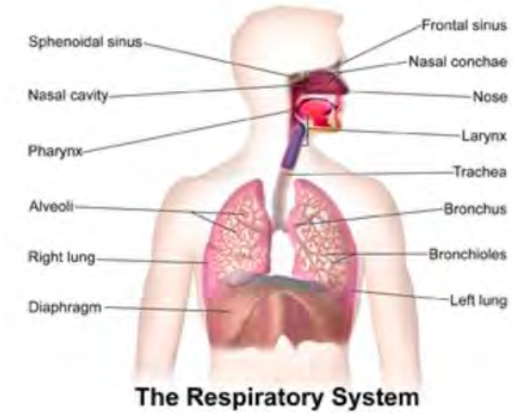
MODULE 03
ASPHYXIA AND CHOKING

3.1 ASPHYXIA

Asphyxia is "**any condition which stops oxygen getting into the lungs then into the blood and/or stops carbon dioxide (CO_2) leaving the lungs"**. This will very quickly lead to oxygen depletion and a build up of carbon dioxide in the cells of the brain and vital organs, finally resulting in the death of those cells through oxygen starvation (approximately 3-4 minutes).



The Respiratory System

Blausen.com staff (29 August 2014), "Medical gallery of Blausen Medical 2014", *WikiJournal of Medicine*, **1** (2), doi:10.15347/WJM/2014.010, ISSN 2002-4436, Wikidata Q44276831

HOW DOES THE AIR GET INTO THE BLOOD?

- Signals from the brain stem initiate the breathing process – resulting in a **normal adult's breathing rate of between 12 -20 breaths per minute** (faster for children)
- Air travels in the mouth and down the windpipe (*trachea*);
- The windpipe then splits into two large pipes (*the left and right main bronchus*);
- These then split into smaller pipes, similar in appearance to an upturned tree (*the smaller bronchi and bronchioles*);
- Finally the air reaches the tiny air sacs (alveoli), which are surrounded by a mesh of tiny blood vessels (*capillaries*);
- It is here that the gases are exchanged into the blood supply.

Causes of Asphyxia

There are many causes of asphyxia, however the majority of causes can be summed up in the acronym **C-O-C-L-E-S** and, if present, these should be identified and rectified as soon as possible:

C - **Compression** *(crush injuries – especially to the chest etc.)*

O - **Obstruction** *(tongue, foreign object, vomit etc.)*

C - **Constriction** *(hanging, strangulation etc.)*

L - **Lack of Oxygen** *(Smoke fumes, carbon monoxide, cyanide etc.)*

E - **Electrical shock & poisoning**

S - **Suffocation** *(plastic bag etc.)*

Bear in mind, **anything that may be asphyxiating the casualty may also affect you, so SAFETY FIRST.**

The Aims of Treating Asphyxia

- To restore a functioning *(patent)* airway to the casualty;
- Maintain a supply of fresh air to the lungs and;
- Seek medical aid as soon as possible.

Signs and Symptoms of Asphyxia

The main signs and symptoms of asphyxia are:

Breathing	Distressed *(flaring nostrils, drawing in of chest muscles)*, Breathing rate under 10 per minute Breathing rate over 30 per minute Breathing stopped Noisy – gurgling / snoring / stridor (high pitch sound on breathing in
Level of Consciousness	Irritable, anxious, aggressive, dizziness confusion, non-verbal signs (*pointing to throat),* fits and seizures
Skin	blue (cyanosed) especially around lips
Posture	usually sitting / attempting to sit bolt upright

There are other signs depending on the means of asphyxiation, including:

- constriction marks around the neck;
- facial congestion;
- frothy, blood tinged sputum.

If asphyxia is not quickly reversed, breathing will cease and the heart will stop.

General Management of the Asphyxiating Casualty

Constriction / Suffocation

- Quickly remove the constriction / obstruction from the casualty's neck / face - supporting the body if they are still hanging;
- DO NOT destroy / interfere with any evidence more than is necessary to save life. If necessary cut the rope away from the knot leaving it intact for evidence;
- Ensure patient transported to an appropriate medical facility.
- If unconscious and breathing - recovery position. Be prepared to resuscitate

Lack of Oxygen

- Removal attempts **must not be attempted** if it puts your life at risk - remember **SAFETY FIRST.**
- Remove casualty from danger
- Ensure patient transported to an appropriate medical facility.
- If unconscious and breathing - recovery position. Be prepared to resuscitate

Electrical and Poisoning

- Think **SAFETY FIRST.** If possible, **SAFELY** remove the casualty from the source.
- Ensure patient transported to an appropriate medical facility.
- If unconscious and breathing recovery position. Be prepared to resuscitate
- Note signs of any poison taken.

Chest Infection / Chronic Chest disease

- Symptoms include cough / shortness of breath / possible high temperature / expectorated phlegm / pre-existing history (e.g. emphysema / bronchitis);
- Sit patient upright and help with their medication if available (e.g. inhalers).
- Transport to medical facility / If unconscious - recovery position.

