National Burn Management Guideline

Table of content

Introduction

Ethiopia is the tenth largest country in Africa, covering 1,104,300 square kilometers (with 1 million sq km land area and 104,300 sq km water. It consists of 11 regions with nine national regional states and two city administration. This country is the second largest county among sub-Saharan Africa with the estimated population of around 87,952 million of which more than 84 percent live in rural areas.(CSA 2014). The proportion of male and female is almost equal, and average life expectancy at birth for male is around 61.40 and for female it is 64.61.(CSA 2012)

The country's National Health Service coverage has reached to the level where there are 146 Public hospitals and 3200 health centers and 15,095 health posts and more than 4000 private for profit and not for profit clinics. The health sector has introduced a three tire system that involves a primary Health Care Unit (PHCU), General hospitals and specialized hospitals. PHCU consists of five satellite health posts, one health center and primary hospital to serve 5,000;25,000 and 100,000 people respectively. The secondary level, General hospital, serves for 1,000,000 population and the tertiary level, specialized hospital, serves for 5,000,000 people. Despite major progresses have been made to improve the health status of the population in the last one and half decades, Ethiopia's population still face a high rate of morbidity and mortality especially related to injury including burn.

A burn is defined as an injury to the skin or other tissue caused by thermal trauma or due to radiation, radioactivity, electricity, friction or contact with chemicals. Thermal (heat) burns occur when some or all of the cells in the skin or other tissues are destroyed by hot liquids (scalds), hot solids (contact burns), or flames (flame burns) . Children under 5 years and the elderly are at increased risk of burn injury

Burn injuries are among the most devastating of all injuries and a major global public health crisis and are the fourth most common type of trauma worldwide, following traffic accidents, falls, and interpersonal violence. [5].

Burn injury is a serious pathology, potentially leading to severe morbidity (intense pain) and significant mortality. It also has a considerable health-economic impact often by long-term illness that creates suffering not only for the victim but also for the whole family and community.

Unlike most forms of trauma, burn injury is something the vast majority of the population can claim to have some experience of, even if in a very mild form. It occurs in all age groups, and may range from the most trivial; such that self treatment is sufficient, through to the most severe, where the highest levels of intensive care and radical surgery is required.

Fortunately, the prevention, acute care and rehabilitation of burns have improved greatly over the past few decades. There is now ample evidence that a number of measures are effective in preventing burns. These include the introduction and enforcement of items such as smoke alarms, residential sprinklers and fire-safe lighters, and laws regulating the temperature of hot-water taps. Nonetheless, considerable disparities exist between countries in the extent of their prevention , care and rehabilitation of burns, especially burns which occur in low to middle income countries generally lack the necessary infrastructure to reduce the incidence and severity of burns

Worldwide Burn care has developed most rapidly at times of conflict and war. Very significant advances in the quality of burn surgery were seen in the Second World War. The multidisciplinary approach of burn injury bore considerable fruit in terms of patient survival and much short length of stay in hospital which is augmented by improvement in skin grafting techniques in late nineties in Europe .In our country the first burn unit was established in 2000G.C at Yekatit 12 hospitals. mean while due to rapid population growth and an increment in need for health service care there is a high burn patient flow where only one center could not handle them anymore. Therefore federal ministry of health take the initiatives with stakeholders to expand the field and try to improve the survival outcome of burn injury by emphasizing on restoring post burn function appearance and confidence by enabling a considered multidisciplinary approach at all stages of managements.

In the developing countries like ours, there is a wide gap between the number of burn patients and available resources to manage them. There is only one functional specialized burn unit in our country. So, some of severe burn patients, who require specialized care, are forced to be managed in general wards in the hands of general practitioners or surgeons who do not have specialized training in managing burn patients. In addition to that there is a high flow of patients to the available burn unit with unnecessary referral which can be managed by lower health care level . Our community is not aware of the preventive measures of pediatric burn injuries since children are susceptible to burn .As a result, we have not been able to lower the burn related deaths as compared to the western world. To overcome the above listed problems there is a need to develop national burn management guideline.

Strategies considered in this burn management guidelines are to include burns as part of the national health

Agenda, Drive effective prevention programmes, including burn educational campaigns in Schools and community, Create a central registry of burns to document extent of burns, Improve pre-hospital care with promotion of better referral systems based on triage, Develop regional centers of excellence with basic burn care undertaken at district and base hospitals, Define health needs based on priorities defined locally with optimization of existing facilities to achieve minimally acceptable standards of care, Implement cost-effective treatment approaches(re-use/recycle/adapt available resources) and to Develop a national body of burn professionals to educate healthcare staff

Classification of burns

Burn injuries are classified by two major factors that influence management and prognosis**; the extent of injury and the depth of burn.** The extent of injury is expressed as a percentage of total body surface area (TBSA), which is calculated according to age. The depth of burn is expressed as either full thickness or partial thickness burn. In practice most burns area combination of both types .

Non-accidental burn injury (i.e., abuse) is present in pediatric population particularly children from families with a single parent, a younger mother, a low income or an unemployed parent

The followings are three commonly used typologies, based respectively on the cause, extent and severity of the burn.

