# LESSON 11 — OVERVIEW

Pre-Hospital Treatment

| | |
|---|---|
| **Duration** | **Lecture:** 01 Periods<br>**Practical Evaluation:** 02 Periods Total: 03 Periods |
| **Main Points** | • Mechanism of injury in collapsed structures<br>• Types of injuries seen<br>• Crush syndrome<br>• Compartment syndrome<br>• Immobilizing a patient on a backboard and transporting |
| **Suggested Preparation** | • Thoroughly study reference material (RM 11)<br>• Based on the lesson objectives, highlight the reference material on related subjects.<br>• Fill in the participant's manual to guide you in helping participants with needed information.<br>• Have on hand any experiences, stories or comments related to this lesson. |
| **Evaluation System** | • Written test the next day |
| **Materials and Resources Needed** | • PowerPoint presentation (7)<br>• Lesson flipchart (5)<br>• Flipchart paper board<br>• Practical evaluation<br>• Post-Test (1)<br>• Spine board (4)<br>• Back board straps<br>• Cervical collar (4)<br>• Ace bandage 6" (8) |
| **Importance of This Lesson** | • By properly managing the patient and his injuries, the participant will gain the required knowledge to save a life amidst the panic and chaos. |

LESSON

# 11

# PRE-HOSPITAL TREATMENT

Lecture: 01 Periods, Practical: 02 Periods Total: 03 Periods

## LESSON OBJECTIVES

**Upon completing this lesson, you will be able to:**

1. Identify the possible mechanisms of injury in a structural collapse.
2. List the potential injuries that could be expected in a structural collapse.
3. Describe the conditions in a patient that might indicate the presence of crush syndrome or compartment syndrome.
4. Demonstrate the pre-hospital treatment for trapped victims.

### Instructor Activity

▶ *PPT 11-1 to 11-3*

Introduce yourself and your assistant.

Present the lesson topic, explain the relevance of the lesson to the course, state the duration, and describe scheduled activities and method of evaluation.

Present lesson objectives. Ask a participant to read them aloud. Ensure that the objectives are clear to all participants.

Explain that all present should have mastery of basic emergency medical response (from MFR course) and that the focus of this lesson will be only on special conditions commonly associated with collapsed structure incidents.

Point out that it is of no use to the victim if the rescuer is a great searcher, shore and concrete cutter if, when he is found, the rescuer provides poor or inefficient treatment and the victim dies as a result.

1

## Mechanisms of Injury and Their Consequences

It is very important for the rescuers not to lose sight of the primary objective of a CSSR operation. Their first responsibility is to assess, stabilise and extricate victims with the least possible injury.

### 1.1 Crushing or compression

Potential injuries and consequences:

- Compartment **syndrome**

_____

- Crush syndrome

_____

- Wide variety of **fractures**

_____

- **Internal** and **External** haemorrhage

_____

**Instructor Activity**

▶ *PPT 11-4*

Discuss crush and compression injuries and briefly describe each one.

Explain that they will be covered in detail further into the lesson.

## Mechanisms of Injury and Their Consequences

### 1.2 Falls

Potential injuries and consequences:

- Fractures of the **extremities, skull** and spinal column

_____

- Internal and **external** haemorrhage

_____

### 1.3 Low temperatures

Potential injuries and consequences:

- **Hypothermia** and associated complications

_____

### 1.4 Blunt Trauma

This can be caused by impact by furniture, loose objects or materials from the structure (at high velocity in explosions). Potential injuries and consequences include:

- **Internal** and **external** haemorrhaging

_____

_____

- **Shock**
- Various injuries

_____

- **Severe contusions**

_____

**Instructor Activity**

▶ Discuss falls.

▶ Discuss low temperatures.

Make sure participants are completing the blank spaces in their workbooks.

▶ Discuss blunt trauma.

When discussion contusions, use the example of the Savar Collapsed Building incident, in which the collapsed caused many injuries.

1

## Mechanisms of Injury and Their Consequences (Cont.)

### 1.5 Contaminated air

It is common in collapsed structure situations to encounter large amounts of airborne dust, and in some situations hazardous and/or flammable vapours.

Potential injuries and consequences:

- Respiratory **difficulties**

_____

- **Cardiac** arrest

_____

- Respiratory arrest

_____

- **Neurological** problems

_____

### 1.6 Lack of water and food

- **Dehydration**

_____

- Starvation

_____

- **Shock**

_____

- Renal **failure**

_____

### 1.7 Prolonged isolation and desperation

- Traumatic stress

_____

**Instructor Activity**

▶ Discuss contaminated air.

Is everyone filling in their workbooks?

▶ Discuss the effects of **lack of water and food.**

Discuss the effects of **prolonged isolation.**

Allow time for questions and comments.

