FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

MINISTRY OF HEALTH EMRGENCY AND CRITICAL CARE DIRECTORATE

NATIONAL BURN MANAGEMENT IMPLEMENTATION GUIDELINE

April 2018

Acronyms

ETT: - Endotracial tube

ABCD: - Air way, Breathing, Circulation and Disability

IV: -Intera vainus

ICU: - Intensive care unite

QI: - Quality improvement

HP:-Health Post

HC: - Health center

TBSA: - Total Body Surface Area

WHO: - World Health Organization

LMICs: - Low Meddle Income Country’s

PHCU: - Primary Health Care Unite

Operational definition

Burn unit- A specific area within the hospital that has committed the resources necessary to meet the criteria for a burn unit. This are contains 19-20 beds and other equipment related to care of patients with burn injury.

Wound care-Any technique that enhances the healing of skin defect by preventing wound complications and promotion of healing.

Hydrotherapy-Immersion in a tub and shower in running water to promote wound healing.

Physical plant-part of the hospital which is specially designed and arranged to give holistic care for burn injury patients

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1.Introduction

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).

Burns has been described by the World Health Organization (WHO) as the 'forgotten global public health crises. 11 million people a year suffer burns requiring medical attention. 95% are suffered by people living in LMICs, 70% of them children. In fact, burns are one of the top five global causes of injury affecting child mortality. The global epicenter of burns is South-East Asia: of the 320,000 global deaths from fire-related burns, over half (184,000) occur in this region. Two thirds of these burns affect females, primarily children and young women. The mortality rate from burns in HICs is lower than 1.0 per 100,000, but averages 16.9 deaths per 100,000 in South-East Asia, one of the highest discrepancies for any cause of injury.

Burns are also a leading cause of disability and disfigurement: fire-related burns alone are estimated to cause 10 million disability adjusted life years (DALYS) per annum. In Nepal, burns are the second most common form of child injury and cause 5% of all disability in the country. In India, over 1,000,000 people suffer moderate to severe burns each year. In Bangladesh, more than 173,000 children are burnt every year. Many of these injuries and the disability they cause are entirely preventable. Estimates have indicated that 'the provision of adequate burn care could reduce the time spent in hospital by 35% and the overall mortality rate by 30%'.

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 which 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 populations. 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.

Burn injury is a major component of unintentional injuries worldwide. It is the leading cause of deaths from injury in some countries. In Egypt, 9% of deaths among married women were due to burns. In India, more than 10,000 burn-associated deaths and over one million moderate to severe burns occur each year. In a hospital in Zimbabwe, burns comprised 8% of trauma admissions .A combined hospital and community based survey of burn injuries in rural southern Ethiopia estimated the lifetime incidence of burns among women of reproductive age to be 11%. Two retrospective analyses of pediatric inpatients showed that burns accounted for 0.8% and 1.7% of all pediatric admissions. Burns were the third commonest unintentional injuries among children, next to firearms and falls and the second leading causes of death.

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.

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.

According to a retrospective study done in Attat Hospital over 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.

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 .In our country the first burn unit was established in 2000G.C at Yekatit 12 hospital. Meanwhile due to rapid population growth and an incremental need for health

service care there is a high burn patient flow where only one center could not handle them anymore. Therefore, the 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 management.

In 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 burn injuries. 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 a national burn management guideline.

Strategies considered in this burn management guideline 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.

Ethiopia is the tenth largest country in Africa, covering1,104,300 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 87,952million of which more than 84 percent live in rural areas. (CSA 2014). The proportion of male and female is almostequal, 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 andmore 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 of the population and the tertiary level, specialized hospital, serves for 5,000,000 people. Despite major progresses

being made to improve the health status of the population in the last one and half decades, Ethiopia's population still faces a high rate of morbidity and mortality especially related to injury including burn.

2.The need for a Burn Management Guideline

The Federal Ministry of Health of Ethiopia has prioritized the provision of emergency medical care. As stated in the introduction part, nowadays there is an increase incidence of injuries including burn injury. Thus, this guideline is required to help.

- Understand the high burden of burn patients in tertiary level of health care system.
- Consider efficient and effective utilization of limited resources including trained man power, specialty services and equipments.
- Recognize the opportunity to utilize the primary health care system for preventive aspect through health extension workers.
- Understand the importance and relevance of integrating burn injury management with other emergency medical services.
- Recognize 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 to relevant policies, strategies, guidelines and scientific evidences.

