CHAPTER 9

RESPIRATORY CONDITIONS

The causes of respiratory distress fall into three main groups; medical conditions, traumatic injury and poisoning. Amongst the medical conditions you need to be aware of are asthma, pulmonary oedema, Chronic Obstructive Airways Disease (COAD) and childhood airway problems. Traumatic injuries include problems such as flail segments, Pneumothorax and haemothorax, hanging, strangulation, choking, drowning and asphyxiation. But whatever the condition, if the casualty is poorly perfused and showing Signs of respiratory distress then get help as soon as possible.

MEDICAL CONDITIONS

ASTHMA

Bronchial asthma is a condition that results from the narrowing of the small air tubes (bronchioles) that lead to the air sacs (alveoli) in the lungs. This narrowing is caused by muscle spasm in the tubes, swelling of the mucus membrane lining the tubes and/or the plugging of the tubes with mucus. Asthma may begin at any age but is much more likely to begin in childhood or early adulthood and there is often a family history of asthma and other allergic responses. Acute asthma attacks can be brought on by allergic reactions, infections and psychological or emotional stress.

Asthma can be as frightening an experience for you as it is for the casualty. It is important that this anxiety and distress be reduced, the casualty helped to use their own medication and an ambulance called as soon as possible.

Asthma is an easily treatable condition and all asthma sufferers are able to self medicate themselves using salbutamol (Ventolin) and a variety of other drugs. In first aid one of the main principles is prevention and if an asthmatic casualty is finding that their medication is not providing them with the usual level of relief then they should see their doctor. The continued dependence on self medication and a reluctance to seek early medical assistance often leads asthmatic casualties to suffer unnecessarily severe attacks.

STATUS ASTHMATICUS

Status asthmaticus is a prolonged asthmatic attack that is not responding to treatment and the casualty becomes progressively worse until they loose consciousness and die. Status asthmaticus is a dire emergency and an ambulance must be obtained as soon as possible.

PROVISIONAL DIAGNOSIS OF ACUTE ASTHMA ATTACK

HISTORY

a. Patient has History of asthma
b. Patient may have asthma drugs in their pockets
c. Patient has been short of breath for some time
d. May have had recent respiratory infection
e. May be emotionally upset
f. Patient presents sitting upright, leaning forward and holding onto, or resting arms upon a table, chair, bench or other support
SIGNS
a. Patient can be heard to wheeze on expiration
b. Poor perfusion with blue colour to casualties face, nostrils, lips
c. The sicker the casualty the less they can talk
d. Patient often coughing
e. Patient becomes quite and drowsy (A very bad sign)

SYMPTOMS
a. Patient is extremely anxious and distressed

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ACUTE PULMONARY OEDEMA

Acute pulmonary oedema is caused by the build up of fluid in the lungs due to failure of the left side of the heart. This failure may be due to AMI, poisoning and drowning. The most common cause is left sided heart failure following AMI.

Pulmonary oedema is caused when fluid leaks out of the capillaries in the lungs and fills the spaces between the capillaries and the air sacs (alveoli). After a time, if the fluid continues to leak out it enters the alveoli and begins to fill them. This filling of the alveoli leads to a reduction in the total area of lung through which the body can get oxygen from the air. This causes the casualty to become short of breath and distressed. The build up of fluid can be so severe that it fills the lungs and airway with a pinkish froth and the casualty dies of asphyxiation.

PROVISIONAL DIAGNOSIS OF ACUTE PULMONARY OEDEMA

HISTORY
a. Patient is often elderly
b. Previous History of heart conditions and pulmonary oedema
c. Patient has been short of breath
d. May have had recent respiratory infection
e. Patient takes fluid (often frusemide [lasix]) tablets and potassium
f. Condition occurs most frequently at night
g. Patient will be sitting upright, leaning forward and holding onto or resting arms upon a table, chair, bench or other support
h. Often occurs between 10pm and 4am during cold weather

SIGNS
a. Patient Appears Poorly Perfused
b. Marked respiratory distress
c. Fluid can be heard in casualties lungs and airway
e. Patient often coughing
f. Patient cannot lie flat and normally sleeps propped up
SYMPTOMS
a. Patient is extremely anxious and distressed
b. Towards the end the casualty becomes very quiet and tired

CHRONIC OBSTRUCTIVE AIRWAYS DISEASE

Chronic Obstructive Airways Disease (COAD) is a term used to describe a number of conditions which affect the airway and the tissue of the alveoli. The most common conditions are emphysema and bronchitis which are caused by smoking cigarettes. Casualties who suffer from severe emphysema are rarely seen in public because of their inability to exercise, even to the extent of walking to the door of their room. They are usually dependent on a strict regime of medication and the self administration of oxygen at low concentrations.