## 1 Crush Syndrome

> Complications resulting from blood toxicity that arise after an extremity or muscle mass has been compressed and circulation compromised for an extended period of time.

Crush syndrome can result when an extremity is caught under pressure between two objects. It is common in trapped victims of collapsed structures. Swelling may be a major problem with resulting loss of blood supply distally. Patients may suffer (tourniquet shock) when the object is removed and toxins that have been built up behind the blockage are released and travel to the heart with often **fatal** results.

According to studies on patients with crush syndrome, if they receive proper treatment in a timely manner, there is a **60** percent chance of remaining alive. Crush syndrome does not necessarily occur in every incident where a victim is trapped. As a general rule, the syndrome may be considered present on the basis of three criteria:

- Involvement of a **muscle mass**
- Prolonged **compression**
- Compromised **circulation**

### Instructor Activity

▶ *PPT 11-5*
Ask a participant to read the definition aloud from the workbook.

Explain that crush and compartment syndromes must be treated promptly by qualified medical personnel, as their effects are potentially fatal.

▶ Point out that in *RM 11* there is additional scientific material on the syndromes that they can provide to doctors in these cases.

## 2 Crush Syndrome (Cont.)

For instance, entrapment of a hand is unlikely to initiate the syndrome. Compression time may be as short as one hour but the average time is four to six hours or greater.

The major problem that faces the rescuer when dealing with suspected crush injury is dissuading helpful bystanders from attempting to remove the compressive force prior to treatment.

_____

_____

_____

**Instructor Activity**

▶ Be sure to discuss the signs and symptoms in detail.

### Signs and symptoms of crush syndrome

- Anxiety _____
- Difficulty breathing _____
- Decreasing blood pressure _____
- Changes in body temperature _____
- Rapid pulse _____
- Cardiac deficiency _____
- Loss of consciousness _____
- Absent pulse and capillary refill in the distal limb

  _____
- Shock _____

## 3 Compartment Syndrome

> An increase in pressure in the closed space of the muscle caused by tissue swelling that causes destruction of muscle fibres and nerves.

Compartment syndrome usually develops over a period of several hours and may not be present initially. It may be the result of crush syndrome, closed or open fractures, sustained compression, or after blood flow has been returned. As the duration and magnitude of interstitial pressure increases, necrosis of soft tissue eventually develops. While compartment syndrome can occur in most areas of the body, the more common sites are the forearm, calf and thigh.

There are two prerequisites for compartment syndrome to occur:

- An envelope within the tissue that limits the available space
- A cause of increased pressure within the envelope

### Signs and symptoms of compartment syndrome

- Swollen limb in an unconscious patient _____
- Severe pain, disproportionate to the injury _____
- Pain on passive stretching of the muscles in the compartment _____

### Instructor Activity

*PPT 11-6*

Ask a participant to read the definition out loud from the workbook.

Describe compartment syndrome and review the signs and symptoms carefully.

Help the participants distinguish clearly between crush and compartment syndromes.

Allow time for questions and comments.

## 3 Compartment Syndrome (Cont.)

- Diminished pulse _____
- Poor capillary refill _____
- Decreased sensation in the affected extremity

_____

- Shock _____
- Dehydration _____
- Loss of motor function in the affected limb

_____

## 4 General Treatment for Trapped Patients

4.1 Do not remove the source of pressure until treatment has begun.

_____

4.2 **Check ABC's**

In case of absent of pulse and breath check CAB

4.3 Protect the patient from possible hazards resulting from the rescue attempt.

_____

4.4 **Administer oxygen**

_____

4.5 Immobilise the neck and spine.

_____

4.6 **Maintain body temperature**

_____

**Instructor Activity**

▶ *PPT 11-7*
*FC 11-1 to 11-3*

Ask everyone to close their workbooks.

Ask a participant to come to flipchart and write down suggestions from the classroom on what they believe to be the proper treatment for a trapped victim.

## 4 General Treatment for Trapped Patients (Cont.)

4.7 Protect the patient from the environment.

4.8 Monitor the patient's cardiac state.

4.9 Allow qualified medical personnel to provide the **required treatment**.

4.10 Place the patient on the backboard or stretcher, immobilise him or her, and proceed with removal from the site, using correct procedure at every step.

4.11 Remember the protocols for contact with victims that were covered in Lesson 6.

The specific treatments for crush syndrome and compartment syndrome must be administered by qualified emergency medical personnel.

Consult the reference material for this lesson.

### Instructor Activity

▶ Once all suggestions have been written, ask participants to open their workbooks.

Review the general steps for treatment without going in-depth into each.

Keep making reference to what they learned in the MFR Course.