3. Goals and Objectives of Burn Management Guideline

Implement standardized burn care at each level of the health care system with trained human resources, physical resource and equipment in coordinated and organized way.

Objectives of the National Burn Management Guideline

The National Burn Management Guideline is developed to fulfill the following objectives:

- To develop an agreed and attainable operational standard for burn care
- To integrate the current national health tier system with standards of burn care with respect to human resource, physical resource, equipment and activities.
- Toimprove the quality of burn management service that is offered at different levels.
- To be used as a general directive and management tool for burn care.

3. Scope of this guideline

This guideline will be applicable at all levels of the health care delivery system

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.

4. Current Challenges with regard to Burn care in Ethiopia

4.1.At Community Level

- Lack of awareness in the community on preventive mechanisms for burn injury.
- Lack of awareness in the community that burn injury ismedically treatable which in turn results in complications due to delay to go to a health facility in time.
- Overcrowded living condition and life style especially in rural part of Ethiopia.

4.2. At Health Facility 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 an accountability mechanism.
- Misconceptions among health professionals at different levels that burn injuries despite its severity should be treated only at burn unit.
- Availability of a few plastic surgeons and trained professionals.
- High turnover rate of trained professionals.
- Low quality of nursing care.
- Problem of pain management.

- Shortage of medical equipment 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…

4.3. Federal and Regional Level

- Lack of police and guiding documents
- Resource mobilization and allocation to the burn care is not adequate
- Lack of awareness and commitment
- Supply list of burn care is not inclusive in national program
- Lack of designate responsible person for overseeing burn program
- Lack of partners supporting the program

5. Levels of Burn Care Service

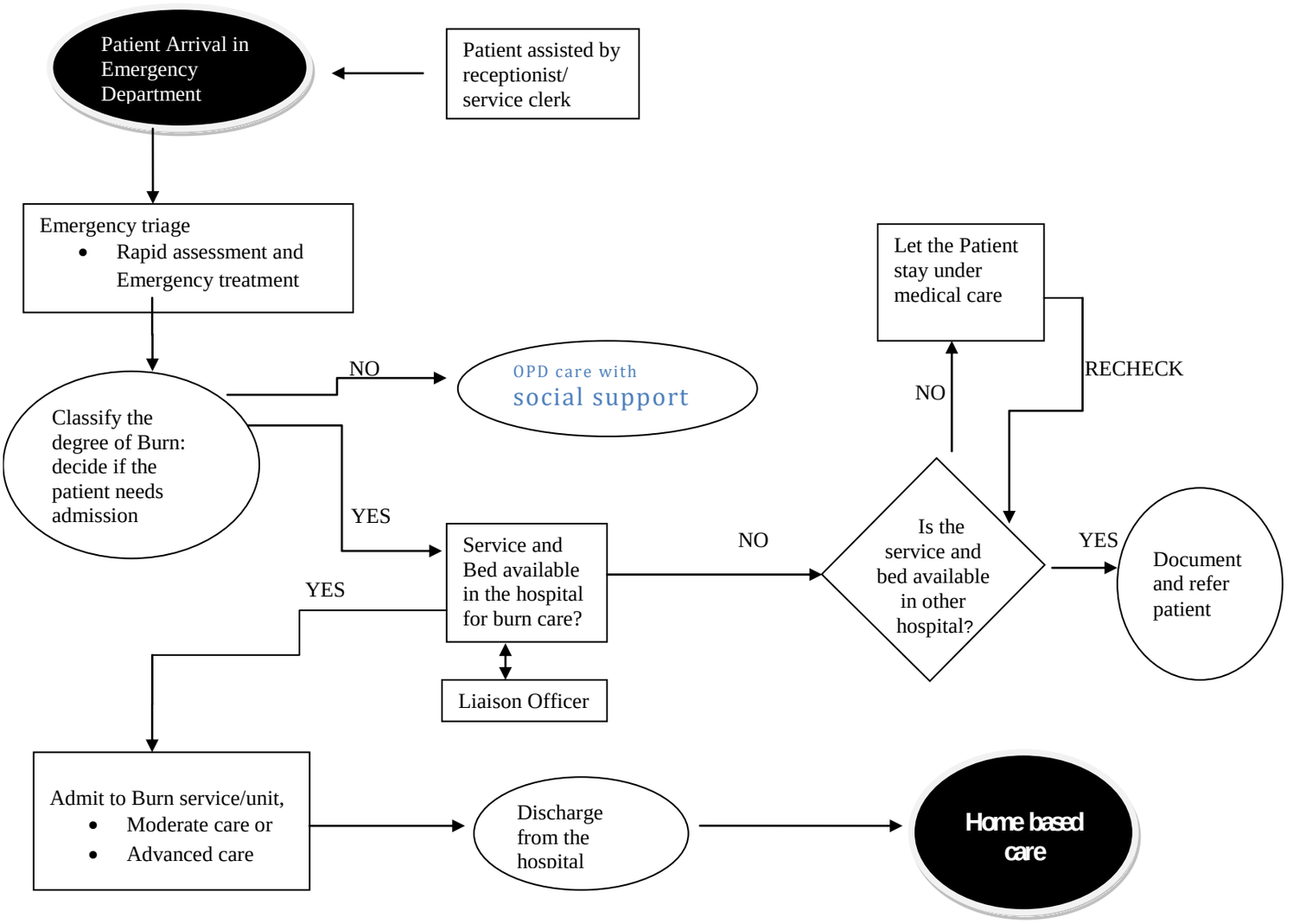
Health care facilities (PHCU, General hospital and Tertiary Hospital) are often used as the end point for defining services, as in the WHO Trauma Care Guidelines. However, the consensus group agreed that defining the level of service provided was more appropriate for burn care. Expecting all general hospitals 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 General Hospital 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 includethe entireservice package under levels I and II. Higher level services support the education, training and research of lower levels; thus, advanced level services assist in the training of intermediate services and intermediate services support the training of basic services. Within the same level of burn care, in-service professional skills knowledge and experience sharing is also mandatory for improving quality of care.

