

Injury/Trauma Management Training Manual (Post-Earthquake - Recovery)

Government of Nepal
Ministry of Health and Population
Department of Health Services
Leprosy Control Division
Disability Prevention and Rehabilitation Focal Unit (DRFU)
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BACKGROUND

Following the earthquakes that hit Nepal on April and May 2015, 8,702 people lost their lives, 8.1 million people are reported to be in need of humanitarian assistance and over 22,220 people were injured. Data gathered from main health facilities receiving earthquake injured in Kathmandu shows that out of 1,005 patients who received rehabilitation care in the first 4 weeks after the earthquake, 71% suffered from fractures, 8% from spinal cord injury and 4% from amputation. It is estimated that 1,500 - 2,000 will need ongoing nursing and rehabilitation support and will continue to have long-term rehabilitation needs.

While life-saving and surgery interventions were available and appropriate immediately after the earthquake, health facilities in Kathmandu showed limited capacity to provide post-surgery care for in-patients. This is due not only to the exceptional number of patients who received surgery, but also to limited specialized skills on nursing for trauma and insufficient rehabilitation staff and assistive devices (crutches, wheelchairs, slings) at all levels of the health system (national, district and community levels). Additional human resources with specialized skills on trauma management, assistive devices and other support services have been provided since the very first days by international organizations and local services to respond to the post-surgery and follow up needs in Kathmandu Valley and later on in the districts. Safe discharge procedures and referral mechanisms to medium and long-term rehabilitation services or community services are essential to avoid the development of secondary complications, especially when other risk factors like lack of shelter, poor sanitation and situations of high vulnerability linked to impairment are present. This is even more challenging for those who have been referred from the most severely affected districts outside Kathmandu who will require additional assistance, including transitional shelter support, besides medical follow up and rehabilitation for full recovery. In addition, it is estimated that many people with injuries have not been reached for medical care and rehabilitation in the most remote affected areas. This increases the risks of developing severe complications that can lead to the worsening of disability or to death.

Injury management comprehensive of pre-surgery, surgery, post-surgery and rehabilitation is not part of the training curricula of medical and paramedical staff in Nepal. The focus is indeed on surgery, while other aspects related to wound care together with early rehabilitation and long-term rehabilitation after discharge are neglected. Similarly, community-based workers (FCHV, CBR workers) do not have identification, referral and follow up skills on trauma management to allow identification of needs and referral to medical and rehabilitation care.

To address these immediate and medium term needs of the injured, the Injury Rehabilitation Sub Cluster within the Health Cluster, together with the Disability and Rehabilitation Focal Unit (Leprosy Control Division, Ministry of Health and Population) have developed a training plan as part of a broader Recovery Plan of the Health Sector. The target of this training is represented by health professionals based in the 14 most affected districts and community workers in the same areas, to improve access to quality trauma care, including rehabilitation, for the earthquake survivors.

OBJECTIVE

General Objective of the trainings for health personnel and community workers

- To prevent secondary complications in injured people and maximize functional outcomes after injury

Specific objectives for health personnel at the tertiary and secondary level

After the training, health personnel will be able to:

- Integrate basic prevention measures for secondary complications after injury for inpatients at risk, in particular patients with fractures, spinal cord injury, head injury, amputation and burn.
- Utilize safe transfers methods when mobilizing patients
- Provide information and education to patients and caregivers on the impairment, hygiene measures, risk of complications and its prevention
- Participate to the discharge plan including information on follow up and referral to rehabilitation services.

Resources and material

You can find the list of resources available for this training curriculum at the end of this document.

After the description of contents and objectives of each session, some extracts from the documents were added.

A package of Power Points Presentations is also available.

OVERVIEW OF TRAINING MODULES

S.N.	Topic	Time	Methodology	Remarks
DAY I				
	Pre Test	20 min		
1	Injury / Poly Trauma <ul style="list-style-type: none"> - Definition - Assessment <ul style="list-style-type: none"> • Primary survey • Secondary survey - Identification / Risk signs of trauma - Management <ul style="list-style-type: none"> • Shock / Hypo-volaemia • Hemorrhage • Compartment syndrome - Rehabilitation and Referral 	2 hours	Power point Pictures Practical demonstration	
2	Basic Life Support <ul style="list-style-type: none"> - Principles - Techniques 	2 hours	Power point Practical demonstration	
3	Psychosocial First Aid	1 hour	Power point Simulation	
4	Wound care & Infection prevention <ul style="list-style-type: none"> - Types - Care - Prevention - Rehabilitation and Referral 	1.5 hour	Power point Practical demonstration Video	
DAY II				
	Review of DAY I			
5	Fracture / Dislocation <ul style="list-style-type: none"> - Definition - Types - Management <ul style="list-style-type: none"> • Safe transportation • Bandaging / Splinting / Plastering - Complication - Compartment syndrome - Rehabilitation and Referral 	1.5 hour	Power point Practical demonstration	
6	Amputation <ul style="list-style-type: none"> - Introduction - Management <ul style="list-style-type: none"> • Stump care • Early ambulation • Prosthesis - Rehabilitation and Referral 	1.5 hours	Power point Practical demonstration Videos	

7	Head Injury / TBI <ul style="list-style-type: none"> - Introduction - Identification - Management <ul style="list-style-type: none"> • Safe transportation - Prevention of complication - Rehabilitation and Referral 	2 hours	Power point Practical demonstration Videos	
8	Burn <ul style="list-style-type: none"> - Introduction - First Aid/response to burn - Management <ul style="list-style-type: none"> • Acute • Definitive - Complication - Rehabilitation and Referral 	2 hours	Power point Practical demonstration GD	
DAY III				
	Review of DAY II			
9	Spinal Injury <ul style="list-style-type: none"> - Introduction - Identification - Transfer - Prevention of secondary injury - Management <ul style="list-style-type: none"> • B/B management - Complication (DVT, Hypostatic Pneumonia, Pressure ulcer) - Rehabilitation and Referral 	3 hours	Power point Practical demonstration GD Videos	
10	CBR & Disability <ul style="list-style-type: none"> • Introduction • Assistive devices • Physiotherapy • Occupational therapy 	2 hours	Power point Practical demonstration	
11	Follow up & Referral <ul style="list-style-type: none"> - Identification of problems - Communication - Referral mechanism & pathway - Follow up - Documentation 	1 hour	Power point Practical demonstration Referral form	
	Post Test and Evaluation	30 min		
	Summary and Closing			

POLY TRAUMA

SESSION 1	POLY TRAUMA
<p>Injury / Poly Trauma</p> <ul style="list-style-type: none"> - Definition - Assessment <ul style="list-style-type: none"> • Primary survey • Secondary survey - Identification / Risk signs of trauma - Management <ul style="list-style-type: none"> • Shock / Hypo-volaemia • Hemorrhage • Compartment syndrome - Implications for rehabilitation and referral mechanisms 	<p>Terminal Objective At the end of the session, the participant will be able to describe the overall management of poly trauma</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1. Define what constitutes Poly trauma in trauma situations 2. List the main complications of poly trauma and preventive measures 3. Identify needs of rehabilitation and referral for specific care <p>Methodology Power point, Practical demonstration, group discussion, Pictures</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 2 hours</p> <p>Evaluation method Pre-test, Participant’s participation and reaction, post-test</p>

DEFINITION

- Defined as a clinical state followed by injury to the body leading to profound physio-metabolic changes involving multiple system
- Two major system injury + one major limb injury
- One major system + Two major limb injuries
- Unstable fracture pelvis with associated visceral injury
- One major system injury + open grade III injury

TRAUMA MORTALITY

- Early phase-immediate death
 - Severe brain injury, disruption of great vessels, cardiac disruption
- Second phase-minutes to hours
 - Subdural, epidural hematomas, hemo-pneumothorax, severe abdominal injuries, multiple extremity injuries (bleeding)
- Third phase-delayed
 - Multisystem organ failure
 - Sepsis

TRIAGE

1. Can the patient walk?

Yes – **GREEN AREA**

No - check for breathing

2. Is the patient breathing?

No - open the airway

Are they breathing now?

Yes – **IMMEDIATE (RED AREA)**

Yes - count the rate

<10 & > 30 / min – IMMEDIATE

10 – 30 /min – check circulation

No - **DEAD (BLACK AREA)**

3. Check the circulation

Capillary refill > 2 sec- IMMEDIATE

Capillary refill < 2 sec – urgent

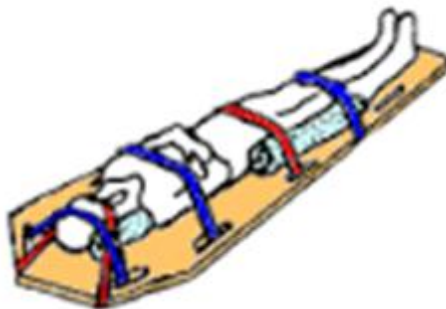
CATEGORY	DESCRIPTION
IMMEDIATE	Victim has life threatening injuries (airway, bleeding or shock) tht demands immediate attention to save the person's life
DELAYED	Injuries don't threaten victim's life, but needs care. It can be delayed while triaging other victims.
MINOR	Victim has insignificant injury (e.g.: minor abrasion on a knee). The victim may need minor care, and might also assist rescuers in helping others with more serious injuries
DEAD	No breathing after 2 attempts to open airways.

PRE-HOSPITAL MANAGEMENT

- prevent further injury,
- initiate resuscitation (BLS),
- transport the patient safely and rapidly to the most appropriate nearby hospital.

TRANSFER

- Immobilize cervical spine with a Philadelphia collar
- Spine boarding helps in protecting further spinal injury.
-



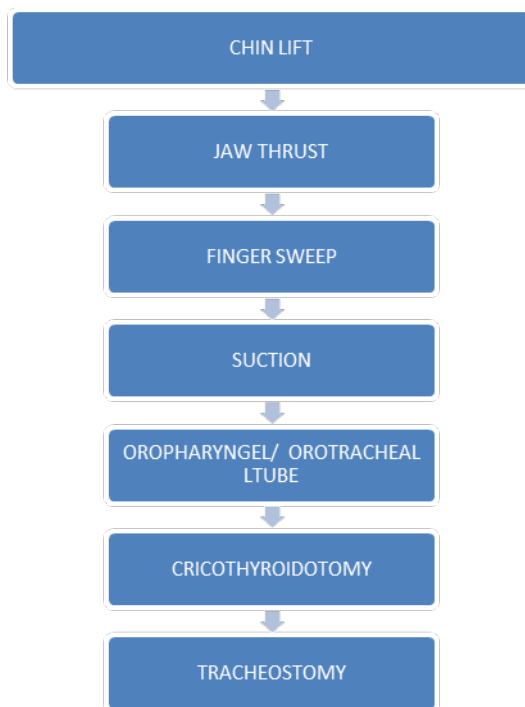
ASSESSMENT

PRIMARY SURVEY

- AIM
 - Protect and secure airway
 - Ventilate and oxygenate
 - Stop the bleeding!
 - Vigorous shock therapy
 - Protect from hypothermia
 - Identify immediately treatable life threatening injury with initial resuscitation

Primary survey & resuscitation follows ABCDE sequence

- A-** airway maintenance with cervical spine control
- If conscious- Ask the patient's name
 - If unconscious-Look for added sounds (stridor, cyanosis etc.)
 - If the patient does not respond to any questions- resuscitate.



Condition that causes airway obstruction

- Mid-facial fractures with obstruction of the Nasopharynx
- Mandibular fractures
- Direct laryngeal and tracheal injury
- Blood and vomit aspiration
- Foreign bodies

B- Breathing and Ventilation

- Exposure

- Inspection
- Palpation
- Movement
- Auscultation

The aim is to find out and treat the life threatening thoracic conditions which include:

- Respiration
- Chest movement
- Respiratory Rate
- Tracheal position
- Breath sound
- Subcutaneous emphysema
- Inspection of neck vein and wound

THORACIC TRAUMA – Six life threatening thoracic conditions-

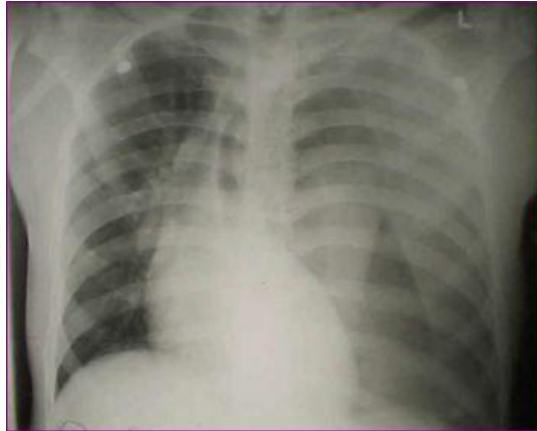
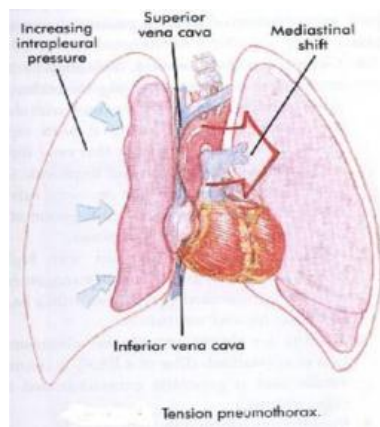
- a. Airway obstruction
- b. Tension pneumothorax
- c. Massive Hemothorax (> 1500ml blood in hemothorax)
- d. Open pneumothorax (sucking wound)
- e. Flail segment with pulmonary contusion
- f. Cardiac tamponade (almost always penetrating injury)

a. Airway obstruction- dealt with airway management.

b. TENSION PNEUMOTHORAX –

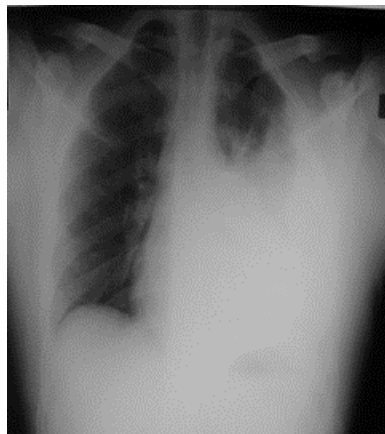
- Signs/ Symptoms
- Chest pain
- Air hunger
- Respiratory distress
- Tachycardia
- Hypotension
- Tracheal deviation
- Unilateral absence of breath sound
- Neck vein distention
- Cyanosis

- 50-75 % of death in blunt trauma
- 15% of injuries require surgical intervention
- Second leading cause of death
- Life-saving procedures performed during the primary survey

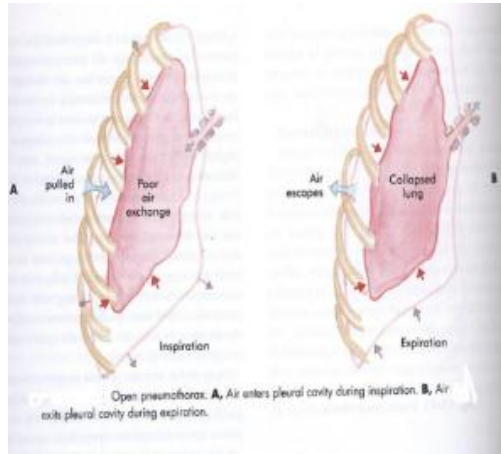


Tension Pneumothorax

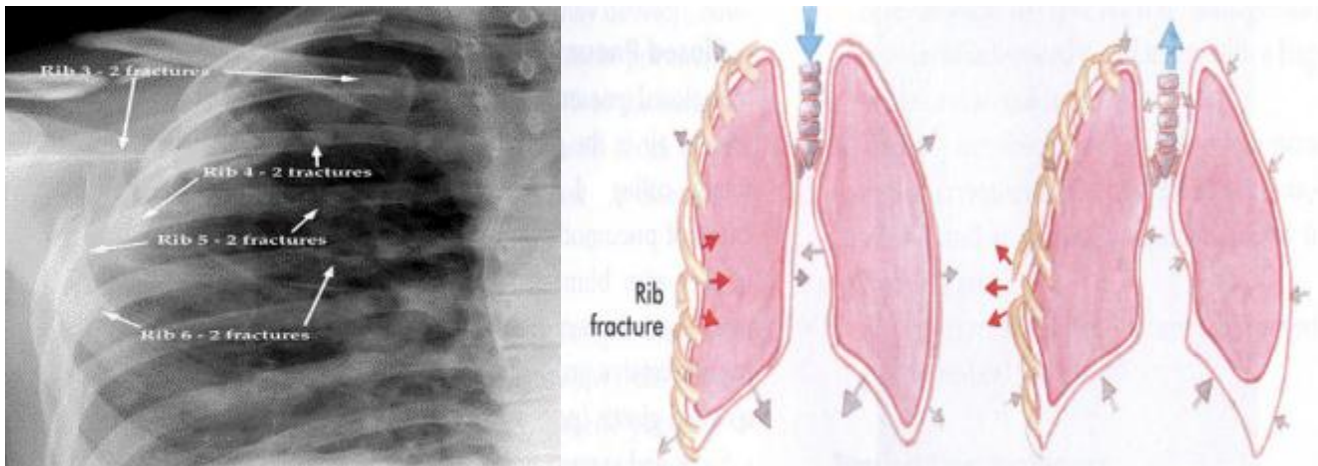
- Treatment
 - Immediate decompression: needle thoracocentesis (Rapidly inserting a large-bore needle into the 2nd intercostal space, mid clavicular line of the affected side)
 - Definitive treatment: chest tube
- c. MASSIVE HEMOTHORAX
- 1,500 ml or more blood in thoracic cavity
 - Associated with tension pneumothorax
 - Treatment - Requires chest drain and fluid resuscitation



- d. Open pneumothorax (sucking wound)
- "sucking chest wound"
 - Trachea deviation
 - respiratory distress
 - sterile occlusive dressing
 - chest tube insertion
 - endotracheal tube



- e. Flail segment with pulmonary contusion
- Rib fractured at 2 different places
 - Paradoxical chest movements
 - Underlying lung contusion
 - Positive pressure ventilation
 - Rarely surgical fixation is necessary



- f. Cardiac tamponade (almost always penetrating injury)
- It is an acute type of pericardial effusion in which fluid, pus, blood, clots, or gas[1] accumulates in the pericardium (the sac in which the heart is enclosed), resulting in slow or rapid compression of the heart.

C- Circulation and bleeding control

- Pulses palpable
 - Radial: B/P 80-90 mm Hg
 - Femoral: B/P 70mm Hg
 - Carotid: B/P 60mm Hg
 - Rapid, thready, >120 = probable shock

- Perfusion
 - Mental status
 - Skin color/temp of extremities
 - BP/secondary survey
 - Quality of the peripheral pulse
- Skin Color, Temperature, & Moisture
 - Vasoconstriction = shock
- Cap Refill < 2 sec
- Level of Consciousness
 - Indicator of central perfusion
- Bleeding
 - Location, type, amount, & rate

Circulation Life Threats <ul style="list-style-type: none"> - PE - Cardiac Tamponade - Shock - Massive Hemothorax > 1,500 ml
--

D- Disability: Neurologic status

- Pupils size and light reaction
- GCS

Variables	Score
Eye opening <ul style="list-style-type: none"> Spontaneous To speech To pain None 	4 3 2 1
Verbal response <ul style="list-style-type: none"> Oriented Confused conversation Inappropriate words Incomprehensible sounds None 	5 4 3 2 1
Best motor response <ul style="list-style-type: none"> Obeys commands Localizes pain Normal flexion Abnormal flexion Extension None 	6 5 4 3 2 1

- E- exposure/environmental control:complete undress the patient but prevent hypothermia
 - Undressed
 - Exam back region
 - All entry and exit wound
 - Prevent hypothermia
- Only radiographs permitted during this phase are
 - cross table lateral C- spine X-ray
 - AP supine chest X-ray
 - AP plain pelvic film

SECONDARY SURVEY

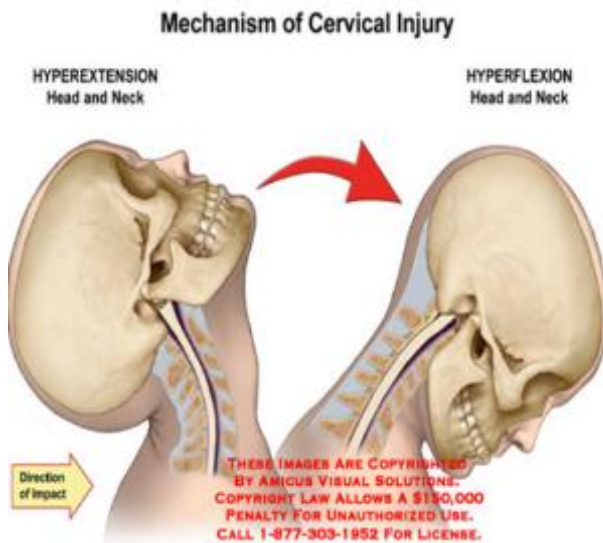
- Head to toe examination
- History
- "AMPLE"
 - A: Allergies
 - M: Medication currently being taken by the patient
 - P: Past illness and operations, pregnancy
 - L: Last meal
 - E: Event/Environment related to the injury
- HEAD
 - Signs of skull base fracture
 - Pupillary size
 - Hemorrhages of conjunctiva
 - Penetrating injury
 - Ocular movement
 - Posterior scalp laceration



- MAXILLOFACIAL
 - Associated with airway obstruction or major bleeding



- NECK
 - Cervical tenderness, subcutaneous emphysema
 - Tracheal/laryngeal injury
 - Carotid injury (penetrating/blunt)



- Chest
 - Visual evaluation of anterior and posterior chest
 - Pain, dyspnea, hypoxia
 - Distended neck veins
 - Distant heart sounds



- **ABDOMEN**

- Inspect
- Auscultate
- Palpate
- Percuss
- Reevaluate
- Special studies



- Perineum: contusion, hematoma, laceration, urethral blood
- Rectum: sphincter tone, blood
- Vagina: blood, laceration
- Musculoskeletal
 - deformity
 - Pain

- Perfusion
- Peripheral neurovascular status
- X-rays



- Neurologic: brain
- GCS Score
- Lateralizing signs
- Frequent reevaluation
- Prevent secondary brain injury

MANAGEMENT

Management of poly-trauma involves the following:

- Life salvage
- Limb salvage
- Salvage of function
- Prevent disability

Goal: improve perfusion of brain and heart

Position patient: Have patient lie down and elevate legs (moves blood into chest and head)

Keep warm if blanket available

Give nothing by mouth if any possibility of internal injuries (may need emergency surgery)

PREPARATION

1. Pre-hospital phase [EMS]

Notify receiving hospital

Airway maintenance, control of external bleeding and shock, immobilization of the patient

2. In-hospital phase

- Resuscitation area
- Equipment, monitor, warmed fluid
- Trauma team
- Protective communicable disease

DEFINITIVE CARE

- Administer supplemental oxygen
- Obtain vascular access
- With wide bore cannula
- Administer fluid/blood to “fill up the tank”
 - Wound closure/management
 - Immobilization
 - Special situations
- Release cardiac tamponade
- Tension pneumothorax
 - Find hidden sources of bleeding

Physiotherapy Management

- Positioning
- Chest physiotherapy
- Active/passive ROM exercises
- Stretching of bi-articular muscles
- Massage (pressure prone areas)
- DVT prevention stockings and exercises
- Ambulation as soon as possible
(Kindly refer to IEC on Wound Care Management)

EVIDENCE OF IMPROVEMENT

BP 90, P < 120

O2 saturation > 92%

Warm, moist skin, < 2 sec capillary refill

Consciousness, no agitation

Urine output 0.5 cc /kg /hr

Complications

- Hemorrhage and Shock
- Compartment Syndrome

- Tetanus
- Acute Respiratory Distress Syndrome
- Fat embolism
- Disseminated Intravascular Coagulation
- Crush syndrome
- Multisystem organ failure (M.S.O.F.)

