Chest Trauma and Pleural Drainage

Diagram showing the anatomy of the chest with labels for parietal pleura, visceral pleura, chest tube, lung, pleural space, rib cage, diaphragm, second intercostal space, and rib cage.

To remove air
To drain fluid and blood
Case Study

• M. Z. is a 28-year-old male who arrives to the ED following a high-speed motor vehicle accident.

• He is complaining of severe chest pain, rating it at a 10 on a scale of 0-10.
Case Study

- You notice that his breathing is labored.

- Part of his chest wall is moving in the opposite direction of the remainder when he breathes.
Case Study

- M.Z.’s blood pressure is 96/50, heart rate 126, respiratory rate 36, temp 37° C, and pulse oximetry 88% on 4L of oxygen.

- He is alert and oriented and states that his car was “T-boned” on the driver’s side where he was sitting.

- He has no open wounds.
Case study

• How would you classify M.Z.‘s trauma?

• What type of injury would you suspect M.Z. to have?

• What potential life-threatening complication of a potential pneumothorax would you need to assess M.Z. for?

• What would be your priority nursing assessments and intervention?
Case Study

• M.Z.’s chest x-ray confirms the presence of right-sided fractures in ribs 6-9 in two places each with a free-standing segment.

• He also has a moderate-sized right hemopneumothorax.

• ED physician asks to prepare for chest tube insertion.
Case Study

• How would you set up a water-suction chest tube drainage system?

• How would you position him for insertion of chest tube?
Chest Tube Insertion
Atrium Videos (updated 3.12.18)

https://www.youtube.com/watch?v=bLf5WexvsEk&index=6&list=PL1B150993226E2765
3600 Dry suction

https://www.youtube.com/watch?v=o_aP3wqAzEQ
2002 Ocean/Wet suction
Chest Tubes and Pleural Drainage

- remove air or fluid from pleural and/or mediastinal space
- Reestablishes negative pressure
- Lung reexpands
- Pleural and/or mediastinal
- 20 inches long
- Various sizes (12F – 40F)
Flutter (Heimlich) Valve

- One-way valve that opens only when intrathoracic pressure greater than atmospheric pressure
- Used for emergency transport and for small- to moderate-sized pneumothorax
- Increased patient mobility
- Must vent any attached drainage bag.
Chest Tubes and Pleural Drainage

- Bubbling in water-seal chamber indicates air leak.
  - Initially large air leak expected
  - Eventually disappears

- Tidaling
  - Reflects changes in pressure
  - Disappears as lung reexpands
Preparing the unit: Nursing Management

- Wet: ?
- Dry: ?
- Maintain patency of drainage system: How?
Case Study

• M.Z. tolerated the chest tube insertion well.

• The tube is attached to a water-seal drainage unit and to wall suction with -20 cm of water in the suction control chamber.

• What is the priority Nsg assessments post-insertion?
Case Study

• M.Z. is stabilized and ready for transfer to the progressive care unit.

• What could the receiving RN delegate to an unlicensed nursing personnel (UAP) in order to optimize time management?

• How would you prepare for chest tube removal?
Collaborative Care
Pneumothorax

- Treatment
  - None
  - Thoracentesis (case study)
  - Chest tubes
  - Pleurodesis
  - Urgent needle decompression
Nursing assessment, plan, Dx, Tx
Chest Trauma: Emergency Management

- What are the signs of respiratory/cardiovascular distress?
- What is the emergency nursing management?