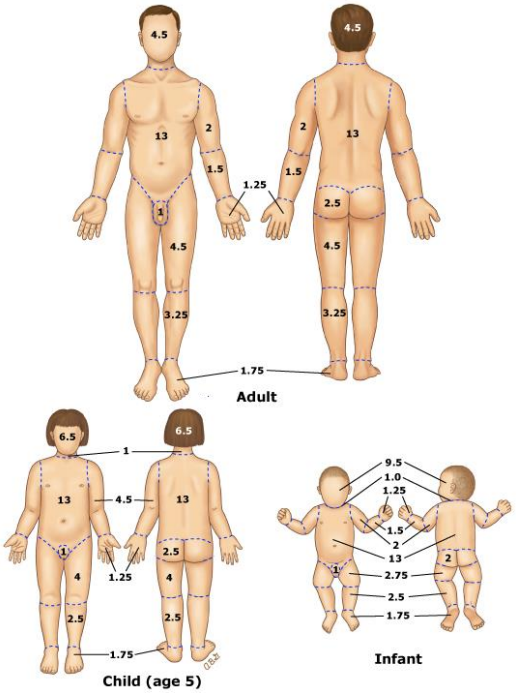
d. Additional questioning will be necessary if the patient was found in an enclosed space, has potential orthopedic injuries associated with the burns, or had clothing on fire.

e. Ask about the affected body part

7.2.2. Extent of burn injury

a. Thorough and accurate estimation of burn size is essential to guide therapy and to determine when to refer a patient.

b. Using one of the methods described below, the extent



of burns is estimated and expressed as the total percentage of body surface area (TBSA).

c. Superficial (first-degree) burns are not included in percentage TBSA burn assessment.

d. The locations of partial-thickness and full-thickness burned areas are recorded on a burn diagram. Burns with an appearance compatible with either deep partial-thickness or full-thickness are presumed to be full-thickness until accurate differentiation is possible.

e. Methods of estimation — The two commonly used methods of assessing percentage TBSA in adults are the Lund-Browder chart and "Rule of Nines." The Lund-Browder chart is the recommended method in children because it considers the relative percentage of body surface area affected by growth. If the burn is irregular and/or patchy, the palm method may be more useful.

f. Lund-Browder – The Lund-Browder chart is the most accurate method for estimating TBSA for both adults and children. Children have proportionally larger heads and smaller lower extremities, so the percentage TBSA is more accurately estimated using the Lund-Browder chart. Refer to APPENDIX 2 for the Modified Lund-Browder

Chart for assessing total body surface area burn in children and adults.

g. Rule of Nines – For adult assessment, the most expeditious method to estimate TBSA in adults is the "Rule of Nines":

- The head represents 9% TBSA
- Each arm represents 9% TBSA
- Each leg represents 18% TBSA
- The anterior and posterior trunk each represent 18% TBSA

8. REFERRAL CRITERIA

8.1. Refer to Family Physician/Specialist for face to face consultation

8.1.1. Burns in patients who will require special social, emotional, or rehabilitative intervention

8.1.2. Burns in patients with pre-existing medical disorders that could complicate management, prolong recovery, or affect mortality

8.1.3. Possible infected burn wound

8.2. Referral to ER:

8.2.1. Any patient with burns and concomitant trauma (e.g., fractures)

8.2.2. Burns that involve the face, hands, feet, genitalia, perineum, or major joints

8.2.3. Chemical burns

8.2.4. Electrical burns, including lightning injury

8.2.5. Inhalation injury

8.2.6. Superficial Partial-thickness burns on more than 10% of the TBSA

8.2.7. Deep second-degree

8.2.8. Third-degree (full-thickness) burns

8.2.9. Fourth degree burns

9. MANAGEMENT

9.1. Refer to APPENDIX 3 for the Virtual Management of Burn Algorithm

9.2. Most superficial (first-degree) burns can be successfully managed via telehealth consultation. Close monitoring and follow-up are important aspects of management because of the dynamic and fragile progression of burn injuries.

9.3. Goals of burn management include rapid healing, pain control, return of full function to the injured area, and good aesthetic results.

9.4. Due to the risk of airway edema and possible inhalation injury, burns to the face or neck should always be referred for face to face consultation for prompt evaluation of the patient's airway, regardless of the burn size.

9.5. A tetanus shot should be given to all patients with more than a first-degree burn.

9.6. The immediate management shall include:

9.6.1. Immediate treatment of minor thermal burns with cool running water is recommended though it is controversial. The running water should not be applied for longer than approximately five minutes.

9.6.2. Although cool water is an acceptable home treatment for minor burns, ice water immersion is not because it can lead to further injury and hypothermia.