1. **Classification by mechanism or cause** - Causally, burns may be classified as **thermal or inhalational**.

- **Thermal burns** involve the skin and may present as:
- **Scalds** – are frequently due to spilling of hot drinks and liquids, and immersion in a hot bath or shower
- **contact burns** – occur either when the skin touches an extremely hot object (often seen in industrial accidents) or when it touches a less hot object for a very long time.
- **flame burns** – caused by flames or incandescent fi res, such as those started by lighted cigarettes, candles, lamps etc
- **chemical burns** – caused by exposure to reactive chemical substances such as strong acids or alkalis and tend to cause deep dermal or full thickness burns because the tissues continue to be damaged until the chemical is completely removed
- **Electrical burns** occur when electricity flows through the body from an entry point to an exit point. The burn is caused by the heat energy of the electric current damaging tissue along its path of flow

- **Inhalational burns** are the result of breathing in superheated gases, steam, hot liquids or noxious products of incomplete combustion. They cause thermal or chemical injury to the airways and lungs and accompany a skin burn in approximately 20% to 35% of cases. Inhalational burns are the most common cause of death among people suffering fire-related burn although it is difficult to distinguish deaths from toxic smoke or other non-burn cases. Death is more likely with increasing age, increasing burn size and presence of inhalational injury,

2.Classification by the depth of a burn

Burns may also be classified by depth or thickness:

A. First-degree or superficial burns- are defined as burns to the epidermis that result in a simple inflammatory response. They are typically caused by exposure of the unprotected skin to solar radiation (sun burn) or to brief contact with hot substances, liquids or flash flames. First-degree burns heal within a week with no permanent changes in skin colour, texture, or thickness.

B. Second-degree or partial-thickness burns- result when damage to the skin extends beneath the epidermis into the dermis. The damage does not, however, lead to the destruction of all elements of the skin.

- **Superficial second-degree burns** are those that take less than three weeks to heal. These type of burn are blistering , pink in colour and painful.
- **Deep second-degree burns** take more than three weeks to close and are likely to form hypertrophic scars and has brownish mottled appearance and variable sensation .

C. Third-degree or full-thickness- burns are those where there is damage to all epidermal elements – including epidermis, dermis, subcutaneous tissue layer and deep hair follicles. As a result of the extensive destruction of the skin layers, third-degree burn wounds cannot regenerate themselves without grafting. These burns have leathery thick appearance and are painless.

d. Fourth degree burn – the damage extends beyond the dermal layer to deeper structures under the skin .

Estimation of burn depth

Different parameters can be used to determine the depth of burn wound .

- ✓ Bleeding
- Delayed bleeding on a deeper prick suggests a deep dermal burn (partial thickness burn), while no bleeding suggests a full thickness burn.
- ✓ Sensation
- Pain equates with a superficial or superficial dermal burn,
- non-painful sensation equates with deep dermal injury, while full thickness injuries are insensate

- ✓ Appearance and blanching
- A red, moist wound that obviously blanches and then rapidly refills is superficial
- A pale, dry but blanching wound that regains its colour slowly is superficial dermal
- Deep dermal injuries have a mottled cherry red colour that does not blanch (fixed capillary staining).
- A dry, leathery or waxy, hard wound that does not blanch is full thickness.
- With extensive burns, full thickness burns can often be mistaken for unburnt skin in appearance.

3. **<u>Classification by extent of burn</u>**

- The extent of burn, clinically referred to as the total body surface area burned **(TBSA)** is an estimate of the percentage of total body surface area involved in burn exposure and injury (5). Several methods are used to determine this measurement, the most common being the so-called **"rule of nines**". This method assigns 9% to the head and neck region, 9% to each arm (including the hand), 18% to each leg (including the foot) and 18% to each side of the trunk (back, chest and abdomen). The "rule of nines" is used for adults and children older than 10 years, while **the Lund and Browder Chart** is used for children younger than 10 years (6). The other method used to assess extent of burn injuries is **Palmar surface** method. The calculation assumes that the size of a palm is roughly 1% of the total body surface area and this method is applicable in burns involving small body surface area.

