BASIC LIFE SUPPORT
AIRWAY MANAGEMENT

CHAIN OF SURVIVAL

Survival from cardiac arrest is greatest when witnessed and resuscitation is commenced immediately. When the heart is in ventricular fibrillation and defibrillation is carried out at an early stage.

Early recognition and access to emergency services

Early basic life support

Early defibrillation

Early access to advanced life support

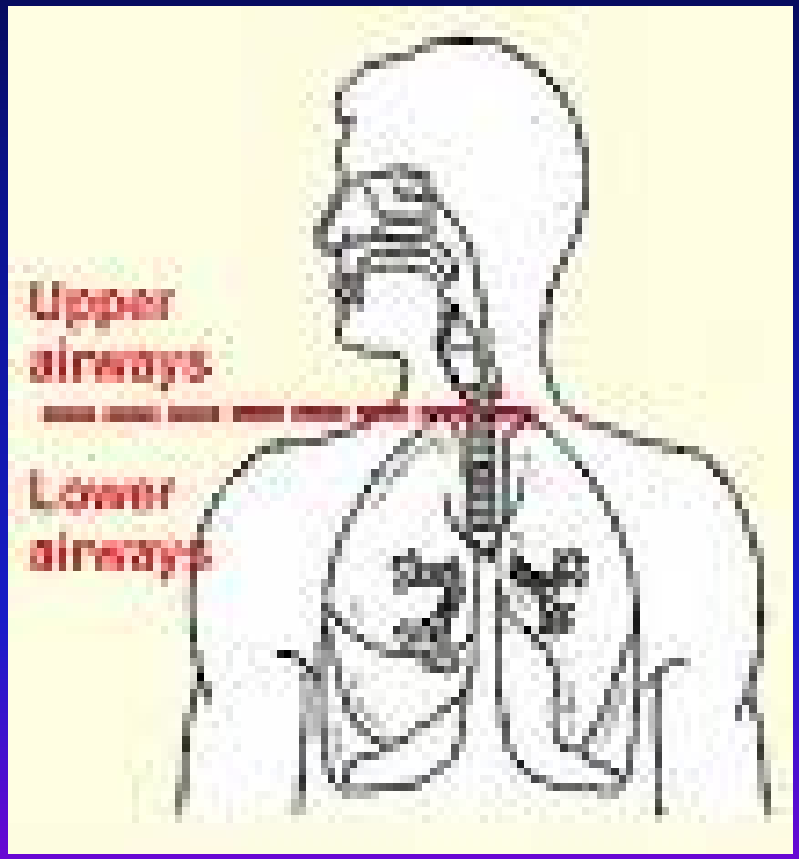
CAUSES

- Problem with airway
- Breathing inadequacy
- Cardiovascular problem
- Life threatening disease – compromising respiratory or cardiac function

AIRWAYS OBSTRUCTION
Can be partial or complete

Causes:

- Blood
- Vomit
- Foreign body
- Trauma
- CNS depression
- Pharyngeal swelling
- Seizure
- Laryngospasm
- Bronchospasm
- Secretions
- Mucosal oedema
- Inhaled gastric contents



BREATHING INADEQUACY

- Cardiac arrest may occur if breathing is insufficient to oxygenate the blood
- May be:
  - acute or chronic
  - continuous or intermittent
- CNS depression may reduce or remove respiratory drive

RESPIRATORY EFFORT

- Main respiratory muscles – diaphragm and inter-costal muscles
- Causes:
  - Muscle weakness
  - Nerve damage
  - Chest wall abnormalities
  - Pain from fractured ribs
  - Chronic malnourishment
  - Generalised weakness from severe chronic illness

LUNG DISORDERS

Severe lung pathology impairs gas exchange. Disorders include:

- Pneumothorax or haemothorax
- Infection
- Aspiration
- COPD
- Asthma
- Pulmonary embolism
- ARDS
- Pulmonary oedema

CARDIAC ABNORMALITIES

- May be primary or secondary
- The heart may stop suddenly

or:

- It may produce an inadequate output prior to stopping

CARDIAC ABNORMALITIES -primary

- Directly involve the heart
- Commonest is ventricular fibrillation from focal ischaemia
- Other causes include:
  - Myocardial infarction - Cardiomyopathy
  - Electrocution - Conduction defects
  - Some drugs - Myocarditis
  - Cardiac rupture - Cardiac failure

CARDIAC ABNORMALITIES -secondary

The heart is affected by a condition elsewhere

which may be acute or chronic

- Conditions include:
  - Severe blood loss
  - Airways obstruction
  - Acute pulmonary oedema
  - Suffocation
  - Hypoxia
  - Anaemia
  - Hypothermia
  - Septic shock

RISKS TO THE RESCUER

- Need for resuscitation often allowed to over-ride all other considerations, potential dangers may be ignored
- Risks must be assessed prior to a resuscitation attempt
- A little thought can provide a safe environment e.g. turning off a car engine after an accident, use of vehicles to block oncoming traffic, use of hazard warning lights or triangles, moving furniture

RISKS TO THE RESCUER

- Poisoning – little risk in most cases
- Infection:
  - HBV and HIV no reported cases through mouth-to mouth ventilation, blood is source of virus so take precautions when blood is visible
  - Needlestick injuries pose a greater risk