9.6.3. Any materials that could cause further injury should be removed.

9.7. Pain management

9.7.1. Immediate attention should be given to pain control, because burns can take weeks to heal, judicious use of analgesics is recommended.

9.7.2. Applying gauze soaked in cool water to a wound for up to 30 minutes is a suitable technique for reducing pain soon after the burn is sustained.

9.7.3. Acetaminophen and NSAIDs are often sufficient for analgesia

9.7.4. Elevation of lower and upper extremity burns above the level of the heart can reduce pain and swelling for several days following the injury.

9.7.5. Pain management needs usually decline markedly once wound epithelization has occurred. However, analgesia requirements can actually increase if rescue medications are inadequate. Patients with larger or recently sustained burns can present with significant pain and may require referral for intravenous (IV) opioids for initial analgesia.

9.8. Topical treatment:

9.8.1. Superficial burns can be treated successfully with topical application of lotion, honey, aloe vera, or antibiotic ointment.

9.8.2. The lipid component of these treatments accelerates the repair of damaged skin and reduces drying. Although there are no medication requirements for patients with superficial burns, evidence has shown that topical nonsteroidal anti-inflammatory drugs and aloe vera reduce pain.

9.8.3. Topical corticosteroids have not been shown to reduce the inflammatory reaction, therefore they should NOT be used to treat superficial thermal burns or sunburns.

9.8.4. Partial-thickness burns should be treated with a topical antimicrobial agent or an absorptive occlusive dressing to reduce pain, promote healing, and prevent wound desiccation.

9.8.5. Topical silver sulfadiazine (Flamazine) is the standard antimicrobial treatment for partial-thickness burns however, it is relatively contraindicated in patients with sulfa allergy, pregnant and lactating women, and new-borns

9.8.6. The selection and application of burn wound dressings and topical agents depends on the nature and extent of the burn wound, a wound quality or state (e.g., contamination, infection), and the patient's allergy history.

9.8.7. Local burn wound care aims to protect the wound surface, maintain a moist environment, promote burn wound healing, and limit burn wound progression while minimizing discomfort for the patient. It is important to note that topical antimicrobials are used in conjunction with appropriate basic wound care.

9.8.8. Burn wound surfaces are prone to rapid bacterial colonization with the potential for invasive infection by pathogens (e.g., methicillin-resistant *Staphylococcus aureus*) that can cause burn wound infection.

9.8.9. Antibiotic treatment depends on local drug resistance and should be tailored toward broad coverage of gram-negative and gram-positive bacteria.

9.8.10. Pruritus and neuropathic pain are common postburn complications. Histamine H1 receptor antagonists such as cetirizine (Zyrtec) are the safest pharmacologic treatment for postburn pruritus.

9.8.11. A tetanus shot should be given to all patients with more than a first-degree burn

9.9. Dressings

9.9.1. A variety of antimicrobial agents can be applied to the burn wound surface, which is then covered with one of several dressing materials (e.g., gauze, nonadherent films).

9.9.2. Gauze alone should be avoided unless there are no other options (i.e., topical antimicrobials are not available). Dry gauze promotes scab formation, which will generally separate spontaneously as reepithelialization occurs.

9.9.3. Non-adherent films or fine mesh gauze (in combination with topical antimicrobials) are common dressings used to cover the burn wound, but films, foams, alginates, hydrocolloids, and hydrogels can also be used depending on the specific qualities of the dressing (e.g., silver containing) and the specific needs of the burn wound.

9.9.4. Dressing changes should be frequent enough to control exudate but not so frequent that they interfere with wound reepithelialization. The frequency ranges from twice daily to weekly depending upon the amount of exudate and choice of dressing material. More frequent dressing changes are performed if there is a large amount of exudate, weeping, or infection.

9.9.5. Topical antimicrobials should be gently removed with dressing changes. Excessive scrubbing and sharp debridement are not necessary and may hinder healing.

9.9.6. In general, superficial burns do not require antimicrobial therapy, but for extensive superficial burns, topical antimicrobials may be used to prevent

colonization while maintaining a moist wound healing environment. Furthermore, because superficial partial-thickness burns may not always be easily distinguished from deeper injuries, topical antimicrobial agents are often used. Start with a combination antimicrobial ointment or creme (e.g., Mupirocin) covered with a non-adherent dressing (e.g., Xeroform, Adaptic, Mepitel). When in close proximity to the eyes, we use an ophthalmic ointment without steroids.

9.9.7. Refer to APPENDIX 4 for Topical Antimicrobial Agents used for Burns

9.10. Summary of Management

9.10.1. Prevention efforts can significantly lower the incidence of burns, especially in children.

9.10.2. Superficial burns can be treated with topical application of lotions, honey, aloe vera, or antibiotic ointment.

9.10.3. Partial-thickness burns should be treated with a topical antimicrobial agent or an absorptive occlusive dressing to help reduce pain, promote healing, and prevent wound desiccation.