Total body surface area

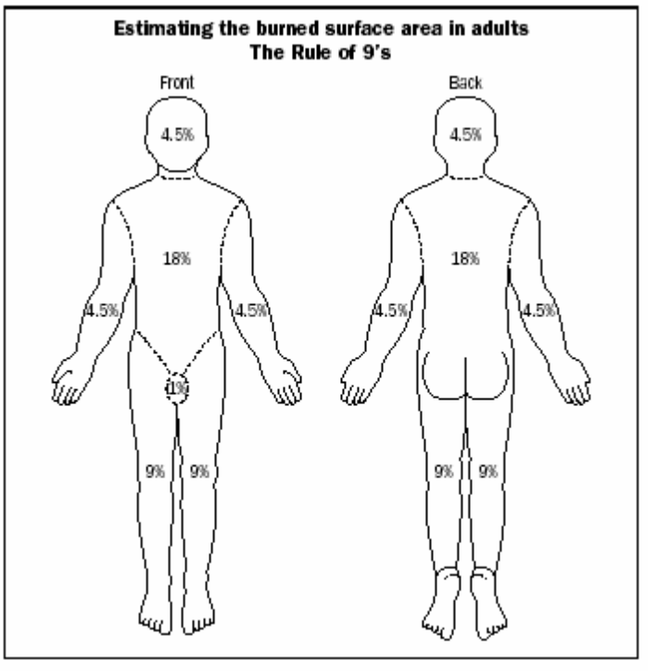

Figure 7

For admission purposes burns can be classified as minor burns and major burns.
Minor burns ,any partial thickness thermal burn covering ≤15% total body surface area (TBSA) in adults or ≤10% in children (≤5% in children younger than 1 year) that does not affect a critical area*. Includes deep dermal burns covering ≤1% of the body.
Major burns, any thermal burn injury affecting a critical area* or covering >15% TBSA in adults or >10% in children (>5% in children younger than 1 year). All chemical and electrical burns are considered complex.
**Burns to hands, feet, face, perineum or genitalia, burns crossing joints and circumferential burns.*

Epidemiology of burns

The long-term consequences and the disability that can result from burns place a considerable strain on individuals and their families, as well as on health-care facilities. According to WHO data, approximately 10% of all unintentional injury deaths are due to fire-related burns . In addition, fire-related burns are among the leading causes of disability-adjusted life years (DALYs) lost in low-income and middle-income countries.

Worldwide, an estimated 6 million people seek medical treatment for burns annually, but most are treated in outpatient clinics (1). However, the lack of national and international registration of burns injuries makes it difficult to estimate the true cost of burns. In developing low- and middle-income countries (LMICs), burn injuries are an indomitable problem, and much more common than in the USA and Europe or other high income developed countries. (2) However, the exact number of burns in LMICs is difficult to determine. A conservative estimate puts the number of people admitted to hospital with burns in India (population over 1 billion) at some 700,000 to 800,000 each year. (3) Illiteracy, poverty and urban overcrowding, along with social, infrastructural, economic and cultural issues complicate further the universal challenges of prevention and management. (2,3)

According to the WHO Global Burden of Disease estimates for 2004, just over 310,000 people died as a result of fire related burns, of whom 30% were under the age of 20 years. Fire-related burns are the 11th leading cause of death for children between the ages of 1 and 9 years. Overall, children are at high risk for death from burns, with a global rate of 3.9 deaths per 100,000 population. Among all people globally, infants have the highest death rates from burns. The rate then slowly declines with age, but increases again in elderly adults.

Burns occur mainly in the home and workplace. Community surveys in Bangladesh and Ethiopia show that 80–90% of burns occur at home. Children and women are usually burned in domestic kitchens, from upset receptacles containing hot liquids or flames, or from cook stove

explosions. Men are most likely to be burned in the workplace due to fire, scalds, chemical and electrical burns. (4)

When we come to the setting in Ethiopia, as any other developing country, there is high susceptibility to burn injuries considering the presence of many risk factors. There are quite few studies done that help us to have some picture of burn injury in Ethiopia. One of these is the study is done in Mekele town, Tigray region. This study showed the annual incidence of burn injuries to be 1.2% . Children less than five years old had the highest incidence 4.8%. Scald was the most common aetiology followed by flame. Crowded households had more burn injuries (74/953) than those with smaller family size. (5)

According to a retrospective study done in Attat Hospital for 7 years period (1983-1989) the cumulative incidence of burns in 16 communities (total population = 10,183) served by the hospital was found to be 5-11%. The study population possesses inadequate knowledge regarding burn prevention and burn first aid. Deleterious traditional compounds were used on 32% of burn patients in the villages.

Goals and Objectives of Burn Management Guide line

The need for burn management Guide line

The Federal Ministry of Health of Ethiopia has prioritized the provision of emergency medical care. As stated in the epidemiology part, now a day there is an increase incidence of injuries including burn injury. Thus:

- Understanding the high burden of burn patients in tertiary level of health care system.
- Considering efficient and effective utilization of limited resources including trained man power, specialty services and equipments.
- Recognizing the opportunity to utilize the primary health care system for preventive aspect through health extension workers.
- Understanding the importance and relevance of integrating burn injury management with other emergency medical services.
- Recognizing the ever increasing risk factor for vulnerability for burn injury due to increased pattern for construction activities.

The Federal Ministry of health of Ethiopia has developed this burn management guideline. This guideline is developed with close consideration and reference of relevant policies, strategies, guidelines and scientific evidences.

Objectives of the national burn management guideline

The national burn management guideline is developed to fulfill the following objectives

- Develop agreed and attainable operational standard for burn care
- Integrate the current national health tier system with standards of burn care with respect to human resource, physical resource, equipment and activities.

- Improve quality of burn management service that is offered at different levels.

- Be used as a general directive and management tool for burn care.

Users of this guideline

The users of this guideline are :

- Health Care providers at different levels.
- Health Managers
- Policy Makers
- Medical Researchers, Monitors and Evaluators
- Stakeholders and implementers of Emergency Medical Service in Government, Non government and Private Sectors.