Remind participants that the specific treatments for crush syndrome and compartment syndrome must be administered only by qualified emergency medical personnel.

Allow time for questions and comments.

Complete discussion on remaining steps for previous page.

## 5 Immobilising a Patient on a Backboard

5.1 Stabilising the patient's head.

5.2 Place the **cervical collar**.

5.3 Rotate the patient onto the backboard.

5.4 Inspect the **patient's back**.

5.5 Centre the patient on the backboard.

5.6 Immobilise the patient onto the backboard.

5.7 Check pulse, motor function and sensation after immobilising the patient.

### Instructor Activity

▶ *FC 11-4 to 11-5*

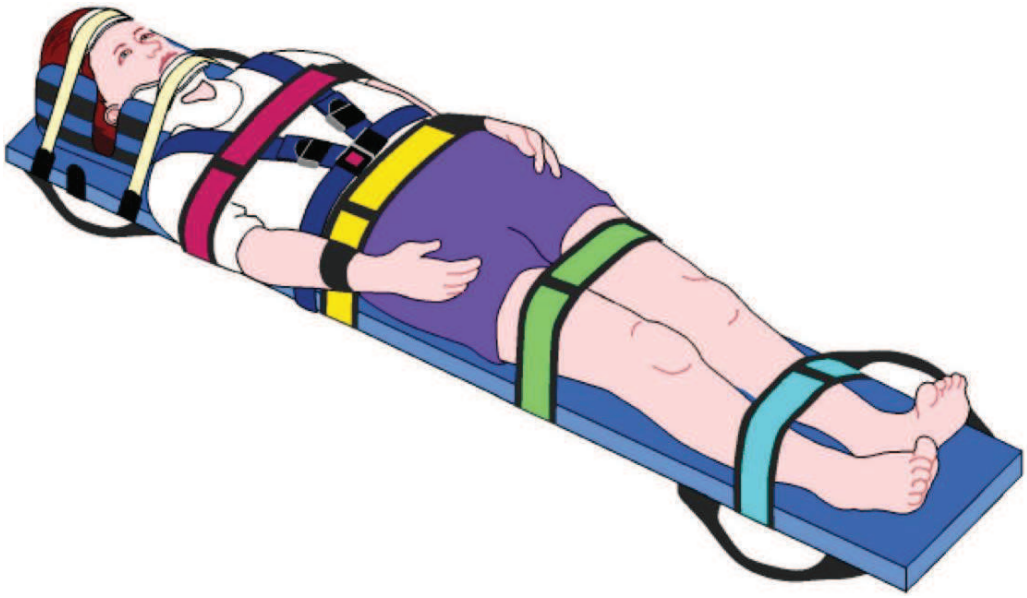
Briefly review the steps for immobilisation.

Ask for a few volunteers to conduct a demonstration.

After the demonstration is complete, ask for other volunteers to conduct a full demonstration (participants only).

Use the procedure in ***RM 11*** as a guide.

## CORRECT
## IMMOBILISATION



## INCORRECT

## Instructor Activity

### *PRACTICAL EXERCISE*

Review EG for Safety Briefing.

Ask participants to complete Lesson Evaluation Form.

### *REVIEW*

Lesson objectives and other main points.

Ensure that lesson objectives have been met.

### *EVALUATION*

Remind participants to study the RM in preparation for Post-Test.

### *CLOSING*

Collect Lesson Evaluation Forms from everyone.

Thank class for their participation and announce the coming lesson.

— INSTRUCTOR'S COPY

# POST-TEST | LESSON 11

## Pre-Hospital Treatment

**1. Complete the table below.**

| Mechanism of Injury | Expected Injuries |
|---|---|
| Lack of water and food | **Dehydration and/or starvation, Shock, kidney failure** |
| **Prolonged isolation and desperation** | Traumatic stress |
| **Contaminated air** | Respiratory problems<br>Possible cardiac or respiratory arrest |
| Crushing and/or compression | **Fractures, internal and external haemorrhaging, compartment syndrome, crush syndrome** |
| Falls | **Fractured extremities, skull, or spinal column** |
| **Low temperatures** | Hypothermia |
| Blunt trauma caused by impact from furniture, objects and structural materials | **Assorted injuries, internal or external haemorrhaging, shock, contusions** |

2. **List the conditions present in a victim that might indicate the possibility of crush syndrome or compartment syndrome.**

   - **Crushing or compression of one or more extremities**
   - **Partial or total blockage of circulation in affected extremities**
   - **Any of the above conditions for a period of 4-6 hours or greater**
   - **Intense pain and/or swelling in affected extremities**
   - **Weak or absent distal pulses in affected extremities**