PRECAUTIONS

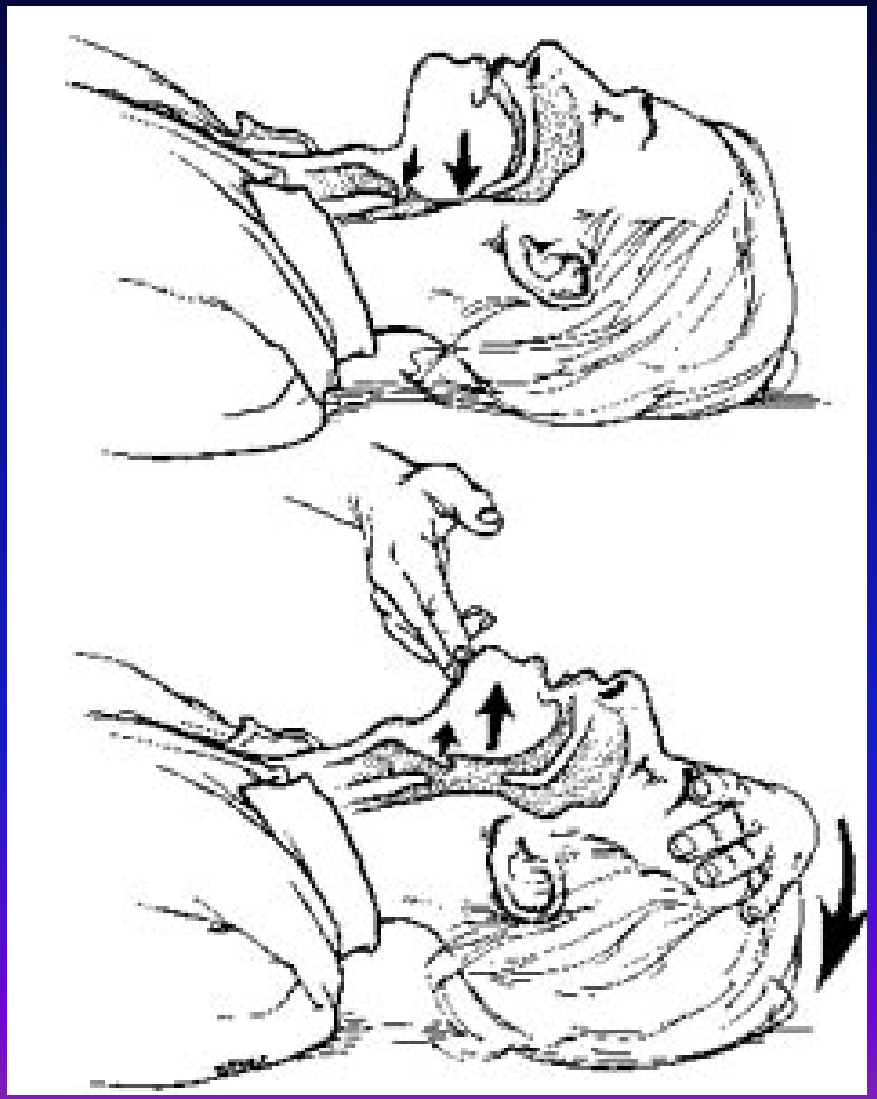
- Always check environment is safe
- Although little risk from mouth-to mouth ventilation most prefer to use a device
- Using a handkerchief is ineffective, may create a risk
- Take care with sharps
- Take care where there is spillage of blood or bodily fluids - wear PPE

ADULT BASIC LIFE SEQUENCE

- Make sure victim, any bystanders, and you are safe
- Check victim for a response:
  - Gently shake his shoulders and ask loudly, 'Are you all right?'
- If he responds:
  - Leave him in the position in which you find him provided there is no further danger
  - Try to find out what is wrong
  - Get help
  - Reassess regularly

ASSESSMENT

- Keeping airway open using head tilt chin lift, look, listen, and feel for normal breathing (no more than 10secs):
  - Look for chest movement.
  - Listen at the victim's mouth for breath sounds.
  - Feel for air on your cheek.
- Victim may be barely breathing, or taking infrequent, noisy, gasps – agonal gasps, not normal breathing

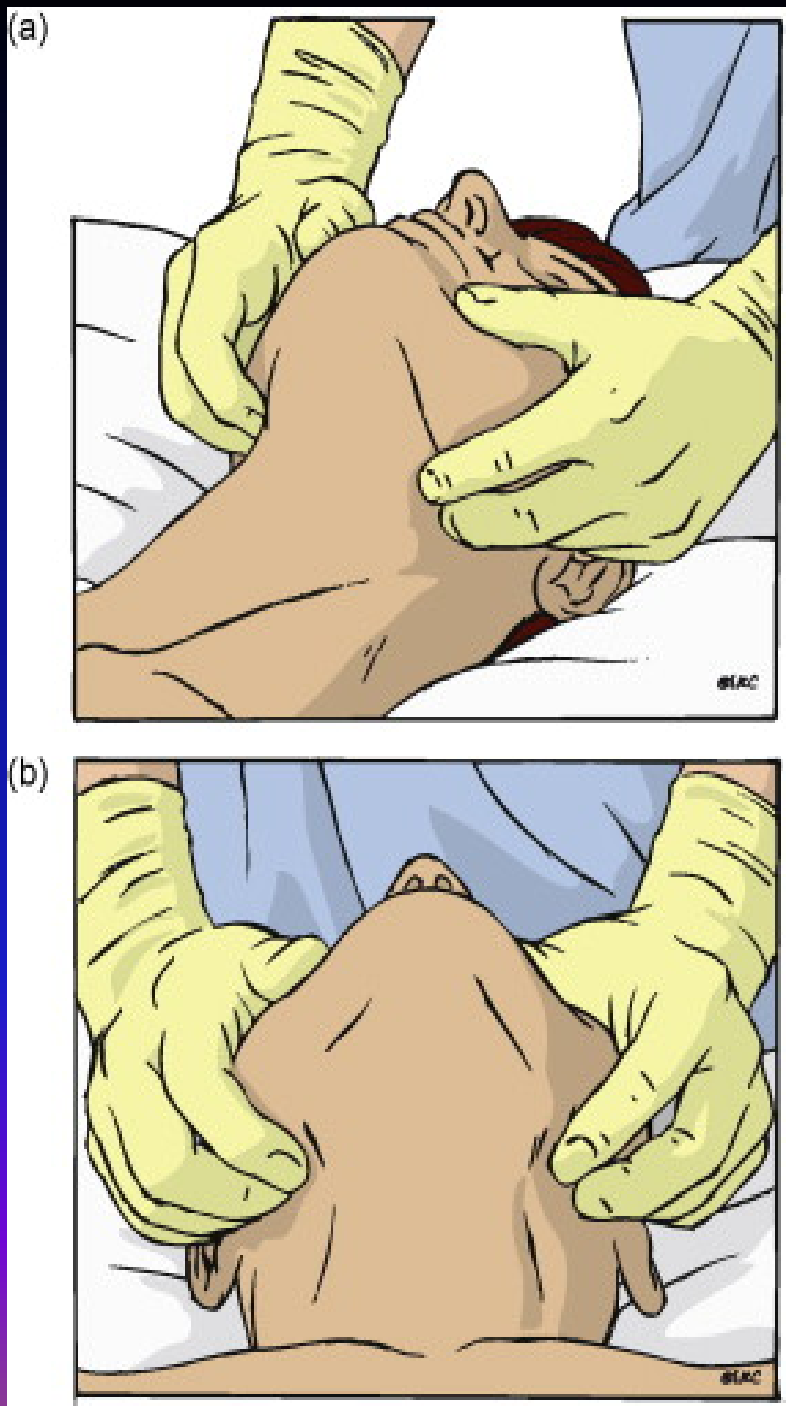


JAW THRUST MANOEVRE

- Alternative for bringing mandible forward and relieving obstruction from tongue
- Can be used in nasal obstruction or if cervical spine injury suspected