Priority Issues and Challenges with regards to Burn Injury in Ethiopia

At Community level

- Lack of awareness in the community on preventive mechanisms for burn injury.
- Lack of awareness in the community that burn injury is treatable which in turn results delay to go to health facility.

- Over crowded living condition especially in rural part of Ethiopia.

At Health Service Delivery Level

- Poor attention and follow up of hospitals management for burn care.
- Poor preparation and planning of hospitals in managing burn conditions.
- Lack of designated responsible person for overseeing burn care.
- Incomplete data registration at health facilities that will hamper to know the true prevalence of burn injuries, available resources and services.
- Attitudinal problems within health professionals with regards to readiness and motivation to help burn injured patients and lack of accountability mechanism.
- Misconceptions among health professionals at different level that burn injuries despite its severity should be treated only at burn unit.
- Availability of few plastic surgeons and trained professionals.
- High turn over rate of trained professionals.
- Low quality of nursing care.
- Problem of pain management.
- Shortage of medical equipments in hospitals needed for plastic surgery.

- Absence of involvement of private sector due to the fact that burn treatment is highly demanding.

- Shortage of well-developed accessory services such as ICU, trauma units etc…

Levels of Burn Care Service

Health care facilities (PHCU, General hospital and Tertiary Hospital) are often used as the end point for defining services, as in the WHO Trauma Care Guidelines. However, the consensus group agreed that defining the level of service provided was more appropriate for burn care. Expecting all district general hospitals (DGH) to reach a certain standard of burn care is unrealistic, and a better approach is to designate standards for a certain level of service: level 1 (Basic), Level 2 (Intermediate) and Level 3 (Advanced). This then allows for a specific facility such as a DGH to deliver an appropriate level of care based on local circumstances and resources.

Setting standards according to the level of burn care service enables the planning of services throughout a region to focus on the actual needs of the community rather than the type and level of existing facility in the region. This approach will enable burn care initiatives to deliver a real breakthrough in the quality of services

Each Burn Care Resource Matrix below defines what each level of service should be capable of and the knowledge, skills and facilities and equipment that are required to ensure this capability. These levels are pyramidal in nature; i.e. all that is mentioned in level I is included in level II. Similarly, level III includes all the items under levels I and II. Higher level services support the education and training of lower levels in the same country and region; thus, advanced level services assist in the training of intermediate services and intermediate services support the training of basic services.

Level I Service – Basic

Capability:level I service providing facilities are capable of implementing prevention activities, provide first aid and assess burn patients, doing some emergency procedures, care of minor burns, facilitate Safe transport, Clear communication & documentation

A. Prevention

1. *Knowledge:*
   - Local epidemiology of burns and condtions which predispose burn injury/Risk factors for Burn injuries
   - Available community support (e.g. schools, NGOs, local media) , Mosques, churchs, Media, Red cross
   - Basics of primary and secondary prevention
2. *Skills*
   - Communication, ability to motivate local community
3. *Facilities / Equipment*
   - Basic communication facilities, posters, banners etc
   - Standardized paper / electronic registry form

B. **First Aid**

1. Knowledge:
    - Stop, drop and roll
    - Application of clean cool water to wounds
    - Awareness of dangerous / bad practices
2. Skills
    - Ability to demonstrate principles of first aid
3. Facilities / Equipment
    - Simple props for demonstrations such as bucket of water

C. Assessment of burn injured patient

1. Knowledge:
    - History taking
    - ABC of immediate burn care
    - Assessment of other injuries
    - Symptoms and signs of inhalation injury
    - Clinical assessment of depth and surface area of burn
2. Skills
    - Appropriate history and clinical examination.
    - Ability to prioritize airway (with c spine control), breathing and circulation
    - Ability to accurately assess size and depth of burn wound and presence of other injuries, including inhalation
3. Facilities / Equipment
    - Basic medical / nursing notes, stethoscope, blood pressure cuff, burn chart, rule of nine(9),neck collar, Minor set for district hospital, Burn Chart

D. Simple emergency procedures

1. Knowledge:
    - Basic airway management
2. Skills
    - Jaw thrust, chin lift, insertion of guedel airway, use of bag and mask.
    - Insertion of iv cannula
      Escharotomy for district hospital
3. Facilities / Equipment
    - Guedel airway, bag and mask, iv fluids (saline or ringers lactate)

E. Clear communication & documentation

1. Knowledge
    - Local legal requirements
    - Availability of local, regional burns services and contact phone numbers
2. Skills
    - SBAR (Situation, Background, Assessment, Response)
    - Clear, accurate and legible documentation
3. Facilities / Equipment
    - Telephone

F. Safe transport

1. Knowledge
2. Local transport options, local burns services, C-spine protection

Skills

- Patient preparation for safe transport

3. Facilities / Equipment
   - Cervical Collar
   - Access to transport (taxi, rickshaw, ambulance etc)

G. care of minor burns

Minor

<15% TBSA in Adult (partial thickness)

< 10% TBSA in children and old

< 2% full thickness burn

1. Knowledge
   - Analgesia, cleaning & dressing wounds
   - Correct positioning
   - Recognition of burn depth and the progression of changes in appearance
   - Signs & symptoms of infection
2. Skills
   - Basic antisepsis, hand washing
   - Cleaning wound and applying a dressing. Correct positioning. Assess wound for signs of infection
3. Facilities / Equipment
   - Oral and injectable analgesics
   - Antiseptic fluids and topical antimicrobials
   - Simple dressings, POP