Patient flow in Burn management



5.1 Level I Service – Basic

A. Prevention

1. *Knowledge:*
    - Local epidemiology of burns and conditions which predispose burn injury/Risk factors for Burn injuries
    - Available community support (e.g. schools, NGOs, local media) , Mosques, churches, 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 materials for demonstrations such as bucket of water

C. Assessment of burn injured patient

1. Knowledge:
    - Triage
    - ABC of immediate burn care
    - Pain assessment
    - History taking
    - 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

- Burn registry format, stethoscope, blood pressure cuff, burn chart, rule of nine (9), neck collar, and Minor set. emergency

D. Basic emergency procedures

1. Knowledge:

- Basic ABCD management

2. Skills

- Jaw thrust, chin lift, insertion of guedel airway, use of bag and mask.
- Administration of oxygen
- Insertion of iv cannula

3. Facilities / Equipment

- Guedel airway, bag and mask, iv fluids (saline or ringers lactate) ,O2 cylinder, suction machine

E. Clear communication & documentation

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

F. Safe transport

1. Knowledge
    - Safe transport
    - Local transport options, local burns services, C-spine protection
2. Skills
    - Patient preparation for safe transport
3. Facilities / Equipment
    - Cervical Collar
    - Access to transport (taxi, ambulance etc)

G. care of minor burns

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

Note:If Moderate/severBurn-provide emergency care, Document and Refer

H. Data Entry: National Registry form

1. Knowledge

- Data encoding and recording

2.Skills

- How to fillNational Registry form

3. Facilities / Equipment

- Registry form
- Computer

5.2 Level II Service – Intermediate

A. Advanced emergency procedures

1. Knowledge

   Advanced life support (airway management,Central venous catheterization….),

   Escharotomy and fasciotomy

2. Skills
   - Oral /Nasal Airway insertion, laryngeal mask, Cricothyrotomy, Tracheostomy andIntubation,
   - Insertion of Peripheraland central line, venous cut down
   - Surgical decompression (Escharotomy and fasciotomy)

3. Facilities / Equipment
   - Oral /nasal Airway ,laryngeal mask ,Laryngoscope, suction, bougie, selection of different size of ETT's, oxygen supply
   - Central line kits, basic surgical set, access to theatre
   - Tracheostomy set
   - cut- down set

B. Fluid management

1. Knowledge
   - Fluid resuscitation formula and maintenance fluids (using Parkland formula)
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
   - Pain grading scale chart
   - Oral and IV Analgesics

D. **In-patient care**

- **Infected minor burn**
- **All moderate burns**

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

1. Skills

- Excision and skin grafting of small /moderate surface area burns
- Debridement of infected burns and wound care
- Pre and post-operative management of burns.
- NG feeding and nutritional supplementation
- Simple contracture release and burn reconstruction
- Physiotherapies and psychosocial therapies
- Distraction and play therapy
- pain management