PROVISIONAL DIAGNOSIS OF COAD

HISTORY
a. Patient has History of respiratory condition treated by a doctor
b. Patient may have medication
c. Patient has been short of breath
d. May have had recent respiratory infection
e. Patient will be sitting upright, leaning forward and holding onto or resting arms upon a table, chair, bench or other support

SIGNS
a. Skin may be pink or cyanosed in colour and perhaps moist
b. Respiratory pattern fast, deep and forced respiration
c. Patient uses accessory muscles of respiration to breathe
d. Patient can be heard to wheeze on expiration
e. Patient often coughing
f. Obvious respiratory distress

SYMPTOMS
a. Patient may be anxious and distressed
b. Patient may be restless

PULMONARY EMBOLISM

Pulmonary embolism is the blocking of a pulmonary artery or one of its branches by a clot of blood, a globule of fat or other obstruction. The outcome of such a blockage will be the death of lung tissue, the failure of respiration and even right-sided heart failure, due to the build up of pressure in the lung.

PROVISIONAL DIAGNOSIS OF PULMONARY EMBOLISM

HISTORY
a. Patient may have been bedridden for a long period of time
b. The casualty may have a History of circulatory problems in their legs
c. The casualty may have suffered recent fractures of large bones

SIGNS
a. Poor perfusion
b. Respiratory distress
c. Jugular veins in neck will be distended

SYMPTOMS
a. There may be a severe sudden onset of sharp chest pain
b. Chest pain worse with deep breath
c. Patient is anxious
TREATMENT OF RESPIRATORY DISTRESS

1. Approach to the Incident
2. Check Airway if casualty is Unconscious
3. If obviously distressed call ambulance
4. Check breathing
5. If necessary support with assisted ventilations
6. Check casualties perfusion status
7. If necessary perform CPR
8. Position casualty in most comfortable position
9. Ensure Flow of Fresh Air Across casualty
10. Take Full Set of Observations

HYPERVENTILATION (OVER-BREATHING)

Hyperventilation (over-breathing) is associated with hysteria or excitement. The direct cause is a lowering of the amount of carbon dioxide in the blood stream by breathing too rapidly and deeply. Short periods of hyperventilation are not life threatening.

PROVISONAL DIAGNOSIS OF HYPERVENTILATION

HISTORY
a. Patient has become excited, frightened, hysterical etc
b. Patient may have suffered this condition before

SIGNS
a. Normal pink, warm dry skin
b. Respiratory Pattern fast, deep and forced
c. Tetany of hands may be present in advanced stages
d. Rapid pulse

SYMPTOMS
a. Patient is extremely anxious and distressed
b. Patient feels as if they are choking
c. Patient feels pins and needles in fingers and around lips

TREATMENT OF HYPERVENTILATION

1. Approach to the Incident
2. Check airway, breathing and casualties perfusion status
3. Reassure casualty
   -firmly get casualties attention
   -tell casualty what is happening
   -firmly tell casualty what has to be done
   -get casualty to agree to co-operate
4. Get casualty to slow down their respiratory rate and depth
5. Have casualty breath slowly
   -until pins and needles are gone
   -and respiratory rate and depth are returned to normal
6. Reassure casualty
PLEURISY

Pleurisy is a condition in which the outer lining of the lungs and the inner lining of the chest wall are roughened or inflamed by disease. When the casualty breathes the inflamed areas rub causing pain. Pleurisy is not a medical emergency but because it is caused by an underlying disease casualties should see their doctors. One of the major problems with pleurisy is that as a chest pain it needs to be taken seriously until it can be proven not to be the pain of a heart attack.

