

# Pathway for Chest Trauma Patients

## Introduction/Overview

- The pathway of a chest trauma patient presenting to Emergency Department can be varied.
- The pathway will depend on the severity of trauma, type of chest trauma (blunt or penetrating), isolated thoracic trauma or polytrauma, cardiorespiratory stability.
- The pathway may change due to patient's complications or surgical approach in a later phase.
- Given the complexity of trauma patients (either with isolated thoracic trauma or polytrauma), case by case-based discussion is often required.
- Generally, patients with isolated thoracic trauma who are anticipated to receive surgical treatment (thoracic operation) should follow the cardiothoracic pathway. Patients with isolated thoracic trauma requiring conservative treatment (e.g., chest drain insertion, analgesia) and polytrauma patients should initially follow the Major Trauma pathway.



## Blunt Chest Trauma

### Major Trauma Ward

- ✓ Fractures of 3 or more ribs
- ✓ Flail chest (clinical or radiological)
- ✓ Pneumothorax or pneumomediastinum after blunt chest trauma
- ✓ Haemothorax after blunt chest trauma with initial blood loss <500ml or persistent blood loss <200ml per hour over 2-4 hours from the chest tube
- ✓ Sternal fractures with or without an abnormal ECG / troponin but without haemopericardium on echo/CT
- ✓ Pulmonary contusion after blunt chest trauma without significant respiratory compromise
- ✓ STUMBL/BATTLE score > 15

### General ICU

- ✓ Significant pulmonary contusion after blunt chest trauma and significant hypoxia ( $PO_2 < 65\text{mmHg}$  or  $8.7\text{kPa}$ ,  $SO_2 < 90\%$ ) despite oxygen supplementation
- ✓ Patients with blunt thoracic aortic injury at the site of aortic isthmus or descending thoracic aorta (treated with endovascular stenting)
- ✓ Acute diaphragmatic injury or rupture after blunt trauma (requiring laparotomy)
- ✓ Traumatic asphyxia
- ✓ Oesophageal injury after blunt trauma

### Cardiothoracic Critical Care

- ✓ Right-sided isolated diaphragmatic injury or rupture after blunt trauma (requiring thoracotomy)
- ✓ Patients with injury of the large vessels (ascending aorta and aortic arch)
- ✓ Haemoptysis/endobronchial blood loss/massive contusion with significant impairment of mechanical ventilation/tracheobronchial tree injury
- ✓ Persisting or retained haemothorax (loculation and/or clots) or empyema or persistent air-leakage after blunt chest trauma (requiring VATS or thoracotomy in an acute or later phase)
- ✓ Massive subcutaneous emphysema or significant air-leakage over the chest tube after blunt chest trauma
- ✓ Uncontrolled pain, or pain that impairs adequate ventilation

### Emergent ED Thoracotomy / Theatre / Cardiothoracic Critical Care

#### Treated with Emergent ED Thoracotomy or Theatre

- ✓ Haemothorax after blunt chest trauma (with initial massive bleeding > 1,500ml)

#### Theatre/Cardiothoracic HDU/ICU

- ✓ Haemothorax after blunt chest trauma with initial blood loss >500ml or persistent blood loss >200ml per hour over 2-4 hours over the chest tube

#### Treated with Emergent ED Thoracotomy or Transferred to Cardiothoracic HDU/ICU/Theatre

- ✓ Sternal fractures with abnormal echocardiogram (e.g., haemopericardium)
- ✓ Blunt injury of the heart (blood loss/pericardial tamponade)

# Pathway for Chest Trauma Patients

## Penetrating Chest Trauma

### Cardiothoracic ICU

- ✓ Chest wall injuries after stab wound penetrating trauma causing haemothorax.
- ✓ intracardiac embolic missiles
- ✓ systemic air embolus due to central lung injury

### General ICU

- ✓ penetrating chest trauma involving other body systems/specialties ( e.g. abdominal, neck)
- ✓ diaphragmatic injury from penetrating trauma (with potential both abdominal and thoracic injuries)
- ✓ Patients with oesophageal injury from penetrating trauma

### Major Trauma Ward

- ✓ pulmonary injuries secondary to penetrating trauma (with small pneumo- or haemothorax requiring chest drain insertion)

### Treated with Emergent ED Thoracotomy, Theatre or Cardiothoracic Critical Care

*Treated with Emergent ED Thoracotomy or Theatre/Cardiothoracic ICU*

- ✓ Penetrating cardiac trauma (depending on the degree of pericardial tamponade/blood loss/haemodynamic stability)
- ✓ Patients with great vessel injury after penetrating thoracic trauma (depending on the degree of pericardial tamponade/blood loss/haemodynamic stability)

*Treated with Emergent ED Thoracotomy or Theatre*

- ✓ Pulmonary injuries secondary to penetrating trauma (with initial massive bleeding >1.500ml)

*Theatre/Cardiothoracic HDU/ICU*

- ✓ Pulmonary injuries secondary to penetrating trauma (with initial blood loss >500ml or persistent bleeding >200ml per hour over 2-4 hours or large/persistent air leak)

### After Major Trauma Ward

- Patients with isolated chest trauma admitted to Major Trauma ward should ideally be discharged home/back to health board. Where capacity is an issue then ISOLATED chest wall injuries may be stepped down to cardiothoracic ward

### Thoracic Trauma Complications

- Patients with thoracic surgical complications of chest trauma (empyema, bronchopleural fistula, organised haemothorax, chylothorax, diaphragmatic hernia, lung abscess, arteriovenous fistula, tracheoesophageal fistula, bronchial stenosis, pseudoaneurysm, great vessel fistula, pericarditis, mediastinitis, and chest wall hernia) should be transferred to Cardiothoracic ward/HDU/ICU for surgical management.