D. Document and Refer ModerateBurn

E. Data Entry: National Registry form

Level II Service – Intermediate

A. Advanced emergency procedures

1. Knowledge

Advanced airway management, central venous catheterization, escharotomy and fasciotomy

- RSI (rapid sequance intubation) with ETT
- Surgical airways
  ABDE
- LMA
- Scar ectomy

2. Skills
   - Oral /Nasal Airway insertion, laryngeal mask, Cricothyrotomy, Tracheostomy andIntubation,
   - Insertion of Periferal andcentral line, veinus cut down

- Surgical decompression (skaletomy &facisiotomy)

3. Facilities / Equipment
   - Laryngoscope, suction, boogey, selection of ETT's, oxygen supply
   - Central line kits, basic surgical set, access to theatre
   - tracheotomy set
   - cut down set

B. Fluid management

1. Knowledge
   - Fluid resuscitation formula and maintenance fluids (Parkland)
2. Skills
   - Implementing and monitoring fluid balance. Insertion of urinary catheter
3. Facilities / Equipment
   - Urinary catheters, catheter bags, monitoring charts

C. Pain management

1. Knowledge
   - Classify theLevel of pain/Pain management ladder
   - Pharmacology of Analgesics
2. Skill
   Select and Administer appropriate Analgesics
3. Facilities /equipments
   Oral and IV Analgesics

Documentation

D. In-patient care of minor & moderate burns

Minor Burn

< 15% TBSA in Adult (partial thickness)
< 10% TBSA in children and old
< 2% full thickness burn

Moderate Burn

15-25% TBSA in adult
10-20% TBSA in children and old
2-10% TBSA full thickness

1. Knowledge
   - Indications for excision and grafting of burns and prioritizing areas
   - Management of infected burns and delayed presentations
   - Basics of nutrition and rehabilitation therapy
   - Psychological/social support
   - Specific requirements of children
   - Pain management

2. Skills

- Tangential excision and skin grafting of small /moderate surface area burns
- Debridement of infected burns
- Pre and post-operative management of burns.
- NG feeding and nutritional supplementation
- Simple contracture release and burn reconstruction
- Physio-, socio- and psychotherapies
- Distraction and play therapy
- cut down
- pain management

3. Facilities / Equipment

- Oral /Nasal Airway insertion, laryngeal mask, Cricothyrotomy, Tracheostomy andIntubation,
- Specific ward or area of ward for patients
- Watson knife, mesher
- Laboratory support and blood transfusion facility
- NG tubes, nutritional supplements
- Specific physiotherapy area and equipment
- Play area for children
- Topical Antibiotics
- Vaseline gauze
- Dressing room
- Documentation
- Topical Antibiotics, Vaseline gauze

E. **Training of level I staff**

1. Knowledge
   - Appropriate educational material (Basic Airway Management, First Aid
2. Skills
   - Simple teaching skills, and ability to motivate staff
3. Facilities / Equipment
   - Laptop computer, printed material, flip chart
   - Video
   - TV set with DVD player
   - First Aid Manikins
   - Basic life support Manikins(Adult and Pediatrics)
   - Poster
   - Flyers

F. Document and refer Sever Burn

G. Data Entry: National Burn Registry

Level 3 Service- Advanced

A. Comprehensive management of complicated and extensive burns

Severe

Partial burn > 25% TBSA in Adult
> 20% TBSA in children and older
>10% TBSA full thickness
Burn involving feet, hand, ear, eye, face, perineum
Burn caused by caustic agent, high voltage Electrical, complicated by inhalational
Require specialized care

1. Knowledge
   - Advanced Pain Management, Supportive Management
   - Advanced pathophysiology of burns
   - Inhalation injury management
   - Critical and Intensive care
   - Advanced wound coverage modalities
   - Sophisticated nutritional supplementation
   - Complex reconstruction
   - Long term and comprehensive rehabilitation (physiotherapy & occupational therapy)
   - Advanced pain management
   - Hydrotherapy
   - Supportive management (DVT prophylaxis, GI prophylaxis)
   - Long term and Comprehensive Rehabilitations(Physiotherapy and occupational therapy)

2. Skills
   - Critical/intensive care skills for adults and children
   - Advanced Plastic and Reconstructive Surgery skills (including microsurgery)
   - Burns specific rehabilitation skills
   -

3. Facilities / Equipment
   - Specialized physical plant and Hydrotherapy
   - Designated critical care area
   - Dedicated burns operating theatre
   - Access to other specialties (e.g. renal, cardiology etc)
   - Post discharge rehabilitation facilities (Occupational therapy)

B. Training of level II staff

1. Knowledge
   - Appropriate educational material

2. Skills
    - Advanced teaching skills
    - Ability to motivate staff
3. Facilities / Equipment
    - Digital camera, projector, lecture theatre/seminar room,
    - skill lab with different manikins
    - Laptop
    - Audio visuals