2. Facilities / Equipment

- Specific ward or area of ward for patients
- Skin graft knife and blades , masher
- Laboratory support and blood transfusion facility
- NG tubes, nutritional supplements
- Specific physiotherapy area and equipment
- Play area for children
- Topical Antibiotics
- Vaseline gauze
- Elastic bandage
- Dressing room/wound care room/
- Pressure garment

E. **Training of level I staff**

1. Knowledge
    - Appropriate educational material (Basic life support , burn prevention and 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

Note If sever Burn-provide emergency care, Document and Refer

F. **Data Entry: National Registry form**

1. Knowledge
- Data encoding and recording

2. Skills
- How to fillNational Registry form

3. Facilities / Equipment
- Registry form
- Computer

5.3 Level III Service- Advanced

A. Comprehensive management of complicated and extensive burns

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

2. Skills

    - Advanced life support
    - Pain assessment and management skill
    - Critical/intensive care skills for adults and children
    - Advanced Plastic and Reconstructive Surgery skills (including microsurgery)
    - Wound management skills
    - Burns specific rehabilitation skills
    - Nutritional support skills

3. Facilities / Equipment

- Specialized physical plant and Hydrotherapy
- Post discharge rehabilitation facilities(Occupational therapy)
- Dedicated Wound care room for burns
- Skin substitutes
- Pain assessment chart and supplies
- Designated critical care area
- fully equipped burns operating theatre with necessary supply and equipment
- Access to other specialties (e.g. renal, cardiology etc)

B. Training of level II staff

1. Knowledge
    - Appropriate educational material
2. Skills
    - Advanced teaching skills
    - Good communication skills
    - Ability to motivate staff
3. Facilities / Equipment
    - Digital camera, projector, lecture hall/seminar room,
    - Educational material
    - Skill lab with different mannequins
    - Clinical attachment area
    - Laptop
    - Audio visuals

C. Research and clinical audit

1. Knowledge
    - Research ethics
    - Principles of research methodology and use of evidence based practice
    - Quality improvement framework
    - Importance of general and targeted clinical audit

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

D. Data Entry : National burn Registry form

1. Knowledge
- Data encoding and recording

2. Skills
- How to fillNational Registry form

3. Facilities / Equipment
- National registry form
- Computer

E. National Policy & 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/units
    - Integration with regional authorities

3. Facilities / Equipment
    - Access to data and report
    - Administrative support

6. Roles and Responsibilities

Roles and responsibilities all stakeholders in the provision of quality burn care at each level of the health tier are 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 tailored 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
    - Initiate and promote preventive programs at all levels nation wide
    - Support and encourage basic and relevant researches at all level
    - Incorporate burn care supply and equipment list in to PFSA list and facilitate those things.
    - Ensure proper and timely Burn care supply and equipment provision.
    - Allocate designated responsible body for overseeing the program.

2. Duties and Responsibilities of Regional Health Bureaus

- Ensure 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
- Advocate burn care on the agenda of periodic review meeting
- 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
- 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 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 and implement ethical conduct of health professionals;
- 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 national registry format , collect , compile, report and get feedback
- Properly utilize existing patient referral system.
- Provide full support and care of burn patient 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 management.
- Would involve in establishing partnership in burn management.
- Initiate and promote preventive programs at all levels
- Involve capacity building of burn care.
- Involve service providers in planning and decision making activates of burn care.

4. Duties and Responsibilities of Partner Organizations

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

7. Monitoring and Evaluation of burn management

Definition: Burn unit performance monitoring and evaluation is a process by which burn units are routinely surveyed so that they can be supported and held accountable for providing effective, efficient and quality health services for all burn patients. Specific aims of burn unit performance monitoring and evaluation include:

- To ensure the provision of effective, efficient and quality health care by all Ethiopian public hospitals that provide bun care
- To identify and dessiminate best practice
- To provide stakeholders, including public and Government Offices, with information about tha availability and the quality of burn care
- To identify areas for further improvements where targeted support by the Regional Health Bureaus, Federal Ministry of Health of Ethiopia or other partners is necessary.

The Key elements of burn unit performance monitoring and improvement are a set of core indicators that are beleived to meet the needsof the Governing Boards, Federal Ministry of Health and Regional Health Bureaus.