TECHNIQUE

- Identify angle of jaw
- With index and other fingers place behind angle of mandible apply steady upwards and forward pressure to lift jaw
- Using thumbs slightly open mouth by downward displacement of chin



BREATHING NORMALLY

- Place in recovery position
- Get help
- Continue to check

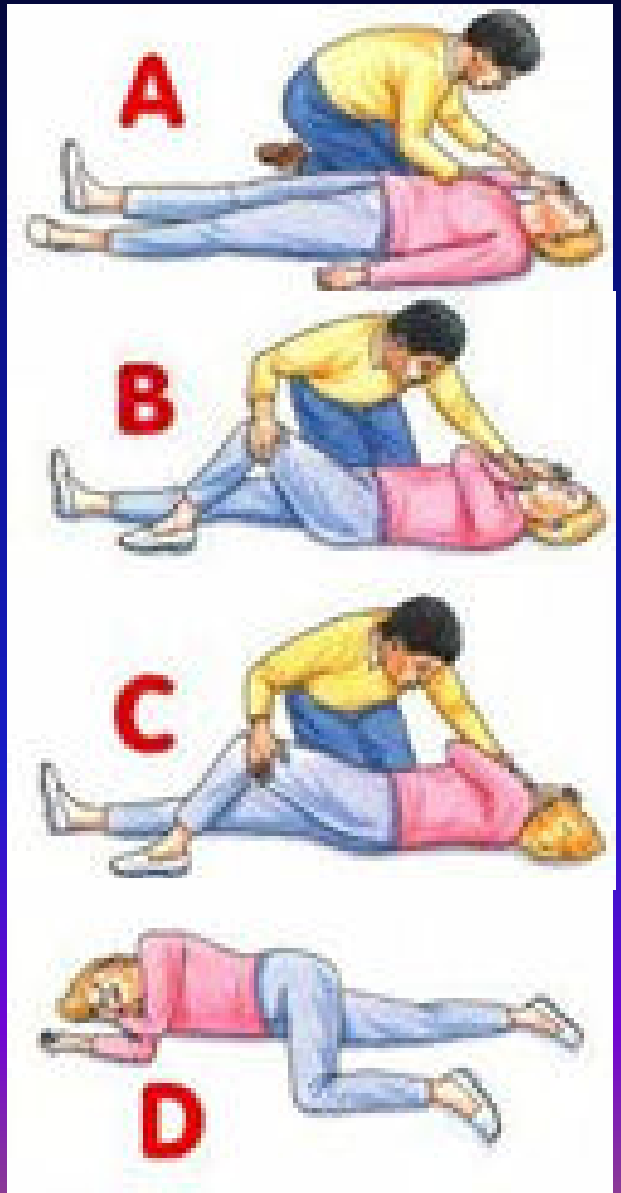
RECOVERY POSITION

Tilt patient's head back then:
A Move patient's nearest arm, as though they are stopping traffic

B Lift patient's furthest knee, and bring their furthest hand to near side of their face

C Using patient's knee as a lever, pull them onto your knees

D Adjust the patient's position, as shown



NOT BREATHING NORMALLY

- Get help – ask for AED if available, if you are alone use your mobile phone to call 999 (available even in absence of a signal)
- Start chest compressions:
  - Kneel by side of the victim
  - Place heel of one hand in centre of chest
  - Interlock fingers of other hand
  - Position yourself vertically above victims chest and with straight arms press down vertically 5-6cms
  - After each compression release pressure without losing contact
  - Repeat at a rate of 100 – 120 per minute

COMBINE CHEST COMPRESSIONS WITH RESCUE BREATHS

- After 30 compressions open airway using head tilt chin lift
- Pinch soft part of nose closed
- Take a normal breath and place your lips around his mouth ensuring a good seal
- Blow steadily into his mouth for about 1 second
- This should make chest rise as in normal breathing (effective rescue breath)
- Watch for chest to fall
- Repeat to give 2 effective rescue breaths0 no longer than 5 secs in total
- Continue with chest compressions and rescue breaths in a ratio of 30:2
- Do not interrupt resuscitation unless victim show signs of regaining consciousness e.g. coughing, opening eyes, purposeful movement

MOUTH TO NOSE VENTILATION

- Effective alternative to mouth-to-mouth ventilation
- May be considered if mouth is seriously injured or cannot be opened, if the
- When assisting a victim in water
- If mouth-to-mouth seal is difficult to achieve.

BAG – MASK VENTILATION

- Practice and skill required, difficult for lone rescuer
- Good seal necessary which is difficult
- Used alone ventilates with ambient air – 21%
- Can be increased to 45% by attaching oxygen at 5-6L min
- Can be increased to approx 90% if reservoir system attached and oxygen increased to 10L min
- Excessive compression of bag may lead to gas passing into stomach

TECHNIQUE

- One person holds mask in both hands
- Assistant squeezes bag
- Better seal achieved and jaw thrust manoeuvre more easily maintained

NOTES

- Initially blood oxygenation remains high so chest compressions higher priority at this time
- Agonal gasps are present in up to 40% of cardiac arrest victims therefore start CPR if victim is unconscious and not breathing normally
- Chest compressions achieve only 30% of cerebral perfusion

ADJUNCTS TO BASIC AIRWAY TECHNIQUES

- Often helpful to maintain open airway especially during prolonged procedures

- Oropharyngeal and nasopharyngeal airways designed to overcome backward tongue displacement in unconscious patient

OROPHARYNGEAL (GUEDAL) AIRWAYS

- Flanged plastic tube
- Fits neatly between tongue and hard palate
- Use airway with length corresponding to distance between corner of mouth and angle of jaw
- Skill needed to insert as can push tongue backwards or cause laryngospasm of reflexes present