9.10.4. Topical silver sulfadiazine is the standard treatment; however, newer occlusive dressings can provide faster healing and are often more cost-effective. Physicians must re-evaluate patients frequently after a burn injury and be aware of the indications for referral to a burn specialist.

9.10.5. Although cellulitis is not common in burns, it can cause the skin to become severely erythematous, exudative, painful, and swollen. This is a difficult process to assess because wounds generally are erythematous, painful, and swollen as they heal. Infections can progress rapidly; some of the most common pathogens found in burn wounds include Staphylococcus aureus, Streptococcus pyogenes, Pseudomonas aeruginosa, and Acinetobacter and Klebsiella species.

9.10.6. Antibiotic treatment depends on local drug resistance and should be tailored toward broad coverage of gram-negative and gram-positive bacteria.

9.10.7. Pruritus and neuropathic pain are common postburn complications. Histamine H1 receptor antagonists such as cetirizine (Zyrtec) are the safest pharmacologic treatment for postburn pruritus.

9.10.8. A tetanus shot should be given to all patients with more than a first-degree burn

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APPENDICES

APPENDIX 1 – CLASSIFICATION OF BURNS BY DEPTH OF INJURY

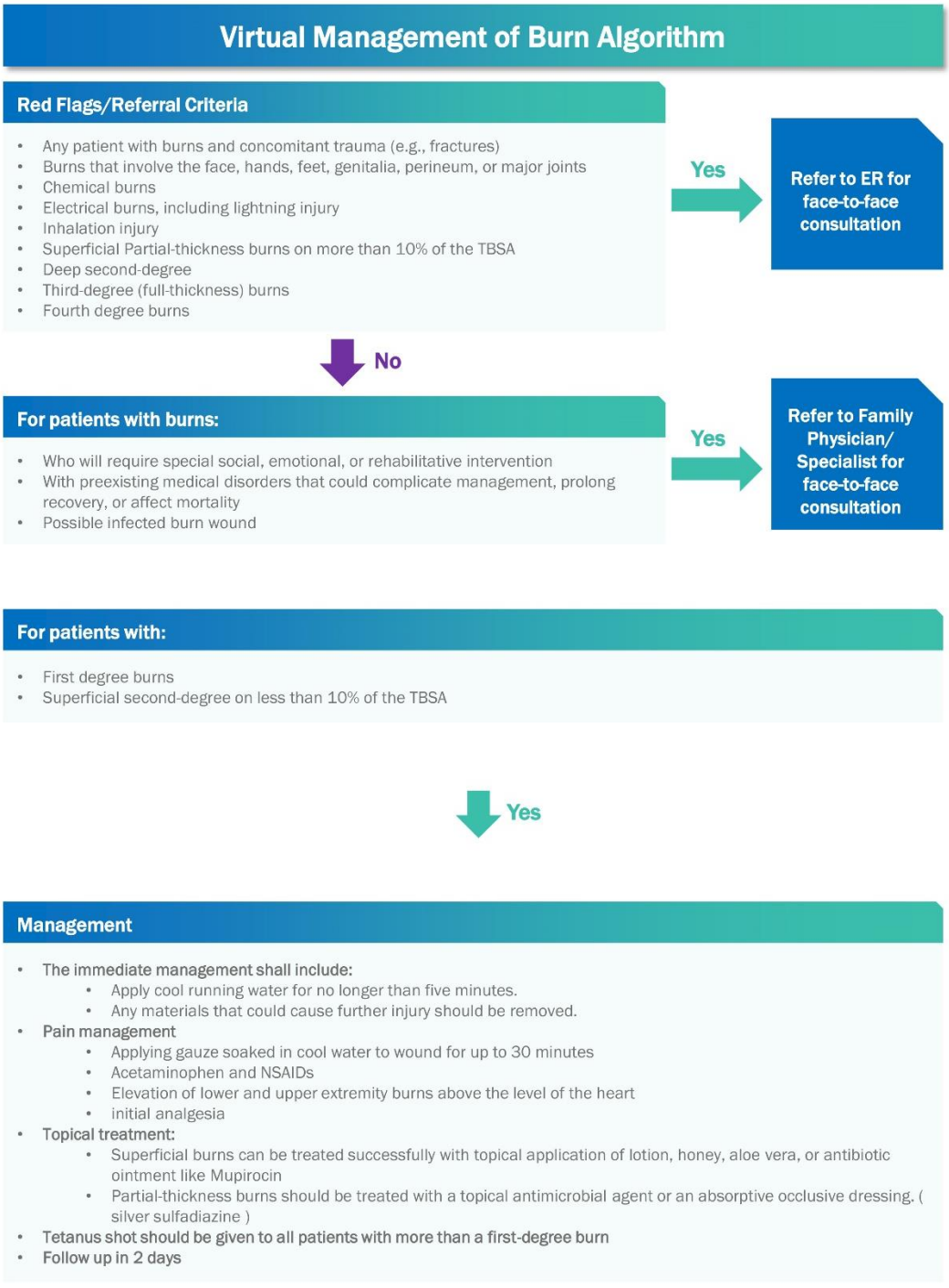
Depth	Appearance	Sensation	Healing time
Superficial (epidermal)	Dry, red Blanches with pressure	Painful	3 to 6 days
Superficial partial-thickness	Blisters Moist, red, weeping Blanches with pressure	Painful to temperature and air	7 to 21 days
Deep partial-thickness	Blisters (easily unroofed) Wet or waxy dry Variable color (patchy to cheesy white to red) Does not blanch with pressure	Perceptive of pressure only	>21 days, usually requires surgical treatment
Full-thickness	Waxy white to leathery gray to charred and black Dry and inelastic No blanching with pressure	Deep pressure only	Rare heal, unless surgically treated
Deeper injury (i.e., fourth degree)	Extends into fascia and/or muscle	Deep pressure	Never heal, unless surgically treated