C. Research and audit

1. Knowledge
    - Principles of research methodology and use of evidence informed practice
    - Quality improvement framework
    - Importance of general and targeted audit

2. Skills
    - Ability to design, develop and implement research projects and audit
    - Ability to lead quality improvement initiatives
3. Facilities / Equipment
    - IT equipment (internet access, data management software)
    - Data collection support
    - Library

D. Data Entry : National Registry form

E. Policy & National Planning

1. Knowledge
    - Health service structure, governmental and non-governmental initiatives relevant to burns
    - Familiarity with regional burn care resources
2. Skills
    - Develop working relationship with health/planning ministries
    - Develop strategic level national framework plans
    - Collaboration with other burn centers in the region
3. Facilities / Equipment
    - Access to data
    - Administrative support

Roles and Responsibilities

Roles and responsibilities all stakeholders in the provision of quality burn care at each level of the health tierare clearly stipulated in this guideline.

1. *Duties and Responsibilities of Federal Ministry of Health*

- Ascertain the availability of standard burn management in all health institutions;
- Establish standard burn management unit at tertiary levels
- provide technical and resource assistance to strengthen burn management facilities of regional health bureaus and public health institutions
- to encourage private health institution in burn management at levels in accordance with the guideline
- Organize and provide capacity building programs ttailored to the needs of burn care service providers towards offering quality burn care;
- Insure appropriate human resource available to different levels of care providers
- Develop M &E framework and conduct regular M& E programs
- Resource mobilization through partners
- Document best practice and distribute
- Develop ,distribute and follow implementation of national manuals/ guideline and tools in burn mgt
- Intiate and promote preventive programs at all levels nation wide
- Support and engurage basic and relevant researches at all level

2. .*Duties and Responsibilities of Regional Health Bureaus*

- insure the implementation of guideline on burn mgt
- adopt in reach the national manuals, tools and standard
- fully engage the stockholders in the management of burn at different levels and activities based on the national guidelines
- Organize and conduct periodic burn care performance monitoring, evaluation and review meeting at regional level;
- mobilize necessary resources including materials equipment for burn care unit Build capacity of health professionals and create favorable working conditions to provide a quality burn care
- Provide up to date, sustainable and organized monitoring and evaluate over performance of health institutions;
- Collect and compile reports from all health institutions; submit them to Federal Ministry of Health; provide feed-back to the institutions in time;
- Engage the establishment of pre hospital management of burn patient and involve the relevant stakeholder in this Endeavour
- Conduct regular M &E and provide regular feedback
- Initiate and promote preventive programs at all levels in the region
- Support and encourage basic and relevant researches at all level
- .

3. *Duties and Responsibilities of Health Institutions*

- Ascertain the implementation of 24/7 burn care service in all health institutions in accordance with this guideline;
- Implement the provision of integrated, strengthened and sustainable and standard burn care service; monitoring and evaluating performance of service in compliance with the standards from time to time;
- Making available key personnel and create optimum working environment .
- Provide ethical service in handling of burn patients in the process of service delivery to meet the needs of users without discrimination and in courteous manner;
- Provide up to date skill improvement training to workers assigned in burn care unit
- Establish and maintain emergency burn care
- The health institution shall observe, respect and recognize the patients' right;
- Execute proper recording of data on agreed or adopted format , collect , compile, report and get feedback Properly utilize patient referral link system
- Implement ethical conduct of health professionals;
- Provide full support and care of burn pateient during referring and making sure for the continuation of the care .
- Promote basic and applicable research
- Play the central role in the pre - hospital burn care.
- Would involve in establishing partnership in burn management
- Initiate and promote preventive programs at all levels

4. *Duties and Responsibilities of Partner Organizations*

- Involve in advocacy and sustainable communication,
- Create and maintain save linving and working environment ,
- Participate in multi-sectorial activities in prevention of burn,
- Involve in planning , implementation, and evaluation of burn prevention and management at the community level,
- Give due attention to vulnerable members of the community of burn
- Conduct prompt and appropriate response during burn incident.

Monitoring and Evaluation

Quality improvement of burn management

The Burn management Center Hospital monitoring and evaluation is designed to assess the institutional organization's ability and performance as well as its role in regional trauma systems. The goals of a burn M&E are to monitor the process and outcome of patient care, to insure the quality of such care, to improve the knowledge and skills of burn care providers and to provider an institutional structure which promotes quality improvement. The multidisciplinary nature of burn care requires that representatives from all disciplines participate in the Program including nursing, physical therapy, occupational therapy, social work, respiratory therapy, nutritional support services and the medical staff.

A number of mechanisms are available to evaluate the process of burn care in order to review outcome. These include continuous audits, periodic focused audits, and specific case review and trend analysis. Deaths and major complications should mandate specific case review. Complication rates can be monitored by trend analysis over a given interval. The incidence of the complication for a given interval is determined and followed over subsequent intervals. Changes in trends or unexpected variations should initiate a focused audit of those patients developing the complication.