They will allow the performance of the burn units to be tracked over time and help to identify problems at an early stage.

Burn unit performance indicators should be reported to the Regional Health Bureaus and the FMOH each month, quarterly and annually.

The key indicators are seen as three separate parts:

1. **Outpatient Services**:
    a. Out patient attendances,
    b. Outpatient waiting time to treatment, and
    c. outpatients not seen on the same day
2. **Inpatient services:**
    a. Inpatient admissions
    b. Inpatient mortality
    c. Bed occupancy
    d. Average length of stay

The following table describes the detailed description of the key indicators:

Indicator	**Formula**	**Frequency of reporting**
Outpatient attendancees	Total number of new and repeat outpatient attendances who attend the the burn unit Unit of measurement: absolute number Data sources: Outpatient registers, HMIS	Monthly
Outpatient waiting time to treatment	Numerator: Sum total of outpatient waiting time (in minutes) Denominator: Number of outpatient waiting time cards completed Data sources: quarterly survey	Quarterly
Outpatients not seen on the same day	Numerator: Number of outpatient burn cases not seen on same day as registration in burn unit OPD during the reporing period Denominator: Number of new and repeat outpatient burn unit attendances Source of data: Registration book	Quarterly
Inpatient admissions	The number of patients admitted to burn unit during the reporting period Data source: Inpatient registration	Monthly
Inpatient mortality	Numerator: Number of deaths among admitted patients Denominator: sum of number of deaths among admitted patients and number of patients discharged alive including transferouts Data source: Discharge registration book	Monthly
Bed Occupancy	Numerator: The sum total length of stay in days during reporting period Denominator: the product of average number of operational beds during reporting period and number of days in reporting period Result expressed in percentage Data source: Admission/Discharge registration book	Monthly
Average length of stay	Numerator: Sum of total length of stay for patients who were discharged (including deaths and transfer outs) during reporting period Denominator: Sum of Number of patients discharged alive (including transferouts) and number of deaths among admitted inpatients Data source: Inpatient registration/admission and discharge register	Monthly
Human resource devt	Number of people who attend health education	Monthly
Number of health professionals who receive training		Monthly

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 pre hospital 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

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

PatientCareConferences:

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 notesshouldbeeasilyidentified.

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 judgmentor 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 aero medical 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.

Supportive supervision:

To assess the performance of burn care at different level of service targeted and integrated supportive supervision.

Hospital management should conduct regular supervision on burn care of their own hospital.

Police makers have also responsibilities to evaluate and monitor the implementation of national sated burn service system. Assessment tool should be developed.

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 andpre-existing and concomitant co-morbid conditionswill 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.

o	Discrptions					
1	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	Woreda Health Office	Zonal/sub city Health office	RHB
		biannually	biannually	biannually	Annually	Annually

2	**Definition**	**Proportion of health facilities (Hospital, Health Center)with staff as per the standards**				
	Formula	*Number of health institutions meeting staffing standards for burn management*			*X100*	
		Total number of Facilities				
	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 and / or surgeon, anesthetists, Integrated emergency surgery and obstetrics, general practitioners ,health officer, nurse, physiotherapist, dietician , psychiatry nurse Social worker Facility Type: Tertiary , General and primary health care unit (Primary Hospital, Health Center)				
	Sources	*Administrative report*				
	Frequency of Reporting	HC	Hospital	Woreda Health Office	Zonal/subcity Health office	RHB
		Annually	Annuall y	Annually	Annually	Annually
3	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 source results 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, burn Registry form ,monthly report (standard data registry annexed no)*						
	Frequency of Reporting	HC/Clinic	Hospital	Woreda Health Office		Zonal/sub city Health office	RHB	FMOH
	LQAS	monthly	Monthly	Monthly	Monthly			

<table>
<tr><td>4</td><td>Definition</td><td colspan="6">Proportion of supportive supervision visits received and/ or review meeting, with written feedback provided at the time of supervision</td></tr>
<tr><td></td><td rowspan="2">Formula</td><td colspan="5">Number of supervisory visits and/or review meeting with written feedback received</td><td rowspan="2">X100</td></tr>
<tr><td></td><td colspan="5">Number of supervisory visits and/or review meeting expected per specified time period</td></tr>
<tr><td></td><td>Interpretation</td><td colspan="6">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.</td></tr>
<tr><td></td><td>Disaggregation</td><td colspan="6">Facility type: health center, hospital, RHB, FMOH</td></tr>
<tr><td></td><td>Sources</td><td colspan="6">Administrative records: supervisory visit log book/meeting minute book /</td></tr>
<tr><td></td><td rowspan="2">Frequency of Reportingand feedback</td><td>HC</td><td>Hospital</td><td>Woreda Health Office</td><td>Zonal/sub city Health office</td><td>RHB</td><td>FMOH</td></tr>
<tr><td></td><td>Quarterly</td><td>Quarterly</td><td>Quarterly</td><td>Quarterly</td><td>Quarterly</td><td>Quarterly</td></tr>
</table>