INSERTION

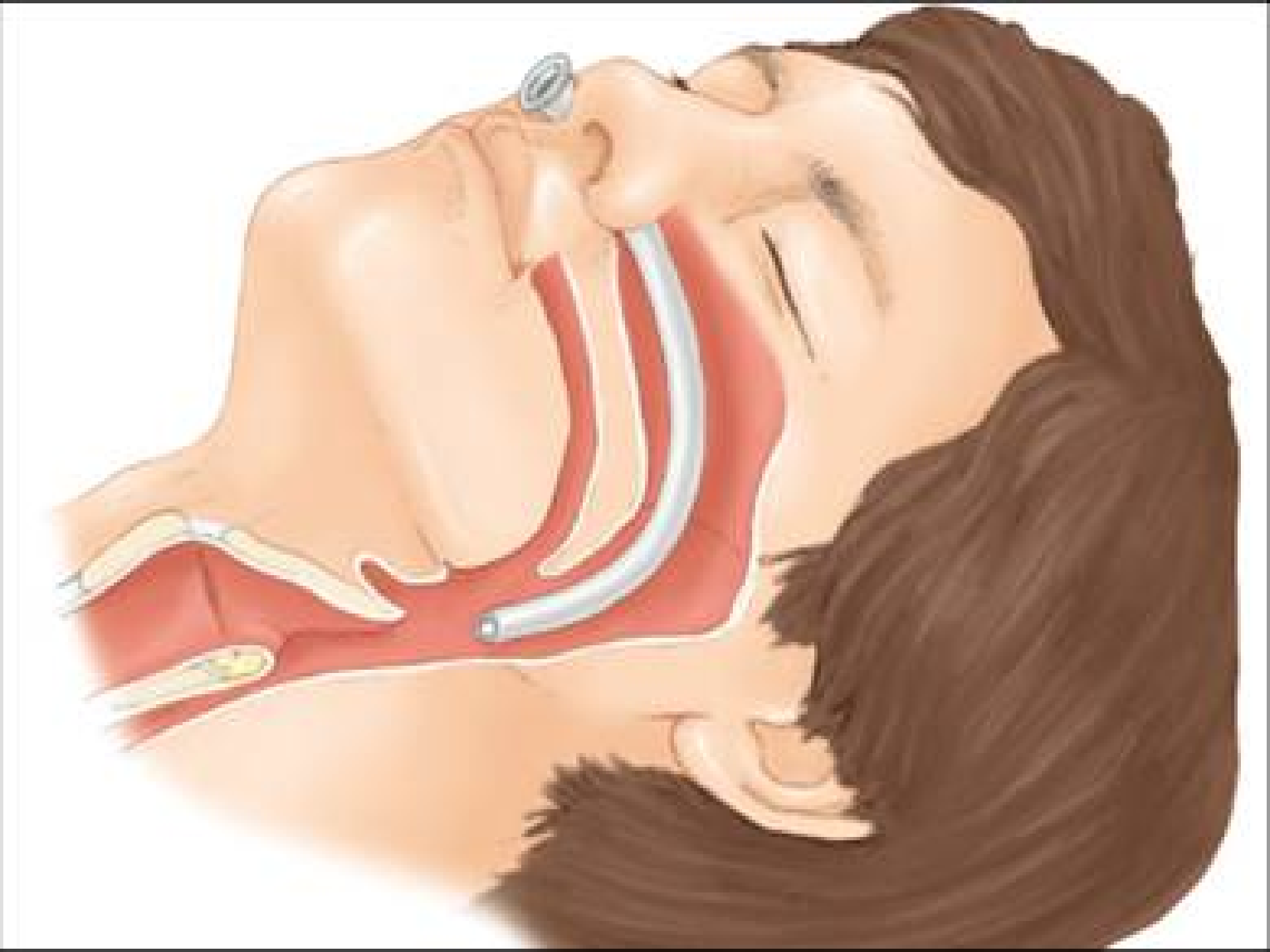
- Open patient's mouth
- Ensure no foreign materials present
- Introduce airway upside down and rotate when it passes below hard palate and into nasopharynx
- If patient gags abandon procedure
- Check patency by look listen and feel technique

NASOPHARYNGEAL AIRWAY

- Soft malleable plastic tube
- May be life saving in trismus o clenched jaw
- Often better tolerated in patients not unconscious
- Do not use if basal skull fracture suspected
- Sized in mms according to internal diameter
- Choose size approx diameter of patient's little finger

INSERTION

- Check patency of right nostril
- Insert safety pin through flange to prevent airway being over inserted and inhaled
- Lubricate
- Insert bevel end first vertically along floor of nose
- Tip should lie in pharynx behind tongue
- When fully inserted flange should lie at level of nostrils



ADVANCED AIRWAY MANAGEMENT

TRACHEAL INTUBATION ADVANTAGES

- Use of bag-mask more likely to cause gastric distension, theoretically more likely to cause regurgitation and aspiration - no reliable data to back this up
- Perceived advantages of tracheal intubation over bag-mask ventilation include:
  - Enabling ventilation without interrupting chest compressions
  - Enabling effective ventilation (particularly when lung and/or chest compliance is poor), minimising gastric inflation and risk of regurgitation
  - Protection against pulmonary aspiration of gastric contents
  - Potential to free a rescuer's hands for other tasks

TRACHEAL INTUBATION DISADVANTAGES

- Risk of unrecognised misplaced tracheal tube – in patients with out of hospital cardiac arrest
- Documented incidence ranges from 0.5% to 17%
- Prolonged period without chest compressions while intubation is attempted
- Comparatively high failure rate: intubation success rates correlate with experience of intubator

TRACHEAL INTUBATION

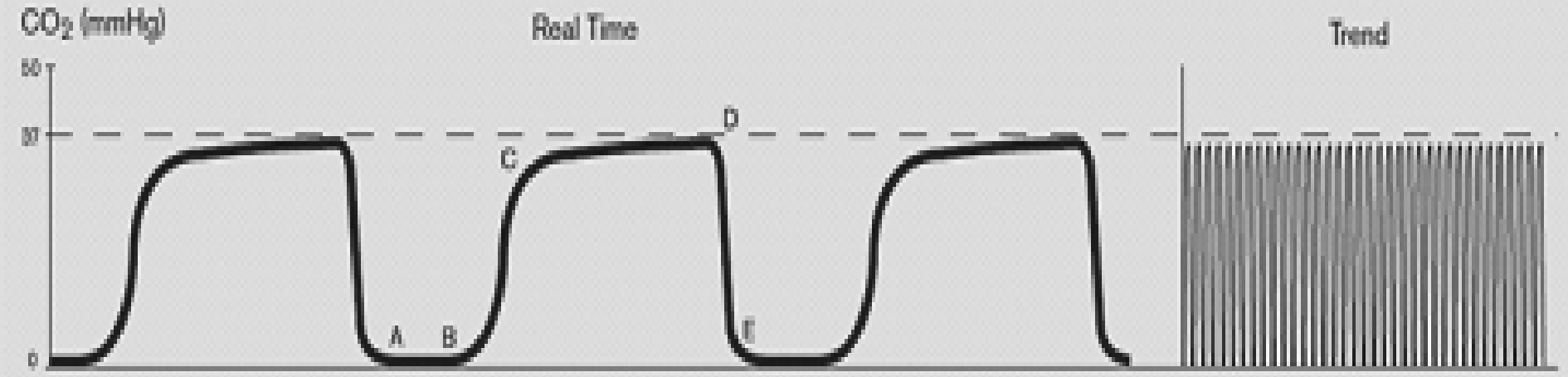
- Rescuers must weigh risks and benefits against need to provide effective chest compressions
- Intubation attempt may require some interruption of chest compressions but, once in place ventilation will not require interruption of chest compressions.
- Personnel skilled in advanced airway management should be able to undertake laryngoscopy without stopping chest compressions with ; a brief pause only as tube is passed through vocal cords
- Alternatively, intubation attempt may be deferred until return of spontaneous circulation
- No intubation attempt should interrupt chest compressions for more than 10 secs
- If intubation is not achievable within 10secs recommence bag-mask ventilation After intubation, confirm correct tube placement and secure the tube adequately.