Hyperventilation

The body is in a state of balance, including the gases oxygen and carbon dioxide (CO_2). Too much, or not enough, of either will cause an imbalance. Many things including a sudden fright can bring on hyperventilation or a "panic attack". This will cause the patient to start breathing very rapidly, and will in fact cause the patient to breathe out too much carbon dioxide. The blood (and body) now has too low levels of carbon dioxide, which may well result in a sharp pain in the chest. **THIS IS NOT ASPHYXIA** (remember asphyxia is either low levels of oxygen and / or high levels of CO_2)

This is often accompanied with pins and needles to the arms and legs and, in severe cases, a cramping of the hands causing them to bend at the wrist – "carpopedal spasm". The worst that should happen is that the patient will become unconscious, in which case the body will re-balance itself!

BE WARNED, NOT ALL RAPID BREATHING IS A PANIC ATTACK, especially if the patient already has another medical condition i.e. asthma or shock. In fact, it can be very difficult for people to differentiate between a panic attack and other, more life-threatening conditions.

For this reason, unless you are an experienced medical professional, and experienced in differentiating between a panic attack and other more serious conditions, we do not recommend asking a patient to place a paper bag over their mouth and asking them to rebreathe their own exhaled air (thereby raising the patient's levels of carbon dioxide).

If you mistakenly presume it is a panic attack, (when in fact it is not) and reduce their air supply and increase levels of carbon dioxide, you could worsen the situation, thereby increasing their asphyxia causing rapid deterioration, suffocation and potentially kill your patient.

Ask the patient to try and slow his or her breathing and, if it does not improve, seek medical help.

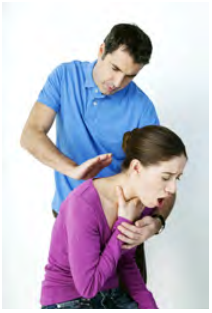
3.2 CHOKING

During the primary survey has been completed (DRs ABC) – once the area has been deemed safe, you may start communicating with your patient and may notice that:

- They are unable to communicate back;
- They may be quite distressed and be pointing at their throat;
- There may be obvious clues present – e.g. there might be the presence of food nearby.

So now we move onto Airway in our DRs ABS checklist

Obstruction (Foreign Object) Adults & Children over 1 year old



If visible, and safe, remove object or **ENCOURAGE COUGHING**;

- If the obstruction is severe and the coughing does not work, then lean the casualty forward so that when the object is dislodged it comes out the mouth rather than further down the airway. Give 4-5 hard, sharp **BACK BLOWS** with the heel of your hand between the shoulder blades;

- If unsuccessful, try 4-5 **ABDOMINAL THRUSTS.** Stand behind the casualty, clench your fist and place it around the upper part of their abdomen midway between the rib-cage and the navel. Grasp this hand with your other hand and pull sharply inward and upward.
- Alternate between back-slaps and abdominal thrusts until the airway is clear and the patient is breathing normally again or the patient becomes unconscious;
- If the patient collapses and the airway is still blocked, try to support them carefully to the ground - **immediately call 999 / 112 and then start normal CPR.**
- **DO NOT USE ABDOMINAL THRUSTS ON BABIES under 1 – use chest compressions instead with '2 fingers' or the '2 thumbs encircling the chest' method. The landmark is just below an imaginary line joining the baby' nipples**

For further information, download the UK Resuscitation Council 2021 guidelines or go to their website https://www.resus.org.uk/library/2021-resuscitation-guidelines

3.3 ASTHMA – HOLOS FACTSHEET

This is a chronic condition, affecting the airways in the lungs. An acute attack can be sparked off by a variety of causes (i.e. allergies / pollen / stress etc.). For an informative video on asthma, its causes, recognition, signs and symptoms go to https://www.youtube.com/watch?v=uBT94QxL7AE&t=62s and for further information go to the Asthma UK website https://www.asthma.org.uk/

In an acute attack (**SSS**):

- The muscles of the air passage go into **S**pasm & start to **S**well;
- The membranes lining the air passages **S**ecrete mucous.

The result of this is a narrowing of the tubes of the airway. This causes:

- Increasing difficulty in breathing (particularly out)
- A prolonged wheeze on expiration (caused by the narrow, constricted airways);
- Barrel chested and sitting / standing bolt upright (often caused by the inability to move "used air" out of the lungs)

This can be a very frightening experience, and the main aims of the first responder should be to:

- Reassure and calm the casualty;
- Help the casualty to sit upright & to lean slightly forward slightly (helping breathing);
- Ensure a good air supply (remove crowds etc.)
- Assist with their reliever medication if available:
    1. Use spacer if available;
    2. One puff every 30-60 seconds
    3. Up to 10 puffs
- If worsening, or no relief after 10 puffs call 999 or 112
- Whilst waiting for the ambulance, repeat the reliever medication steps 1-3 if necessary

ABSOLUTELY NO PAPER BAGS

Remember – **a silent Asthmatic is dangerous** (they are now too exhausted to breathe)