Annex

Burn classification

1st degree Burn (superficial burns)	***2nd degree Burn (partial-thickness burns)***	***3rd degree burn(full-thickness)***	***4th degree burn***
Take proper history Use check list, confirm **the degree of burn** • Burns to the epidermises that result in a simple inflammatory response. • 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. Register the patient on registry	• 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 types 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 Register the Patient registry	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. Register the Patient registry	The damage extends beyond the dermal layer to deeper structures under the skin. Register the patient on registry

NATIONAL REGISTRY DATA FORM

FOR BURN UNIT

NAME :_____

ADDRESS: REGION _____ WOREDA _____KEBELE _____HOUSE NO _____
_____

HOSPITAL NO: _____

AGE _____ SEX _____

ETHNIC ORIGION _____

ADMITION DATE: D_____M_____ Y _____TIME/24-HOUR CLOCK_____

---------Treatment as an outpatient

---------Acute new admission to hospital /burn unit

--------Readmission for reconstruction/rehabilitation

-------New admission for reconstruction /rehabilitation

REFERAL SOURCE

_____

Day of injury: Day _____Month_____ Year _____ H.No_____

ADDRESS OF INJURY EVENT: REGION _____ WOREDA_____KEBELE _____
_____

HOW DID BURN INJURY HAPPEN _____
_____

_____

ETIOLOGY OF INJURY:_____FIRE/FLAME _____SCALD _____ CONTACT

_____CHEMICAL_____SKINDISEASE_____ELECTRICITY

_____OTHERBURN_____OTHER NON BURN_____UNKNOWN

PLACE: _____INDOOR OUTDOOR _____UNKNOWN

LOCATION OF INJURY: _____HOME _____OTHER PRIVATE DWELLING ____
_____WORK

CIRCUMSTANCE _____ACCIDENT WORKRELATED

_____NONWORKRELATED _____SUSPECTED ASSAULT

_____SUSPECTED SELF INFLICTE _____SUSPECTED ARSON

_____UNKNOWN _____OTHER

PRE-INJURY CONDITIONS:_____NONE _____PULMONARY _____SUBSTANCE:ABUSE

_____NEAUROLOGY _____ABDOMEN/GI ____SMOKING

_____VISION _____GENITOURINARY ___ PSYCHIATRIC

_____HEARING _____MUSCULOSKELETAL OTHER

PRE-EXISTING DISABILITY _____YES _____NO

AREAS BURNED: COMPLETE AT TIME OF DISCHARGE/USE BROWDER CHART

PARTIAL THICKNESS _____ %

FULL THICKNESS _____ %

TOTAL BURNED SURFACE AREA _____ %

INHALATION INJURY:

TOTAL SURGICAL PROCEDURES _____ TOTAL BURN WOND PROCEDURES __ _____

NUMBER OF DAYS WITH VENTILATORY SUPPORT: _____(i.e ICU)

____None _____PULMONARY/THORACIC _____ INFECTION

____ NEUROLOGICAL _____ABDOMEN/GI _____PSYCHIATRIC

____EARS _____MUSCULOSKELETAL _____MULTITRAUMA

____CARDIOVASCULAR _METABOLIC/ENDOCRINE _____AMPUTATION

OTHER _____

DATE OF DISCHARGE: D_____M_____Y _____

DISPOSITION: DIED LEFT AGAINST ADVICE DISCHARGED HOME

EXTENDED CARE FACILITY OTHER BURN CENTET

OTHER _____

CAUSE OF DEATH: TREATMENT WITH HELD _____METABOLIC ___BURN SHOCK

PRE-EXISTING ILLNESS _____ MONSTY FAILURE /INFECTION_ _____

BURN WOUND INFECTION _____

HOSPITAL CHARGES: _____

REMARKS: _____
_____
_____
_____
_____