CHECKING PLACEMENT OF TUBE

- Waveform capnography (monitoring of CO_2 in respiratory gases)is most sensitive and specific way to confirm and monitor position of a tracheal tube
- Waveform capnography will not discriminate between tracheal and bronchial placement of tube – careful auscultation is essential Existing portable monitors make capnographic initial confirmation and continuous monitoring of tracheal tube position feasible in almost all settings where intubation is performed, including out of hospital
- Supplements clinical assessment (auscultation and visualisation of tube passing between vocal cords)

Normal Capnogram

Normal $EtCO_2$: 35 – 45 mmHg



The "normal" capnogram is a waveform which represents the varying CO_2 level throughout the breath cycle.

Waveform Characteristics:

A-B	Baseline	D	End-Tidal Concentration
B-C	Expiratory Upstroke	D-E	Inspiration
C-D	Expiratory Plateau		

CHOKING

Airways obstruction caused by solid matter – attack usually occurs while eating and victim may clutch his neck

CHOKING

Signs of severe obstruction

- **RESPONSE TO QUESTION 'ARE YOU CHOKING?'**
- Victim unable to speak
- Victim may respond by nodding
- **OTHER SIGNS:**
- Victim unable to breathe
- Breathing sounds wheezy
- Attempts at coughing are silent
- Victim may be unconscious

Signs of mild obstruction

- **RESPONSE TO QUESTION 'ARE YOU CHOKING?'**
- Victim speaks and answers yes
- OTHER SIGNS
- Victim is able to speak, cough, and breathe

CAUSES OF AIRWAY OBSTRUCTION - Pharynx

- Commonest site in unconscious person when pharynx becomes occluded by tongue which falls backwards when normal tone in muscles attaching tongue relaxes
- Also:
  - Secretions, vomit or blood
  - Regurgitation of gastric contents
  - Swelling due to allergy, infection or trauma
  - Foreign bodies

CAUSES OF AIRWAY OBSTRUCTION - Larynx

- Swelling
- Anaphylaxis
- Spasm as a result of upper airways stimulation
- Inhalation of secretions, blood or foreign body

CAUSES OF AIRWAY OBSTRUCTION – Below level of larynx

- Less common
- Excessive bronchial secretions
- Mucosal swelling
- Bronchospasm
- Aspiration of gastric contents
- Pulmonary oedema

RECOGNITION OF AIRWAY OBSTRUCTION

- Best achieved by look, listen and feel approach
  - LOOK – for chest and abdominal movements, observe colour
  - LISTEN AND FEEL – for airflow at the mouth
- Central cyanosis is a late sign of airway obstruction

PARTIAL OBSTRUCTION

- Air entry is diminished and usually noisy
- INSPIRATORY STRIDOR (noise on breathing in) is caused by obstruction at laryngeal level or above
- EXPIRATORY WHEEZE suggests obstruction of lower airways which may collapse during expiration e.g.asthma

PARTIAL OBSTRUCTION

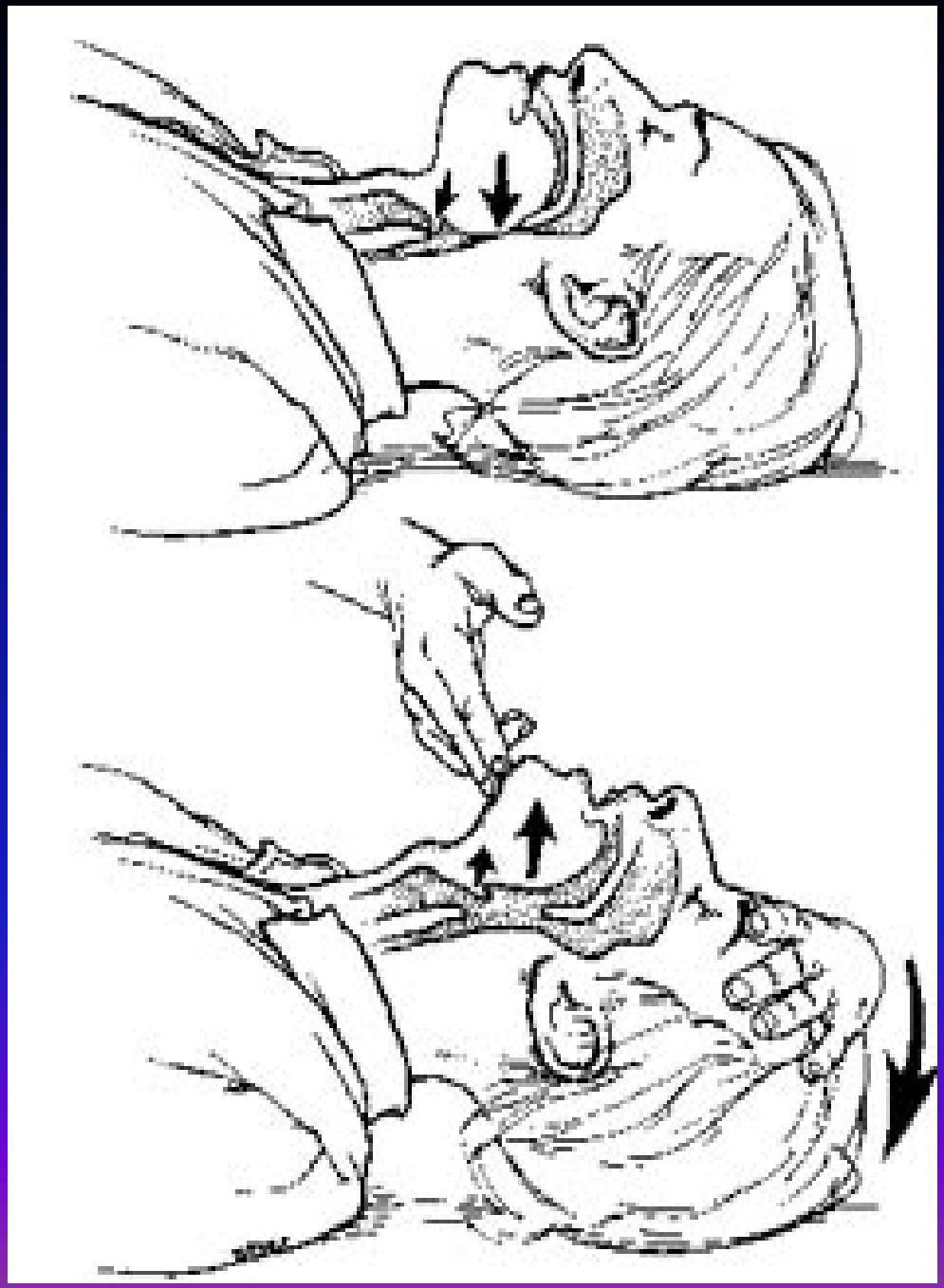
- GURGLING – suggests presence of liquid or semi solids in main airways
- SNORING – occurs when pharynx is partially occluded by tongue
- CROWING – sound of laryngeal spasm (causes considerable distress)