Audit filters are clinical indicators used to examine the delivery of care and to identify potential patient care problems. Audit filters used by burn centers should be constructed to examine the timeliness, appropriateness and effectiveness of care. The validity of the chosen filters lies in their ability to identify patients at an increased risk of adverse outcome. The continuous or periodic use of these filters in the Quality Improvement Program should be reviewed regularly to access their effectiveness in identifying problems and improving care. The verification review does not require a specific number of filters or define the topics to be reviewed. Examples of such filters for burn center programs include the following:

- Appropriateness of prehospital fluid and airway management
- Need for emergency airway management during resuscitative phase
- Volume of resuscitation fluid required for first 24 hour resuscitation
- Patients with resuscitation failure
- Time to first excision and grafting procedure
- Major complications subcategorized by organ system
- Infectious complications
- Graft take less than 80%
- Adequacy of nutritional supplementation
- Ventilator days
- ICU days
- Total hospital stay
- Readmission for unexpected problems
- Mortality
- Need for reconstructive procedures
- Return to work

Focused audits:

Focused audits may be performed when increased trends are noted in specific adverse outcomes. They may also be used periodically to examine the process of care. Potential examples of focused audits include physician response times, transfer of patients to other facilities prior to the completion of wound coverage, and clinical record documentation of vital signs, the presence of Doppler detected blood flow in circumferentially burned extremities and documentation of pain level determinations.

Patient Care Conferences
Patient care conferences should be held on a weekly basis to review and evaluate the status of each burn patient admitted to the Burn management Center Facility. Each clinical discipline should be represented and documentation of their contribution to the treatment plan should be recorded. Such documentation may be in the form of progress notes in the

permanent record of each patient or in the form of conference minutes. Those care providers in attendance should be identified by the presence of their signature or by a listing of attendees in the minutes. At the time of the verification visit, the minutes should be available for review or the documentation in the patient's progress notes should be easily identified.

Morbidity and Mortality Conferences
A Morbidity and Mortality Conference must be held at least monthly and appropriate documentation maintained. An important component of this conference, which reviews all deaths and significant morbid events, includes medical staff peer review. Clinicians other than those regularly caring for burn patients must be involved in this review and the committee should make a judgment about the appropriateness and quality of care in each case of adverse outcome. This has been cited as a deficiency on several verification/consultation visits. The judgment should include the designations, no preventable, potentially preventable, or preventable for each case and contributing factors enumerated. Examples of contributing factors include delay in diagnosis, error in diagnosis, error in technique, patient disease, system problem, inadequate protocol and error in judgment or interpretation of diagnostic tests.

The construction of these meetings may take several forms. Commonly, the institution has departmental, i.e. Department of Surgery, Morbidity and Mortality Conferences in which complications are presented from the divisions that make up the department. This format constitutes adequate peer review and the determinations of this committee should be recorded. Since burn care involves a multidisciplinary team, the findings of these conferences should be reported back to the Burn QI Team and the same cases should be reviewed in a multidisciplinary format. Another option for adequate peer review would be to include a non-burn team surgeon in the Multidisciplinary Morbidity and Mortality Conference and judgments regarding appropriateness of care recorded in the minutes of that meeting.
In all cases, the minutes and related proceedings should be forwarded to the governing body of the peer review process for the institution. The peer review process should include a tabulation of the number of problems identified on a quarterly and annual basis. During the verification visits the reviewers will examine the medical records of all patient deaths during the past year. Other selected charts will also be requested. When they review the deaths and other serious complications, documentation that an open, candid discussion of the cases took place in the peer-reviewed conference must be available.

Loop Closure
when specific problems in patient care or problems in system performance are identified through the quality improvement or morbidity and mortality reviews, corrective action in the form of "loop closure" must be taken. Documentation in the minutes of the various meetings should specifically include the method of loop closure for individual cases or for program alterations. Corrective action for problems identified may take place through one of the following mechanisms:

- Existing policies and procedures that govern or define the standard of care may be altered to correct the problem identified.
- Professional education: specific cases or system problems may be selected for discussion at the Quality Improvement Committee Meeting, the Morbidity and Mortality Conference or specific conferences selected for team member education. Such education may be addressed to the entire group of providers or to specific providers as appropriate.
- Professional counseling: review of a specific case or cases is made by the burn center director with the individual physician, nurse or other care provider. This process of evaluation and counseling should be documented carefully.
- System problems involving the pre burn center phase of treatment may be addressed in the form of letters or documented telephone calls to referring physicians, local EMS and aeromedical transport personnel.
- System problems which involve institutional practices not under Burn Center control, such as the performance of consulting or ancillary services should be addressed through memoranda to the specific director of those programs.

QII records should document that "loop closure" has dealt with the problem identified.

Annual Review
The minimum components for review on an annual basis to be performed by the burn center include burn severity, burn mortality and length of hospitalization. A review of the hospital charges for care is desirable but not essential at this time. The hospital Quality Improvement Committee should oversee the QI process of the Burn Center Multidisciplinary Team and the Morbidity and Mortality peer review on an annual basis. Such a review insures that the burn center quality improvement process legitimately fulfills its mission of quality improvement.