Pain relief, using aspirin or paracetamol, and treatment of any coughing with pholcodine linctus may also be useful. Further pain relief can be obtained by placing a warm object close to the site of the pain.

PROVISIONAL DIAGNOSIS OF PLEURISY

HISTORY
a. Chest pain following chest infection or illness

SIGNS
a. Warm, dry skin
b. Easily localised chest pain which casualty can point to
c. Respiratory pattern is shallow and a little faster than normal
d. Normal pulse
e. Some guarding and unwillingness to breathe deeply

SYMPTOMS
a. Pain is described as sharp and stabbing
b. Pain often on the sides of the chest and sometimes, in the back
c. Pain is made worse by movement, touching or on inspiration
d. If the diaphragm is involved they may have shoulder tip pain

TREATMENT OF PLEURISY

1. Approach to the Incident
2. Check airway, breathing and casualties perfusion status
3. Allow casualty to Find Most Comfortable Position (usually lying on the injured side)
4. Pain Relief
   -wrap hot water bottle in towel and put on site of pain
   -if medical aid not immediately available give manufacturer recommended dosage of paracetamol or aspirin
   -control cough with cough linctus using recommended dose
5. Send casualty to See Own Doctor
CROUP

Croup is caused by infection in the respiratory tract which leads to swelling of the mucosa. In babies and younger children, because the diameter of their airway is so small in relation to its lining, even a small degree of swelling can result in significant obstruction of their airway.

PROVISIONAL DIAGNOSIS OF CROUP

HISTORY
a. Child is between six months and four years of age
b. There is a History of recent illness
c. The condition worsens during the night

SIGNS
a. Child has a hoarse brassy sound when breathing or speaking
b. Child can have a high pitched noise (stridor) during respiration or a whooping sound during inspiration
c. Child may have a bark like a seal when coughing
d. Use of accessory muscles of respiration
e. Tracheal tugging with windpipe being pulled into the chest
f. Muscles between ribs are pulled in during inspiration
g. Skin is warm, moist and may be cyanosed
h. Pulse is rapid and rises as the condition worsens

SYMPTOMS
a. Difficult to obtain

TREATMENT OF CROUP

1. Approach to the Incident.
2. Reassure mother and father.
3. Check and clear airway.
4. Check breathing and circulation.
5. If child hot, Remove excess clothing.
6. Run hot shower and fill bathroom with steam and place mother and child in bathroom
7. Take and Record Full Set of Observations.
8. If child conscious give Paracetamol as directed.
9. Obtain Assistance, arrange for doctor or ambulance if child severe.

EPIGLOTTITIS

Epiglottitis is inflammation of the epiglottis situated below the base of the tongue in the pharynx. The inflammation is caused by a bacterial infection, haemophilus influenza, and the condition is a serious medical emergency with a high risk of complete airway obstruction. It is absolutely essential that if epiglottitis is suspected no attempt is made to examine the casualties mouth or throat and no action taken that may upset casualty. Urgently call for an ambulance.
PROVISIONAL DIAGNOSIS OF EPIGLOTTITIS

HISTORY
a. Child aged 3-7 years but also adults
b. There is a History of recent throat infection
c. The condition worsens during the night

SIGNS
a. Patient will not talk or swallow and has marked drooling
b. High pitched noise (stridor) when breathing
c. Use of accessory muscles of respiration
d. Tracheal tugging with windpipe being pulled into the chest
e. Muscles between ribs may be sucked inwards during inspiration
f. Skin is hot, moist and may be cyanosed
g. Pulse is rapid and rises as the condition worsens
h. Patient has a high fever

SYMPTOMS
a. Patient has pain on swallowing
b. Patient is very quite and still

TREATMENT OF EPIGLOTTITIS

Never attempt to examine the airway of a casualty with suspected epiglottitis
1. Approach the Incident - do not disturb child
2. Calm and Reassure Mother and Child
3. Call ambulance immediately
4. Visually Check Breathing and Circulation
5. If Child hot, carefully remove any excess clothing
6. Be prepared to give Assisted Ventilations and CPR

TRAUMATIC INJURY

AIRWAY PROBLEMS

For airway obstruction see page 14 etc.