COMPLETE OBSTRUCTION

- Breath sounds absent
- Paradoxical chest and abdominal movement as person attempts to breathe in chest wall lifts but abdomen is drawn inwards – often described as ‘see saw’ breathing
- Use of accessory muscles – neck and shoulder as they attempt to assist chest movement

WHAT TO DO

- Get help in all cases
- Encourage to cough
- Do nothing else



WHAT TO DO -severe obstruction

- If conscious give up to 5 back blows:
  - Stand to side and slightly behind victim
  - Support chest and lean victim forward
  - Give up to 5 sharp blows between shoulder blades with heel of hand
  - Check between each one to see of obstruction is clear

WHAT TO DO -severe obstruction

- If back blows fail, give up to 5 abdominal thrusts:
  - Stand behind victim and put both arms around upper part of abdomen
  - Lean victim forwards
  - Clench your fist and place between umbilicus and sternum
  - Grasp with other hand
  - Pull sharply inwards and upwards
  - Repeat up to 5 times

WHAT TO DO -Unconscious victim

- Support carefully to the ground
- Call 999
- Begin CPR even if a pulse is present

NOTES

- Following successful treatment foreign materials may remain in upper respiratory tract
- Victims should be seen by a doctor particularly if a persistent cough, difficulty swallowing or the feeling of something stuck in the throat is present
- Abdominal thrusts can cause serious internal injuries

ANAPHYLAXIS

OBJECTIVES

By the end of the session attendees will:

- Have an understanding of anaphylaxis
- Be able to identify common triggers of anaphylaxis
- Recognise the signs and symptoms of anaphylaxis
- Know what to do if someone has an anaphylactic reaction

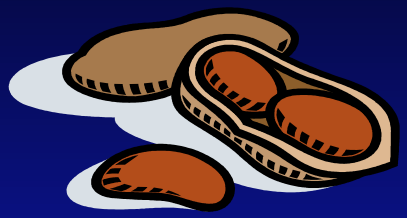
WHAT IS ANAPHYLAXIS?

- Severe, systemic life threatening allergic reaction
- Involves either or both the following features:
- Respiratory distress – may be due to laryngeal oedema or asthma
- Hypotension – may present as collapse or loss of consciousness
- Other features may be present:
  - Erythrema (redness)
  - Generalised pruritis (itching)
  - Urticaria (nettle rash)
  - Angio-oedema (when urticaria involves, lips, eyes or tongue causing swelling)
  - Asthma
  - Rhinitis (runny nose)
  - Conjunctivitis
  - Itching of palate/external auditory meatus
  - Nausea/vomiting/abdominal pain
  - Palpitations
  - Light headeness
  - Sense of impending doom

WHAT HAPPENS DURING ANAPHYLAXSIS?

- People with coexisting asthma and allergies at high risk
- Occurs following exposure to an allergen to which the person is sensitive
- Specific sensitised IgE antibodies recognise the allergen and react with it
- This stimulates the Mast cells top release inflammatory mediators causing an anaphylactic reaction

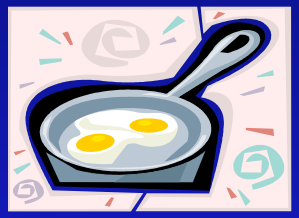
COMMON TRIGGERS - FOOD



Peanuts

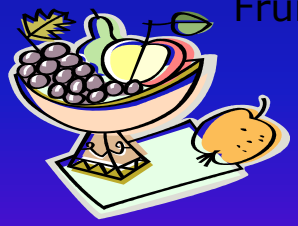
Tree nuts : almonds, brazils,cashews, hazelnuts, pistachios, walnuts

Sesame



Eggs

Fish and shellfish



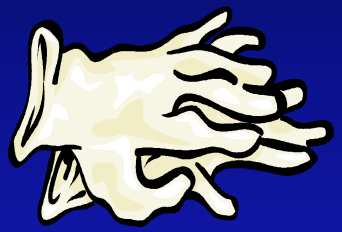
Fruit

Dairy products

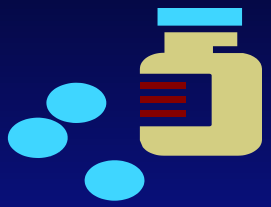
COMMON TRIGGERS – NON FOOD

Wasp stings

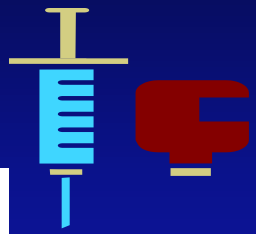
Bee stings



Latex



Certain medicines or injections



Antibiotics (especially penicillin)