APPENDIX 2 – MODIFIED LUND-BROWDER CHART FOR ASSESSING PERCENTAGE TOTAL BODY SURFACE AREA BURN IN CHILDREN AND ADULTS

Area*	Birth to 1 year	1 to 4 years	5 to 9 years	10 to 14 years	Adult
Head	9.5	8.5	6.5	5.5	4.5
Neck	1	1	1	1	1
Trunk	13	13	13	13	13
Upper arm	2	2	2	2	2
Forearm	1.5	1.5	1.5	1.5	1.5
Hand	1.25	1.25	1.25	1.25	1.25
Thigh	2.75	3.25	4	4.25	4.5
Leg	2.5	2.5	2.5	3	3.25
Foot	1.75	1.75	1.75	1.75	1.75
Buttock	2.5	2.5	2.5	2.5	2.5
Genitalia	1	1	1	1	1

* Values listed are for one surface area and each individual extremity. Anterior and posterior surface area values are equivalent in estimating total body surface area (TBSA). For circumferential burns, multiply surface area burned by two.

APPENDIX 3 – VIRTUAL MANAGEMENT OF BURN ALGORITHM



APPENDIX 4 - TOPICAL ANTIMICROBIAL AGENTS USED FOR BURNS

Antimicrobial agents	Clinical indications	Effectiveness	Contraindications	Adverse effects
Silver sulfadiazine (1% cream) with or without cerium	Small, medium, and large surface area burns	Decreased colonization of wounds Alleviates pain Broad spectrum No evidence to support improved wound healing or reduction in bacterial wound infections	Burns near eyes Pregnant Breastfeeding New-borns <2 months Allergic to sulfonamides Signs of re-epithelialization	Skin hypersensitivity Neutropenia (usually transient) Leukopenia (usually transient) Methemoglobinemia
Bacitracin ointment 500 units/gram	Small surface area burns Face Ears Perineum Graft sites Alternative if allergic to sulfonamides	Ease of application and of removal Painless Frequent dressing changes	Bacterial resistance Signs of re-epithelialization	Yeast colonization Skin hypersensitivity
Combination antibiotic ointment (bacitracin, neomycin, and polymyxin B)	Small surface area burns Face Ears Perineum Graft sites Alternative if allergic to sulfonamides	Ease of application and of removal Painless Frequent dressing changes	Bacterial resistance Allergic reaction Signs of reepithelialization	Yeast colonization Skin hypersensitivity Ototoxicity and nephrotoxicity with neomycin-containing ointments (Neosporin)

Mupirocin (Bactroban) ointment 2%	Small, medium surface area burns Face Ears Nose Perineum Alternative if allergic to sulfonamides	Gram-positive coverage includes methicillin-resistant *Staphylococcus aureus* (MRSA) Ease of application and of removal Painless Frequent dressing changes	Bacterial resistance Allergic reaction Signs of re-epithelialization	Yeast colonization Skin hypersensitivity
Chlorhexidine	Only superficial burns	Does not interfere with reepithelialization Can be used with silver sulfadiazine Generally used as a cleansing agent	Deep burns Caution in neonates – rare association with cutaneous burns	Skin hypersensitivity
Povidone-iodine	Small, medium surface area burns	Only when no other agent is available	Children under 2 years Pregnant Breastfeeding Thyroid disorders Signs of reepithelialization	Cytotoxicity (toxic to fibroblasts, reduces cell proliferation) Painful Skin hypersensitivities Chemical burn Iodine toxicity Renal failure Acidosis Anaphylaxis