HANGING

Hanging is a reasonably common cause of death. It is often used by suicides and is used as an auto-erotic sexual practice by some. Whatever the reasons for the hanging, the problems faced by the first aider are not confined to simple asphyxia. As well as asphyxia the hanged casualty can suffer severe damage to the spinal column and muscles of the neck due to stretching of these structures by the body weight. This stretching can also cause damage to the carotid sinuses, which are located in the neck, and this can result in disturbances of heart rhythm and blood pressure.
TREATMENT OF HANGING

1. Approach incident
2. Check casualties abdomen for warmth
3. If casualty still warm get help immediately
4. When help arrives, lift casualty as follows
   -first support casualties head and neck
   -lift casualty and loosen noose (watch your back!!)
   -cut noose or rope
   -allow casualty to slip to ground while supporting head and neck
5. Check and clear airway -ensure cord/rope is cleared from neck
6. Check breathing –Assisted Ventilation if necessary and CPR
7. Full Examination and treat for spinal injury

You will need help to get the casualty down so first get help. Watch your back and be aware that some suicides use steel cable and chains to hang themselves and to release the noose you must undo the knots or use bolt cutters.

STRANGULATION

Strangulation occurs when the tracheae and larynx are compressed or crushed by pressure from outside. True strangulation is usually the result of criminal assault.

TREATMENT OF STRANGULATION

1. Approach to the Incident
2. Check and Clear Airway -ensure cord/rope is cleared from neck
3. Check breathing –Assisted Ventilation if necessary and CPR
4. Full Examination
5. Take and record observations

DROWNING

People drown quietly. In drowning the victim can swallow a lot of air and water which fills their stomach and oesophagus before flowing over into the windpipe and lungs. In children this can mean that the stomach can be hyper-inflated so that it distends into the chest cavity and reduces the ability of the lungs to expand. In adults the stronger body structures prevent this happening.

With both adults and children, vomiting of water and stomach contents increases the danger to the casualties airway.

Although fresh and salt water drowning lead to differing chemical problems, the first aid treatment remains the same.

TREATMENT OF DROWNING

1. Approach -never attempt rescue unless conditions are suitable
2. Call ambulance immediately
3. Check and clear airway
4. Check breathing –Assisted Ventilation if necessary and CPR
CHEST WALL INJURIES

The walls of the chest are made up of the thoracic spinal vertebrae at the back, the twelve sets of ribs moving around the sides to the front, where 10 sets of ribs connect up to the sternum. This skeletal structure gives the chest wall the rigidity which is essential for respiration and is the mechanism of respiration. This mechanism of respiration can be disrupted by damage or restriction.

FRACTURED RIBS

With simple rib fractures, the major problem is pain. This makes breathing difficult and is very uncomfortable.

PROVISIONAL DIAGNOSIS OF FRACTURED RIBS

HISTORY
a. Direct blow/trauma
b. Usually 5th through 9th ribs - these are unprotected by shoulder

SIGNS
a. Respiratory pattern faster and shallower than normal
b. Deformity
c. Bruising
d. Site of fracture tender to touch

SYMPTOMS
a. Pain on breathing and casualty is able to easily localise pain

Fig. 6-1: Treatment of simple fractured ribs using arm sling

TREATMENT OF FRACTURED RIBS

1. Approach incident
2. Check airway, breathing and circulation
3. Check for major haemorrhage
4. Examine chest wall –isolate area of pain
5. Allow casualty to Find Comfortable Position (usually lying on injured side)
6. Apply Arm Sling
7. Take and record observations
8. Send casualty to hospital
FLAIL SEGMENT

A flail segment is where a rib or series of ribs are fractured in two places allowing a segment of the chest wall to float free from the surrounding chest wall. This reduces the amount of air that can be taken into the lungs and can lead to asphyxia. Obviously the larger the segment the more dangerous the injury.