Aspirin

Exercise, by itself or in combination with other factors

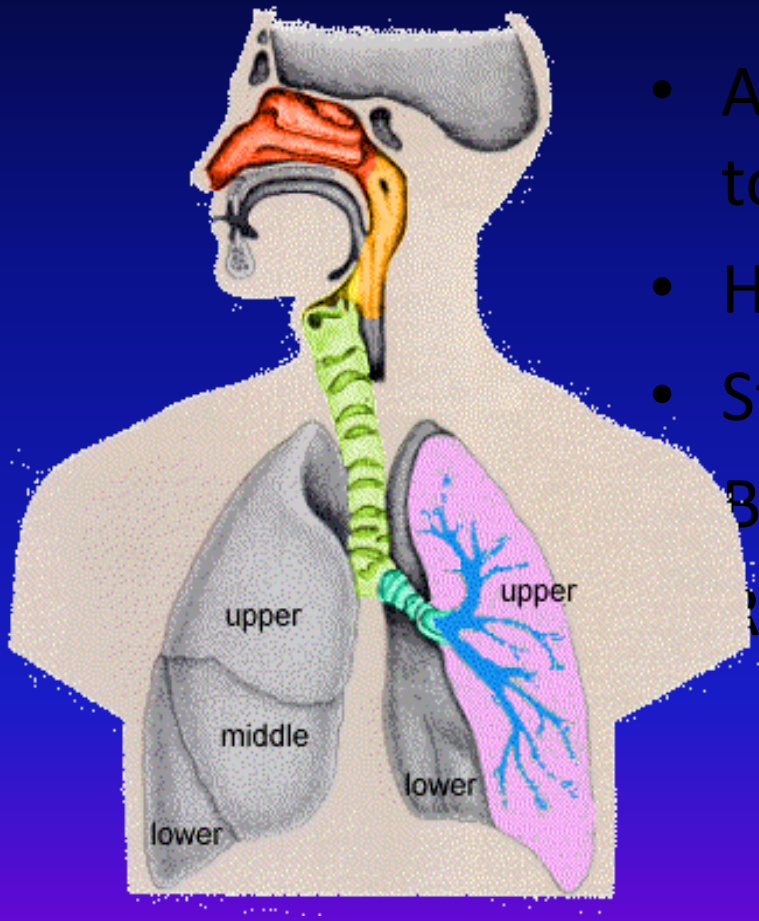
NSAIDs eg. ibuprofem

RECOGNISING THE SIGNS AND SYMPTOMS

Anaphylaxis may cause signs and symptoms in:

- Respiratory tract
- Cardiovascular system
- Gastrointestinal system
- Skin
- Nervous system
- Genitourinary system

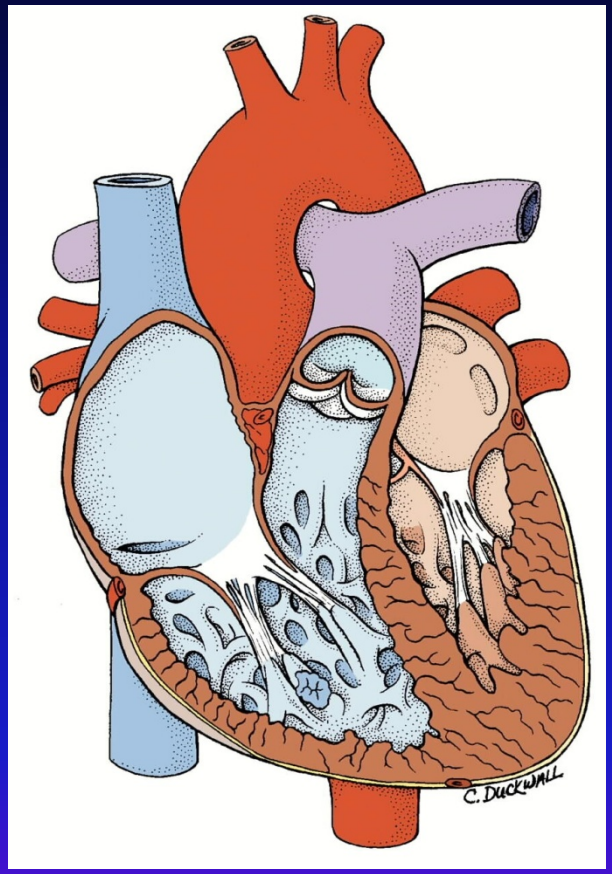
RESPIRATORY SYSTEM



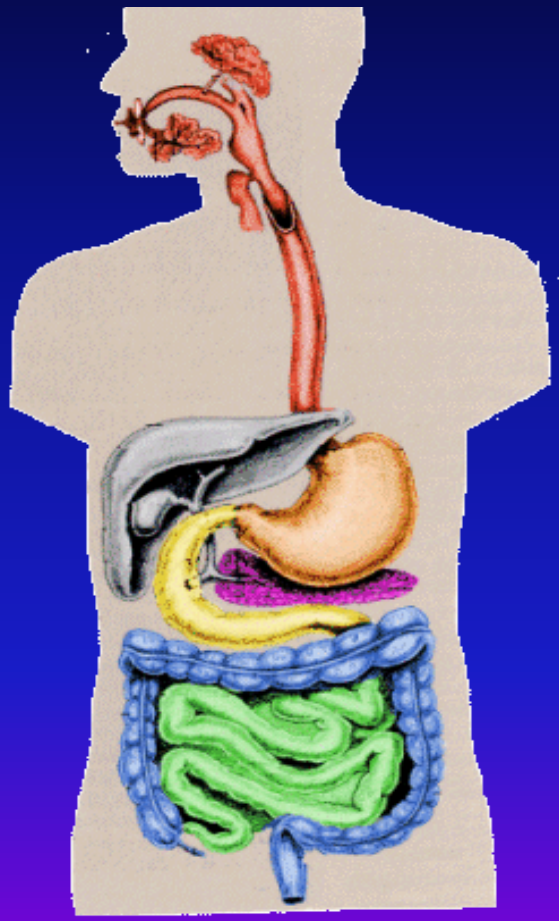
- Angio-oedema of mouth, tongue, pharynx, larynx
- Hoarseness
- Stridor/wheezing
- Bronchospasm
- Respiratory arrest