3. **What immediate steps must you and your CSSR squad take upon find a victim with possible crush syndrome? Select all the correct answers by placing an "X" in the spaces provided.**

   ( ) Remove the compressive force and initiate treatment

   ( **X** ) Immobilise the victim neck and spine

   ( **X** ) Administer oxygen

   ( **X** ) Check ABC's (airway, breathing and circulation)

   ( **X** ) Treat for shock

   ( ) Extricate the victim immediately and take him/her in for treatment by medical doctors at the nearest hospital

# LESSON 11
# — PPT's

## 11-1


PPT 11 - 1

## 11-2

**OBJECTIVES**

Upon completing this lesson, you will be able to:

1. Identify the possible mechanisms of injury in a structural collapse.
2. List the potential injuries that could be expected in a structural collapse.

PEER | CSSR | INDIA

PPT 11 - 2

## 11-3

**OBJECTIVES**

Upon completing this lesson, you will be able to:

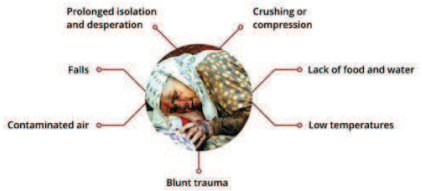
3. Describe the conditions in a patient that might indicate the presence of crush syndrome or compartment syndrome.

PEER | CSSR | INDIA

PPT 11 - 3

## 11-4

**Mechanisms of Injury**




PEER | CSSR | INDIA

PPT 11 - 4

## 11-5

**CRUSH SYNDROME**

- Compressed for an extended period of time
- Blood toxicity
- Fatal results

PEER | CSSR | INDIA

PPT 11 - 5

## 11-6

**COMPARTMENT SYNDROME**

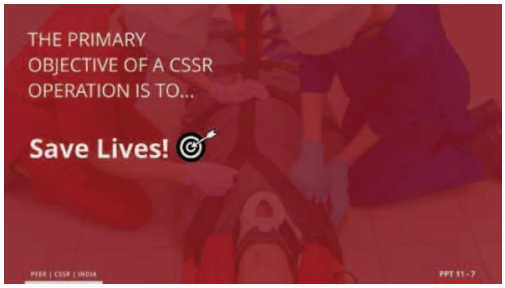
- Sustained compression in the closed space of the muscle
- Destruction of muscle fibres and nerves

PEER | CSSR | INDIA

PPT 11 - 6

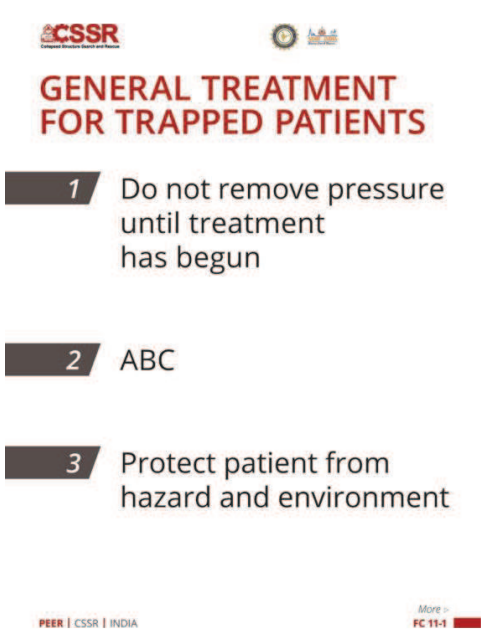
# LESSON 10
# — PPT's

**11-7**

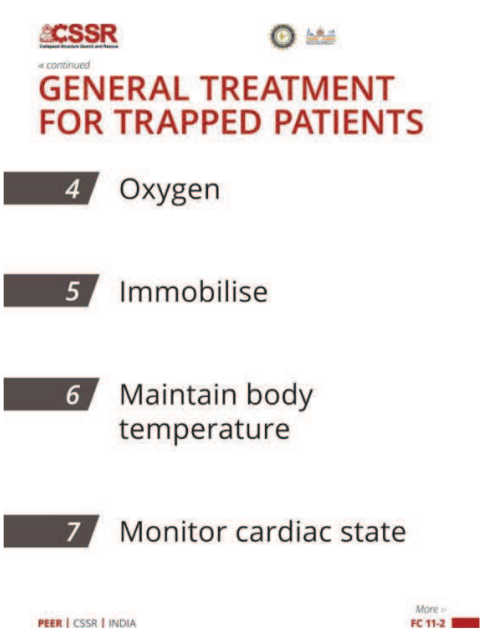


# LESSON 11
# — FLIP CHARTS

**FC11-1**




**FC11-2**




**FC11-3**


**FC1-4**