PROVISIONAL DIAGNOSIS OF FLAIL SEGMENT

HISTORY
a. Direct blow/ trauma

SIGNS
a. Poor perfusion
b. Respiratory distress
c. Chest wall collapses in during inspiration
d. Site of fracture tender to touch

SYMPTOMS
a. Pain on attempt to breathe deeply
b. Shortness of breath
c. Patient is able to easily localise pain
d. Conscious state may be reduced

TREATMENT OF FLAIL SEGMENT

1. Approach incident
2. Check airway, breathing and circulation
3. Examine Chest Wall - isolate area of injury
4. Call ambulance immediately
5. Immobilise chest wall with hands and then
   -place towel or large pad over flail segment
   -bandage pad firmly to chest:
   -tie knots on front of uninjured side over pads
   -place arm on the injured side in an Arm sling
6. Allow casualty to find most comfortable position
7. Take and record observations
8. Recheck casualty frequently

SUCKING CHEST WOUND

A sucking chest wound is usually the result of sharp trauma, that is where an object such as a bullet or knife penetrates the chest wall and either passes through or is removed leaving a hole. The significance of this is that during inhalation air moves into the chest cavity through the hole in the chest wall and not through the mouth. This leads to asphyxia and the collapse of the casualty. Therefore sucking chest wounds are life threatening and quick treatment is essential.
PROVISIONAL DIAGNOSIS OF SUCKING CHEST WOUND

HISTORY
a. History of violence, a fight, assault or shooting

SIGNS
a. Poor perfusion
c. Fast and shallow respiration
d. Distended neck veins
f. Blood stained froth in mouth or on lips
g. Wounds to chest wall

SYMPTOMS
a. Patient apprehensive and distressed

TREATMENT OF SUCKING CHEST WOUND
1. Approach incident
2. Check airway, breathing and circulation
3. Call ambulance immediately if injury identified
4. If necessary Assisted Ventilations and CPR
5. Check for major haemorrhage
6. Examine chest wall
   - look for more than one wound
   - isolate all wounds
   - leave protruding foreign objects in place
7. Seal wound during inspiration and release during expiration
8. If you have time dress wound (This may not be possible on sweaty skin)
   - place air-tight (plastic/rubber) dressing on wound
   - tape only three sides of dressing
   - ensure dressing seals during inspiration and lets air vent during expiration
9. If Conscious, let casualty find most comfortable position
10. Take and record observations

PNEUMOTHORAX AND/OR HAEMOTHORAX

Pneumothorax is a condition where air gets between the outside lining of the lung and the inside lining of the chest wall. Pneumothorax can occur as a result of injury or as a result of a surface air sac bursting under pressure.

Haemothorax is where blood gets between the outside lining of the lung and the inside lining of the chest wall. Pneumothorax and haemothorax are often present together, as the initial injury often causes bleeding in addition to the escape of air.

PROVISIONAL DIAGNOSIS OF SIMPLE PNEUMO-HAEMO THORAX

HISTORY
a. History of injury to chest

SIGNS
a. Poor perfusion with cyanosis
b. Respiratory rate getting faster and shallower
c. Air may be felt in the tissues of the chest wall

SYMPTOMS
a. Pain and local tenderness
b. Patient is restless
Pneumothorax and haemothorax are uncomfortable and can cause the casualty some distress. However, they are not necessarily life threatening, unless air and blood are trapped in the chest cavity under pressure. This is called Tension Haemo-Pneumothorax and this is a true medical emergency.

**PROVISIONAL DIAGNOSIS OF TENSION PNEUMOTHORAX**

**HISTORY**
- a. History of chest injury

**SIGNS**
- a. Poor perfusion
- b. Respirations get faster and deeper before becoming shallower
- c. Distended neck veins
- d. Air may be felt in the tissues of the chest wall
- e. Windpipe may be pushed to the uninjured side

**SYMPTOMS**
- a. Extreme anxiety and distress
- c. Severe pain and tenderness

**TREATMENT OF TENSION PNEUMO/HAEAMOTHORAX**

1. Approach incident
2. Check airway, breathing and circulation
3. Call ambulance immediately
4. Examine neck and chest wall
   - Look at neck veins:
   - Examine neck, shoulders and chest wall for damage and air in skin
   - Examine windpipe and top of breastbone to check they align
5. If conscious, let casualty find most comfortable position
6. Take and record observations