CARDIOVASCULAR SYSTEM

- Hypotension
- Arrythmias
- Myocardial ischaemia
- Cardiac arrest



GASTROINTESTINAL SYSTEM

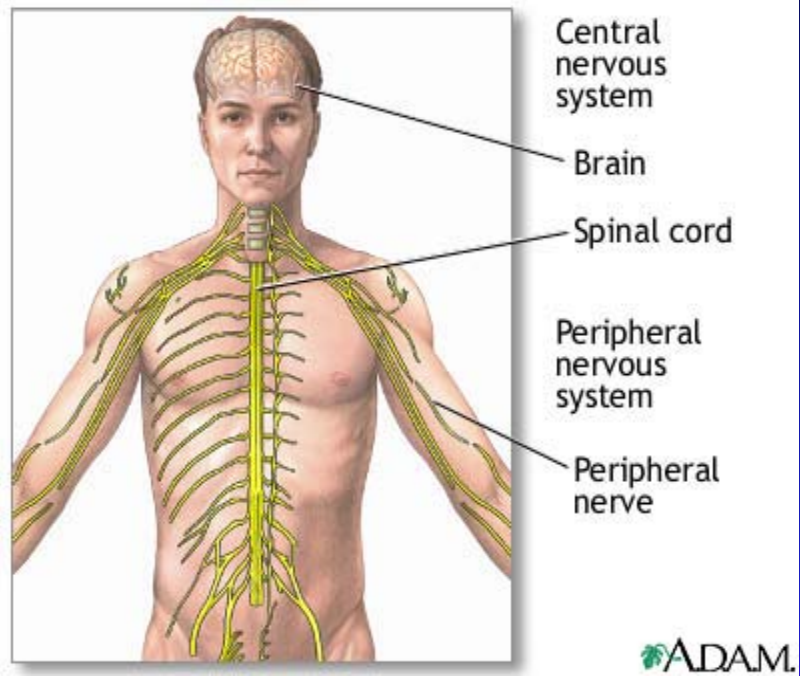


- Nausea
- Vomiting
- Diarrhoea/incontinence
- Abdominal cramps

SKIN

- Flushing
- Pruritis – particularly hands and scalp
- Sweating
- Urticaria
- Angio-oedema

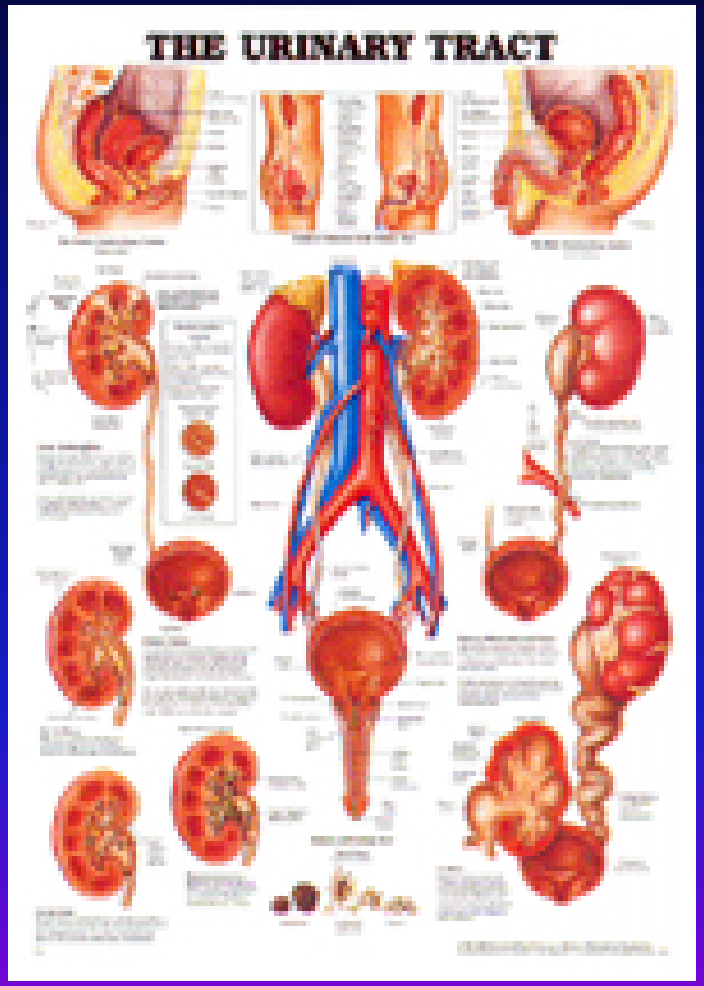
NERVOUS SYSTEM



- Anxiety
- Convulsions
- Loss of consciousness
- Sense of impending doom

GENITOURINARY SYSTEM

- Urinary incontinence
- Uterine contractions



WHAT TO DO – EMERGENCY TREATMENT

- Get help – ring emergency nurse call bell
- Dial (9)999 and say:

ANAPHYLAXIS – Holy Cross Hospital, Hindhead Road, Haslemere

- Intramuscular adrenaline is recommended first line treatment

ADRENALINE

- Should be given as soon as the person experiences severe symptoms i.e. respiratory distress – hypotension – sense of impending doom
- Treatment failure is likely if adrenaline is delayed
- Pre loaded adrenaline auto injectors are highly effective

ADRENALINE

- Auto injectors (EpiPen™) are available in two strengths:

1. 0.3 mgs of adrenaline for adults (>30 kgs)
2. 0.15mgs adrenaline for children (15-30 kgs)

HOW DOES ADRENALINE WORK?

- Reverses peripheral vasodilation
- Increases peripheral vascular resistance
- Improves blood pressure and coronary perfusion
- Decreases angio-oedema
- Causes bronchodilation which improves respiration
- Reduces release of inflammatory mediators

HOW TO USE THE EPIPEN™

- Grasp in dominant hand with thumb closest to grey safety cap
- With other hand pull off grey safety cap
- Black tip should point towards outer thigh
- Jab firmly into outer thigh at a right angle – through clothing if necessary
- Hold in place for 10 seconds
- Remove EpiPen and hand over to team taking over management of patient
- Massage injection area for 10 seconds
-  A&E as soon as possible as a relapse may occur

DON'T !!!!

- Use EpiPen™ to practice
- Remove grey safety cap until ready to use
- Place fingers over black tip
- Attempt to inject into veins or buttocks
- Inject into extremities as adrenaline causes local vasoconstriction
- Leave patient until paramedics arrive

PRACTICE USING EPIPEN™

BIPHASIC REACTION

- Symptoms return several hour after initial reaction
- Although rare recurrence is possible 12-24 hours after initial event
- Risk can be minimised by early administration of adrenaline followed by chlorpheniramine and hydrocortisone

STEP-WISE EMERGENCY PLAN

- Administer EpiPen™
- Dial (9)999 and say ANAPHYLAXIS
- Give an inhaled B2 agonist if asthma is present
- Observe patient, if symptoms present after 15 minutes administer second EpiPen™
- Hand used EpiPen™ over to team taking over management of patient
- Administer chlorpheniramine and hydrocortisone
- Be vigilant for 24 hours due to risk of biphasic reaction
- Ensure patient has a future supply of EpiPens™

Any questions