- **Hemorrhage and Shock**
- Shock is inadequate tissue perfusion with oxygenated blood
- Shock is a clinical syndrome characterized by
 - Hypotension (SBP < 90 mmHg)
 - Oliguria (urine output <20 ml/hr or 0.3 ml/kg/hr for 2 consecutive hours)
 - Poor peripheral perfusion (e.g. cool and clammy skin which demonstrates poor capillary refill)

- **WHY SHOULD YOU CARE?**
- High death rate 20-90%
- Early effects of low oxygen in the cell are REVERSIBLE
- Early intervention reduces death

- **TYPES - 4 types of shock**
- a. Hypovolemic – low blood volume
- b. Cardiogenic
- c. Obstructive
- d. Distributive

- **PRINCIPLE MECHANISMS**
- Not enough blood volume
- Pump failure
- Abnormalities of peripheral circulation (when all small blood vessels dilate)
- Mechanical blockage of outflow from the heart

- a. **Hypovolemic Shock –**
- Heart pumps well, but not enough blood volume to pump
- Most common type of shock
- Insufficient circulating blood volume
- Recovery dependent on duration and severity

- Causes
- Blood loss
- Dehydration

- Reduced cardiac output
- Consequences
- Inadequate blood circulation
- Decreased oxygen supply to the tissues
-
- Primary cause = loss of blood or body fluids from an internal or external source
- Hemorrhage, severe burns, severe dehydration



- Recognizing Shock
- Mental status
- Radial pulse
- Heart rate (HR)
- Blood pressure (BP)
- Respiratory rate (RR)
- Likelihood of death

What happens when you start to bleed? – It depends on how much blood you lose

Normal Adult Blood Volume – 5 litres



CASE I – 0.5 liter blood loss



- Mental state – alert
- Radial pulse – full
- Heart rate – normal or somewhat increased
- Systolic blood pressure – normal
- Respiratory Rate – normal
- **Is he going to die from this? NO**

CASE II – 1 liter blood loss

- Mental state – alert
- Radial pulse – full
- Heart rate – 100+
- Systolic blood pressure – normal in lying down position
- Respiratory rate – may be normal
- **Is he going to die from this? NO**



CASE III – 1.5 liters blood loss



- Mental state – alert but anxious
- Radial pulse – may be weak
- Heart rate – more than 100
- Systolic blood pressure – may be decreased
- Respiratory rate – 30
- **Is he going to die from this? PROBABLY NOT**

CASE IV – 2 liters blood loss



- Mental state – confused, lethargic
- Radial pulse – weak
- Heart Rate – 120+
- Systolic blood pressure – decreased
- Respiratory rate – >35
- **Is he going to die from this? MAYBE**

CASE V – 2.5 liters blood loss



- Mental state – unconscious
- Radial pulse – absent
- Heart rate – 140+
- Systolic blood pressure – markedly decreased
- Respiratory rate – over 35
- Is he going to die from this? PROBABLY

If shock is “inadequate tissue perfusion with oxygenated blood,” then look at the tissues:

Cardiovascular	<ul style="list-style-type: none"> - Anxiety - Restlessness - Altered mental state
Respiratory	<ul style="list-style-type: none"> - Hypotension - Rapid, weak, thready pulse - Rapid and deep respirations
Skin	<ul style="list-style-type: none"> - Cool, clammy skin - Capillary refill > 3 seconds
CNS	<ul style="list-style-type: none"> - Hypothermia - Fatigue - Cold skin
Renal	<ul style="list-style-type: none"> - Thirst and dry mouth - Low urine output

Stages of Shock –

- **Compensated - early**
 - Initial stage, body progressively compensated for blood loss
 - High pulse,
 - Weak pulse, cold clammy skin, anxiety, thirst, weak
- **Decompensated – late**
 - Body’s compensatory mechanisms no longer maintain system

- Loss of radial pulse, low BP, loss of consciousness, shallow respirations

HEMORRHAGE – CRITICAL CONCEPTS

- “All bleeding stops eventually”
- Rapid, simple interventions are highly advantageous to the patient
- The overwhelming cause of preventable trauma death continues to be extremity hemorrhage

DEFINITION –

- Extravasation of blood due to ruptured vessels
- From hemo = blood, rrhagia = to burst out
- Hemorrhage may be external or internal
- Hemorrhage may be obvious (gross) or hidden (occult)
- This is whole blood with RBCs, not just edemic transudates or exudates



Internal Hemorrhage

External Hemorrhage

HOW MUCH BLOOD LOSS?

- **Class I:** up to 15% of blood volume
 - typically no change in vital signs
 - routine blood donation amounts to ~10%
- **Class II:** 15-30% of total blood volume
 - tachycardia (rapid heartbeat) with a narrowing of the difference between the systolic and diastolic blood pressures
 - cool, pale skin; altered mental status, dizzy or confused
 - fluid resuscitation with saline or Lactated Ringer's solution
- **Class III:** 30-40% of circulating blood volume
 - blood pressure drops, heart rate increases, peripheral perfusion worsens, mental status worsens
 - fluid resuscitation and/or blood transfusion
- **Class IV:** >40% of circulating blood volume
 - hypovolemic shock--limit of the body's compensation is reached
 - aggressive resuscitation is required to prevent death

- **TYPES OF HEMORRHAGE**

- a. AMOUNT OF LOSS --MINOR/MAJOR
- b. ACUTE/CHRONIC
- c. ARTERIAL/VENOUS/CAPILLARY/MIXED
- d. LOCALIZED/DIFFUSE
- e. EXTERNAL/ INTERNAL
- f. OVERT/OCCULT

CAUSES

- Internal
- Blunt force trauma
- Contusions, lacerations, shear, fractures
- Penetrating trauma
- Punctures
- External
- General trauma
- Contusions, abrasions, lacerations, incisions, avulsions, amputation

Sources of blood loss

- **Arterial bleeding**

Usually bright red in color, rich in oxygen

Often profuse and spurting

Often hard to control - continuous direct pressure required

- **Venous bleeding**

Usually dark red/maroon in color, does not contain much oxygen

Usually easy to control because veins are under low pressure

Venous bleeding in neck can draw in air and cause further complications

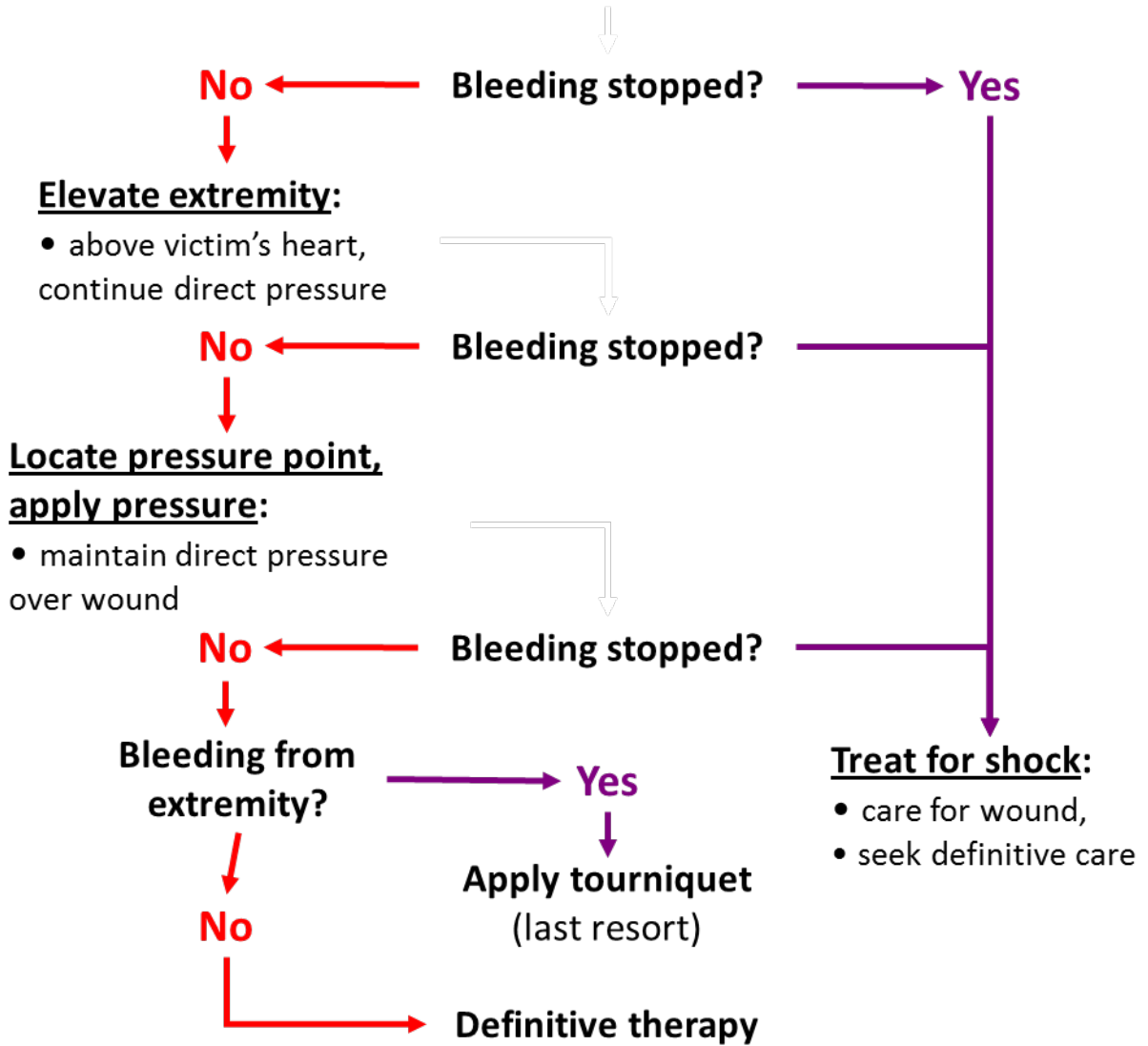
- **Capillary bleeding**

MANAGEMENT

- Usually slow, oozing, small size and low pressure
- Generally minor and easy to control
- STOP the bleeding
- Supportive care measures
- Positioning of victim
- Ensuring A-B-C's
- Maintenance of body temp
- Definitive management

Apply direct pressure:

- with gloved hand,
- sterile dressing(s).



- Apply pressure directly to wound site:
Gloved hand, dressing
If dressing soaks thru, add more gauze on top and press harder



- Elevate the part - If possible, raise wound site above level of victim's heart



- Pressure Point - Find proximal "pressure point" and press on it (Radial, ulnar, brachial, axillary, femoral arteries—not carotid)
Apply direct pressure to site



- Tourniquet –
Apply band above injury site, tighten to stop bleeding:
Last resort—risky
Note time of application
Reassess frequently



SUMMARY

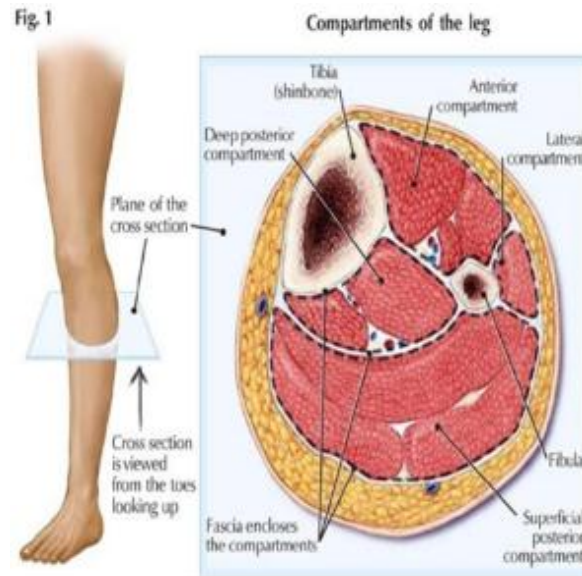
Shock = inadequate tissue perfusion

Find shock by looking at tissue perfusion

- Categories of shock
 - Hypovolemic
 - Obstructive
 - Distributive
 - Cardiogenic
- Most common source of shock = hemorrhage
- Management of hemorrhagic shock
 - Stop the bleeding
 - Vascular access
 - Volume
 - Reassess

➤ COMPARTMENT SYNDROME

- Closed area of muscles group, nerves & blood vessels surrounded by fascia



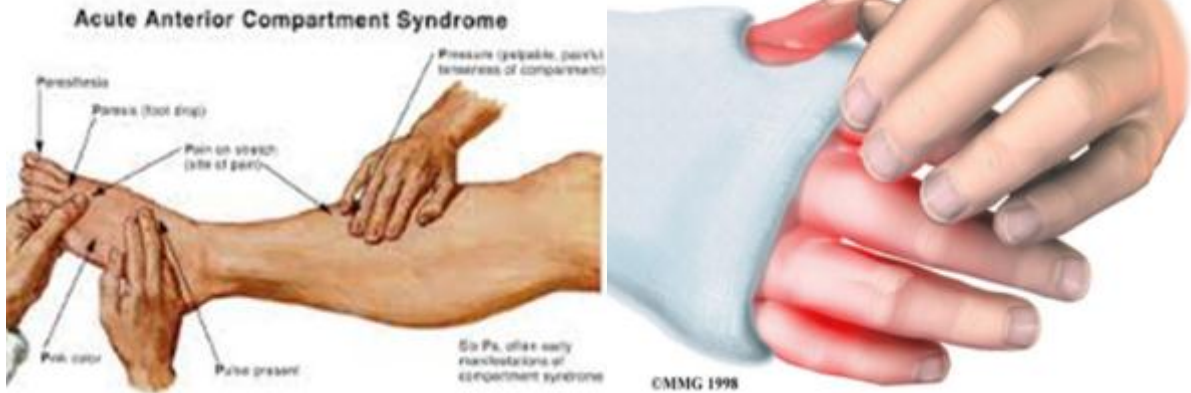
Compartment Syndrome

- Compartment syndrome occurs when blood supply is dramatically reduced to muscles in a closed body space. E.g.: Hand, forearm, upper arm, abdomen, buttock and leg.
- It is an orthopedic emergency.

CAUSES

- Bleeding from a bone fracture
- Burn eschar
- Casts applied too tightly
- Crush injuries
- Leaking of IV Fluid into the compartment
- Snake bite
- Swelling of the muscle itself
- Fractures
- Soft Tissue Injury (Crush)
- Arterial Injury
- Post-ischemic swelling
- Reperfusion injury
- Drug Overdose (limb compression)
- Burns
- Fractures
- Soft Tissue Injury (Crush)
- Arterial Injury
- Post-ischemic swelling

- Reperfusion injury
- Drug Overdose (limb compression)
- Burns
- Severe bruised muscle (even if there is no fracture)



HALLMARK SYNDROME OF COMPARTMENT SYNDROME

- Severe pain or parasthesia disproportionate to the injury
- Increase in pain after pain medication has been administered.
- In severe cases there may be decreased sensation, weakness and paleness of the skin.



WHY IS IT DANGEROUS?

- Nerves:
 - Neuropraxia: will regenerate
 - Ischemia: cell death
- Muscles: contracture (Volkmann's ischemic contracture)
- Gangrene



HISTORY AND PHYSICAL EXAMINATION – LOOK FOR 6 P's

- **Subjective :**
 - Pain
 - Pressure
 - Parasthesia
- **Objective :**
 - Pallor
 - Pulselessness
 - Paresis

Why is compartment syndrome an emergency?

- If not diagnosed and treated promptly there can be permanent nerve injury and loss of muscle function.
- Permanent nerve injury can occur after 12-24 hours.
- In severe cases limbs may need to be amputated because of gangrene

SIGNS AND SYMPTOMS

- Severe pain inappropriate to the injury(not relieved even with morphia)
- Burning of the affected limb
- Tight muscle(rigid)
- Numbness: bad sign
- Passive stretching of fingers or toes (muscle stretch) will lead to severe pain (diagnostic sign)

- **Never wait for signs of ischemia (5 Ps): irreversible damage**



DIAGNOSIS

- A swollen limb, tense on palpation strongly indicates compartment syndrome.
- Diagnosis is based on high degree of clinical suspicion
- Classic signs of the 6 P's - **ARE NOT RELIABLE:**
- These are signs of an ESTABLISHED compartment syndrome where ischemic injury has already taken place
- These signs may be present in the absence of compartment syndrome.
- The most important symptom of an impending compartment syndrome is **PAIN DISPROPORTIONATE TO THAT EXPECTED FOR THE INJURY MOST COMMON LOCATIONS**

1. **Forearm:** anterior compartment, especially in the deep flexor area



2. **Leg:** deep posterior and the anterior compartments



MANAGEMENT

- Non-surgical management:
 - Remove any tight bandage, tubigrip or soaked dressing
 - Cast should be removed completely
 - Elevation
- Surgical management:
 - (FASCIOTOMY) - Open skin and fascia down to a compartment



FASCIOTOMY

COMPLICATIONS

- Permanent nerve damage
- Infection
- Loss of limb/Gangrene
- Death
- Cosmetic deformity from fasciotomy

BASIC LIFE SUPPORT

<i>Session 2</i>	<i>BASIC LIFE SUPPORT</i>
<p>Basic Life Support</p> <ul style="list-style-type: none"> - Definition - Principles - Techniques 	<p>Terminal Objective At the end of the session, the participant will be able to perform Basic Life Support techniques</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1. Perform an ABC assessment on a mannequin 2. Perform all the steps of resuscitation (air way opening, chest compression, rescue breath) on a mannequin 3. List criteria to stop resuscitation <p>Methodology Power point, Practical demonstration</p> <p>Learning Materials Training manual</p> <p>Time for session 2 hour_s</p> <p>Evaluation method Pre-test, Participant's participation and reaction, post-test</p>

BASIC LIFE SUPPORT

1. AIRWAY
2. BREATHING
3. CIRCULATION



- SEQUENCES OF PROCEDURES PERFORMED TO RESTORE THE CIRCULATION OF OXYGENATED BLOOD AFTER A SUDDEN PULMONARY AND/OR CARDIAC ARREST
-
- CHEST COMPRESSIONS AND PULMONARY VENTILATION PERFORMED BY ANYONE WHO KNOWS HOW TO DO IT, ANYWHERE, IMMEDIATELY, WITHOUT ANY OTHER EQUIPMENT

WHAT TO DO?

APPROACH SAFETY
CHECK RESPONSE
SHOUT FOR HELP
OPEN AIRWAY
CHECK BREATHING
30 CHEST COMPRESSIONS
2 RESCUE BREATHS

ADULT CPR 5 YEARS AND OVER

SCENE
VICTIM
RESCUER
BYSTANDER

APPROACH SAFETY
CHECK RESPONSE
SHOUT FOR HELP
OPEN AIRWAY
CHECK BREATHING
30 CHEST COMPRESSIONS
2 RESCUE BREATHS

CHECK RESPONSE



- APPROACH SAFETY
- CHECK RESPONSE**
- SHOUT FOR HELP
- OPEN AIRWAY
- CHECK BREATHING
- 30 CHEST COMPRESSIONS
- 2 RESCUE BREATHS

CHECK RESPONSE



- Shake shoulders gently
- Ask "Are you all right?"
- If he responds
- Leave as you find him.
- Find out what is wrong.
- Reassess regularly.

SHOUT FOR HELP



- APPROACH SAFETY
- CHECK RESPONSE
- SHOUT FOR HELP**
- OPEN AIRWAY
- CHECK BREATHING
- 30 CHEST COMPRESSIONS
- 2 RESCUE BREATHS

OPEN AIRWAY



- APPROACH SAFETY
- CHECK RESPONSE
- SHOUT FOR HELP
- OPEN AIRWAY**
- CHECK BREATHING
- 30 CHEST COMPRESSIONS
- 2 RESCUE BREATHS

AIRWAY OPENING BY NECK EXTENSION



OPEN AIRWAY



Head tilt and chin lift
 - lay rescuers
 - non-healthcare rescuers

NO NEED FOR FINGER SWEEP
 UNLESS SOLID MATERIAL IS
 FOUND IN THE MOUTH

HEAD TILT, CHIN LIFT + JAW THRUST



CHECK BREATHING



APPROACH SAFETY

CHECK RESPONSE

SHOUT FOR HELP

OPEN AIRWAY

CHECK BREATHING

30 CHEST COMPRESSIONS

2 RESCUE BREATHS

CHECK BREATHING



- LOOK, LISTEN AND FEEL FOR NORMAL BREATHING

- DO NOT MISTAKE AGONAL BREATHING FOR NORMAL

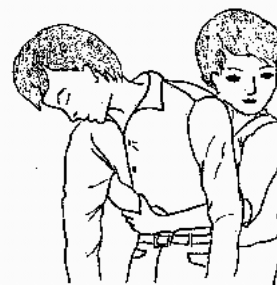
FOREIGN-BODY AIRWAY OBSTRUCTION (FBAO)

SIGNS	MILD obstruction	SEVERE obstruction
"Are you choking?"	"YES"	Unable to speak, may nod
Other signs	Can speak, cough, breathe	Can not breathe/wheezy breathing/silent attempts to cough/unconsciousness

BACK BLOWS



ABDOMINAL THRUSTS



30 CHEST COMPRESSIONS



APPROACH SAFETY
CHECK RESPONSE
SHOUT FOR HELP
OPEN AIRWAY
CHECK BREATHING
30 CHEST COMPRESSIONS
2 RESCUE BREATHS

CHEST COMPRESSIONS



- Place the heel of one hand in the centre of the chest
- Place other hand on top
- Interlock fingers
- Compress the chest
 - Rate 100 min⁻¹
 - Depth 4-5 cm
 - Equal compression : relaxation
- When possible change CPR operator every 2 min

2 RESCUE BREATHS



APPROACH SAFETY
CHECK RESPONSE
SHOUT FOR HELP
OPEN AIRWAY
CHECK BREATHING
30 CHEST COMPRESSIONS
2 RESCUE BREATHS

RESCUE BREATHS



- Pinch the nose
- Take a normal breath
- Place lips over mouth
- Blow until the chest rises
- Take about 1 second
- Allow chest to fall
- Repeat

RESCUE BREATHS

- **RECOMMENDATIONS:**
 - Tidal volume
500 – 600 ml
 - Respiratory rate
give each breaths over about 1s with enough volume to make the victim's chest rise
 - Chest-compression-only
continuously at a rate of 100 min



APPROACH SAFETY
CHECK RESPONSE
SHOUT FOR HELP
OPEN AIRWAY
CHECK BREATHING
30 CHEST COMPRESSIONS
2 RESCUE BREATHS

IF VICTIM STARTS TO BREATHE NORMALLY PLACE IN RECOVERY POSITION



CONTINUE RESUSCITATION UNTIL.....

- Qualified help arrives and takes over
- The victim starts breathing normally
- Rescuer becomes exhausted

WHEN CAN I STOP CPR ?

- VICTIM REVIVES
- TRAINED HELP ARRIVES
- TO EXHAUSTED TO CONTINUE
- UNSAFE SCENE
- PHYSICIAN DIRECTED
- CARDIAC ARREST FOR MORE THAN 30 MINUTES

WHY CPR MAY FAIL ?

- Delay in starting
- Improper procedures (ex. Forget to pinch nose)
- No ACLS follow-up and delay in defibrillation
 - Only 15% who receive CPR live to go home
 - Improper techniques
- Terminal disease or unmanageable disease (massive heart attack)

COMPLICATIONS OF CPR

- Vomiting
- Aspiration
- Place victim on left side
- Wipe vomit from mouth with fingers wrapped in a cloth
- Reposition and resume CPR

PSYCHOSOCIAL FIRST AID (PFA)

SESSION 3	PSYCHO-SOCIAL FIRST AID (PFA)
<p>Psycho-social First Aid (PFA)</p> <ul style="list-style-type: none"> - Overview/ Definition - Importance and Indications for PFA - PFA Principles - Role Play 	<p>Terminal Objective At the end of the session, the participant will be able to describe the main principles of applied PFA</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1. Explain the concept and the purpose of Psychological First Aid (PFA) in emergency context 2. Explain the principles, who it is for, when and where it is provided <p>Methodology Power point, Practical demonstration</p> <p>Learning Materials Training manual</p> <p>Time for session 1 hour</p> <p>Evaluation method Pre-test, Participant’s participation and reaction, post-test</p>

DEFINITION

Humane, supportive and practical assistance to fellow human beings who recently suffered exposure to serious stressors, and it involves:

- Non-intrusive, practical care and support
- Assessing needs and concerns
- Helping people to address basic needs (food, water)
- Listening, but not pressuring people to talk
- Comforting people and helping them to feel calm
- Helping people connect to information, services and social supports
- Protecting people from further harm

How do crisis events affect people?

Different kinds of distressing events happen in the world, such as war, natural disasters, accidents, fires and interpersonal violence (for example, sexual violence). Individuals, families or entire communities may be affected. People may lose their homes or loved ones, be separated from family and community, or may witness violence, destruction or death.

Although everyone is affected in some way by these events, there are a wide range of reactions and feelings each person can have. Many people may feel overwhelmed, confused or very uncertain about what is happening. They can feel very fearful or anxious, or numb and detached. Some people may have mild reactions, whereas others may have more severe reactions. How someone reacts depends on many factors, including:

- the nature and severity of the event(s) they experience;
- their experience with previous distressing events;
- the support they have in their life from others;
- their physical health;
- their personal and family history of mental health problems;
- their cultural background and traditions;
- their age (for example, children of different age groups react differently).

Every person has strengths and abilities to help them cope with life challenges. However, some people are particularly vulnerable in a crisis situation and may need extra help. This includes people who may be at risk or need additional support because of their age (children, elderly), because they have a mental or physical disability, or because they belong to groups who may be marginalized or targeted for violence. Section 3.5 provides guidance for helping vulnerable people.

What is PFA?

According to Sphere (2011) and IASC (2007), psychological first aid (PFA) describes a humane, supportive response to a fellow human being who is suffering and who may need support. PFA involves the following themes:

- providing practical care and support, which does not intrude;

- assessing needs and concerns;
- helping people to address basic needs (for example, food and water, information);
- listening to people, but not pressuring them to talk;
- comforting people and helping them to feel calm;
- helping people connect to information, services and social supports;
- protecting people from further harm.

It is also important what PFA is not:

- It is not something that only professionals can do.
- It is not professional counseling.
- It is not “psychological debriefing”¹ in that PFA does not necessarily involve a detailed discussion of the event that caused the distress.
- It is not asking someone to analyze what happened to them or to put time and events in order.
- Although PFA involves being available to listen to people’s stories, it is not about pressuring people to tell you their feelings and reactions to an event.

1 WHO (2010) and Sphere (2011) describe psychological debriefing as promoting ventilation by asking a person to briefly but systematically recount their perceptions, thoughts and emotional reactions during a recent stressful event. This intervention is not recommended. This is distinct from routine operational debriefing of aid workers used by some organizations at the end of a mission or work task.

PFA is an alternative to “psychological debriefing” which has been found to be ineffective. In contrast, PFA involves factors that seem to be most helpful to people’s long-term recovery (according to various studies and the consensus of many crisis helpers²). These include:

- feeling safe, connected to others, calm and hopeful;
- having access to social, physical and emotional support; and
- feeling able to help themselves, as individuals and communities.

Importance and indications for PFA

WHO:

PFA is for distressed people who have been recently exposed to a serious crisis

event. You can provide help to both children and adults. However, not every one who experiences a crisis event will need or want PFA. Do not force help on people who do not want it, but make yourself easily available to those who may want support. (See Hobfoll, et al. (2007) and Bisson & Lewis (2009) in References and Resources)

There may be situations when someone needs much more advanced support than PFA alone. Know your limits and get help from others, such as medical personnel (if available), your colleagues or other people in the area, local authorities, or community and religious leaders. In the following box we have listed people who need more immediate advanced support. People in these situations need medical or other help as a priority to save life.

People who need more immediate advanced Support:

- people with serious, life-threatening injuries who need emergency medical care
- people who are so upset that they cannot care for themselves or their children
- people who may hurt themselves
- people who may hurt others

WHEN:

Although people may need access to help and support for a long time after an event, PFA is aimed at helping people who have been very recently affected by a crisis event. You can provide PFA when you first have contact with very distressed people. This is usually during or immediately after an event. However, it may sometimes be days or weeks after, depending on how long the event lasted and how severe it was.

WHERE:

You can offer PFA wherever it is safe enough for you to do so. This is often in community settings, such as at the scene of an accident, or places where distressed people are served, such as health centres, shelter or camps, schools and distribution sites for food or other types of help. Ideally, try to provide PFA where you can have some privacy to talk with the person when appropriate. For people who have been exposed to certain types of crisis events, such as sexual violence, privacy is essential for confidentiality and to respect the person's dignity.

Principles of PFA:

We will discuss:

- Good communication with people in distress
- Preparing to help.
- The PFA action principles of look, listen and link.
- Ending your help.
- People who are likely to need Special attention in a crisis situation.

1. Good communication

The way you communicate with someone in distress is very important. People who have been through a crisis event may be very upset, anxious or confused. Some people may blame themselves for things that happened during the crisis. Being calm and showing understanding can help people in distress feel more safe and secure, understood, respected and cared for appropriately.

Someone who has been through a distressing event may want to tell you their story. Listening to someone's story can be a great support. However, it is important not to pressure anyone to tell you what they have been through. Some people may not want to speak about what has happened or their circumstances. However, they may value it if you stay with them quietly, let them know you are there if they want to talk, or offer practical support like a meal or a glass of water. Don't talk too much; allow for silence. Keeping silent for a while may give the person space and encourage them to share with you if they wish.

To communicate well, be aware of both your words and body language, such as facial expressions, eye contact, gestures, and the way you sit or stand in relation to the other person. Each culture has its own particular ways of behaving that are appropriate and respectful. Speak and behave in ways that take into account the person's culture, age, gender, customs and religion.

Below are suggestions for things to say and do, and what not to say and do. Most importantly, be yourself, be genuine and be sincere in offering your help and care.

- Try to find a quiet place to talk, and minimize outside distractions.
- Respect privacy and keep the person's story confidential, if this is appropriate.
- Stay near the person but keep an appropriate distance depending on their age, gender and culture.
- Let them know you are listening; for example, nod your head or say "hmmmm...."
- Be patient and calm.
- Provide factual information, if you have it. Be honest about what you know and don't know. "I don't know, but I will try to find out about that for you."
- Give information in a way the person can understand – keep it simple.
- Acknowledge how they are feeling and any losses or important events they tell you about, such as loss of their home or death of a loved one. "I'm so sorry. I can imagine this is very sad for you."
- Acknowledge the person's strengths and how they have helped themselves.
- Allow for silence.
- Don't pressure someone to tell their story.
- Don't interrupt or rush someone's story (for example, don't look at your watch or speak too rapidly).
- Don't touch the person if you're not sure it is appropriate to do so.
- Don't judge what they have or haven't done, or how they are feeling. Don't say: "You shouldn't feel that way," or "You should feel lucky you survived."
- Don't make up things you don't know.
- Don't use terms that are too technical.
- Don't tell them someone else's story.
- Don't talk about your own troubles.
- Don't give false promises or false reassurances.
- Don't think and act as if you must solve all the person's problems for them.
- Don't take away the person's strength and sense of being able to care for themselves.
- Don't talk about people in negative terms (for example, don't call them "crazy" or "mad").

Keep good communication in mind as you look, listen and link – the action principles of PFA covered in the following pages.

2. Prepare – learn about the Situation

- Learn about the crisis event.
- Learn about available services and supports.
- Learn about safety and security concerns.

Crisis situations can be chaotic and often need urgent action. However, wherever possible before entering a crisis site, try to get accurate information about the situation. Consider the following questions:

Before entering a crisis site, learn about the following:

The crisis event important questions

- What happened?
- When and where did it take place?
- How many people are likely to be affected and who are they?

Available services and supports

- Who is providing for basic needs like emergency medical care, food, water, and shelter or tracing family members?
- Where and how can people access those services?
- Who else is helping? Are community members involved in responding?

Safety and security concerns

- Is the crisis event over or continuing, such as an aftershock from an earthquake or continuing conflict?
- What dangers may be in the environment, such as rebels, landmines or damaged infrastructure?
- Are there areas to avoid entering because they are not secure (for example, obvious physical dangers) or because you are not allowed to be there?

These important preparation questions can help you to understand the situation you are entering, to offer PFA more effectively and to be more aware of your safety.

3. Action principles of PFA – look, listen and link

The three basic action principles of PFA are look, listen and link. These action principles will help guide how you view and safely enter a crisis situation, approach affected people and understand their needs, and link them with practical support and information (see the table below).

LOOK

- Check for safety.
- Check for people with obvious urgent basic needs.
- Check for people with serious distress reactions.

LISTEN

- Approach people who may need support.
- Ask about people's needs and concerns.
- Listen to people, and help them to feel calm.
-

LINK

- Help people address basic needs and access services.
- Help people cope with problems.
- Give information.
- Connect people with loved ones and social support.

Crisis situations can change rapidly. What you find at the scene may be different from what you learned before entering the crisis situation. Therefore, it is important to take time – even a few moments – to “look” around you before offering help. If you suddenly find yourself in a crisis situation without time to prepare, this may be just a quick scan. These moments will give you a chance to be calm, be safe and think before you act. See the following table for questions to consider and important messages as you “look” around you.

Safety

- What dangers can you see in the environment, such as active conflict, damaged roads, unstable buildings, fire or flooding?
- Can you be there without likely harm to yourself or others?

If you are not certain about the safety of the crisis site, then do not go. Try to get help for people in need. If possible, communicate with people in distress from a safe distance.

People with obvious urgent basic needs:

- Does anyone appear to be critically injured and in need of emergency medical help?
 - Does anyone seem to need rescuing, such as people trapped or in immediate danger?
 - Does anyone have obvious urgent basic needs, such as protection from the weather, torn clothing?
 - Which people may need help in terms of accessing basic services and special attention to be protected from discrimination and violence?
 - Who else is available around me to help?
4. Know your role and try to get help for people who need special assistance or who have obvious urgent basic needs. Refer critically injured people to medical personnel or others trained in physical first aid.

People with serious distress reactions

- Are there people who appear extremely upset, not able to move on their own, not responding to others, or in shock?
- Where and who are the most distressed people?

Consider who may benefit from PFA and how you can best help.

People may react in various ways to a crisis. Some examples of distress responses to crisis are listed below:

- physical symptoms (for example, shaking, headaches, feeling very tired, loss of appetite, aches and pains)

- crying, sadness, depressed mood, grief
- anxiety, fear
- being “on guard” or “jumpy”
- worry that something really bad is going to happen
- insomnia, nightmares
- irritability, anger
- guilt, shame (for example, for having survived, or for not helping or saving others)
- confused, emotionally numb, or feeling unreal or in a daze
- appearing withdrawn or very still
- not responding to others, not speaking at all
- disorientation (for example, not knowing their own name, where they are from, or what happened)
- not being able to care for themselves or their children (for example, not eating or drinking, not able to make simple decisions)

Some people may only be mildly distressed or not distressed at all.

Most people will recover well over time, especially if they can restore their basic needs and receive support such as help from those around them and/or PFA. However, people with either severe or long-lasting distress reactions may need more support than PFA alone, particularly if they cannot function in their daily life or if they are a danger to themselves or others. Make sure that severely distressed people are not left alone and try to keep them safe until the reaction passes or until you can find help from health personnel, local leaders or other community members in the area.

Also, look for people among the affected population who are likely to need special attention for their care and safety:

Children – including adolescents – especially those separated from their caregivers, may need protection from abuse and exploitation. They will also likely need care from those around them and help to meet their basic needs.

People with health conditions or physical and mental disabilities may need special help to get to a safe place, to be protected from abuse and to access medical care and other services. This may include frail elderly people, pregnant women, people with severe mental disorders, or people with visual or hearing difficulties.

People at risk of discrimination or violence, such as women or people of certain ethnic groups, may need special protection to be safe in the crisis setting and support to access available help.

Listen

- Approach people who may need support.
- Ask about people’s needs and concerns.
- Listen to people, and help them to feel calm.

Listening properly to people you are helping is essential to understand their situation and needs, to help them to feel calm, and to be able to offer appropriate help. Learn to listen with your:

- Eyes » giving the person your undivided attention

- Ears >> truly hearing their concerns
- Heart >> with caring and showing respect

1. Approach people who May need Support:

- Approach people respectfully and according to their culture.
- Introduce yourself by name and organization.
- Ask if you can provide help.
- If possible, find a safe and quiet place to talk.
- Help the person feel comfortable; for example, offer water if you can.
- Try to keep the person safe.
- Remove the person from immediate danger, if it is safe to do so.
- Try to protect the person from exposure to the media for their privacy and dignity.
- If the person is very distressed, try to make sure they are not alone

2. Ask about people's needs and concerns:

- Although some needs may be obvious, such as a blanket or covering for someone whose clothing is torn, always ask what people need and what their concerns are.
- Find out what is most important to them at this moment, and help them work out what their priorities are.

3. Listen to people and help them to feel calm:

- Stay close to the person.
- Do not pressure the person to talk.
- Listen in case they want to talk about what happened.
- If they are very distressed, help them to feel calm and try to make sure they are not alone.

Help people to feel calm

Some people who experience a crisis situation may be very anxious or upset. They may feel confused or overwhelmed, and may have some physical reactions such as shaking or trembling, difficulty breathing or feeling their heart pounding. The following are some techniques to help very distressed people to feel calm in their mind and body:

- Keep your tone of voice calm and soft.
- If culturally appropriate, try to maintain some eye contact with the person as you talk with them.
- Remind the person that you are there to help them. Remind them that they are safe, if it is true.
- If someone feels unreal or disconnected from their surroundings, it may help them to make contact with their current environment and themselves. You can do this by asking them to:
 - Place and feel their feet on the floor.
 - Tap their fingers or hands on their lap.
 - Notice some non-distressing things in their environment, such as things they can see, hear or feel. Have them tell you what they see and hear.
- Encourage the person to focus on their breathing, and to breathe slowly.

Link

- Help people address basic needs and access services.
- Help people cope with problems.
- Give information.
- Connect people with loved ones and social support.

Although each crisis situation is unique, people who are affected often need the things listed in the following box.

Frequent needs:

- Basic needs, such as shelter, food, and water and sanitation.
- Health services for injuries or help with chronic (long-term) medical conditions.
- Understandable and correct information about the event, loved ones and available services.
- Being able to contact loved ones, friends and other social supports.
- Access to specific support related to one's culture or religion.
- Being consulted and involved in important decisions.

People may feel vulnerable, isolated or powerless after a distressing event. In some situations, their daily life is disrupted. They may be unable to access their usual supports, or they may find themselves suddenly living in stressful conditions. Linking people with practical support is a major part of PFA. Remember that PFA is often a one-time intervention and you may only be there to help for a short time. Affected people will need to use their own coping skills to recover in the long term.

5. Help people to help themselves and to regain control of their situation.

A. Help people address basic needs and access services

In helping people to address basic needs, consider the following:

- Immediately after a crisis event, try to help the person in distress to meet the basic needs they request, such as food, water, shelter and sanitation.
- Learn what specific needs people have – such as health care, clothing or items for feeding small children (cups and bottles) – and try to link them to the help available.
- Make sure vulnerable or marginalized people are not overlooked (see Section 3.5).
- Follow up with people if you promise to do so.

B. Help people cope with problems

A person in distress can feel overwhelmed with worries and fears. Help them to consider their most urgent needs, and how to prioritize and address them. For example, you can ask them to think about what they need to address now, and what can wait for later. Being able to manage a few issues will give the person a greater sense of control in the situation and strengthen their own ability to cope. Remember to:

- help people identify supports in their life, such as friends or family, who can help them in the current situation;
- give practical suggestions for people to meet their own needs (for example, explain how the person can register to receive food aid or material assistance);
- ask the person to consider how they coped with difficult situations in the past, and affirm their ability to cope with the current situation;
- ask the person what helps them to feel better. Encourage them to use positive coping strategies and avoid negative coping strategies (see the following table).

Coping

Everyone has natural ways of coping. Encourage people to use their own positive coping strategies, while avoiding negative strategies. This will help them feel stronger and regain a sense of control. You will need to adapt the following suggestions to take account of the person's culture and what is possible in the particular crisis situation.

Encourage positive coping strategies

- Get enough rest.
- Eat as regularly as possible and drink water.
- Talk and spend time with family and friends.
- Discuss problems with someone you trust.
- Do activities that help you relax (walk, sing, pray, play with children).
- Do physical exercise.
- Find safe ways to help others in the crisis and get involved in community activities.

Discourage negative coping strategies

- Don't take drugs, smoke or drink alcohol.
- Don't sleep all day.
- Don't work all the time without any rest or relaxation.
- Don't isolate yourself from friends and loved ones.
- Don't neglect basic personal hygiene.
- Don't be violent.

3. Give information

People affected by a crisis event will want accurate information about:

- the event
- loved ones or others who are impacted
- their safety
- their rights
- how to access the services and things they need

ROLE PLAY: Case Scenario: Accident



You are travelling on a busy village road in a safe part of the country when up ahead you see an accident. It appears a man who was crossing the road with his wife and young daughter was hit by a passing car. The man is lying on the ground, bleeding and not moving. His wife and daughter are near him. His wife is crying and shaking, while his daughter is standing motionless and silent. Some villagers are gathering on the road near the scene of the accident.

You need to react quickly in this situation, but take a moment to stay calm and consider the following as you prepare to help:

- Are there any safety concerns for me or others?
- How can I address the situation?
- What needs to be done urgently, particularly for the man who is seriously injured?

What is important to look for?

- Who needs assistance? What kind of assistance do they need?
- What assistance can I provide myself and what special help is needed?
- Who can I ask to help me? What help could the people who are gathering around the site provide? In what ways might they interfere or not be helpful?
- As you make contact with the people involved in the accident, how can you best listen and provide comfort?
- How will I identify and introduce myself to offer support?
- How can I help to keep people safe from further harm? Are there special concerns for the daughter who has witnessed her father's injury and appears dazed and shocked? Can her mother care for and comfort her at this time?
- Where can I provide PFA that is safe and relatively quiet?
- How will I ask people about their needs and concerns?
- How can I give affected people comfort and help them to feel calm?

WOUND CARE AND INFECTION PREVENTION

SESSION 4	WOUND CARE AND INFECTION PREVENTION
<p>Wound care & Infection prevention</p> <ul style="list-style-type: none"> - Causes of wounds and types - Management of wounds - Main complications(compartment syndrome, infection, crush syndrome) - Universal precautions for prevention of infection 	<p>Terminal Objective At the end of the session, the participant will be able to describe the main principles of management of wounds and infection prevention</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1. Explain all the steps of wound care protocols : identification, examination, preparation, irrigation, use of medications, debridement, closure 2. Recognize signs of infection and neurovascular issues 3. Explain principles of preservation and transportation of amputated parts <p>Methodology Power point, Practical demonstration, group discussion, Videos</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 1.5 hours</p> <p>Evaluation method Pre-test, Participant’s participation and reaction, post-test</p>

Definition

- Is discontinuity or break in the surface epithelium
- Involves underlying nerves, vessels, tendons etc.



Causes of wound

Causes of injury may be the result of mechanical, chemical, electrical, thermal, or nuclear sources. The skin can be damaged in a variety of ways depending upon the mechanism of injury.

- Inflammation is the skin's initial response to injury.
- Superficial (on the surface) wounds and abrasions leave the deeper skin layers intact. These types of wounds are usually caused by friction rubbing against an abrasive surface.
- Deep abrasions (cuts or lacerations) go through all the layers of the skin and into underlying tissue like muscle or bone.
- Puncture wounds are usually caused by a sharp pointed object entering the skin. Examples of puncture wounds include a needle stick, stepping on a nail, or a stab wound with a knife.
- Human and animal bites can be classified as puncture wounds, abrasions, or a combination of both.
- Pressure sores (bed sores) can develop due to lack of blood supply to the skin caused by chronic pressure on an area of the skin (for example, a person who is bedridden, sits for long hours in a wheelchair, or a cast pressing on the skin). Individuals with diabetes, circulation (peripheral vascular disease), or malnutrition are at an increased risk of pressure sores.

Types of wounds

A. Closed Wound



I. Contusion



II. Abrasion

B. Open Wound



I. Laceration



ii. Puncture wounds



iii. Penetration wound



iv. Incised wound



v. Crush injuries

Wound Care Management

A. Examination

- Location
- Size
- Shape
- Margins
- Depth
- Alignment with skin lines
- Neuro function
- Vascular function
- Tendon function
- Underlying structures
- Wound contamination
- Foreign bodies

B. Preparation - Anaesthesia

Topical

- Solution or paste

Local

- Direct infiltration
- 1% lidocaine with or without epinephrine
- Bupivacaine or sensorcaine for longer acting anaesthesia

Regional Block

- Local infiltration proximally in order to avoid tissue disruption
- Smaller amount of anaesthesia required

<u>Drug</u>	<u>Max Dose</u>	<u>Onset</u>	<u>Duration</u>
Lidocaine	5 mg/kg	5-30 min	2 hours
(with Epi)	7 mg/kg	5-30 min	2-3 hours
Bupivacaine	2 mg/kg	7-30 min	> 6 hours

C. Wound Preparation - Hemostasis

- Physical vs. chemical
 - Direct pressure
 - Epinephrine
 - Gelfoam
 - Cautery
- Refractory
 - Use a tourniquet

D. Medication - Minimize the pain of injection

- Use sodium bicarbonate mixed with the anesthetic (1 ml/10 ml solution)
- Use smallest needle possible
- Inject slowly
- Insert needle through open wound edge and skin that has already been anesthetized
- Visual inspection

E. Wound preparation – Foreign Body Removal

- Imaging
- Glass, metal, gravel fragments >1mm should be visible on plain radiographs
- Organic substances and plastics are usually radiolucent
- Always discuss and document possibility of retained foreign body

F. Irrigation

- Local anesthesia prior to irrigation
- Do not soak the wound
- Use normal saline
- Large syringe (60mL)
- Do not use iodine, chlorhexidine, peroxide or detergents



G. Debridement

- Remove foreign matter & devitalized tissue
- Create sharp wound edge
- Excision with elliptical shape
- Respect skin lines
- **Guidelines for wound debridement (Excision)**
- Traumatic wounds should be excised comprehensively and systematically and the following sequence should be followed in all cases:
 - Wash with a soapy solution and use brush if a lot of dirt and contamination found.
 - Prepare limb with an alcoholic chlorhexidine or betadine solution.
 - Debridement/excision is safely performed under tourniquet control.
 - Assess tissues from superficial to deep (skin, fat, muscle, bone) and from the periphery to the centre of the wound.
 - Non-viable skin, fat, muscle and bone is excised.
 - * Wound should be lavaged using copious amounts of normal saline. High pressure lavage is not recommended.

H. Wound Preparation –

i. Antibiotics

- Infections occur in ~3-5% of traumatic wounds seen in the ED
- Factors that increase risk
 - Heavily contaminated wound, especially with soil
 - Immuno-compromised patients
 - Diabetics
 - Human bites > animal bites
- Most important prevention
 - Adequate irrigation & debridement

ii. Tetanus Prophylactic

- Clean wounds
 - Incomplete immunization → toxoid
 - >10 years, then give toxoid
- Tetanus prone wound
 - Incomplete immunization

- Toxoid & immune globulin
- > 5 years, give toxoid

G. Wound Closure

- Primary closure
 - Suture, staple, adhesive, or tape
 - Performed on recently sustained lacerations: <12 hours generally and <24 hours on face
- Secondary Intention
 - Secondary intent
 - Allowed to granulate
- Tertiary closure
 - Delayed primary closure (observed for 4-5 days)

Signs of Infection

- Continuous oozing
- Soakage
- Wound gaping(dehiscence)
- Inflammation, redness, warm,
- Discharge of sero-sanguineous fluid, pus or discharging sinus
- Elevation of temperature
- High count of blood cells
- Appearance of slough, skin necrosis
- Protrusion of internal organs (evisceration)
- Exposed implants
- **SIGNS OF COMPROMIZED NEUROVASCULAR STATUS:**
 - Excessive pain,
 - Impairment of skin colour (pallor),
 - Impairment of circulation (pulselessness),
 - Abnormal sensation(paresthesia and paralysis)

KEY TO REMEMBER:

Always check and record neurovascular status of distal parts of the wound

Necrosis and Gangrene



Preservation of amputated parts

- Cover with sterile gauze
- Moist with saline
- Put into sterile plastic bag



Figure 11.
Case report 3 of male patient. Original injury.

Transport time to deliver amputated part

- A non-cooled amputated part : within 6 hrs of injury
- Cooled part: not late than 18 to 20 hours

Complications –

Infection



i. Hand washing/ Use of Hand sanitizer



ii. Decontamination



iii. Cleaning



iv. HLD



v. Sterilization

A. Compartment Syndrome

- A condition resulting from increased pressure within a confined body space, especially of the leg or forearm.
- Compartment syndrome usually results from bleeding or swelling after an injury.



Figure 12. Clinical image of thigh compartment syndrome after fasciotomy

History Universal precautions for prevention of infection

- Hand washing
- Use of aseptic technique
- Use of PPEs
- Discard sharp objects in leak proof container
- Safe disposal of biohazards

FRACTURE AND DISLOCATION

SESSION 5	FRACTURE AND DISLOCATION
<p>Fracture and Dislocation</p> <ul style="list-style-type: none"> - Definition - Causes and types - Diagnosis - Management - Early and late complications - Early rehabilitation intervention and follow up 	<p>Terminal Objective At the end of the session, the participant will be able to describe the overall management of fracture and dislocation</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1) Describe types and causes of fractures and dislocation 2) Describe types of fracture and dislocation management : plaster cast, traction, functional braces, internal fixation, external fixation 3) List signs of early and late complications: nerve and vessel injuries, pulmonary embolism, infection, gangrene, multi-organ failure, non-union and mal-union, contractures, limb shortening 4) Provide safe mobilization with crutches and walkers for patients with lower limb injuries 5) Explain the importance of early physiotherapy treatment and follow up <p>Methodology Power point, Practical demonstration</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 1.5 hours</p> <p>Evaluation method Pre-test, Participant's participation and reaction, post-test</p>

OVERVIEW:

Open fractures represent complex wounds involving soft tissue and bone. In the setting of a disaster scenario, the majority of patients with open fractures will be presenting late, with severely contaminated wounds, and often times, other injuries. Avoiding complication of the open fracture takes highest priority (sometimes at the expense of rapid mobilization)—especially important to consider in the setting when severe wounds may be treated by the non-specialist surgeon, nurse, or physiotherapist during a disaster scenario.

4.2 TREATMENT PRIORITY:

Priority for treatment of the open fracture depends on meeting standards of basic wound and fracture care revolving around four principles:

- *Adequate wound debridement*
- *Achieving soft tissue cover*
- *Achieving satisfactory bone healing*
- *Restoring function for the patient*
- *Appropriate pre-operative counseling, consent and multi-disciplinary care for each patient whenever possible*

4.3 PRINCIPLES OF MANAGEMENT:

Treatment begins with principles of good wound management:

- *Emphasize use of liberal wash and scrub with clean water and soap!*
- *Adequate wound excision/debridement with removal of dead and nonviable tissue, contaminated debris, foreign body*
- *Adequate wound drainage—most often achieved with bulky, absorbent dressing (and supported with a back-slab in most cases)*
- *Hemostasis*
- *Avoid unnecessary dressing changes*
- *Delayed Primary Closure at 4-5 days (otherwise skin graft/flap as needed)*
- *Initial fracture stabilization until healing of soft tissue—most often back-slab*

- *Definitive immobilization/stabilization (most often with POP; traction or external fixation is selected cases) to achieve acceptable configuration and healing of bone*
- *Tetanus prophylaxis, antibiotic coverage, analgesia*
- *Adequate/supplemented nutrition*
- *Nursing and Physiotherapy for early patient mobilization, maintain joint motion, maintain strength, return to optimal function*

4.4 OPEN FRACTURES - PRINCIPLES

4.4.1 DIAGNOSTIC CONSIDERATIONS:

Remember that open fractures may be associated with other severe injury—including spinal injury. Examine the patient fully prior to initiating operative therapy.

- Complications (wound infection and osteomyelitis) from open fracture increase the longer the patient goes without adequate wound debridement (optimally performed within 6 hours of injury, although often not possible in the disaster scenario).
- ALWAYS assess distal extremity for vascular (color, pulses), motor, sensory function
- X-ray is often not needed for initial treatment of open fracture, particularly if the wound is large and bone fragments can be visualized during OT. Remember—treat the wound and not the X-ray!
 - X-rays are an aid to precise diagnosis of fracture, but not indispensable for provision of good surgery, wound care and treatment

4.4.2 MANAGEMENT:

A. Outpatient Department/Accident Ward

- A-B-C-D-E followed by complete secondary exam with removal of clothing and exam of back (spinal precautions if indicated)
- Hydration or Fluid Resuscitation—Start IV infusion (RL or NS)
 - Hydrate all patients

- Treat for shock if indicated: 2 large IV lines, careful monitor of vital signs and urine output
- Start appropriate and available antibiotic regimen (4-5 days)
- Provide analgesia for pain
- Tetanus prophylaxis
- Apply bandage to injury (cover only the wound, not whole extremity)—AVOID: tourniquet or circumferential pressure dressing
 - Wash patient and prepare for OT—when stable

B. OPERATING THEATRE (1st)—WOUND DEBRIDEMENT

- Take down dressing and Wash and scrub Wound with clean water and soap—Prep and Drape
- Wound toilet, debridement and irrigation
 - All wounds should go to OT for treatment
 - Debride all severely contaminate tissue, non-viable tissue, foreign body
 - Debride all non-viable tissue—even if it leaves bone exposed--as infected wound will not help fracture healing!
 - Remove free fragments of bone
 - Bone that is firmly attached by periosteum or muscle should remain in place
 - Leave vessel, nerve, tendon intact—but remove contamination or foreign body from them
 - Irrigate with 3 liters of NS or available solution using big syringe with cannula (or pulse lavage, if available)
- Apply bulky, absorbent dressing
 - One layer of gauze over exposed soft tissue
 - 10 cm thick layer of “fluffy gauze” place over exposed wound (CAUTION—do not pack wound—need to allow for drainage)
 - Loosely applied crepe bandage.

- Stabilize fracture
 - Back-slab most often achieves adequate stabilization for initial treatment
 - Well-fitted and padded splint as an alternative when lacking resources
 - Consider traction for large wounds or for fractures in which distal pulse is lost when traction (hand held) is released (rare)
 - External fixation may be indicated in rare circumstances for vascular injury (viability of extremity is unlikely if prolonged time since insult) or extremely complex and large wounds that will require prolonged therapy to achieve soft tissue closure. Generally there is not a need to apply the External Fixation during initial surgery, and as well, the device and clinical expertise needed to utilize may not be available in early disaster stages.
 - Internal fixation of fractures is discouraged in the disaster scenario characterized by injuries demonstrating severe contamination—often with a “crush component”, delayed wound care, and limited resources and ability to provide a surgical atmosphere that meets AO standards.

C. WARD

A. Post-operative Ward

- Standard post-operative vital signs and care
- Check distal extremity for warmth, color, pulses, movement, sensibility

II. General Ward

- Continue vital sign check and care per routine
- Continue to check of distal extremity for warmth, color, pulses, movement, sensibility
- Check Hb if needed
- Continue antibiotics and analgesia
- Provide good chest physiotherapy
- Wound is left untouched until Delayed Primary Closure at 4-5 days

- In case of oozing—overdress wound
 - If suspect vigorous, active bleeding—consult surgeon
- In case of sign of infection (high fever, increasing pain, proximal swelling/redness)—inform surgeon who will determine if patient needs to return to OT for inspection and dressing change
- Consider high protein diet, vitamins, iron—as available
- Elevation: pillow or bed blocks (foot of bed)
- Assist with frequent turning and monitor for pressure sore (especially in traction patient)
 - Apply padding AROUND the area of concern; using foam or water-filled exam glove

D. OPERATING THEATRE(2nd)—wound closure

- Ensure all tissue are clean and viable—if not, need to repeat debridement (above), and begin process again
- Delayed Primary Closure if wound clean and edges can be approximated.
- Consider skin graft or flap if wound clean, but soft tissue defect too large for DPC
 - Skin graft or flap does NOT need to be done immediately. If further expertise needed to achieve wound closure—consider referral options.

E. WARD

I. Post-operative Ward

- Post-operative vital signs (as above)
- Check distal extremity for warmth, color, pulses, movement, sensibility

II. General Ward

- Continue to check vital signs per routine
- Continue to check distal extremity for warmth, color, pulses, movement, sensibility
- Dressing every 3 days until removal of sutures (10-14 days)
- Close POP when soft tissue has healed
- Continue analgesia

- Assist with frequent turning and monitor for pressure sore (especially in traction patient)
- Physiotherapy: Goal= general mobilization and restoration of limb function
 - Phase I—gentle movement of un-involved joints proximal and distal to immobilized segment
 - Phase II—Mobilize and/or exercise in bed (for patients confined to “bed rest”) maintain range of motion and muscle strength
 - Phase III—Retrieval of limb function: early mobilization, sitting, standing when appropriate, walking (with or without weight bearing)
 - Begin in earnest when wound healed and bone adequately stabilized
 - Through PT and early mobilization, these complications are avoided: 1) DVT
 - 2) Contractures
 - 3) pressure sores
 - 4) chest infections

4.4.3 REFERRAL

- Most patients can be treated with adequate wound debridement, soft tissue closure, and bony stabilization with POP (sometimes with window)
- Patients requiring External Fixation because of large and complex soft tissue defect may need referral. NOTE: External Fixation is treatment strategy for obtaining soft tissue closure. Once this has been achieved, most patients should have removal of Fixator and POP applied. Often times pin traction is a more reasonable option for these patients—particularly in a setting in which there is a limitation of resources and technical expertise.
 - Trans-tibial pin traction for open (or closed) femur fracture
 - Pin (no. 5) or K-wire (max. 2.5mm) place below apophysis—approximately 10% body weight of traction applied. Elevate foot of bed on blocks.
 - Begin early quadriceps motion IF skilled physio available (“Perkins traction”)
 - Gallows traction (infants)

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- Skin Traction (children—maximum 3kg traction applied)
- Internal Fixation is generally NOT indicated in setting of large-scale disaster and the associated factors present for most injuries.

BANDAGING/ SPLINTING/ PLASTERING

- Mainstay of treatment for most fractures
- Joint above and a joint below
- Avoid pressure points
 - Excessive molding
 - Cast indentations
- Appropriate padding
 - More at bony prominence
 - Not too much at fracture site
- Consider skin wounds

SPLINTING

Purpose

- Reduce pain
- Reduce bleeding and swelling
- Prevent further soft tissue damage
- Prevent vascular constriction

What to splint

- Fracture
- Dislocation
- Tendon rupture
- Forearm and wrist
 - Ulnar gutter - Metacarpal
 - Thumb spica - Scaphoid
- Ankle
 - Posterior splint
 - “L and U” or Sugartong



SUPPLIES

- Stockinette
- Padding material- Cotton
- Cast material
 - Plaster: cheaper, long shelf life, easier to work with
 - May be fragile, disintegrate in water
 - Fiberglass: more durable, lighter, dry quicker, multiple colors, water tolerant
 - Newer synthetic materials

PROCEDURE

- Apply stockinette
 - Protect skin and provide smooth edge
- Apply padding
 - Protect bony prominence
 - Allows for swelling
- Wet the casting material
 - Hot water hardens faster
 - Squeeze out excess water

- Apply splint or cast

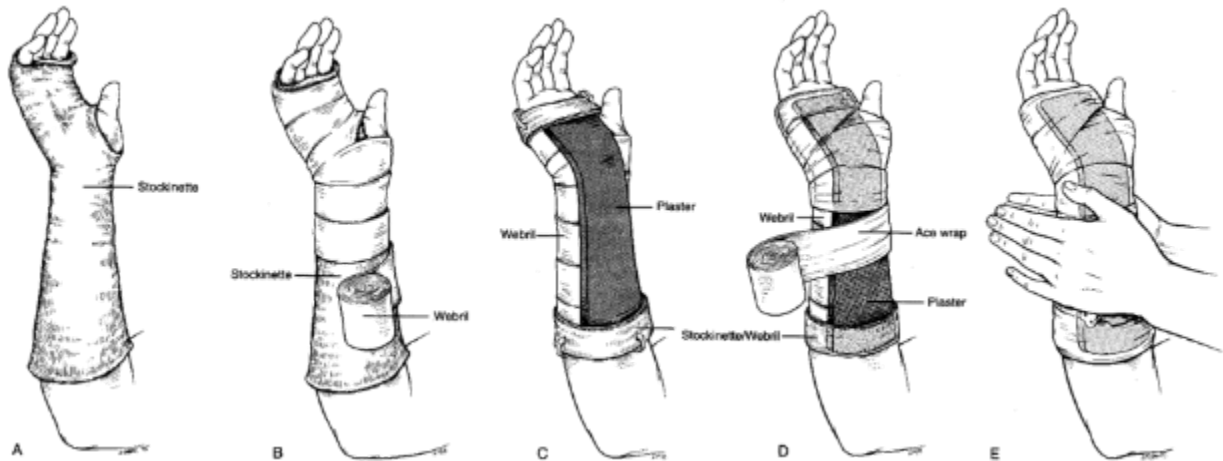


POSITION TO APPLY BANDAGE/ STOCKINETTE

INDICATIONS FOR SPLINTING

- Fractures
- Sprains
- Joint infections
- Tenosynovitis
- Acute arthritis / gout
- Lacerations over joints
- Puncture wounds and animal bites of the hands or feet

APPLICATION OF SPLINTS



1. Stockinette applied to extend abt 2 - 3 inches beyond plaster.
2. 2-3 layers of Webril are applied and smoothed.
3. Plaster applied and stockinette rolled over plaster edge.
4. Bandage applied over plaster.
5. Plaster molded as it dries.

Specific Splints

Upper Extremity

- **Elbow/Forearm**
 - Long Arm Posterior
 - Double Sugar - Tong
- **Forearm/Wrist**
 - Volar Forearm / Cockup
 - Sugar - Tong
- **Hand/Fingers**
 - Ulnar Gutter
 - Radial Gutter
 - Thumb Spica
 - Finger Splints

Lower Extremity

- **Knee**
 - Knee Immobilizer / Bledsoe
 - Bulky Jones
 - Posterior Knee Splint
- **Ankle**
 - Posterior Ankle
 - Stirrup

PATIENT EDUCATION

- Keep injured limb elevated and iced
 - Numb extremity
 - Inability to move extremity
 - Discoloration, Cold
 - Increased pain
- Avoid getting wet
 - Completely with plaster
 - May use hair dryer on cool setting if fiberglass



COMPLICATIONS OF SPLINTING/ BANDAGING

1. Burns
 - Thermal injury as plaster dries
 - Hot water, Increased number of layers, extra fast-drying, poor padding - all increase risk
 - If significant pain - remove splint to cool
2. Ischemia
 - Reduced risk compared to casting but still a possibility
 - Do not apply padding and bandage tightly

- Instruct to ice and elevate extremity
- Close follow up if high risk for swelling, ischemia.
- When in doubt, cut it off and look
- Remember - pulses lost late.

3. Pressure sores

- Smooth padding and plaster well

4. Infection

- Clean, debride and dress all wounds before splint application
- Recheck if significant wound or increasing pain

5. **Any complaints of worsening pain - Take the splint off and look!**

- COMPARTMENT SYNDROME – As described in POLY TRAUMA and Wound CARE

4.4.4 PATIENT INSTRUCTIONS

- Patient should be encouraged to be active participant in rehabilitation
- Patient should be supported emotionally during the difficult time

AMPUTATION

<i>Session</i>	<i>Amputation</i>
<p>Amputation</p> <ul style="list-style-type: none"> - Causes and types of amputation - Management of amputation: <ul style="list-style-type: none"> • Post-surgery wound care • Stump care and prevention of complications • Early ambulation • Prosthetic care\; pre-fitting , fitting, gait training 	<p>Terminal Objective At the end of the session, the participant will know the main principles of management of amputation and prevention of its complications</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1) list post-operative care principles for patients with amputation: wound management, positioning, early mobilization 2) Perform stump bandaging and safe mobilization 3) describe the rehabilitation process with prosthesis for information and referral <p>Methodology Power point, Video, Practical demonstration, group discussion, Pictures</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 1.5 hours</p> <p>Evaluation method Pre-test, Participant’s participation and reaction, post-test</p>

1 OVERVIEW:

Patients may require amputation of limb following earthquake due to partial or complete traumatic amputation from the event, or because of severe crush injury. Wounds will likely be severely contaminated or demonstrate frank infection. Particularly with regard to crush injury, there may be different severity of tissue damage at different levels—depending on mechanism of injury, and type of tissue involved (different tissue type—skin, fat, muscle, nerve, bone—has different susceptibility to crush injury). Compartment syndrome must be considered and evaluated in all cases.

3.2 APPROACH/PRIORITY:

1. Determine extent of injury and need for amputation, including severity of injury to nerve, vessel, bone, muscle, skin. During surgery examine for tissue color, bleeding, and muscle contraction.
2. Endeavour to avoid amputation if fracture or bone loss is treatable and soft tissue can be rendered clean, vascularized, and sensate.
3. Indication for Amputation
 - i. *In order to save the life of the patient*
 - ii. *Clear evidence of nonviable (“dead”) extremity—no pulse, no bleeding, no sensation. Consult experienced surgeon if in any doubt.*
4. In case of needed amputation, consider the following principles (given likelihood of late treatment, severely contaminated or infected tissue, and questions of viability):
 - i. *Thorough wound toilet including adequate debridement of ALL non-viable and severely contaminated tissue and foreign body followed by irrigation and rinsing of bone and soft tissue.*
 - ii. *Plan for Delayed Primary Closure (leave adequate soft tissue envelope for coverage), avoiding unnecessary dressing changes.*
 - iii. *Leave stump that is acceptable for fitting prosthesis.*
 - iv. *Adequate antibiotic, tetanus, and analgesia coverage.*

v. *Early mobilization and physiotherapy.*

5. Appropriate pre-operative counseling, consent, and multi-disciplinary approach are goals for each patient whenever possible.

3.3 TRAUMATIC AMPUTATION—Principles of Management

3.3.1 DIAGNOSTIC CONSIDERATIONS:

The goal is to preserve extremity function for those that are amenable to repair while at the same time seek to minimize surgical interventions (and drain on limited resources) during the disaster scenario.

- 1) Recognize patients who can have limb salvage rather than amputation by considering those with adequate bone that can be repaired along with viable soft tissue coverage. Seek senior-level advice if available. Evaluate for (NISSA criteria):
 - a. Distal vascularity-sensibility-motor function (vascular and neurologic status)
 - b. Bone injury/loss
 - c. Soft tissue injury
 - d. Obtain X-ray only if the result will change the treatment plan
- 2) For those requiring amputation--do it in a manner that minimizes surgical interventions and dressing changes—strive for Adequate Debridement and fashioning of skin and muscle flaps/coverage, followed by Delayed Primary Closure of stump of adequate length.

3.3.2 MANAGEMENT

A. OUTPATIENT/ACCIDENT WARD

- A-B-C-D-E along with resuscitation, then secondary survey
- Hydration or Fluid Resuscitation—Start IV infusion (RL or NS)
 - Hydrate patient as needed

- Treat for shock if needed: 2 large bore IV lines, monitor vital signs, urine output
- Start appropriate, available antibiotic regimen
- Provide analgesia for pain
- Tetanus prophylaxis
- Apply bandage to injury (cover only the wound, not whole extremity)
 - Wash patient and prepare for OT—when stable

B. OPERATING THEATRE — Patients Requiring Amputation

I. General Principles:

Resect dead, severely damaged and contaminated soft tissue and then plan bone resection as distal as possible that will allow for adequate soft tissue coverage at time of Delayed Primary Closure (DPC). This is achieved by:

- Raising healthy skin/fascia layer—as determined by the pattern of the injury
- Develop muscle layer for stump coverage--use intact muscle bundle when possible, to avoid transection of muscle and subsequent more severe edema
- Section of bone proximal to muscle such that soft tissues can be easily approximated at the end of primary operation in order to avoid need for further bone shortening at time of DPC

II. Operative Approach

- Definitive Amputation for Delayed Primary Closure (Recommended Approach): In cases where expertise exists, definitive amputation which includes debridement of contaminated and non-viable tissue, leaving the wound open for Delayed Primary Closure to achieve soft tissue coverage (muscle and skin) of the stump. (see below)
- Guillotine Amputation: may be preferable for the untrained operator outside a formal surgical environment, while recognizing:
 - Dead muscle may be missed because of compartmental nature and uneven distribution of tissue necrosis

- Transection of thick muscle layer (calf or thigh) may have extreme swelling preventing closure without use of skin graft or significant shortening at time of revision
- Subsequent revision often requires further blood loss and shortening--resulting in amputation level that is higher than necessary.
- Compromise approach: to perform the amputation as distal as possible, through viable tissue (and with techniques similar to normal or elective surgery, leaving the stump open. This technique may require revision/shortening of the stump at time of Delayed Primary Closure if soft tissue edema prevents tension free coverage.

III. Operative Technique

Definitive amputation for Delayed Primary Closure

- Apply (pneumatic—if available) tourniquet; Wash and scrub Wound with clean water and soap, Prep and Drape
- Create skin and muscle layers/flaps
 - Try and provide for muscle layer that includes entire muscle belly (in order to decrease edema) rather than transected muscle belly
 - Gastrocnemius muscle(or Soleus muscle for long stump) for BKA
 - Vastus Medialis (medial muscle compartment) for AKA
 - **REMEMBER:** Post-operative edema of skin and muscle will lead to shortening of soft tissues at time of DPC—keep soft tissue layers/flaps long (at least 8-10 cm longer than length needed for soft tissue approximation at time of DBR surgery) to allow for muscle and skin edema at time of DPC
- Transect bone—do not strip periosteum proximal to level of bone transection. Shape and smooth bone end as needed
 - BKA—Try to preserve at least 10-15 cm distal to tibial tuberosity (minimum for prosthesis is 4 cm)
 - Transect fibula 3-4 cm proximal to level of tibia transection
 - AKA—10 cm above femoral condyles

- Upper extremity—keep stump as long as possible that allows for adequate soft tissue coverage
- Division of nerve and vessels
 - Double ligate arteries 1 cm proximal to stump site
 - Gentle traction and sharp division of nerves (to allow them to retract well above stump site)

Note: sciatic nerve should be ligated because of large vessels that run within it

- Irrigate profusely (2-3 liter of saline or available solution of choice)
- Deflate/remove tourniquet and examine for tissue viability. Obtain hemostasis. Minimize use of cautery. Do not use bone wax.
- Apply dressing
 - One layer of gauze over exposed soft tissue
 - 10 cm thick layer of “fluffy gauze” place over exposed wound (CAUTION—do not pack wound—need to allow for drainage)
 - Loosely applied crepe bandage in “Figure of 8” pattern.

C. WARD

a) Post-operative Ward

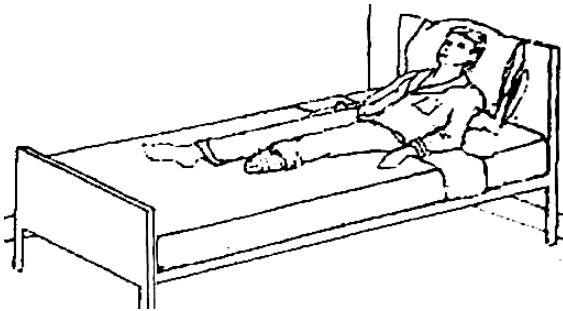
- Post-operative: standard post-op vital signs per standard

b) General Ward

- Monitor vital signs per standard
- Check Hb if needed
- Continue antibiotics and analgesia
- Chest physiotherapy
- Wound is left untouched until Delayed Primary Closure at 4-5 days
 - In case of oozing—overdress wound
 - If suspect significant active bleeding—consult surgeon

- In case of sign of infection (high fever, increasing pain, proximal swelling/redness)—inform surgeon who will determine if patient needs to return to OT for inspection and dressing change
- Consider high protein diet, vitamins, iron—as available
- Assist with turning and check for pressure sores
 - Treat areas of concern with extra padding AROUND the area of concern.
 - Foam pad or exam glove filled with water may be used for padding
- Stump elevation for 48 hours (traction frame or bed blocks): patient may sit-- with stump above hip level if appropriate chair available
 - Physiotherapy
 - BKA--gentle knee extension with isometric contraction of quadriceps—do not disturb dressing or strain stump. Gentle hip extension.
 - AKA—gentle hip extension—do not disturb dressing or strain stump

Position to recommend (for BKA amputation)



*Lying on the back with the knee in
Complete extension*



Sitting with the knee in extension

Position to recommend (for AKA amputation)



Lying on the belly with a pillow under the thigh

***Position to prevent!! (Never use pillows under the thigh for AK
or Under the knee for BK)***

c) **OPERATING THEATRE--DPC**

- Delayed Primary Closure (DPC) day 4-5
 - Ensure all tissue are clean and viable—if not, need to repeat debridement (above), and begin process again
 - Closure of myoplastic flap over bone stump using absorbable suture
 - Closure of skin/fascia layer—interrupted, “everting” suture line
 - Use drain ONLY in case of dead space

d) **WARD**

I. **Post-operative Ward**

- Monitor vital signs per post-operative standard

II. **General Ward**

- Continue to monitor vital signs per standard
- First Dressing after 3 days
- Stump elevation until first dressing, then increasingly mobilize
- Second dressing after 3 more days, then as needed
- Removal of suture 14-20 days
- Physiotherapy

- Assist with turning and monitor for pressure sores
- Continue Range of Motion of knee and hip
- Positioning to prevent contracture; Range of Motion and strengthening exercises
- Begin stump shaping after second dressing change—elastic bandage
- Increasingly mobilize patient—vigorous exercise of limb after one week
 - Crutch walking as soon as possible
- Evaluate(typically) for prosthesis 12-15 weeks after DPC
 - Consider early evaluation for prosthesis or temporary prosthesis if personnel, expertise and needed materials are available

3.3.3 PATIENT INSTRUCTIONS

- Encourage active participation in care and physiotherapy
- Strive for early mobilization with crutches
- Introduce to others with amputation in order to set expectations and support psycho-social recovery and cultural re-integration
- Support physical, mental and social rehabilitation

(Kindly refer to IEC on Amputation Care)

TRAUMATIC HEAD/ BRAIN INJURY

SESSION 7	TRAUMATIC HEAD/ BRAIN INJURY
<p>Head Injury / Traumatic Brain Injury</p> <ul style="list-style-type: none"> - Clinical evaluation, Glasgow coma scale - Classification of head injuries - Management : diagnostic considerations, prevention of further neurological injury - Prevention of complications for bedridden patients - Criteria for referral , including rehabilitation and follow up 	<p>Terminal Objective At the end of the session, the participant will be able to describe the overall management of head injury</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 6. describe elements of clinical evaluation of head injury (Glasgow coma scale) 7. Describe main principles of management of head injury 8. List main complications for bedridden patients: respiratory tract infections, pressure sores, contractures , cognitive and communication problems 9. Describe the main principles of rehabilitation both for acute care and long-term care <p>Methodology Power point, Practical demonstration, group discussion, Videos</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 2 hours</p> <p>Evaluation method Pre-test, Participant’s participation and reaction, post-test</p>

1. Definition

Head injury also referred to as traumatic brain injury (TBI), is a broad term that describes a vast array of injuries that occur to the scalp, skull, brain, and underlying tissue and blood vessels in the head. It is a non-degenerative, non-congenital insult to the brain from an external mechanical force resulting in cognitive, emotional, sensory, and motor impairments which can lead to a variety of temporary or permanent disabilities. The number and extent of impairments vary tremendously with the severity of injury. Head Injury is one of the most common causes of disability and death worldwide. Also, it is one of the most misdiagnosed, misunderstood and underfunded public health problems meriting it to be called a ‘silent epidemic’.

2. Criteria for Admission or Observation

- Impaired level of consciousness
- Skull fracture
- Positive neurological symptoms or signs
- Difficulty in assessing the patient (for example alcohol, epilepsy, significant medical problems e.g. anticoagulant use)
- Other sources of concern (for example other injuries, shock, meningism, CSF leak)
- Continuing worrying signs (for example persistent vomiting, severe headaches)
- Lack of guardian to supervise at home

3. Clinical Evaluation Neurologically

Direct	Indirect
Unconsciousness	CSF otorrhea/rhinorrhea
Seizure	Persistent or severe headache
Neurological deficit	Repeated vomiting
Major scalp wound	Panda sign/ Raccoon’s eyes

II. Diagnostic points to consider include -

- a. Subtle – h/o amnesia or LOC, irrelevant talks especially elderly.
- b. Vomiting - 2 episodes in adults

III. Grade severity of injury based on GCS

Mild - GCS 13-15

Moderate – GCS 9-12

Severe - GCS 3-8

Since the level of consciousness in head-injured patients is dynamic, the exact circumstances and the time of examination have to be taken into account. Also, over time, trend is more important than an absolute value.

IV. Classify Head Injury

- Scalp lacerations
- Fractures

- Closed
- Overlying skin intact
- Open
 - Discontinuity of the skin overlying a skull fracture often with dural laceration.
 - Indirect open, e.g. small fractures of the frontal sinus or skull base fractures (only possible to diagnose after CT head).
- Subdural/epidural hematomas, contusions

IV. Imaging

It may be difficult to obtain in disaster scenario. X-ray skull has no value in the evaluation of head injured patient. However, C-spine should be evaluated radiologically as up to 15% patients with head injury have associated C-spine injury and if missed have a disastrous consequences. CT scan of head with brain and bone sequence has a very high sensitivity and specificity and should be obtained in all moderate to severe head injured patients if available. CT is not recommend if patient is alert and has no history of loss of conscious or antegrade amnesia. Many hospitals have their own protocols for obtaining CT scan in suspected head injury.

Also refer to the respective hospital for guidelines. Generally agreed upon indications on obtaining a CT scan in patient with head injury are as follows:

- a) GCS less than 13 on initial assessment in the emergency department.
- b) GCS less than 15 at 2 hours after the injury on assessment in the emergency department. c) Suspected open or depressed skull fracture.
- d) Any sign of basal skull fracture (hemotympanum, 'panda' eyes, cerebrospinal fluid leakage from the ear or nose, Battle's sign).
- e) Post-traumatic seizure.
- f) Focal neurological deficit.
- g) More than one episode of vomiting.
- h) Amnesia for events more than 30 minutes before impact.

V. Lab tests

Labs-Hb, coagulation studies, Na+ K+, glucose, Blood grouping and X-match.

4. DEFINITIVE MANAGEMENT

Early identification and treatment of injury and skilled nursing and physiotherapy are key to successful outcome.

A) ACUTE CARE

- Assess patients with ABCDE approach; secondary exam with removal of clothes.
- Prevent and treat hypoxia. Several large studies have shown it to be an independent risk factor for poor outcome.
- Prevent and treat hypotension and hypovolemia. IV infusion with RL or NS Avoid 5% D.
- Monitor respiratory and cardiac status especially in the elderly.

Note: Ensure hypotension not caused by missed chest, abdominal or extremity injuries.

- Keep patient NPO unless abdominal injuries ruled out or patient unconscious. Consider NG tube; or orogastric tube in suspected anterior skull base fracture.
- Catheterize bladder and begin bladder care. g) Give antiulcer prophylaxis.
- Anticonvulsants- Phenytoin is the drug of choice. Load (15 mg/kg for adults and 18 mg/kg for children IV over half an hour) and maintain (5 mg/kg/day) if patient has history of seizure or if patient has mass lesions on CT even if no seizure.
- Mannitol. Patients with moderate to severe HI- start mannitol 1g/kg bolus pending investigation/transfer. Option- continue as a maintenance dose (0.25 to 0.5 gm/kg every 6-8 hourly) if no surgically 'evacuatable' lesions and GCS low. Almost never give mannitol to a patient with a GCS of 15/15.
- Steroids not indicated. It is harmful.

B) PREVENT FURTHER INJURY

a) Patient position

30° head up in neutral position (figure 3). This results in an improvement of cerebrovenous return and ICP while CPP and cerebral oxygenation remain constant. Remove potentially constricting clothes at the neck level. Change position in unconscious patient every two hours maintaining the same level.



Figure 3: Proper 30 degree head up position

b) Temperature Control

Hyperthermia aggravates brain injury by increasing energy metabolism and demand. Therefore hyperthermia ought to be treated aggressively in all patients with cerebral lesions. Fever caused by infections has to be treated promptly (physical, pharmacological, and causal treatment, i.e. antibiotics). The most common nosocomial infection in neurosurgical critical care patients is pneumonia. Traditional methods of fever treatment such as cooling blankets are not that effective. Empiric, calculated or targeted antibiotic treatment is indicated based on the degree of suspicion or proof of infection.

c) Normoglycemia and Nutritional Balance

Hyperglycemia is associated with significantly worse clinical outcomes. Consequently, normoglycemia is the goal in all neurologically critical patients. If necessary, insulin is administered to maintain serum glucose at 100–200 mg/dl. Nutritional balance has to be kept in order to respond to the altered requirements of post-injury metabolism.

d) Sodium and Hemoglobin Balance

Since both hypo- and hypernatremia increase the risk of edematous brain swelling, prevention or cautious normalization needs to be undertaken. Similarly, hemoglobin concentrations should be maintained above 10 g/dl in all severe HI patients to ensure adequate tissue oxygenation.

e) Coagulation Status

Bleeding and hypocoagulable states are not infrequent seen in HI and may contribute to enlarging hemorrhagic contusions as well as traumatic intracerebral hematomas. Hence, monitoring and stabilization of coagulation parameters are of paramount objectives.

f) Sedation/Analgesia

Adequate analgosedation is necessary to avoid stress, pain and fear. Sedation also efficiently reduces cerebral metabolism, cerebral blood volume, and therefore supports ICP treatment. On the other hand, the need for neurological assessments requires to minimize sedation as much as possible. Commonly, a combination of a benzodiazepine (e.g. midazolam 0.09 mg/ kg/h) and an opioid (e.g. fentanyl 1.2 mcg/kg/h) is used. Individual variations exist and increased ICP eventually makes a higher sedation level desirable. Careful and gentle restraining is justified in agitated patients provided the cause of agitation is simultaneously addressed. Avoid restraining on fingers, for it may damage the phalanges (redness, abrasions, loss of blood circulation & dislocation, even fractures of phalanx). Therefore apply padded bandage on wrist and have the patients wear mitts



(figure 4). (A): Wrapping the patient hand with mitts, (B): Correct way to restrain the hand

C) PREVENT COMPLICATIONS OF NEUROLOGICAL INJURY (LONG TERM CARE):

Goals = no bedsores, no contractures, no pneumonia, no UTIs, no cognitive deterioration

(Communication, awareness, orientation)

a) Respiratory

- i. Prevent atelectasis/pneumonia- cough and deep breath in conscious patients. Chest physio in obtunded patients
- ii. Maintain O₂ sat > 90%.
- iii. Monitor for DVT/ PE- check baseline calf circumference and monitor daily.

b) Skin- prevent pressure sore

- i. Position change every 2 hours. Involve family members too.
- ii. Examine daily for evidence of pressure sore: sacrum, iliac crest, hips, sides of knees, malleoli, occipital region of head, penis (if using condom catheter).
- iii. Note: Redness, blisters and ulcer. In case of skin damage, avoid pressure to the area. Place padding around the area of concern.

c) Bladder

- i. Avoid bladder distension- increases ICP.
- ii. Strictly monitor fluid intake and output.

d) Bowel- be alert for fecal impaction

- i. Laxative daily
- ii. High residue diet
- iii. Enema or dis-impaction if necessary.

e) **Osteo-muscular system** – to prevent contractures and preserve muscular strength

- i. Begin gentle range of motion exercise in all paralyzed and normal limbs.
- ii. Active strength exercise in conscious patients

f) Cognitive and communicative skill

Start as soon as the patient is able to participate in an aphasic or dysphasic patient.

D) SPECIFIC FRACTURE/HEMATOMA MANAGEMENT

In all likelihood, in a large scale disaster scenario, access to specialty diagnostic, clinical and nursing resources may not be available. Generally, major neurosurgical undertaking should not be undertaken unless considered life saving- such as unilateral pupillary dilatation with contralateral hemiparesis/plegia.

- **THOSE THAT CAN BE EFFECTIVELY CARRIED OUT BY NON SPECIALISTS:**

Scalp lacerations

- Closure of wound in 2 layers with adequate debridement.

Skull fractures

- Closed- no surgery.
- Open- undisplaced - repair scalp laceration only

- **THOSE THAT NEED SPECIALISTS' HELP:**

Skull fractures

- Depressed- debridement of wound, removal of bone pieces, repair of dura and scalp.

Epidural/ Subdural hematomas

- Craniotomy/craniectomy and removal of clot. Often needs specialist's help.

Ventriculostomy

- In cases of acute hydrocephalus due to intraventricular hemorrhage.

Massive hemispheric swelling

- Decompressive craniectomy. Only in select cases. ICU and ventilator support is required.

CRITERIA FOR DISCHARGE FROM THE HOSPITAL

Goal of any successful treatment is to send patient home with a very low risk of deterioration further. No full proof criteria exist as of yet. In general no patients presenting with head injury should be discharged until they have achieved GCS equal to 15, or normal consciousness in infants and young children.

- a) Discharge of low risk patients with GCS equal to 15

When the CT is negative for acute pathology or the CT was not indicated initially based on history and physical examination, and if the patient is neurologically intact with a normal mental status for at least 24 hours, discharge

home has been established as a safe policy as long as no other factors that would warrant a hospital admission are present (for example, drug or alcohol intoxication, other injuries, shock, suspected non-accidental injury, meningism, cerebrospinal fluid leak) and there are appropriate support structures for subsequent care (for example, competent supervision) at home.

b) Discharge of patients with GCS <15

Patients admitted after a head injury may be discharged if the intracranial pathology has been taken care of; if there is improvement of GCS to 15; and if there is resolution of all significant symptoms and signs of head injury provided they have suitable care takers at home.

c) All patients deemed safe for discharged should be sent home with written and verbal instructions as to when to report to a healthcare facility. These include:

- Severe headache
- Confusion
- Increasing sleepiness or difficulty waking
- Seizure
- Repeated vomiting
- Walking off balance
- Change in vision or double vision
- Weakness of an arm or leg

In addition, IEC materials developed on complications of Head Injury should be given to the patients with clear instructions on how to take care of the patient by him/herself to avoid further complications at home and by the family members as well before discharge.

Also, patients should be clearly instructed to refrain from taking alcohol, or recreational drugs and driving or operating machinery until full recovery.

D. REFERRAL

Transfer Vs treatment at makeshift facility

1. The majority of patients are best treated with conservative therapy and good nursing and physiotherapy care at local institution.
2. All salvageable patients with severe head injury (GCS score 8 /15 or less) should be transferred to, and treated in, a setting with 24-hour neurological ICU facility. Transfer of a child to a specialist neurosurgical unit should be undertaken by staff experienced in the transfer of ill children.
3. The multiply injured patient: consider the possibility of occult extracranial injuries, and do not transfer to a service unable to deal with other aspects of trauma.

4. Consultation on the best method of transfer for a patient should be done with referring health care professionals, transfer clinicians and the receiving neurosurgeon. It should take into account the clinical circumstances, skill of available staff, imaging, mode of transfer and timing issues.

5. Transfer only when benefits clearly outweigh the risk of transport. Make sure the referral mechanisms and capacity are clear. Transfer of patients purely on the purpose of imaging should be avoided.

6. Medical care during transfer:

- In all circumstances: complete initial resuscitation and stabilization of the patient and establish adequate monitoring before transfer to avoid complications during the journey.
- Patient persistently hypotensive despite resuscitation: do not transport until the cause of hypotension has been identified and the patient stabilized.

6. Once the acute care is over, patients with moderate to severe injuries often require rehabilitation services. Appropriate referral should be done to these places as far as possible.

E. PATIENT INSTRUCTIONS

- Information must be given to the family on potential impairment of emotional, behavioral, communication and motor skills; Moral supports for the patient care at all levels- treat them and their families with respect and compassion. Monitor and address mood- Many of these patients develop post head injury syndrome- a type of depression. Treat it if needed. Patient instructions should include psycho-social support and community & occupational integration.
- Support early teaching of activities of daily living and education of health and function maintenance to patient and family.

BURN INJURY

SESSION 8	BURN INJURY
<p>Burn Injury</p> <ul style="list-style-type: none"> - Types and severity of burns - First Aid/response to burn - Assessment : primary and secondary survey - Criteria to transfer to burn unit - Complications : prevention - Early and long term rehabilitation principles 	<p>Terminal Objective At the end of the session, the participant will be able to describe the overall management of burns and how to prevent its complications</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1. Describe types and severity of burns 2. List first aid principles 3. Describe the criteria of severity for transfer to tertiary level facilities: pediatric, electrical burns 4. Describe the complications and ways to prevent them in hospital and at home: dehydration, limb loss, wound infection, joint contracture, hypertrophic scar, PTSD 5. Perform simple bandaging and splinting in functional position to avoid joint contractures <p>Methodology Power point, Practical demonstration, group discussion,</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 2 hours</p> <p>Evaluation method Pre-test, Participant’s participation and reaction, post-test</p>

BURN FIRST AID: PRIMARY MANAGEMENT

- Immediate or within 3 hours
- Drop, Roll and cover the face
- Stop the burning process
- Cool the burn area (PLEASE DO NOT APPLY ICE PACKS or ICE WATER) for at least 30 minutes or more.

Do's

- ✓ Stop the burning process by removing clothing and irrigating the burns.
- ✓ Use cool running water to reduce the temperature of the burn (for more or equal to 30 minutes)
- ✓ Extinguish flames by allowing the patient to roll on the ground, or by applying a blanket, or by using water or other fire-extinguishing liquids.
- ✓ In chemical burns, remove or dilute the chemical agent by irrigating with large volumes of water.
- ✓ Wrap the patient in a clean cloth or sheet and transport to the nearest appropriate facility for medical care.

Don'ts

- x Do not start first aid before ensuring your own safety (switch off electrical current, wear gloves for chemicals etc.)
- x Do not apply paste, ice, oil, haldi (turmeric) or raw cotton to the burn.
- x Avoid prolonged cooling with water because it will lead to hypothermia.
- x Do not open blisters until topical antimicrobials can be applied.
- x Do not apply any material (cloths, blanket, contaminated hand, topical medications) directly to the wound as it might become infected.

PRIMARY MANAGEMENT: ACUTE MANAGEMENT

LOOK FOR:	ACT ON :
1. Airway : check patency to clear	C- spine stabilization
2. Breathing : Check breathing pattern	O ₂ maintenance
3. Circulation	I/V access and hemorrhage control
4. Disability	Prevention of the secondary injury
5. Exposure	Environmental control

- Hydrate the patient (preferably rice water, soup, ORS)/ Fluid resuscitation
- Give ample analgesics
- Send for needful investigations
- Ensure adequate nutrition

A) AIRWAY MAINTENANCE AND C-SPINE STABILIZATION:



C-spine stabilization and oxygen supply

- Airway is to be cleared of any foreign material and maintained with chin lift/ jaw thrust.
- C-spine stabilization is a must. Philadelphia collar can be used if available or sand bags can be used keeping them on the sides of the head.

B) BREATHING AND VENTILATION:

- Ensure adequate and equal chest expansion.
- Ventilation is to be ensured with bag and mask and if necessary with intubation or even tracheostomy.
- Supplemental oxygen
- Circumferential chest burns must be managed with escharotomy.

C) CIRCULATION:

- Look for pallor – occurs with > 30% blood loss
- Capillary refill time – normal return is 2 seconds
- More than 2 seconds = Hypovolaemia

D) DISABILITY: NEUROLOGICAL ASSESSMENT

- Glasgow Coma Scaling

A: alertness

V: vocal stimuli

P: response to painful stimuli

U: unresponsiveness

E) EXPOSURE:

- Removal of clothing and jewellery (esp. constricting objects like rings, bangles, watches, chain)
- Inspection of the front of the patient
- Log roll (P) – to inspect back of the patient
- Coverage of the burn area – to avoid evaporation from the wounds
- Keep the patient warm

3.1 FLUID RESUSCITATION:

a) FIRST 24 HOURS:

- Fluids should be administered via Two Large Cannulae (16 G at least in adults) preferably inserted through unburned skin.
- Area of the burn with the rule of “nine”.
- Fluids are given as per modified Parkland’s Formula.

Monitoring the adequacy of the fluid:

Urine output must be:

- Adults: 0.5-1.0ml/kg/hr
- Children: 1.0-1.5ml/kg/hr

NOTE: if urinary output is more than 2 ml / kg/ hour then suspect for **Pulmonary Edema**.

Not improving with initial resuscitation?

- Consider continued volume loss, myocardial depression, neurogenic shock

If urine output is not adequate (>30ml/hr), give extra fluid:

- Boluses of 10 ml/kg and/or increase the next hour’s fluids to 150% of planned volume.

In case of haemoglobinuria/myoglobinuria: RED URINE

- Increase urine output to 2ml/kg/hr
- Mannitol 12.5gm/litre resuscitation fluid: unless haemoglobin/ myoglobin urea will be cleared.
- Sodium bicarbonate (150 mEq/ L) infusion: is considered to alkalinize the urine and to reduce tubular pigment deposition.

A commonly used solution is:

- Normal Saline + Potassium Chloride (+ Dextrose for children)
- Before supplementing Potassium, urine output should be adequate.
- If blood loss present: replace with blood transfusion

3.5 REFERRAL / ADMISSION CRITERIA

Burns greater than 10% Total Body Surface area (TBSA)
Burns of Special Areas – Face, Hands, Feet, Genitalia, Perineum and Major Joints
Full thickness burns greater than 5% TBSA
Electric Burns
Chemical burns
Burns with an associated inhalation injury
Circumferential burns of chest or limbs
Burns at the extremes of age – children and the elderly
Burn injury in patients with pre-existing medical disorders which could complicate management, prolong recovery or affect mortality
Any burn patient with associated trauma

Admission Criteria

- Intubated patients
- Head and neck burns
- Burns >10% in children or >20%
- In adults
- Burns with associated inhalation
- Burns with significant comorbidities E.g.: trauma
- Electrical/chemical injury
- Significant pre-existing medical disorder
- Circumferential to limbs or chest compromising circulation or respiration

4. SECONDARY MANAGEMENT:

A) PRE-OPERATIVE CARE:

- Monitor vital signs on hourly basis.
- Once the patient is stable enough following things should be carried out

a) HISTORY:

A – Allergies

M – Medications

P – Past illness

L – Last meal

E – Events / Environment during accident

b) MECHANISM OF INJURY

Elaborate history must be taken from patient or patient party including the following:

- Date and time of burn injury, date and time of first presentation.
- Source of injury (flame/electrical/chemical?) and length of contact time.
- Clothing worn.
- Any explosions/ fall / trauma?
- Any first aid measures received

c) HEAD TO TOE EXAMINATIONS:

Parts	Examination
Head	- Injuries over scalp
Face	- Injuries over eyes, ears, nose, mouth. CSF leakage over nose, ears, mouth - Odema of tongue and pharynx
Neck	- Cervical spine – any pain? - Circumferential burn? - Check x-ray – lateral view
Chest	- Front and back of the chest - Any fractures of ribs/clavicles/sternum? - Circumferential burn? - Soot cough/ altered voice?
Abdomen	- Any swelling/ bruises? - Examination of all quadrants
Perineal and rectal	- Any bleeding/ bruises from rectum/ vagina/ penis?
Limbs	- Open #/ contusions/ crepitus/ tenderness - Pain/ parasthesia/ pulselessness/ paralysis - Any circumferential burn?
Pelvis	- Stability/ external wounds?

NOTE: RE-EVALUATION IS TO BE DONE!!

d) ON ARRIVAL OF THE PATIENT AT EMERGENCY:

- **A-B-C-D-E** followed by complete secondary examination along with pain management and fluid resuscitation.
- **Rest and evacuation position**
 - Help the conscious Patient to find the most comfortable position.

- **Preparation**

- Explain to the Patient what you are doing and make him comfortable.

- **Clean the burn**

- Wash the burn gently with plenty of clean water (running cold water if available) for at least 30mins or more if burn is within 3 hours.

- **Protect the burn**

- Cover the burn with a clean dressing (sterile compress or Vaseline, Gauze if available) or use an appropriate local treatment (e.g. banana leaves) or simply cover the areas with clean plastic.
- Be gentle: a burn can be very painful.
- Consider wrapping the burn wound with the clean and if possible transparent to translucent plastic material during shifting of the patient so that there can be clear and easy assessment of the burn wound at the time of inspection and examination.
- Apply a bandage to keep the dressing in place.

- **Hydrate the Patient**

- Give plenty of fluids to drink (prefer rice water, soup, ORS).

- **Keep the Patient warm**

- Wrap the casualty in blankets or sheets.

- **If a hand or foot is burnt**

- After cleaning the burn, put the hand or foot in a clean plastic bag (using it as a glove or a sock).
- Fix loosely around the wrist or ankle.
- Encourage the casualty to move his fingers or toes.

- **If the burn is circumferential**

- Do not roll the bandage around the limb as it may increase the constriction.

e) WOUND CARE AND DRESSING:

- Proper aseptic procedure should be used with needful analgesia (Details in Annex)

f) RESPIRATORY CARE:

Goals: Prevent pneumonia, atelectasis, and other lung infections.

Patient's respiratory function must be stabilized at first before any other procedures for which a physiotherapist or any medical professional must conduct techniques of improving chest expansion and clearing the secretions if present.

- Breathing exercises
- Chest physiotherapy if needed followed by suctioning (if needed)
- Effective coughing
- Proper positioning



INCENTIVE SPIROMETER

g) HYGIENE AND INFECTION CONTROL PROTOCOL: Moments of

Hand Hygiene



h) EDEMA MANAGEMENT:

- Positioning of patient:
 - Elevate limbs above level of heart
 - Elevate head – sit patient up or raise the top end of the bed
- Active mobilization and passive movements of the joints.
 - Lymphatic drainage or compression bandaging (figure of 8 mostly)

i) NUTRITIONAL GUIDELINES:

- A burn patient is in a hyper-metabolic state. The Basal Metabolic Rate in a severe burn patient will be 2-2.5 times more. There is increased rate of calorie expenditure so they need adequate nutrition.
- If Burns > 20 % TBSA , the calorie requirement will be
 - 40-50kcal/kg/day and
 - If burns < 20%TBSA
 - 35- 40 kcal/kg/day.

- Nutrition can be achieved by:
- Oral/ Nasogastric fluids**
- Patient with severe burn should receive high protein and calorie supplements either freely by mouth or by nasogastric tube. There should not be the evidence of ileus.
- Oral Naso-gastric feeding for a burn >25% with supplemented feeding of a 3 bolus feeds during the day and overnight feeding. Encourage from admission
- TPN (Total Parenteral Nutrition) and TEN (Total Enteral Nutrition) can also be given if it is available and affordable.
- A fluid regimen that produces an excessive urinary output is not appropriate always. Observation of patient very closely, if there is difficult to breathing and low urine output, should report to duty Doctor.

j) PROPER SPLINTING, POSITIONING AND PREVENTION OF CONTRACTURE:

- Splinting in proper manner and positioning in proper way not only enhances the wound healing but also prevents probably secondary complications, mainly, contractures.

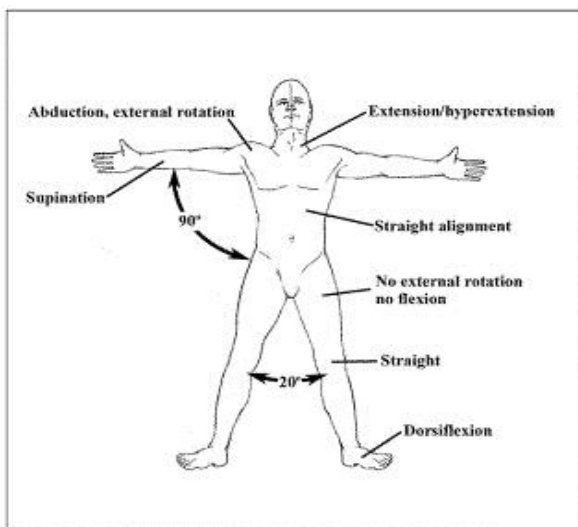
Splinting

- **Static splints**
 - Used when necessary (especially during night) to hold the position and prevent soft tissue tightening until movement can start.
 - Customized as individual requirements and changed as patient recovers, e.g. from grafting.
- **Dynamic splints**
 - Used occasionally when we desire muscle strengthening program along with stabilization

NOTE: General points for Splinting

- Position has to be effective, not necessarily position of function (in burn cases, we need to make a splint depending on the type and area of burn and to prevent contracture we need to do it as per the need not as per functional position)
- Joints must not be included unnecessarily
- Tight encircling must be avoided
- Bony prominences require more padding in the splinting
- Nerve compression must be avoided!

k) ANTI-CONTRACTURE / ANTI DEFORMITY POSITIONS



Face and Neck

Area of burn	Contracture	Anti-contraction position
Face	Inability like mouth opening, closing eyes fully, etc.	? For mouth – blotting of intubation tubes, placing wooden spatulas, etc. ? Facial mask can be made
Anterior neck	Neck flexion	? Neck in hyperextension by placing a rolled-towel behind neck; discarding pillows overhead, application of neck collar
Posterior neck	Neck extension	? Neck in flexion by placing pillows behind head, sitting with head in flexion, application of neck collar

Axilla and Arm

Area of burn	Contracture	Anti-contraction position
Axilla – with anterior and posterior axillary folds	Adduction	? Aeroplane splint can be applied, lying and sitting with arms abducted at 90 degrees by use of pillows or foam materials
Elbow	Flexion	? Extension with help of static splint
Hand Dorsum	Hyperextension of MCPs and Flexion of IPs	? Functional position of hand
Hand Palm	Fingers adducted and flexed, palm pulled inwards	? Wrist extended, minimal MCP flexion, fingers extended and abducted

Lower Limb

Area of burn	Contracture site	Anti-contraction position
Groin	Hip flexion, Hip Adduction	? Lie in prone with legs extended. ? Limit sitting

Posterior Knee	Knee flexion	?	Knee extended in lying and sitting, static splint can be used
Foot and toes (Dorsum)	Dorsiflexion, Hyper-extension at MTP	?	Plantar flexion and toe flexion by Static splint
Foot and toes (Plantar)	Plantar flexion, Hyper flexion at MTP	?	Dorsi flexion and toe extension by Static splint (Ankle Foot Orthosis- ankle at neutral) Pillows can be placed to keep foot in neutral

5. UNDERSTANDING PSYCHOLOGICAL ASPECT

- Health and rehabilitation professionals (Nurses, counselors, Physiotherapist) should keep talking to the patient. Inform them, and reassure them.
- Try to calm patient as well as families. They will be of more help to the patient, if they can reduce the patient's anxiety levels.
- Nurses or health personnel must have helpful activities, like sharing information, reassurance of practical options to deal with pain, support, normalization and relaxation.

I) ACHIEVING MAXIMUM AVAILABLE RANGE OF MOTION OF JOINTS AND GOOD TO NORMAL STRENGTH OF MUSCLES- (STRETCHING AND STRENGTHENING)

- Exercises helps patients maintain ROM available and good strength of muscles (conditioning).
- Exercises should be done after pain medication if pain is not tolerable

m) INDEPENDENT AND EARLY AMBULATION:

Goal: PREVENTS DVT, Pressure Ulcer, promote blood circulation, maintain proprioception, builds confidence.

Supportive/ self-ambulation can be encouraged with assistance by the therapist or help of walking devices like: walker, rollator, crutches, etc.

(NOTE: CONSIDER GIVING PROPHYLACTIC HEPARIN FOR DVT IF CANNOT BE MOBILIZED WELL)

B) SURGICAL MANAGEMENT OF BURN

- Monitor vital signs as required. Duration as in any other admitted patient, most commonly twice a day.
- Burn wounds can be treatment according to extent of degree:
 - **First-degree** (No any surgical management required)
 - Treated with topical moisturizers
 - Avoidance of recurrent injury (from prolonged sun exposure without blisters)
 - **Second-degree**

- Devitalized skin and ruptured blisters should be debrided.
- Coverage with topical antimicrobial agents or synthetic wound dressings
- Silver sulfadiazine cream (CSS) applied as a thin layer with gauze dressings twice daily.

For face: Use a combination antimicrobial product containing polymyxin B, neomycin, and bacitracin (eg, Neosporin ointment).

- Perineal burns: Leave open after applying antimicrobial cream.
- Asking patient to take regular bath and body cleansing with gentle removal of loose eschar and topical ointments.

Important: Burns not healing within 10 days of injury needs skin grafting.

- **Third degree**

- Requires early excision and skin grafting if larger than two centimeters.
- All the eschars are excised up to facial plane.
- Small areas are covered with SSG.
- For joints use FTSG or local flaps.
- Big Burn areas are covered with Meshed Grafts (1:1.5, 1:2, 1:4 or 1:8)



Post debridement



At the time of discharge

C) POST OPERATIVE CARE:

1) SCAR MANAGEMENT (REHABILITATION)

- Fitting pressure garments is a must! (according to WHO, pressure garments should be used 23 hours/day for best results)
- Oiling and moisturizing scar frequently (mixture of Nivea cream and liquid paraffin has been found very effective)
- Proper scar massage to be done and taught
- Stretching of tight structures and scars
- Silicone tapes are available in market
- Taping directly over hypertrophic scars (if small areas)





2) POST-SURGICAL (GRAFTING, FLAPS ETC.) REHABILITATION:

- Post-Split-skin thickness Graft (SSG), it is advisable to move at 7th day. (Discuss with the Surgeon)
- Post Full-thickness Skin Graft (FTSG), it is advisable to move at 5th day. (Discuss with the Surgeon)
- Post flap-Discuss with the Surgeon

3) AT THE TIME OF DISCHARGE:

- Vocational training
- Proper home exercises must be explained.
- Scar management must be explained thoroughly to the patient and the family members.
- Proper usage and care of pressure garment must be explained
- If any splint is being prescribed; usage, care, technique must be explained.



Patient being trained and learning to write after release of PBC hands

In addition, IEC materials developed on complications of Burn Injury should be provided to the patients with clear instructions on how to take care of the patient by him/herself to avoid further complications at home and by the family members as well before discharge.

V. REFERRAL SERVICE:

- Need of referring to other institutions for needful Prosthesis, Orthosis, pressure garments, etc. must be checked out while discharge and has to be explained well to the patient and the care giver.
- Functional training / Vocational training is a must for a patient post burn injury depending on the ability that has to be accessed and examined properly by an Occupational Therapist.

VI. INSTRUCTION FOR PATIENTS

Things to Know about Skin Grafts and Healed Burns

- 1) Coconut oil without perfume twice a day, or more often, if needed for dryness.
- 2) Try not to rub or scratch the healing skin- this may cause new blister or open wounds.
- 3) The healing areas will be PINK / PURPLE in color for several months- this discoloration will improve with time.
- 4) Protect all healing areas from the sun- use sunscreen SPF 30 or higher.
- 5) New areas of redness around wounds may indicate an infection-you should notify your healthcare provider.

Things to know about Donor Site Care:

- 1) The donor site dressing will remain adherent (stuck) to the wound until it has healed underneath, usually 10-14 days.
- 2) The dressing will be moist for the first 3-5 days; drainage is normally a reddish-brown color.
- 3) The dressing will begin to dry as healing occurs. As the donor site heals, the dressing will begin to peel off. It is OK to trim loose edges.
- 4) Do not try to force the dressing off. This may injure the healing skin underneath.
- 5) At home: You should keep the dressing clean and dry. It does not need to be covered with any other dressing.

Things to know about Pain Medication:






- 1) Take pain medication approximately 30 minutes before wound care for best results.
- 2) Increasing pain or swelling.
- 3) New areas of redness around any wounds.
- 4) Fever
- 5) Some pain medications cause constipations. So, drink plenty of fluids, eat fruits and vegetables, a stool softener as prescribed by the doctor.
- 6) Some pain medications cause drowsiness - you should not drive a car, operate machinery, or return to work until you are cleared by your healthcare provider.

APPENDIX

BURN EDUCATION:

I. Definition:

A burn is a type of injury to flesh or skin caused by heat, electricity, chemicals, friction, or radiation.

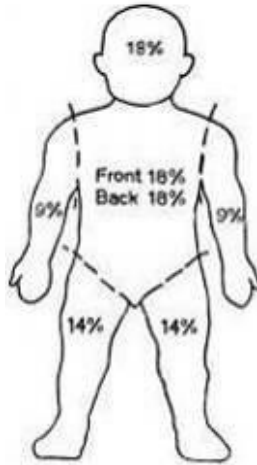
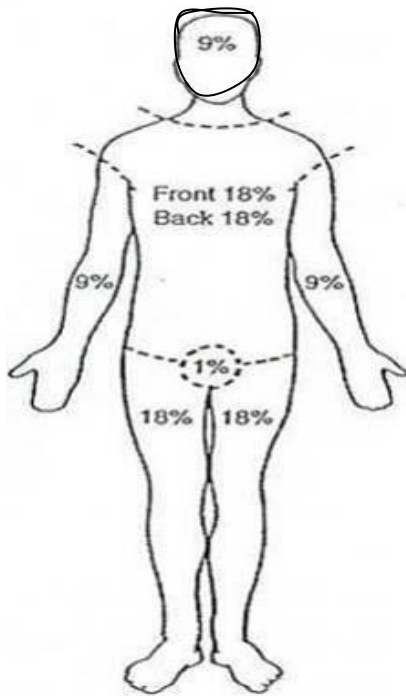
Type	Layers involved	Appearance / sensation	Example
Superficial (First degree)	Epidermis	Red without blisters Dry Painful	
Superficial partial thickness (second degree)	Extends into superficial (papillary) dermis	Redness with clear blisters Blanches with pressure Moist Very painful	
Deep partial thickness (second degree)	Extends into deep (reticular) dermis	Yellow or white Less blanching May be blistering Fairly dry Pressure and discomfort	
Full thickness (Third degree)	Extends through entire dermis	Stiff and white or brown No blanching Leathery Painless	
Fourth degree (sub-dermal)	Extends through entire skin and into underlying fat, muscle and bone	Black charred with eschar Dry Painless	

II. SURFACE AREA ASSESSMENT:

Rule of Nine:

For children:

For every year of life after 12 months take 1% from the head and add ½% to each leg, until the age of 10 years.



Palmer method:



- Palm and fingers of the patient = 1% TBSA
- Useful for small and scattered burns
- Can be used for subtraction e.g. full arm burnt except for hand-sized area = 8% TBSA

III. TYPES OF BURN:

A) On the basis of causes:

1) Thermal burn: a) Flame burn b) Scald burn c) Frost bite	2) Electrical burn: a) Low voltage : <1000volts b) High voltage: >1000volts c) Lightening : Ultra high voltage
3) Chemical burn: a) Acid burn: Sulphuric acid, hydrochloric acid, Hydrofluoric acid b) Alkali burn: sodium hydroxide, calcium oxide, Cement (note: Inhalation of cement)	

B) On the basis of timing:

- a) Acute : < or = to 24hrs
- b) Subacute : > 24hrs to < or = 2 weeks
- c) Chronic : > 2 weeks

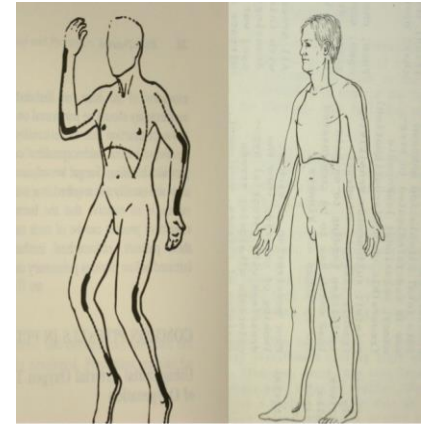
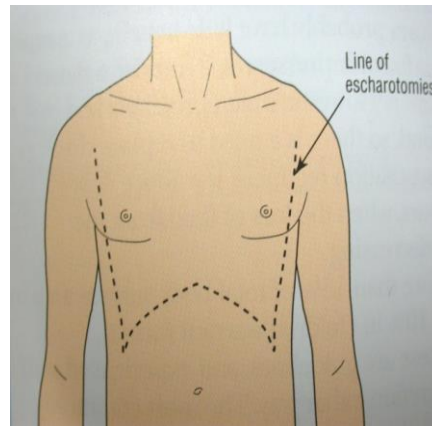
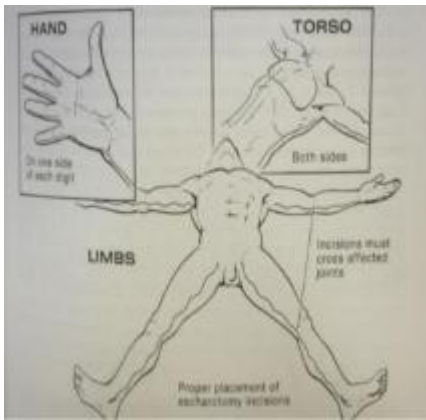
IV. GUIDELINES FOR PAIN ARE AS FOLLOWS:

For regular analgesia,

- Use pain assessment tool, for example, FACE tool for each patient to determine their pain score 1-10.
- Administer regular Paracetamol and NSAID 4-6 hourly.
- Use Morphine regularly with other analgesia if required.
- Check patient has had correct dose of analgesia if patient is still in unnecessary pain.
- Pain relief to be given PRN only when patient does not require regular, as different pain thresholds.

V. ESCHAROTOMY:

- An escharotomy is a surgical procedure used to release pressure caused treat full thickness (third- degree) circumferential burns.
- Since full thickness burns are characterized by tough, leathery eschar, an escharotomy is used primarily to combat compartment syndrome.
- Following a full thickness burn, due to formation of eschar, circulation is impaired distal to the wound.
- An escharotomy is performed by making an incision through the eschar to expose the fatty tissue below.
- Due to the residual pressure, the incision will often widen substantially.
- Severely burned extremities should be elevated and range of motion exercises performed every 15-30 minutes as tolerated by the patient. This can help to minimize tissue edema and elevated tissue pressures.



VI. GRAFTS:

- Autograft skin is preferred whenever possible. For patients with large burns who do not have enough autologous skin available for complete coverage, burns can be excised and temporarily covered with numerous biologic dressings (eg: cadaveric skin, pigskin) or skin substitutes.
- As more donor sites become available, the temporary wound covers are removed and the wounds are grafted.
- To cover large area and to allow exudates grafts are meshed with mesher of different expansion ratio like 1:1.5, 1:2, 1:4 or 1:8.
- For aesthetic area use sheet grafts (SSG) for cosmetic result. Nonetheless, sheet grafts should be used whenever possible, especially in highly visible and functional areas,

VII. CARE OF SKIN GRAFTS:

- All the grafts are covered with petroleum jelly gauze
- Dry to wet Normal saline soaked gauze is put to cover petroleum jelly gauze
- If the surface is uneven and hollow, Use Tieover Blasters.
- Use splint for immobilization.
- 1st dressing of graft site on 3rd/5th day; donor site on 10th day for SSG & mesh grafts.
- 1st dressing of graft site on 3rd/5th day with daily dressing of donor site for FTSG
- After the graft is taken use creaming and oil massage.
- Early discharge should be considered to prevent Nosocomial infections.

VIII. WOUND CARE AND DRESSING:

- Give analgesia at least 40 minutes prior to dressing change.
- Pain medication as per Pain guidelines.
- Prepare dressing materials needed before starting procedure.
- When possible all dressing should be changed in the dressing room using aseptic techniques.
- Distraction can be a good way to relieve pain which can be done by providing toys, television, radio, mobile phone, magazine, newspaper etc.

- When the dressing is difficult to remove, saline/sterile water should be used to soak off the dressing.
- Where appropriate patients could be bathed to aid the dressing to be removed.
- Debride any areas with saline soaked gauze.
- Remove any loose or dead skin with forceps and scissors if present.
- Do not use occlusive dressing and the inner layer should be a non-adherent. E.g.: paraffin gauze, jelonate – helps to prevent pain and bleeding.
- Use separate bandaging for joint area for easy mobilization.
- Outer layer something thick and absorbent e.g wool, followed by crepe bandage.
- Change daily initially and then as needed
- Ensure adequate perfusion
- Minimize negative effects of inflammation.
- Provide optimal wound environment.
- Promote adequate nutrition and fluid management.

IX. HYGIENE AND INFECTION CONTROL PROTOCOL

- Maintaining good hygiene practices decreases the risk of infection in burns patients.
- Maintain clean dressing room before and after procedures
- Clean patient's room thoroughly after discharge of patient
- Segregates the highly infectious waste in hazardous container
- Place sharp, like knife and needle, in a puncture proof container.
- Central Venous catheter care –Dressing with aseptic technique.
- Catheter care –maintain clean in perineal area and catheter.
- Catheter change- usually two weeks.
- Intravenous line- change site, if patient complain pain in IV site.
- Advice not to come too many visitors.

X. PALLIATIVE CARE:

- The WHO defined palliative care in 2002 as: ‘ an approach that improves the quality of life of patients and their families facing the problem associated with life threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.
- In service terms, palliative care starts from the diagnosis of an incurable disease and ends with the help and support for the bereaved after the death of the patient.
- It aims to improve the quality of the life that is remaining.
- Medical care, although essential, is only one aspect of palliative care. It is important to differentiate specialist palliative care from routine palliative care, the latter being essential for all.
- Many patients do not need specialist palliative care but those who do are usually suffering from one or more complicated symptoms such as extreme pain, breathlessness, nausea, seizures, fear,

depression and facing break down of even the most intimate and caring relationships. It is estimated that about 60% of patients diagnosed to have advanced incurable illnesses require specialist care.

- Palliative care service also includes support to the care takers, family and partners, not only the patient.

XI. INHALATIONAL INJURY:

Modes of injury:

- A. Thermal injury to airway
- B. Injury due to inhalation of smoke, chemicals

Both leading to inflammation, and hypoxia, patient may get worse from 24-48 hours.

Signs and Symptoms of inhalational injury:

Signs :	
1.	Facial burn
2.	Facial odema
3.	Stridor
4.	Dyspnoea
5.	Black sputum
6.	Wheezing

Symptoms :	
1.	Cough
2.	Anxiety
3.	Shortness of breath
4.	Headache
5.	Hoarse voice
6.	Confusion

XII. SPECIAL HISTORY TO BE NOTED

Environmental:

- Was the patient in the enclosed space?
- Did the patient inhale lot of smoke?
- Did the burn take place at the site of collapsed building?
Was it an industrial burn?

General condition of the patient:

- Was the patient unconscious?
- Was the patient coughing or gasping

Examination:

- Respiratory rate: should not be >20/min
- Quality of breathing: quiet or noise?
- Obtunded
- Soot in mouth /nose

XIII. MANAGEMENT:

- Positioning: make the patient sit up
- Oxygen inhalation: 15l/min, humidified
- If wheezy, bronchodilator nebulization hourly
- Chest physiotherapy

Note: overload of fluid to be avoided as it causes pulmonary edema

- Simple airway maneuvers:

Chin lift/ jaw thrust

Guedel airway or nasal airway

- Nebulization with 5mg of epinephrine or as required.
- Intubation and ventilation if needed: Intubation is preferred prophylactically since there could be laryngeal edema within 24 hrs.

XIV. ELECTRICAL BURN

- The airway must be protected and the cervical spine protected, by using roll of the towel underneath the neck and sand bag either side of the head.
- Vital sign to be check hourly, because breathing may be arrested as a result of the discharge affecting the medulla and cardiac arrest may also have occurred due to the effect of the current on the myocardium.
- CPR is the vital to the resuscitation of victims of electrical injury, so that all CPR equipments and medicine and injection should be ready.
- Frequent monitoring for compartment syndrome in electrical burn is essential.
- Urgent fasciotomy is indicated if it includes cyanosis of distal uninjured skin, impaired capillary filling of nail beds, progressive neurologic changes, and edema with extreme tightness of muscle compartment.
- Observation of limbs and part of the body, to see any fractures. Electrical workers may suffer from falls from poles, towers.
- Nurses should do hourly assessment of the peripheral circulation must be made, like skin color, edema, capillary refill, peripheral pulses and skin sensation.
- The general principles of burn wound care apply to electrical burns.
- Observation of compartment of lower limbs, and upper limbs which may be affected by fiscal edema.

XV. CHEMICAL BURN

- Prompt water irrigation. All chemical burns require copious irrigation.(note down for special acids)
- Chemical injuries to the eye also require copious irrigation and then referral.
- Trim finger nails.
- Topical calcium, gluconate, burngel should be apply.
- Bitumen if causes burn, apply oil.DO NOT try to peel it off
- Psychological support and pain management as other burns.

XVI. HOME ADVICE

Do's

- ✓ Eat diet high in calories and protein: take a multi-vitamin until all wounds are closed.
- ✓ Do continue your physical therapy at home.
- ✓ Do wear a hat and long sleeves while in the sun: always wear sunscreen.
- ✓ Do keep all follow up clinic and physical therapy appointments.
- ✓ Do wear pressure garments 23 hours a day to help reduce scarring
- ✓ Do change all dressings once daily or as directed
- ✓ Do call for any signs or symptoms of infection: severe chills or fever, excessive pain, redness, swelling, or new drainage, odor at the site of the burn dressing.

Don'ts

- × Don't go in the sun without sunscreen and coverage.
- × Don't pick or scratch at your wounds. This may cause bleeding and infection.
- × Avoid strenuous activity, driving, heavy lifting, and contact sports until cleared by doctor
- × Don't wear tight fitting clothes that may rub against burn areas and cause friction blisters and skin.

(Kindly refer to IEC on Complications of Burn Injury)

SPINAL INJURY

SESSION 9	SPINAL INJURY
<p>Spinal Injury</p> <ul style="list-style-type: none"> - Clinical features and imaging for cervical and lumbar injuries - Neurological deterioration, complete and incomplete spinal cord injuries - Stabilization and transfer criteria - Complications in neurologic injuries - Measures of prevention at district hospital - Principles of early rehabilitation and long term rehabilitation: referral to specialized services and community-based follow up 	<p>Terminal Objective At the end of the session, the participant will be able to describe the overall management of SCI and how to prevent main complications in hospital care</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1. Explain what stable and unstable and complete and incomplete injuries are; explain what is neurological deterioration and secondary injury 2. Perform safe transfers methods when mobilizing patients and utilize devices for immobilization (braces) 3. Describe main complications of patients with SCI: urinary tract infections, DVT, chest infections, pressure ulcers 4. Describe prevention measures: bowel and bladder management, positioning, safe mobilization. 5. Provide information to patients and caregivers on the impairment, hygiene measures, risk of complications and its prevention 6. List rehabilitation milestones and provide information on available services for long-term rehabilitation <p>Methodology Power point, Practical demonstration, Group discussion</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 3 hours</p> <p>Evaluation method Pre-test, Participant's participation and reaction, post-test</p>

1.1 PRINCIPLES OF CARE:

- B. *Identify other injuries***--ensure no other trauma injury due to diminished physical signs and symptoms in the setting of spinal cord injury
- C. *Prevent further injury to spine or spinal cord***—safe transfer and movement
- D. *Provide stabilization***--typically with bed rest and cervical collar
- E. *Prevent complications of neurologic deficit***--respiratory, skin, bowel, bladder care
- F. *Provide physiotherapy***--to prevent contracture, pressure ulcers and maintain strength of functioning muscles
- G. *Identify***--the rare, special cases that may require further expertise—unstable cervical fracture with normal or near- normal neurologic function (for consideration of skeletal traction)
- H. *Care with Transport***—Transport and movement of the patient, whether from accident scene, within the facility, or between facilities, presents the greatest danger for increasing the severity of neurologic damage. At all times, transport with trained personnel (or at least with people who have had adequate instructions) to provide for spinal precautions using correct equipment and techniques of head and neck support, body support, and appropriate hard-board and equipment (cervical collar—when available, or rolled blankets and sand bags).

* **AVOID:** * Carrying by hand, over shoulder, in Doko, etc.!

- I. *Appropriate counseling, consent and multi-disciplinary approach with attention toward rehabilitation, psycho-social support, and cultural re-integration for each patient whenever possible.***

1.2 SPINAL INJURY- PRINCIPLES OF MANAGEMENT

1.2.1 DIAGNOSTIC CONSIDERATIONS:

Determining whether a fracture is stable (spinal cord protected at time of injury and with subsequent movement) or unstable would be ideal, but unlikely during the scenario of a large-scale disaster—when adequate diagnostic and specialty resources are scarce. Often spinal injuries are missed because the patient is not alert or is suffering from severe, distracting injuries. (NOTE: 1/3 of spinal injuries are associated with concurrent head or abdominal injury). A systematic effort must be made to identify spinal injury using history and careful physical exam. ALL spinal injuries should be considered unstable until they

are able to be adequately evaluated with appropriate tests and clinical specialists. Diagnostic points to

consider include:

1. Neurologic deficit (may be complete or partial)—should assume an unstable injury
2. Evidence of injury/deformity over spine (bruising, skin lesion or edema—soft, “doughy” feeling over spinous process with/without a palpable “gap” or deformity—indicates unstable injury).

NOTE: DO NOT

TEST MOVEMENT OF SPINE if injury is suspected!

3. Severe pain over the spine with/without radiation
4. X-ray examination—May be difficult to obtain good quality and have access to expert interpretation in disaster scenario. They may be indicated if specialist input is available, and can be performed in safe manner (see Annex 1).
5. Cervical spine injury can be ruled out clinically if the patient fulfills (ALL OF) the following (NEXUS) criteria:

- ❖ There is no posterior midline cervical tenderness
- ❖ There is no evidence of intoxication/altered mental status
- ❖ The patient is alert and oriented to person, place, time, and event
- ❖ There is no focal neurological deficit
- ❖ There are no painful distracting injuries (e.g., long bone fracture, multiple trauma, etc.)

1.2.2 MANAGEMENT:

Skilled nursing and physiotherapy care is key to outcome

A. ACUTE CARE—Prevent further injury—SPINAL PRECAUTIONS!

- a) A-B-C-D-E; secondary exam with removal of clothes and exam of back—USING SPINAL PRECAUTION/Log Roll (see below)
- b) Cervical collar until cleared clinically or (if available) X-ray
- c) Treat hypotension—transection of cord disrupts sympathetic pathways and may cause hypotension—may take several days to resolve. IV infusion with RL or NS—requirements may be high. Monitor respiratory and cardiac status.

NOTE: Ensure hypotension not caused by missed injury (chest, abdomen, extremity)

- d) Treat ileus—NPO until bowel sounds and gas. Consider NG tube for quadriplegia patients.
- e) Catheterize bladder and begin bladder care
- f) Steroids generally NOT indicated

B. PREVENT FURTHER INJURY

- a) All patient movement must be performed in a controlled manner using “spinal precautions”:
 - Minimum of 3 people involved (4 is better)
 - Most experienced person controls the head and neck
 - “Log roll” supporting the entire body
- b) Apply cervical collar for suspected cervical fracture
 - Hard collar (prefabricated) is best
 - Soft collar or “blanket roll” with sand bag support if hard collar not available
 - Construction of hard collar using foam and POP if expertise exists
 - Plaster Cuivasse or Minerva cast— ONLY if expert specialty assistance is available for a documented injury—done after acute phase
- c) Appropriate bed/position
 - Board covered with two 10 cm foam mattress is best
 - Foam pad/pillow between knees and supporting back and pressure points as needed
 - Keep underlying sheet clean, dry, free of creases and food particles
- d) Monitor for Autonomic Dysreflexia (patients with injury T6 or above)—excessive autonomic response to stimuli below the level of injury which can lead to LIFE THREATENING CONDITION marked by:
 - Severe Hypertension (BP>200/100); pounding headache; sweating/shivering; chest tightness; feelings of anxiety; blurred vision; nasal congestion; blotch skin rash above spinal injury level; cold “goosebumps” below injury level
 - Treatment: FIRST, Check for possible source of noxious stimuli
 - Bladder distension—make sure catheter not blocked or bladder is empty

- Check for Urinary Tract Infection
- Fecal impaction—GENTLE rectal exam and dis-impaction if needed
- Lower extremity traumatic stimuli
- Treat hypertension as needed
 - Nifedipine 10 mg PO/SL –add other agents if needed
 - May repeat dose in 30 minutes if symptoms persist

C. PREVENT COMPLICATIONS OF NEUROLOGIC INJURY:

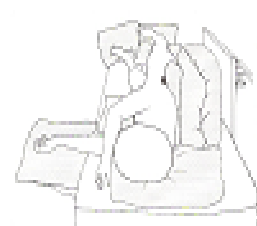
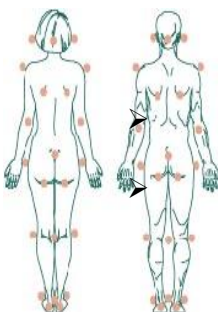
GOAL= No Bedsores, No Contractures, No Urinary Tract Infections

a) Respiratory



- Prevent atelectasis/pneumonia—cough and deep breath
- Check baseline oxygen saturation, and monitor regular intervals—if available
- Monitor for DVT/pulmonary embolism—check baseline calf circumference and monitor daily

b) Skin—prevent pressure sore



- Turning--using 3-4 member team, “log roll” EVERY TWO HOURS—DAY AND NIGHT. (Over time, family members may be taught how to help with this). Record turning of patient in chart, if possible.

- Turn in sequence every 2 hours—BEGIN IMMEDIATELY: full left lateral—supine—full right lateral—supine—partial left lateral—supine—partial right lateral—supine...repeat
 - After 3 weeks, patient may be able to gently assist with turning—if assistive devices (Balkan Beam, etc.) available
 - Examination daily for evidence of pressure necrosis: sacrum, iliac crests, hips, sides of knees, heels, malleoli, penis (if using condom catheter)
 - Redness
 - Blister...ulcer
 - In case of skin damage, avoid pressure to area. Place padding AROUND the area of concern (not directly on the area)
 - Monitor nutritional status and supplement if able
- c) Bladder—avoid bladder distension and reflux—monitor fluid intake and output when possible**
- Begin intermittent bladder catheterization if possible (lack of staff and supplies may prevent this optimal approach)
 - Every 3-4 hours for first 3 weeks, then every 6-8 hours
 - Foley catheter (less optimal)—clamp Foley and release every 2 hours—until patient can progress to intermittent or condom catheter.
- d) Bowel—be alert for fecal impaction**
- Enema or dis-impaction every 4 days for first 2 weeks
 - High residue diet
 - Laxative daily as needed
 - Begin paraffin suppository and rectal stimulation daily beginning day 4
- e) Joint—prevent contracture; preserve strength**
- Begin range of motion exercise of joints immediately and do often
 - Special attention to avoid hip, knee, heel cord contraction

- Active strength exercise (upper extremity for paraplegic) with weights or books

D. FRACTURE/DISLOCATION MANAGEMENT

In all likelihood, in a large-scale disaster scenario, access to specialty diagnostic, clinical and nursing resources will not be available. Generally, surgical decompression or acute spinal fusion/fixation should not be considered during the early stages of the disaster event.

- a) Spinal decompression—likely not helpful, and access to essential diagnostic and clinical resources not available
- b) Spinal fusion—may be helpful in the mid-long-term, but not needed acutely, as long as spinal precautions in place
- c) Cervical traction—may be helpful for the (rare) patient with unstable fracture/dislocation cervical injury, and minimal or no neurologic involvement. Factors to consider:
 - Requires expert and focused nursing care
 - Requires portable X-ray capacity
 - May require (unsafe) transfer of the patient over disrupted roads and with shortage of skilled staff
 - Generally, these patients will be better served with hard collar, bed rest, and spinal precautions for first 6 weeks—followed by Cervical Brace

E. REFERRAL

- a) **Must balance risk of transport versus gain of treatment option**
- b) Most patients are best treated with conservative therapy and good nursing care at local institution
- c) Eventual transfer to Spinal Cord Unit for long-term management and Activities of Daily Living when referral mechanisms and capacity are clear

2.3.3 PATIENT INSTRUCTIONS:

- Moral supports for the patient are of utmost importance—treat them and their families with encouragement and respect. Monitor and address mood—check and treat for depression if needed
- Support early teaching of activities of daily living and education of health maintenance to patient and family

COMMUNITY BASED REHABILITATION (CBR) AND DISABILITY

SESSION 10	COMMUNITY BASED REHABILITATION (CBR) AND DISABILITY
<p>Community Based Rehabilitation and Disability</p> <ul style="list-style-type: none"> - Definition and importance of CBR - Components of CBR and actors involved in Nepal - Primary, secondary and tertiary prevention of impairment at the community level - Physiotherapy: definition, objectives and types of interventions - Assistive devices: walking aids, orthosis and prosthesis 	<p>Terminal Objective At the end of the session, the participant will be able to describe CBR principles and scope in injury management</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <ol style="list-style-type: none"> 1. explain the importance of CBR for people with injuries and with disability 2. explain who is involved in CBR and the role they play 3. understand how primary, secondary and tertiary prevention measures are applied at the community level 4. list types and use of assistive devices 5. understand the role of physiotherapists, community workers and care-givers in providing physiotherapy care <p>Methodology Power point, Practical demonstration, Group discussion</p> <p>Learning Materials Training manual, IEC materials</p> <p>Time for session 2 hours</p> <p>Evaluation method Pre-test, Participant's participation and reaction, post-test</p>

New definition and classification of Disability in Nepal

Disability is the condition of difficulty in carrying out daily activities normally and in taking part in social life due to problem in parts of the body and physical system as well as obstacles created by physical, social, cultural, environmental and by communication.

Classification of Disability: According to the nature of problem and difficulty in the parts of the body and in the physical system, disability has been classified into the following seven categories:

1. **Physical Disability:** Physical disability is the problem that arises in operation of physical parts, use in movement in a person due to problems in nerves, muscles and composition and operation activities of bones and joints. For example; polio, cerebral palsy, absence of a body part, effect of leprosy, muscular dystrophy, problems with joints and spinal cords, club feet, weakness produced due to problem related to bones etc are physical disability. Short and stunted also fall in to this category.

2. **Disability related to vision:** Disability related to vision is the condition where there is no knowledge about an object's figure, shape, form and color in an individual due to problem with vision. This is of two types:

a. **Blind:** A person who cannot see the figures of hand by both eyes at a distance of 10 feet despite treatment (medicine, surgery and the use of glasses) or cannot read the first line of Snellen chart (3/60), then that person is blind.

b. **Low vision:** If any person who cannot distinguish fingers of a hand from 20 feet distance despite treatments like medicine, surgery and use of glasses. In other words, cannot read the letters of the fourth line of Snellen chart, then that person has low vision.

3. **Disability related to hearing:** Problem arising in an individual related to discrimination of composition of the parts of hearing and voice, rise and fall of position, and level and quality of voice is a disability related to hearing. It is of two types:

a. **Deaf:** An individual, who cannot hear, speaks incoherently or cannot speak and who has to use sign language for communication is deaf. An individual who cannot even hear sound above 80 decibels is deaf.

b. **Hard of Hearing:** An individual who can hear only little but can hear little and cannot talk clearly, can only speak little, who needs to put hearing aid on the to listen, is a hard of hearing. An individual who can hear sound between 65 decibels and 80 decibels is a hard of hearing.

4. **Deaf- Blind:** An individual who is without both hearing and vision is a deaf- blind disable.

5. **Disability related to voice and speech:** due to difficulty produced in parts related to voice and speech and difficulty in rise and fall of voice to speak, unclear speech, repetition of words and letters is disability related to voice and speech.

6. **Mental Disability:** The inability to behave in accordance with age, situation and delay in intellectual learning due to implementation of intellectual activities like problems arising in the brain and mental parts and awareness, orientation, alertness, memory, language, calculation is mental disability.

a. **Intellectual disability/ Mental retardation:** An individual having difficulty in carrying out relative to age or environment due to absence of intellectual development before age of 18 is intellectual disability/ mental retardation.

b. **Mental Illness:** Mental disability is an inability where there is difficulty in living daily life due to mental illness or weakness or deviation.

c. **Autism:** Absence by birth of normal behavior in accordance with a person's age, to show abnormal reaction, to keep on repeating one activity, do not socialize with others or to show extreme reaction is autism.

7. **Multiple disabilities:** Multiple disabilities are a problem of two or more than two types of disability mentioned above.

IMPORTANCE OF CBR

1. **REHABILITATION :** Rehabilitation includes all measures aimed at reducing the impact of disability for an individual, enabling him or her to achieve independence, social integration, a better quality of life and self – actualization. Rehabilitation can no longer be seen as a product to be dispensed; rather rehabilitation should be offered as a process in which all participants are actively and closely involved.

2. **COMMUNITY BASED REHABILITATION (CBR) –** It is a strategy within general community development for the rehabilitation, equalization of opportunities and social inclusion of all people with disabilities. The primary objective of CBR is the improvement of the quality of life of people with disability / marginalized persons. Key principles relating to CBR are equality, social justice, solidarity, integration and dignity

CBR is not an approach that only focuses on the physical or medical needs of a person or delivering care to disabled people as passive recipients. It is not outreach from a center. It is not determined by the needs of an institution or groups of professionals, neither it is segregated and separate from services for other people.

Conversely CBR involves partnerships with disabled people, both, adults and children, their families and careers. It involves capacity building of disabled people and their families, in the context of their community and culture. It is an holistic approach encompassing physical, social, employment, educational, economic and other needs. It promotes the social inclusion of disabled people in existing mainstream services. It is a system based in the community, using district and national level services.

Institutional rehabilitation provides excellent services to address the problems of individual disabled person and is often available only for a small number at a very high cost. Moreover, the endeavor in an institution, is often out of context to the felt needs of the disabled person, and thus falls short of their expectations. In an institutional rehabilitation program, the community is not linked with the process. Hence, when the disabled person returns home, it may become difficult for them to integrate into their community.

Disability often requires life-long management, therefore, activities aimed at enabling people with disability should be community based as much as possible.

Sustainability is the ability of project or program to continue to address needs as long as needs exist. The most basic rehabilitation activities can be carried out in the person's own community. A multi -sectoral / multi- disciplinary concept of CBR is to be adopted. This concept emphasizes working with and through the community. In response to this conceptual change, CBR is now defined as a community development program that has seven different components –

i. Creation of a positive attitude towards people with disabilities

- ii. Provision of rehabilitation services
- iii. Provision of education and training opportunities
- iv. Creation of micro and macro income – generation opportunities
- v. Provision of long term care facilities VI.
- vi. Prevention of causes of disabilities VII.
- vii. Monitoring & Evaluation.

The core values of individual dignity, autonomy or self-determination, equality and the ethic of solidarity are fundamentals of human rights law that concern disability. To achieve this there is an increased focus on the participation and involvement of disabled people and their representatives

3. PRIMARY HEALTH CARE & REHABILITATION - Health is defined as

‘A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’.

Primary health care is essential health care based on practical scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country’s health system, of which it is the central function and main focus, and of all the overall social and economic development of the community. It is the first level of contact of individuals, the family and the community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process.

Community based rehabilitation is fully consonant with the concept of Primary Health Care. This approach promotes awareness, self-reliance and responsibility for rehabilitation within the community. It builds on manpower resources in the community, including the disabled themselves, their families and other community members. CBR encourages the use of simple methods and techniques that are acceptable, affordable, effective and appropriate to the local setting.

CBR is implemented through the combined efforts of disabled people themselves, their families and communities, and the appropriate health, education, vocational and social services. CBR program must be flexible so that it can operate at the local level and within the context of local conditions.

In case of Leprosy, the social implications of the disease are closely interwoven with the cultural traditions of society. Every society considers health and disease, and life & death in different ways and this influences the attitude taken by the community towards patient. Adverse reactions of the community tend to devalue the status of patients. This manifests itself by fear, insecurity and withdrawal leading to deviant behavior which hinders leprosy control activities.

In initial phase of CBR process it is important to identify and understand the current situation and map services; then to identify with all those concerned what gaps exist and what is required. Only then consideration by all relevant parties be given to what health service provision is most appropriate. This needs to take account of feasibility, accessibility and acceptability issues. None of this can be done without

consideration of resource constraints, financial, facilities/equipment, education, transport, and manpower, including level of skills and competency required to deliver what is necessary

4. CBR PERSONNEL -

1. CBR workers are grass root workers delivering services in a community

2. Supervisors or medico social workers who organize and support gross root workers.

3. Professionals such as surgeon, physiotherapist, vocational trainers, counselors to whom referrals can be made from the community.

4. CBR workers are key in the implementation of CBR. They are usually the main person in contact with the family. They are able to:

- Act as local advocates on behalf of people with disabilities and their families with the health services personnel
- Provide liaison and continuity of care in the community on behalf of professionals eg. Continued supervision of home programs
- Act as directors of community initiatives to remove social and physical barriers that affect exclusion
- Provide a positive role model for service users if they themselves have a disability

Professionals involved at the third level of service provision can be included, but are not limited to doctors, nurses, physical therapists, occupational therapists, counselors, support staff, orthotists / prosthetists and technicians.

The basic concept inherent in the multi-sectoral approach to CBR is the decentralization of responsibility and resources, both human and financial, to community-level organizations. In this approach governmental and non- governmental institutional and outreach services must support community initiatives and organizations

4.1. The useful initiatives for CBR can be -

- Social counseling
- Training in mobility and daily living skills
- Providing or facilitating access to loans
- Community awareness raising
- Providing or facilitating vocational training/apprenticeships
- Facilitating information for local self-help groups, parents groups and

Disabled People's Organizations (DPOs)

- Facilitating contacts with different authorities
- Facilitating school enrolment (school fees and contacts with teachers)

Components of CBR program –

1. Prevention of cause of disability
2. Provision of care facilities.
3. Creating a positive attitude towards people with disabilities.
4. Provision of functional rehabilitation services.
5. Empowerment, provision of education and training opportunities.
6. Creation of micro & macro income –generation opportunities.
7. Management / monitoring and evaluation of CBR projects

Empowerment component – The essence of empowerment is that people with disabilities and their families take responsibility for their development within the context of general community development. The outcome of CBR in NLEP is expected to be a change in their mindset- from passive receiver to active contributor and that each LAP participate in family and community life; in learning, playing, working, and household activities; in politics and cultural activities. Empowerment of community to assume responsibility for ensuring that all its members, including those with disabilities, achieve equal access to all of the resources that are available to that community, and that they are enabled to participate fully in the social, economic and political life of the community.

Approaches for empowering may be social mobilization, political participation, communication, Self Help Groups (SHGs) and Disabled

People's Organization (DPOs). People come together in groups to pursue common interests. A DPO is a bigger than a SHG. It is more formally structured, with office bearers and with systematic ways of conducting its work.

Providing information and choices about rehabilitation, education and livelihood, and laying out choices and opening up opportunities for decision making enhances the process of empowerment. For empowerment to happen five approaches can be used –

1. Social mobilization.
2. Political participation.
3. Language & communication.
4. Self Help Groups (SHGs).
5. Disabled People's Organizations. (DPOs)

Social mobilization

Social mobilization means to bring people and resources together to achieve a particular task. It is necessary to promote the inclusion of LAP / people with disability into all aspects of society. The purpose of social mobilization is to get disability into the social consciousness of the community and integrate the disability issue into all development programs

Political & economic approach is most powerful, it influences local economic and cultural life. Every decision made by political leaders affects local people. Society is to be involved in problem solving by understanding 'cause and effect'. Changing the policies which causes the pattern of exclusion may result in a wider and more long term effect.

The behaviors of people reveal their values and attitudes. Behaviors include how people treat each other. Understanding what motivates people is critical to bring about a change in behavior.

Advocacy and Negotiation skill is required to mobilize community. To advocate means to ask and persuade. The steps of advocacy are:

i Ask the basic questions:

- What is the problem?
- Where and when does it occur?
- Is it a one-off or does it recur?
- How does it all come about?
- Does it connect to any other problems?
- Who can do something about it?

ii. Set out what you want to achieve – a clear goal.

iii. Collect information – policy documents, legal documents, reports of seminars and conferences, information from professionals and the community, and stories from people with disabilities and their families.

iv. Collect similar examples of social injustice from newsletters, TV, the community, people with disabilities, etc.

v. Identify the best point at which to make an intervention – at village, district, provincial or state level.

vi. Look at how decisions were made :

- What is the process ? What is the decisive moment Whose opinion carries most weight and why ?
- Build a good working relationships with decision-makers, agencies, media and allies.
- Make sure the interests of people with different impairments and multiple disabilities are included.
- Follow-up, review, change the plan.
- Document the process – the successes and failures.

Negotiation: The SHG or DPO will:

- Agree on a core demand and what can and cannot be negotiated away.
- Try to understand the point of view of the other parties who might be able to influence the decision-making.

- Look for points of agreement between parties not just the differences.
- Take into account the belief system and spiritual background of the different parties.
- Choose a negotiating team and allocate roles to each team member – who will open up the conversation, who will keep a record, who will ask questions etc.
- Organize and co-ordinate the event – decide whether to arrange a high profile event, how to use the local media etc.

Political Participation -

Political & economic approach is most powerful; it influences local economic and cultural life. Every decision made by political leaders affects local people. Society is to be involved in problem solving by understanding 'cause and effect'. Changing the policies which causes the pattern of exclusion may result in a wider and more long-term effect.

Political participation means people using their power as citizens to take part in and shape the decisions that affect their lives.

This means being involved in government at local, regional and national levels, and playing an active part in politics parties, choosing representatives and voting. It included contesting elections and standing as representatives, and forming, shaping and implementing policies. It also means being active from outside the political structures by pressuring, persuading and lobbying to ensure representatives take the interest of people with disabilities seriously.

The element is about enabling people with disabilities take part in the family, community decisions and in political decisions which affect their lives.

The goal of political participation is integrate disability issues into political decision-making, to put these issues at the centre of policies, programmes and their implementation, and for people with disabilities to be active decision-makers.

There are six long-term outcomes for political participation:

- Increased awareness of political processes by people with disabilities and their family members;
- Increased awareness of civic rights;
- Increased awareness of civic responsibilities;
- Ability to exercise civic rights and responsibilities.
- Increased knowledge of how to benefit from policies and programs.
- Ability to get grievances redressed through political processes.

Decisions are made by the people with power. Analyzing what underpins someone's power – what makes him or her powerful – is the first step to being able to influence this power and start to play a role in decision-making.

Politics means the power play between groups of people with different ideas and interests. The tensions, struggles, and arguments between these groups are the practice of politics. (See also the element on Social Mobilization).

There are three branches to government: the legislative branch e.g. parliament, the judiciary eg. The courts, and the executive e.g. the bureaucracy. The CBR programme needs to know who the key players are on each of the government bodies, how the bodies relate to each other, and how they make decisions.

Politics is about power and therefore participation in the political process is critical to achieving inclusion. Participation in this process involves identifying issues, prioritizing them, separating causes from effects, and choosing from a range of methods, such as lobbying, voting and campaigning to influence that decision-making and bring about change.

Communication and Language -

Communication is a two way process that is important in every one's life. People communicate for many reasons, for example, to make social contract, to exchange news, to express their needs and their feelings. It is not just about words but also about facial expressions – smiles, frowns, stares, about gesture, touch, noises. All these aspects of communication are used to build relationships with each other. Without using at least some of these words, sounds, signs and symbols, it is difficult to relate to each other.

Communication is an essential part of social, cognitive and emotional growth. As such, it is a key element in the process of empowerment and underpins inclusion and equal rights. Communication is a basic human need.

Communication is basic human right. Talking with others, listening to others, expressing our wants, emotions, opinions connects us to our family and community. Impairments of various sorts can hamper both verbal and non-verbal communication. The CBR program plays a key role in working with people with disabilities to improve their ability to express themselves and to engage with others. Sometimes the assistive solutions are simple, sometimes more technical and sophisticated.

Communication is not straight forward. Our relationship with the other person, feeling intimidated, having less status, being stereotyped, being left out and ignored, feeling small because the other person talks in incomprehensible jargon, having our wishes pre-empted rather than being asked- all these factors are just as important as more obvious factors such as hearing or speech.

Self-help Groups (SHGs) -

Enable people with disabilities to form Self-help Groups to advocate for themselves and to take responsibility for their own development. In CBR programs, the outcomes for SHGs are:

- Increased visibility of group members within the community;
- Stronger support for individual group members;
- Better solving of group problems;

- Enhanced mainstreaming of disability issues into development projects;
- Increased sense of group identity among the group members and of the group within the community;
- Members becoming a resource to the community, for example as bookkeepers, rehabilitation workers and facilitators.

Self-help Groups work to these values:

- Mutual respect, and an understanding that everyone knows something and there is no one who knows nothing;
- A recognition of the strengths of the weakest and poorest members;
- The participation of people with severe and multiple disabilities;
- The equal participation of women with disabilities.
- Leadership from amongst the weakest sections of the group.

The characteristics of SHGs include:

- a common goal which is shared by all and which originates from the needs of the members;
- a group name;
- a set of rules and regulations, and guidelines on how to work together
- shared responsibility among the members;
- democratic decision – making;
- Leadership from within the group.

Groups often need considerable support and capacity building before they can function effectively and democratically. Members may need a mix of skills including:

- How to prepare an agenda
- How to write minutes
- How to conduct meetings
- How to resolve differences
- How to facilitate consensus
- How to learn from failure
- How to delegate tasks
- How to plan and review progress
- How to speak in public with confidence

Other trainings for the group may include:

- Analyzing skills – identifying the common threads between individuals' problems; connecting the shared problems to the wider issues of disability and poverty;
- Linking issues – identifying the links between disability, poverty and discrimination;
- Joining with others – understanding the benefits of joining with other groups who are working on similar issues and translating these mutual concerns into social action.

Self-help Groups have become the focus of development around which many disadvantaged communities have found solutions to their day to day problem, and from which rights movements have made real progress in gaining justice and equity.

The concept of self-help has given a new dimension to the disability movements in countries around the world.

Disabled People's Organization (DPO) -

They are membership organizations. Initially a few people with disabilities come together and form a group. They work to increase membership and draw up a constitution. They register as a legal entity. The membership becomes the General Body of the organization. The General Body elects a Governing Body.

The Governing Body elects office bearers.

The General Body meetings are conducted every one or three years. The function of the General Body is to elect the Governing Body, to approve the annual report and financial statements of the organization and also to make amendments to the constitution.

The Governing Body is accountable and responsible for conducting the affairs of the organization. The office-bearers include president, secretary and treasurer. They are the legal holders of the organization. The Governing Body employs staff to implement its policies and programs. The DPO is also accountable to its members and to other constituencies such as donors, staff and volunteers, service providers, and statutory bodies such as government agencies.

DPOs are bigger and more structured version of SHGs. DPOs focus more widely on influencing policy and resource allocation. By working together, SHGs and DPOs are able to meet the needs of people with disabilities at the local and wider level, and in the short and long-term. The CBR program achieves its objectives largely through these groups.

Three levels of prevention

Prevention interventions can be at one of three levels.

1. **Primary prevention** – the phrase “prevention is better than cure” is one that many people are familiar with and is the focus of primary prevention. Primary prevention is directed at avoidance and uses interventions that prevent health conditions from occurring (17). These interventions are mainly aimed at people (e.g. changing health behaviors, immunization, nutrition) and the environments in which they live (safe water supplies, sanitation, good living and working conditions). Primary prevention is equally important for people with and without disabilities and is the main focus of this element.

2. **Secondary prevention** is the early detection and early treatment of health conditions, with the aim of curing or lessening their impacts. Examples of early detection include mammograms to detect breast cancer and eye examinations to detect cataracts; examples of early treatment include treatment of trachoma with antibiotics to prevent blindness, multidrug treatment of leprosy to prevent disease progression and appropriate handling of a fractured bone to promote proper healing and prevention of deformity. Secondary prevention strategies for people both with and without disabilities are discussed in the Medical care element below.

3. **Tertiary prevention** aims to limit or reverse the impact of already existing health conditions and impairments; it includes rehabilitation services and interventions that aim to prevent activity limitations and to promote independence, participation and inclusion. Tertiary prevention strategies are discussed in the elements on Rehabilitation and Assistive devices.

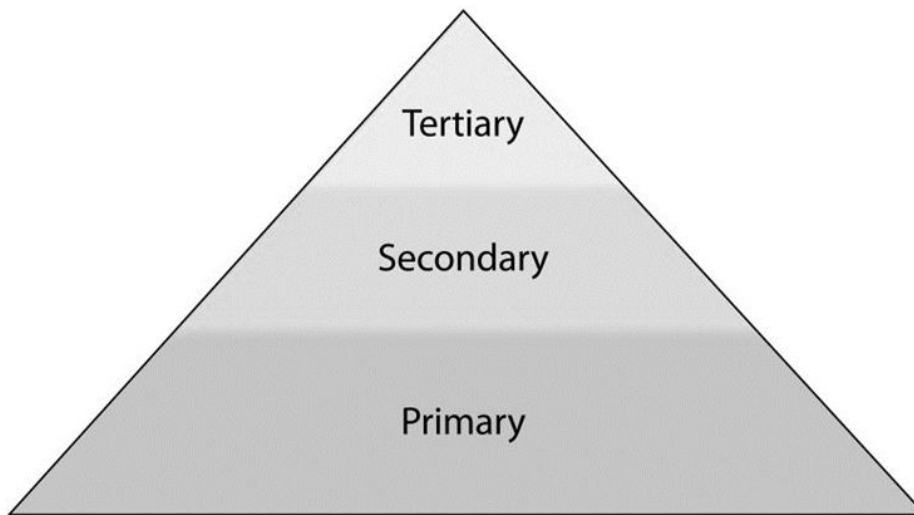


Fig 1Three levels of prevention

What does prevention mean for people with disabilities?

Like everybody, people with disabilities are exposed to risk factors for which they require routine preventive health care, e.g. immunizations. However, they may also require targeted and specialized interventions because often they are more vulnerable to the health risks present in the community. For example, in situations of poverty people with disabilities have the least access to safe water and sanitation facilities. Poor access to these facilities can force them to follow unhygienic practices, putting their health

at risk and contributing to keeping them poor and unable to improve their livelihoods. In these situations, special facilities or modifications may need to be provided for people with disabilities.

People with disabilities are also at risk of secondary conditions (i.e. health problems or complications which are related to their primary health condition). Examples include: pressure sores, urinary tract infections, joint contractures, pain, obesity, osteoporosis and depression. These secondary conditions can be addressed with early intervention and many of them can be prevented altogether. For example, a person with paraplegia can prevent pressure sores with good skin care and prevent urinary tract infections with good bladder management.

Facilitate access to existing prevention programmes

CBR programmes can gather information about existing prevention activities in their communities and work with prevention programmes to include people with disabilities, thus ensuring greater coverage. CBR programmes can:

- ensure that people with disabilities and their families are aware of the types of prevention activities available in their communities;
- ensure that health personnel are aware of the needs of people with disabilities;
- ensure that information about prevention activities is available in appropriate formats and in a variety of locations close to where people live;
- determine if locations where prevention activities take place are physically accessible and if not, provide practical ideas and solutions to make them accessible;
- determine whether prevention services can be provided in alternative locations, e.g. in home environments, when access is difficult.

Steps in implementation of CBR –

- I. Identification of person requiring rehabilitation services.
- II. Assessment of disabilities and various needs for rehabilitation of identified person.
- III. Provide the basic services through PHC, such as drugs, dressing materials, protective footwear, counseling and training in self-care.
- IV. Introduce / escort the person to 'Village Health & Sanitation Committee' along with his/her problems or issues.
- V. Refer him/her to secondary or tertiary care center for physical rehabilitation services, like ulcer care, physiotherapy, surgical treatment, treatment of eye complications, prostheses and so on. Follow up of referral services is also an essential task.
- VI. Facilitating the accessibility to 'socio-economic rehabilitation services' through social welfare department by a 'CBR worker'. A health supervisor, MPW, ANM, AWW, ASHA, or even a volunteer can play the role of CBR –worker. Joint efforts by 'Village health & sanitation committee' will be often required.

VII. Review meetings by all stake holders, to discuss the progress of CBR project or individual's problems will help in expediting the rehabilitation.

VIII. District Nucleus steers the rehabilitation activities and provides support to CBR workers in facilitating the accessibility to different services IX. Coordination with social welfare department and working jointly.

X. Education of people, behavioral change communication and all effort to reduce stigma need to be carried out simultaneously and jointly so that rehabilitation activities can be carried out smoothly.

XI. Participatory Evaluation of CBR services/projects at definite intervals will open the avenues of effective and sustainable rehabilitation

ASSISTIVE DEVICES

- An Assistive device which helps person to move from one place to another place



Parallel Bar



Walker



Crutches and walking stick

PHYSIOTHERAPY

- Preventing, identifying, correcting, and alleviating acute or prolonged movement dysfunction of anatomic or physiologic origin.
- The primary objective of physical therapy is to promote optimum human health and function/s.

WHAT DOES PHYSIOTHERAPIST DO?

- Movement
- Restoration of function
- Improvement in mobility

ROLE OF PT

- Evaluating functionality
- Treatment to regain functionality

AIM OF PT

- Increase strength
- Increase endurance / stamina
- Increase flexibility / plasticity/suppleness
- Increase balance / equilibrium / steadiness
- Increase coordination / Synchronization / Harmonization

WHO NEEDS PHYSIOTHERAPY?

- Deformities and contracture
- Different diseases / conditions
- Gynecology and obstetrics
- THOSE having Problem in 5 S

WHO CAN PROVIDE PT SERVICE?

- Physical therapist
- Trained Community worker or facilitator
- Trained Social mobilizer
- Rehabilitation workers
- Trained Parents and clients themselves

WHEN TO START PT??

- As early as possible

THERAPEUTIC EXERCISES

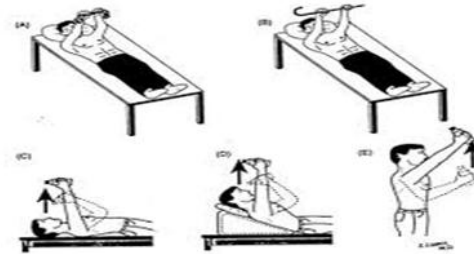
- **Range of Motion (ROM) exercises**

- Active ROM exercise
- Passive ROM exercise
- Active assisted



- **Strengthening exercises**

- Isometric strengthening exercise
- Isotonic strengthening exercise



- **Stretching exercises**

- Manual stretching exercise
- Mechanical stretching exercise



FOLLOW UP AND REFERRAL

SESSION 11	FOLLOW UP AND REFERRAL
<p>Follow up & Referral</p> <ul style="list-style-type: none"> - Strategies for identification of people with injuries in the community - Reasons for referral from the community to services - Referral system flow - Documentation - Follow up : objectives and approaches 	<p>Terminal Objective At the end of the session, the participants will be able to describe principles and modalities of referral of people with injuries from the community to the DH and vice versa.</p> <p>Enabling Objective At the end of the session, the participant will be able to:</p> <p>Describe ways of identifying people in need of care at the community level, including home visits and mobile camps.</p> <p>Explain the importance of referral mechanisms between the community and services for people with injuries and follow up</p> <p>Utilize referral forms</p> <p>List available rehabilitation services</p> <p>Methodology Power point, Practical demonstration, Group discussion</p> <p>Learning Materials Training manual, Referral form</p> <p>Time for session 1 hour</p> <p>Evaluation method Pre-test, Participant’s participation and reaction, post-test</p>

Referral:

A person in need of specific support when recommended to some specialized (health) professional is referral.

Health referral is the process:

Health care providers at lower levels to seek the assistance of providers who are better equipped or specially trained to guide them in managing or to take over responsibility for a particular episode of a clinical condition in a client.

REASON FOR REFERRAL

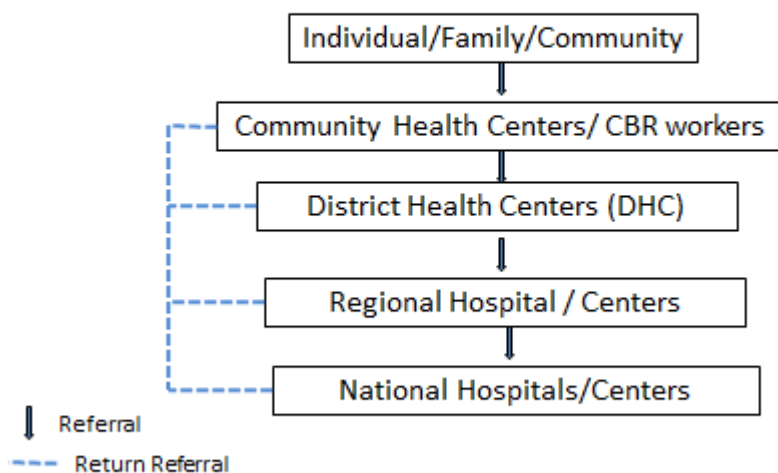
- seek expert opinion regarding the client
- seek additional or different services for the client
- seek admission and management of the client
- seek use of diagnostic and therapeutic tools

OBJECTIVE OF REFERRAL MECHANISM

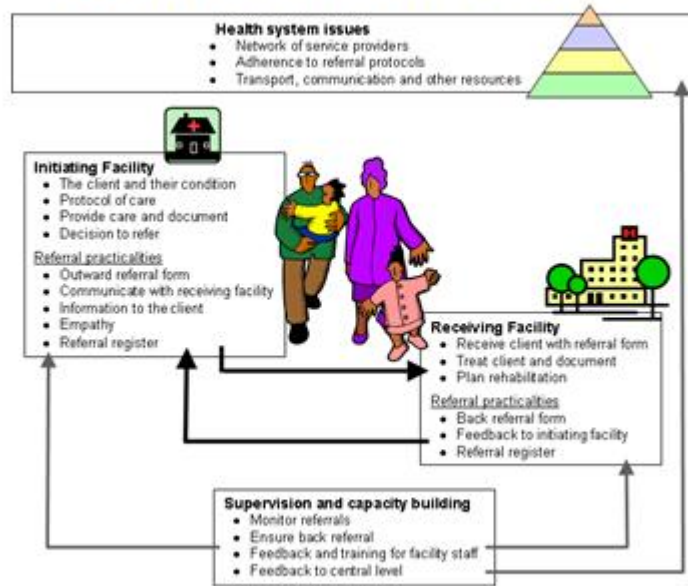
- A good referral mechanism can help to ensure:
- Clients receive optimal care at the appropriate level.
- Reduce unnecessary cost.
- Use optimal and cost-effective facilities in hospital.
- Access clients who need special services in a time
- Primary health services are well utilized and their reputation is enhanced

Framework of Referral mechanism

Four level referral system:



REFERRAL SYSTEM FLOWS



FOLLOW UP

GOALS:

- To assist in achieving Optimal Functional Independence through;
 - Regular follow-up of the clinical outcome and its maintenance
 - Ensuring physiotherapy & use of orthopedic appliance
 - Administration of medications

To assist in achieving Optimal Functional Independence through;

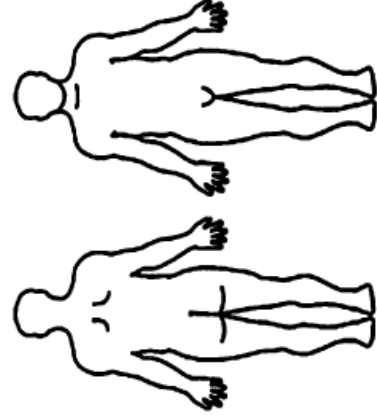
- Transferring Knowledge and Skill
- Improving accessibility to service
 - Partnership
 - Collaboration
 - Networking
- Developing awareness in prevention & rehabilitation, inclusion & rights through information & knowledge



Emergency Referral Form page 4	
Rehabilitation Health Care	
Rehabilitation Centre	Date/place
Present Physical status	
Treatment provided	
Follow-up needed	
Referred FROM	Referred TO
NAME/phone of REFERRING PERSON	

Important Phone Numbers for information on referral places for Kathmandu Valley		
Central Regional Health		
Directorate Office Hetauda	057-524510	Civil Service Hospital
DPHO Kathmandu	01-4212620	Patan Hospital
Fire Brigade	101	Kanti Hospital
DHO Lalitpur	01-5521566	Nepal Medical College
		Armed Police Forces
Bhaktapur Hospital	01-6610676	Hospital
Nepal Red Cross Society	01-4219187	Psychiatric Hospital
	102	
Nepal Ambulance Services	01-4284738	Police
	01-4412303, 4412404, 4412505	
TUTH		Maternity Hospital
Shree Birendra Hospital	01-4285621	NDF
	01-4240805, 4240806	KMCTH
Model Hospital		
SPK	01-4880684	

Emergency Referral Form Page 1	
PATIENT FULL NAME:	
Name/Phone number of person who fills in this first page:	
INCIDENT SITE	DATE/TIME OF INCIDENT:
INCIDENT TYPE	Earthquake <input type="checkbox"/> Landslide <input type="checkbox"/> Accident <input type="checkbox"/> Other <input type="checkbox"/>
Dependent child :	Yes <input type="checkbox"/> No <input type="checkbox"/> Breastfed <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Dependent disabled :	Yes <input type="checkbox"/> No <input type="checkbox"/> Name of dependant
PATIENT	CONTACT PERSON
Specific feature:	Name
Age/Sex	
Phone/mobile:	Phone/Mobile
Address	Address
Ward No.	Ward No.
VDC/municipality	VDC/municipality



Emergency Referral Form Page 2	
PATIENT FULL NAME:	
Pre-Hospital Emergency Health Care	
<i>Date/Time</i>	
<i>Main Problem</i>	
<i>First Aid:</i> Stop bleeding <input type="checkbox"/> Airways <input type="checkbox"/> Breathing <input type="checkbox"/> Immobilisation <input type="checkbox"/> Dressing <input type="checkbox"/> Cardiac massage <input type="checkbox"/>	
<i>Referred FROM</i>	
<i>Referred TO</i>	
<i>Ambulance name & phone</i>	
<i>Treatment provided (during travel)</i>	
NAME/Phone OF REFERRING PERSON	
Primary Health Care Facility	
<i>Facility Name & Address</i>	<i>Patient Number</i>
<i>Triage Category (tick)</i>	<input type="checkbox"/> Red <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Black
<i>Diagnosis</i>	
<i>Treatment provided</i>	
<i>Referred FROM</i>	
<i>Referred TO</i>	
<i>Ambulance name & phone</i>	
<i>Treatment during travel</i>	
NAME/Phone OF REFERRING PERSON	

Emergency Referral Form Page 3	
PATIENT FULL NAME:	
Hospital 1-Emergency Health Care Referral	
<i>HOSPITAL name</i>	<i>Date/Place</i>
<i>Patient Number</i>	
<i>Reason for referral</i>	
<i>Triage Category (tick)</i>	<input type="checkbox"/> Red <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Black
<i>Diagnosis</i>	
<i>Treatment</i>	
<i>Referred FROM</i>	<i>Referred TO</i>
<i>Ambulance name & phone</i>	
<i>Treatment provided (during travel)</i>	
NAME/phone OF REFERRING PERSON	
Hospital 2- Emergency Health Care Referral	
<i>HOSPITAL name</i>	<i>Date/Place</i>
<i>Patient Number</i>	
<i>Reason for referral</i>	
<i>Triage Category (tick)</i>	<input type="checkbox"/> Red <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Black
<i>Diagnosis</i>	
<i>Treatment</i>	
<i>Referred FROM</i>	<i>Referred TO</i>
<i>Ambulance name & phone</i>	
<i>Treatment provided (during travel)</i>	
NAME/phone OF REFERRING PERSON	



आकास्मिक प्रेषण फाराम पेज १

विरामीको पुरा नाम:

परिचय सम्बन्धि भाग भर्ने व्यक्तिको नाम:

घटना भएको स्थान:

घटना भएको मिति र समय:

घटनाको किसिम:

भूकम्प पहिरो बुर्धटना अन्य

आश्रित बालबालिका:

छान् छैनन् स्तनपान गर्ने बच्चा छान् छैनन्

आश्रित अपाङ्गता भएका व्यक्ति: छान् छैनन् आश्रित व्यक्तिको नाम:

विरामी सम्पर्क व्यक्ति

विशेष गुण: नाम:

उमेर/सिंह

फोन/मोबाइल:

फोन/मोबाइल:

ठेगाना:

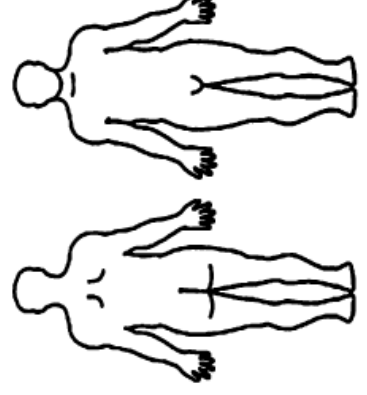
ठेगाना:

बडा नं.

बडा नं.

गा.वि.स./नगरपालिका

गा.वि.स./नगरपालिका



आकास्मिक प्रेषण फाराम पेज ४	
पुनर्स्थापना केन्द्र	मिति/स्थान
हालको शारीरिक अवस्था	
प्रदान गरिएको उपचार	
गर्नुपर्ने फलोअप	
प्रेषण भई आएको संस्था:	प्रेषण भई जाने संस्थाको:
प्रेषण गर्ने व्यक्तिको नाम र फोन नं.	

काठमाण्डौ उपत्यकामा प्रेषण गर्ने ठाउँहरूको महत्वपूर्ण फोन नम्बरहरू			
केन्द्रीय स्वास्थ्य निर्देशनालय, हेटौडा	०१-४२१२३१०	निजामती सेवा अस्पताल	०१-४१०७०००
जिल्ला स्वास्थ्य कार्यालय, काठमाण्डौ	०१-४२१२३२०	पाटन अस्पताल	०१-४२२२२६६
अग्नि नियन्त्रक/दमकल	१०१	कान्ति अस्पताल	०१-४४११५५०
जिल्ला स्वास्थ्य कार्यालय, तलितपुर	०१-४५२१५६६	नेपाल मेडिकल कलेज	०१-६२२२६९७
भक्तपुर अस्पताल	०१-६६१०६५६	सशस्त्र प्रहरी अस्पताल	०१-४३५४२२४
नेपाल रेडकस सोसाइटी	०१-४२१९१८७	मानसिक अस्पताल	०१-४५२१३३३
	१०२		
नेपाल रेडकसको एम्बुलेन्स सेवा	०१-४२८४७३८	प्रहरी	१००
त्रिभुवन विरविविद्यालय शिक्षण अस्पताल, काठमाण्डौ	०१-४४१२३०३, ४४१२४०४, ४४१२४०५	प्रसूती गृह	०१-४२५३१७९
श्री विरेन्द्र अस्पताल	०१-४२५६२१	राष्ट्रिय अपाङ्गता कोष	०१-४२२४९६८
मोडेल अस्पताल	०१-४२४०८०५, ४२४०८०६	काठमाण्डौ मेडिकल कलेज	०१-४४६९०६४, ४४७६१५२
सैनिक पुनर्स्थापना केन्द्र	०१-४८८०६८४	शिक्षण अस्पताल	

आर्कास्मिक प्रेषण फाराम पेज २	
विरामीको पुरा नाम:	
अस्पताल पुग्नु भन्दा पहिले गरिएको आर्कास्मिक स्वास्थ्य हेरचाह	
मिति/समय:	
मुख्य समस्या:	
प्राथमिक उपचार:	रक्तश्राव रोक्ने <input type="checkbox"/> हलचल गर्न नदिने <input type="checkbox"/> ड्रैजिङ <input type="checkbox"/>
खुलाउने	शवासतली <input type="checkbox"/> श्वासप्रश्वास <input type="checkbox"/> कार्डियाक मसाज <input type="checkbox"/>
प्रेषण भई आएको संस्था:	
प्रेषण भई जाने संस्था:	
एम्बुलेन्सको नाम र फोन नं.	
यात्राको बेलामा गरिएको उपचार	
प्रेषण गर्ने व्यक्तिको नाम र हस्ताक्षर	
प्राथमिक स्वास्थ्य केन्द्र	
स्वास्थ्य संस्थाको नाम र ठेगाना	विरामीको नं.
समस्याको प्राथमिकताको किसिम (चित्तो लगाउनुहोस्)	रातो <input type="checkbox"/> पहेँलो <input type="checkbox"/> हरियो <input type="checkbox"/> कालो <input type="checkbox"/>
निदान	
प्रदान गरिएको उपचार	
प्रेषण भई आएको संस्थाको नाम:	
प्रेषण भई जाने संस्थाको नाम:	
एम्बुलेन्सको नाम र फोन नं.	
यात्राको बेलामा गरिएको उपचार	
प्रेषण गर्ने व्यक्तिको नाम र हस्ताक्षर	

आर्कास्मिक प्रेषण फाराम पेज ३	
विरामीको पुरा नाम:	
अस्पताल १ आर्कास्मिक स्वास्थ्य हेरचाह	
अस्पतालको नाम:	मिति/स्थान
विरामीको नं.	
प्रेषण गर्नुको कारण:	
समस्याको प्राथमिकताको किसिम(चित्तो लगाउनुहोस्)	रातो <input type="checkbox"/> पहेँलो <input type="checkbox"/> हरियो <input type="checkbox"/> कालो <input type="checkbox"/>
निदान	
उपचार	
प्रेषण भई आएको संस्था:	प्रेषण भई जाने संस्थाको:
एम्बुलेन्सको नाम र फोन नं.	
यात्राको बेलामा गरिएको उपचार	
प्रेषण गर्ने व्यक्तिको नाम र फोन नं.:	
अस्पताल २ आर्कास्मिक स्वास्थ्य हेरचाह	
अस्पतालको नाम:	मिति/स्थान
विरामीको नं.	
प्रेषण गर्नुको कारण:	
समस्याको प्राथमिकताको किसिम(चित्तो लगाउनुहोस्)	रातो <input type="checkbox"/> पहेँलो <input type="checkbox"/> हरियो <input type="checkbox"/> कालो <input type="checkbox"/>
निदान	
उपचार	
प्रेषण भई आएको संस्था:	प्रेषण भई जाने संस्था:
एम्बुलेन्सको नाम र फोन नं.	
यात्राको बेलामा गरिएको उपचार	
प्रेषण गर्ने व्यक्तिको फोन नम्बर:	

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- Disaster Management Guidelines—Emergency Surgical Care and Disaster Situations (WHO Guide)
- War Surgery: Working with Limited Resources in Armed Conflict and Other Situations of Violence. (Giannou, C; Baldan, M.; ICRC, Geneva, 2009)

3. AMPUTATION

1. Primary Surgical Care—Volume 2, Trauma (Maurice King, editor; 2005)
 2. Surgical Care at the District Hospital (WHO guide)
3. Disaster Management Guidelines—Emergency Surgical Care and Disaster Situations (WHO Guide; 2005)
4. War Surgery: Working with Limited Resources in Armed Conflict and Other Situations of Violence. (Giannou, C; Baldan, M.; ICRC, Geneva, 2009)
 5. The Rehabilitation of People with Amputation (WHO, 2004)

4. SCI

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ANNEX 1: Spinal X-ray--Evaluation

NOTE: normal X-ray does not mean normal spine! Indications of unstable injury include, BUT ARE NOT LIMITED TO:

- ❖ Injury (or mal-alignment) of 2 or more of the 3 spinal columns
- ❖ Rotational mal-alignment
- ❖ Subluxation or dislocation of one vertebra on another
- ❖ Fracture of odontoid
- ❖ 50% or more vertebral body compression
- ❖ Increased width between the pedicles on the AP view

5. HEAD INJURY

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7. Emergency Trauma Guidelines

8. ICRC Guidelines

9. PREVENTION OF MAIN COMPLICATIONS – PATIENT AND CARE GIVER EDUCATION (IEC)

- a. Wound Care**
- b. Amputation Care**
- c. Bladder and Bowel Care**
- d. Deep Vein Thrombosis Care**
- e. Pressure Sore Care**
- f. Respiratory Tract Infection Care**
- g. Urinary Tract Infection Care**
- h. Flaccidity and Spasticity Prevention and Care**
- i. Cognitive, Emotion and Behavior Problems Care**
- j. Post Burn Contracture Prevention and Care**

k. Itching and Infection Care

l. Scar and Hypertrophic Scar Prevention and Care

10. CBR Guidelines