Burn Registry Participation
Participation in a burn registry is a required component for burn center verification. Use of a registry will facilitate system

audits and monitoring of complications. Additionally, as more participants submit data to a national data bank, a method of external comparison will become available much as the National Trauma Registry is used for outcome determination in the trauma patient population. Appropriate segregation of patient groups based on extent of burn, age and preexisting and concomitant co-morbid conditions will permit more precise filters for adverse outcome than could be obtained by data from single institutions. Such cooperation will also help fulfill the goal of the verification process regarding the development of

Standard for burn care from within the community of burn center professionals.

1. Health institutions newly started or upgraded integrated burn management service.

<table>
<tr><td>Definition</td><td colspan="7">Number of facilities newly started or upgraded integrated burn management service.</td></tr>
<tr><td>Formula</td><td colspan="7">*Number of facilities newly* started integrated burn management
service</td></tr>
<tr><td>Interpretation</td><td colspan="7">Number of facilities newly started integrated burn management considers new health facilities started functional burn management within the respective region or higher level at a gven period of time. Upgrading refers to some level of expanding existing health facility to upgrade the level of service. It indicates upgrading previously existing burn care level by adding required number of personnel, premises etc. Both new establishments and upgrading indicates the level of FMOH and RHB support in burn management</td></tr>
<tr><td>Disaggregation</td><td colspan="7">Facility type: primary health care units, general hospitals and tertiary hospital Newly established burn care /upgraded</td></tr>
<tr><td>Sources</td><td colspan="7">*Administrative report*</td></tr>
<tr><td rowspan="2">Frequency of Reporting</td><td>HP</td><td>HC</td><td>Hospital</td><td>WorHO</td><td>ZHD</td><td>RHB</td><td>FMOH</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Annually</td><td>Annually</td></tr>
</table>

Definition	**Proportion of health Institutions with drug, medical supply and functional equipment's**					
Formula	*Number of health facilities with drug, medical supply and functional equipment's* *Total number of health facilities* *A. Number of health facilities with tracer drugs* *Total number of health facilities* *B. Number of health facilities with emergency supply* *Total number of health facilities* *C. Number of health facilities with necessary equipment within facilities* *Total number of health facilities*					*x100*
Interpretation	Health Institutions need with drug, medical supply and functional equipment's facilities to optimally carry out burn service. Absence of any of drug, medical supply and functional equipment's limits the facility's scope for management and treatment. Functional equipment &facilities (see list annexed)					
Disaggregation	Facility type: health center, hospital					
Sources	*Facility audit, Administrative report*					
Frequency of Reporting	HC	Hospital	WorHO	ZHD	RHB	FMOH
	biannually	biannually	biannually	Annually	Annually	Annually
Definition	**Proportion of health facilities (Hospital, Health Center) trained staffed as per the standards**					
Formula	*Number of health institutions meeting staffing standard for burn management* *Total number of Facilities*					*X100*
Interpretation	Monitoring the recruitment of trained health workers into the national health labor market is critical in order to reduce inefficiencies in the hiring system, identify potential gaps between supply and demand for health workers, and monitor achievements in health workforce planning and deployment in health facility.					
Disaggregation	Health workers: plastic surgeon, surgeon, anesthetists, IESO, general practitioners ,health officer, nurse, physiotherapist Facility Type: Tertiary , General and primary health care unit (Primary Hospital, Health Center)					
Sources	*Administrative report*					
Frequency of Reporting	HC	Hospital	WorHO	ZHD	RHB	FMOH
	Annually	Annually	Annually	Annually	Annually	Annually

Definition	**Correspondence between data reported and data recorded in registers and patient / client records, as measured by data reported versus source).**					
Formula	The quality data can be estimated using data elements and comparing the results with a standard. Selected from the report submitted to the next level are compared with the tallies and registers sums that are the sources these data elements.					
Interpretation	Discrepancies between data compiled, reported and events recorded in patient / client records are a major source of error and poor quality data. A quick and reliable method for comparing compiled, recorded and reported data should be implemented. . Compiled, recorded and reported data should correspond with sourceresults error <5%. If a high proportion of the numbers are the same, then the quality of the data can be assumed to be high; if a low proportion is the same, then the quality of the data is low.					
Disaggregation	None					
Sources	*Tally sheet, Registersmonthly report (standard data registry will be prepared)*					
Frequency of Reporting	HC/Clinic	Hospital	WorHO		ZHD	RHB	FMOH
LQAS	monthly	Monthly	Monthly	Monthly			
Definition	**Proportion of supportive supervision visits received and/or review meeting, with written feedback provided at the time of supervision**					
Formula	Number of supervisory visits**and/or review meeting** with written feedback received Number of supervisory visits **and/or review meeting**expected per specified time period				*X100*	
Interpretation	A targeted burn management supportive supervision performed by a team that looks into all aspects of health institutions operations, both clinical and administrative-includes data recording reporting and data quality status. Supervision **and/or review meeting** is one of the tools for performance review and improvement, The number of received supervisory visits is to be reported by the receiving, not the providing, institution.					
Disaggregation	Facility type: health center, hospital, RHB, FMOH					
Sources	*Administrative records: supervisory visit log book/meeting minute book /*					
Frequency of Reporting	HC	Hospital	WorHO	ZHD	RHB	FMOH

	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly