On-site Activities in MCI

CHAIN OF MEDICAL CARE

ON SITE ACTIVITIES and PRE-HOSPITAL ACTIVITIES

Learning Objectives

By the end of this module, the participant should be able to:

• Describe the organization of on site activities, especially medical activities
• Describe the main reasons for having special arrangements on scene such as Advanced Medical Post and specific procedures such as sectorisation and triage
• Discuss the various links of the medical chain and the needs for policy, planning and training
• Discuss the roles of the Health Sector in developing the various elements of pre-hospital medical capacity
In your country:

- What are the main components of on site activities and pre-hospital activities and how are they organized?
- What are the Health Sector responsibilities and what are the activities more specifically delivered by the Health Sector?
Pre-hospital chain of medical care extends:

- **in space:** from the site (sector level) to the final hospital triage area/ reception area
- **in time:** from the alarm (pre-alert, early warning) until the admission of the last casualty

1. **strategy:** emergency operation plans
2. **tactic:** activation of response plans / contingency plans
3. **logistics:** human & material resources / systems for command, coordination and control/ communication/ Advance Medical Post/ triage/ evacuations of patients/ dispatching/ management of information/ management of the dead and the missing

**CONDITIONS FOR SUCCESS**

Some fundamental PRE-REQUISITE for success:

- a broad health sector policy and strategy for emergency management in synergy with inter-sectoral emergency management plan
- a clear designation and definition of:
  - overall authority and responsibilities
  - site authority and responsibilities (IMS)
- programs of regular training for emergency management
- trained medical teams ready to operate in a special environment:
  - skilled and trained personnel
  - equipment and other resources
- Pre-established management mechanisms (IMS)
MODULE 2

Mass Casualty Management

A multi-sectoral organization

- Police
- Fire - Rescue
- Medical Volunteers

- Medical Team
- Triage
- Life saving
- Stabilization

- EMS
- Dispatching
- MEC

- Triage
- Emergency Dept
- Treatment
- OPD
- Information

Sectors
AMP
MEC
Hospitals

ECC –
national or
provincial

Site: ICP

EOC - local or
provincial

MODULe 2

The conditions for effectiveness in medical care delivery

1. to provide at the sector level life-support measures as soon as possible
2. to organize medical triage as quickly as possible
3. to start with medical care as close as possible to the site (Advanced Medical Post)
   - stabilisation of patients
   - treatment of acute situations
   - without taking excessive risks
4. to integrate medical activities with rescue and relief operations
5. to avoid any discontinuity in the chain:
   - during first transportation to the AMP
   - during evacuation
   - between pre-hospital and hospital activities
Three closely organized systems

1. First transfer of patients
2. Evacuations process
3. Activation of plans

Continuum: C C C C

Inter-sectoral/inter-agency

Pre-hospital medical chain

CHAIN OF MEDICAL CARE: Large scale disaster

AMP / MEC

ICP(s)

Ambulances / helicopters...

hospitals

EOC(s)

ECC
 MODULE 2

The main activities:

1. alert (in some situations: warning) : activation of plans
2. Reconnaissance activities (of the site)
3. Setting up front medical organization
   - triage and emergency care
   - medical care during relief and rescue operations, AMP
4. Evacuations (medicalized) - Dispatching
5. Hospital reception (triage and care)

MODULE 2

CONDITIONS FOR SUCCESS

Alarm – alert & communications:

First alarm → Emergency center → alert → police, medical, rescue → Activation of plans/ mobilisation of resources etc.

Many countries have one telephone number for all emergencies
In other countries: police, health, rescue.. each sector has its own number
MODULE 2

Is this scene safe?

How do you know?

THE ALERT

some basic characteristics of the alert:

1. as quick as possible
2. as precise as possible
3. providing information about:
   ✓ location / place of the disaster
   ✓ type / nature
   ✓ extent (first estimate: 10 / 50 / 100…)
   ✓ possible casualties, type, etc.
4. shared with all concerned services and agencies:
   ✓ it is possible that disaster medical teams are not the first to be on the spot: the first to reach the scene (ambulance crew, etc.) with “medical capacity” should start to work immediately according to their professional competence
First inspection of the site:
1. establish first casualty report.
   - number of injured, stretcher cases, types of injury....
2. assessment of the medical situation (human and logistical needs...)
3. integration of the collected information into the broader assessment of the situation as made by the rescue units:
   - material losses
   - ongoing risks, hazardous material....
   - access roads, entry points, marking of the buildings
   - specific problems: dust, climatic....
4. sectorization of the site
5. no sophisticated medical care before reconnaissance process is completed

the main objectives of the sectorisation of a site:
1. not to forget any part of the disaster site
2. not forget any casualty
3. not overlook any secondary hazard (chemical leaks, gas...)
4. to allocate efficiently the medical resources:
   - dynamic process
   - meet actual needs
   - renew usable items, etc.
5. to facilitate the coordination and the command process
6. to ensure general security of the personnel
7. to ensure good communication
8. to avoid crowd gathering
From the French verb « trier » (Napoleon wars)
✓ to sort
✓ to select
✓ to classify
  = to save life and function
✓ reasons for triage:
✓ deep imbalance: immediate needs – available resources
✓ necessity for categorization of victims in order to ensure the most efficient use of available resources:
  ✓ to save as many as possible lives
  ✓ to reduce human suffering as much as possible
  ✓ To reduce disability
  ✓ to adapt the level of ambition

MEDICAL TRIAGE: goals

Establish priorities for surgical treatment

Determine priorities for evacuation

Dispatching of patients to hospitals

Ensure med care to casualties according to:
- severity of injury
- need for treatment
- possibility of good quality survival
- availability of med care

Ongoing & Dynamic process:
Re-evaluation
## MODULE 2

### TRIAGE CATEGORIES

<table>
<thead>
<tr>
<th>Patient Status</th>
<th>START</th>
<th>Military / International</th>
<th>Color Code</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>Critical / Immediate</td>
<td>Immediate</td>
<td>Red</td>
<td>1</td>
</tr>
<tr>
<td>Delayed</td>
<td>Urgent / Delayed</td>
<td>Delayed</td>
<td>Yellow</td>
<td>2</td>
</tr>
<tr>
<td>Can wait/hold</td>
<td>Minor</td>
<td>Minimal</td>
<td>Green</td>
<td>3</td>
</tr>
<tr>
<td>Deceased</td>
<td>Dead / Dying</td>
<td>Expectant</td>
<td>Black</td>
<td>4</td>
</tr>
</tbody>
</table>

### CESIRA PROTOCOL

1. **Able to walk?**
   - Yes: **GREEN**
   - No: **RED**

2. **Is casualty conscious?**
   - Yes: **RED**
   - No: **RED**

3. **Does casualty present with external arterial bleeding?**
   - Yes: **RED**
   - No: **GREEN**

4. **Is shock present?**
   - Yes: **RED**
   - No: **GREEN**

5. **Respiratory failure?**
   - Yes: **RED**
   - No: **GREEN**

6. **Fractures / cranial trauma / injury to backbone?**
   - Yes: **YELLOW**
   - No: **Green**

Another pathology: poisoning / heat stroke / hypothermia / thoracic pain, burns..
MODULE 2

START TRIAGE

Assessment using RPM

- Casualties are color coded to quickly identify a casualty’s priority for medical treatment.
  - Black – Expectant/Dead-Dying
  - Red - Immediate
  - Yellow - Delayed
  - Green – Minimal/Minor

**Respiration’s** 0, 30

**Perfusion** 2, Radial Pulse

**Mental Status** Can Do
## MODULE 2

### Triage at different levels by different staff

<table>
<thead>
<tr>
<th>On Site T</th>
<th>Medical T</th>
<th>Evacuations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>RED</strong> transferred asap to tertiary facility in an equipped ambulance with med. escort</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>YELLOW</strong> after evacuation of Red* * w/o life-threatening problem</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td><strong>GREEN</strong> walking wounded to OPD</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td><strong>BLACK</strong> to morgue, forensic services</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>❖ PH &amp; Psycho-social interventions to relatives/kin</td>
</tr>
</tbody>
</table>

Evacuation T

<table>
<thead>
<tr>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
</tr>
<tr>
<td>Green</td>
</tr>
<tr>
<td>Black</td>
</tr>
</tbody>
</table>

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**UNIFIED SYSTEM WITHIN THE COUNTRY**
MODULE 2

Medical care DELIVERY on the scene

- **secure vital functions:**
  - airway – breathing – circulation
- **diagnosis:**
  - rapid & systematic examination
  - chest / abdomen / pelvis / head / spinal /limbs
- **decision:**
  - only measures that have significant effects on survival / function or
  - can lead to a lower priority (downgrading priority)
- **treatment:**
  - register performed measures on the triage-card or the patient record
- **setting priority:**
  - continuous process - re-evaluation
  - using tags
- **transfer or evacuation:**
  - how, where, medical surveillance, when......

• Simple measures can contribute to save life
• How to assess those who will need first attention for
  simple life-saving measures and/or for more medical
  emergency care

Who could provide what?
Tension pneumothorax causing compression of the 'normal lung'
ADVANCED MEDICAL POST – site casualty clearing station

The AMP is NOT a structure but a concept:

1. All casualties should go through when AMP is set up:
   - for registration / triage / medical care / discharge or evacuation

2. Not all situations require a formal AMP to be set up but the “functions and activities” of the AMP still have to be carried out through other organizational arrangements
the AMP is NOT a structure but a concept:

3. the location of the AMP:
   - should be as close as possible to the site
   - should not be exposed to foreseeable developing risks
     - poisoning fumes, collapse of buildings, etc.
   - should be as much as possible accessible to transport:
     - access in and out
     - suitable roads....
AMP IS A CONCEPT NOT A BUILDING OR ANOTHER FORMAL STRUCTURE
MODULE 2

DISASTER MEDICAL TEAMS

- Medical teams working in the pre-hospital chain should respect the following characteristics:
  1. Personnel trained in emergency care and advanced life support
  2. Personnel trained in emergency management
  3. Personnel trained to use equipment and resources
  4. Composed of different categories of personnel

- Role of physicians:
  - To organize and manage medical care
  - To organize triage and categorization of victims
  - To monitor and treat casualties during the evacuation process
  - To work in close cooperation with rescue services
### Head injuries in disaster situations

<table>
<thead>
<tr>
<th>Finding</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully or almost conscious</td>
<td>0-10 %</td>
</tr>
<tr>
<td>Somnolent</td>
<td>25 %</td>
</tr>
<tr>
<td>Responds to pain, not to talk</td>
<td>70-75 %</td>
</tr>
<tr>
<td>No or inaccurate response to pain</td>
<td>95 %</td>
</tr>
</tbody>
</table>

#### Consciousness
- Reflexes normal • 35 %
- Different size • 60 %
- Dilated, no response in light • 95 %

#### Eye (pupils)
- Insufficient (because of head injury) • 65 %
- No spontaneous respiration (because of head injury) • 95 %

### Indications for early endotracheal intubation

<table>
<thead>
<tr>
<th>Risk for obstruction</th>
<th>Risk for hypoxia</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Maxillofacial injury</td>
<td>- Chest injury</td>
</tr>
<tr>
<td>- Burn/smoke inhalation</td>
<td>- Pulmonary contusion</td>
</tr>
<tr>
<td>- Head injury</td>
<td></td>
</tr>
<tr>
<td>- Severe shock</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk for aspiration</th>
<th>Risk for posttraumatic lung injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reduced consciousness</td>
<td>- Major trauma</td>
</tr>
<tr>
<td>- Intoxication</td>
<td>- Long prehospital time</td>
</tr>
</tbody>
</table>
MODULE 2  Simple measures such as securing airway can not only save life but also downgrade the urgency for evacuation and surgical treatment.
MODULE 2

MEDICAL TEAMS CAPACITY

Front medical capacity is limited and depends on:

- in optimal conditions:
  - 1 surgeon + 1 anaesthetist + 2 paramedics + several rescue workers:
    - maximum: < 10 seriously injured persons (cat 1 &2) per hour and for less than 8 hours non-stop work
    - better count 8 = more realistic for assessing the needs regarding the number of required medical teams
  - many first-aid workers to carry out many tasks are necessary to back-up the medical teams

MODULE 2

Medical Evacuation Centre

MEC

- Command section
- Psycho-social section
- Information & support activities /center
- Triage & medical care section
- Logistic & supply section
- Evacuation & regularization section
- Hospitals
Middle aged man with severe crush injury left limb. HR 128. Breathing OK

What must be done before and during evacuation?

Air transport in major disasters is resource consuming although very useful
MODULE 2
The reality.....transfer of a young pregnant women after landslide...roads cut

MODULE 2
Linking pre-hospital and hospital phases... coordination and information sharing
MODULE 2 Linking pre-hospital and hospital phases

Harmonization of the systems for ensuring effectiveness and consistency from the site to the ward

For special case of chemical incident it is vital to coordinate pre-hospital and hospital phases
MODULE 2

TRAINING and EXERCISES

ACTIVATION OF PLANS

TRAINING EXERCISES

COMMAND CONTROL COORDINATION IMS - ICP - EOC

TRAINING EXERCISES

INTER-SECTORAL INTER-AGENCIES

TRAINING EXERCISES

MEDICAL CARE

ALL ARE NECESSARY FOR MANAGING EFFICIENTLY THE CHAIN

MODULE 2

INFORMATION AND SUPPORT CENTRE (1)

- information management to relatives, to affected people
- sheltered from public and media where survivors and relatives can gather and meet; psychosocial support teams
- support and holding environment (psychosocial programs can be initiated in this Centre)
- forum place and meeting place (reduce convergence to site or hospitals…)
- identification of immediate and urgent social and economical needs
- inquiry (casualty bureau for police, coroner…)

MODULE 2 INFORMATION AND SUPPORT CENTRE (2)

• facilitation of the management on the scene
• linkage activities: local and distant (international transport, information to away families, etc.)
• presence of:
  ▪ health personnel / social workers / religious leaders / police / volunteers...
• help line 24/24 for several days or weeks

MODULE 2 GROUP WORK

• What is the reality in your country for managing on-site activities in MCI?
• How the health sector contributes to the overall management of these activities?
• What is the organization for medical activities; who is in Command?
• What are the existing training programs for medical and paramedical staff?
• What are the exercises conducted by the Health Sector and also with other sectors?
• How to improve the present situation?
• The special case of a pandemic

• Importance of the surge capacity to absorb patients in NON-hospital settings: from home-care to “equivalent of field-hospital”

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**We are now at WHO Pandemic Phase 3**

<table>
<thead>
<tr>
<th>Inter-pandemic period</th>
<th>Phase 1</th>
<th>No new influenza virus detected in humans. If a new influenza virus presents in animals, the risk of human infection is considered to be low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pandemic alert period</td>
<td>Phase 2</td>
<td>No human infections, but a circulating animal influenza virus poses a risk to humans</td>
</tr>
<tr>
<td></td>
<td>Phase 3</td>
<td>Human infection (s) with a new virus, but no (or very infrequent) human-to-human spread.</td>
</tr>
<tr>
<td></td>
<td>Phase 4</td>
<td>Small human-to-human cluster (s) - less than 25 people, lasting less than 2 weeks, highly localized - virus is not well adapted to humans</td>
</tr>
<tr>
<td></td>
<td>Phase 5</td>
<td>Larger human-to-human cluster (s) - between 25-50 people, lasting from 2-4 weeks, still localized but virus increasingly better adapted to humans</td>
</tr>
<tr>
<td>Pandemic period</td>
<td>Phase 6</td>
<td>Significantly increased and sustained transmission in general population</td>
</tr>
</tbody>
</table>
MODULE 2

Medical Surge Capacity for Pandemic is much more than just mobilising “field hospitals”...the threat of a pandemic has brought many new ideas...can we learn for MCM?

Patient Triage

- Alternative triage locations
  - Institutional lockdown for walk-in patients
  - Decompress ED
  - Prevent disease spread
- Ideal location depends on specific ARI transmission and volume of patients affected
Identifying the buildings, the necessary resources needed; layout...and Health Sector contribution.

Hall A

Main Power

Isolated

First Aid Pack

Pharmacy

House Support

1614 sq. ft.

250 sq. ft.

126'-0"
THANK YOU