



JESSENIUS FACULTY
OF MEDICINE IN MARTIN
Comenius University
Bratislava



Medical Education Support Center

Life-threatening non-traumatic events - First Aid (Heart Attack, Stroke, Anaphylaxis, Asthma, Seizures)

MUDr. Zuzana Biringerová, PhD.

Content

Unconsciousness

Syncope (Fainting)

Seizures

Anaphylactic reaction

Heart attack

Stroke

Asthma attack

Hypoglycemia/Hyperglycemia

Unconsciousness (unresponsiveness)

- an abnormal state in which a person is not alert and not fully responsive to the surroundings
- a person is unable to respond to stimuli (to loud sounds or shaking)

It's life threatening condition !!!

Often a sign of a serious health issue that could result in death or permanent disability!!!

Risks of unconsciousness:

- **respiratory disorders, including changes of breathing pattern, even cessation of breathing**
- **cardiovascular disturbances, hypo/hypertension, brady/tachycardia, failure of circulation**
- **aspiration of gastric content (loss of protective airway reflexes)**

Requires immediate medical intervention!!!

Consciousness is a function of the brain

LEVEL OF CONSCIOUSNESS - indicates a patient's level of arousal and awareness

Causes of unconsciousness: mnemonic ***AEIOU TIPS***:

- **A - Alcohol**
- **E - Epilepsy or exposure** (heat stroke, hypothermia)
- **I - Insulin** (diabetic emergency)
- **O - Overdose or oxygen deficiency**
- **U - Uremia** (toxins due to kidney failure)
- **T – Trauma** (shock or head injury)
- **I - Infection**
- **P – Poisoning**
- **S - Stroke**

GLASGOW COMA SCALE (GCS)

AVPU

- scales for quick assessment of the level of consciousness

Behaviour	Response
 Eye Opening Response	4. Spontaneously 3. To speech 2. To pain 1. No response
 Verbal Response	5. Oriented to time, <u>person</u> and place 4. Confused, but able to answer Qs 3. Inappropriate words 2. Incomprehensible sounds 1. No response
 Motor Response	6. Obeys commands 5. Moves to localised pain 4. Flex to withdraw from pain 3. Abnormal flexion, decorticate posture 2. Abnormal extension, decerebrate posture 1. No response
Minor Brain Injury = 13-15; Moderate Brain injury = 9-12; Severe Brain Injury = 3-8 Record the GCS as a total and its tree sperate components: e.g., GCS 8/15: E3, V2, M3	

A	The patient is awake.
V	The patient responds to verbal stimulation.
P	The patient responds to painful stimulation.
U	The patient is completely unresponsive.

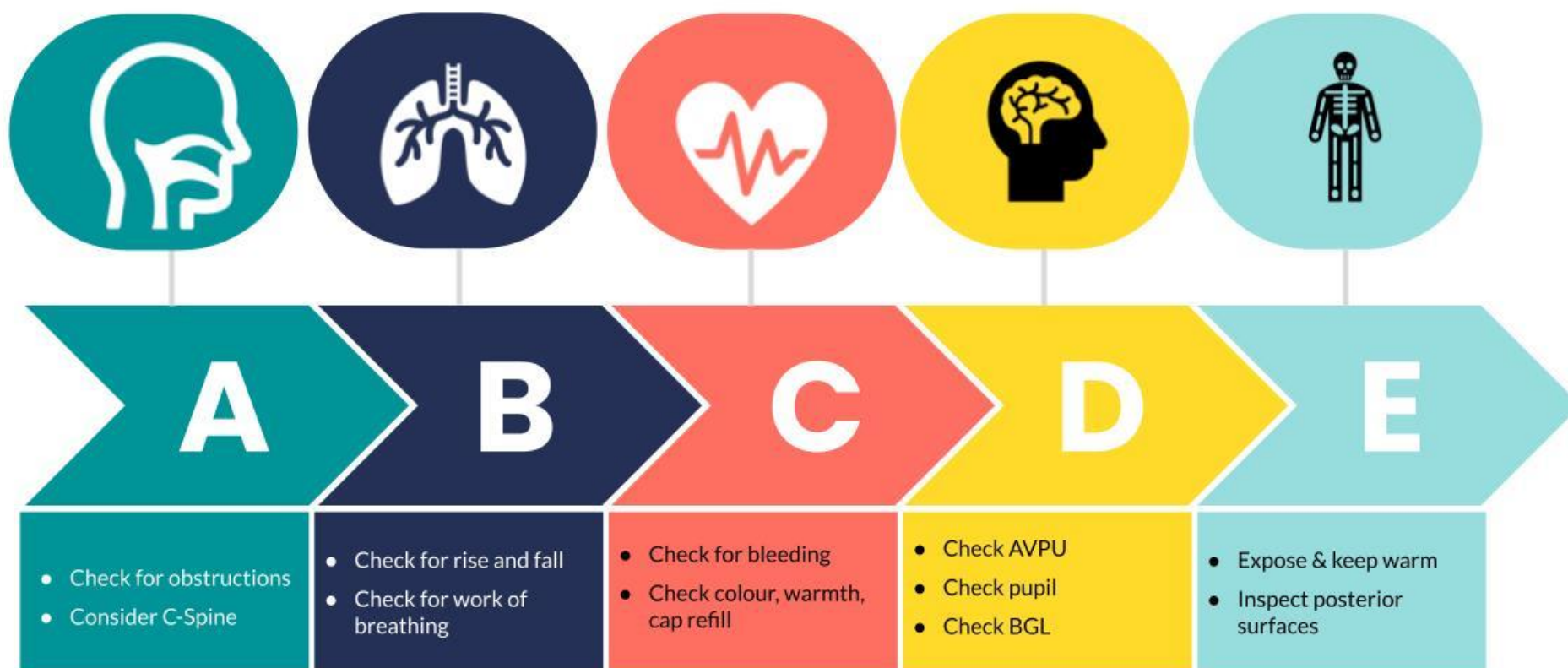
GCS 15 -

fully awake patient

GCS 3 -

a coma

Unconsciousness – First Aid



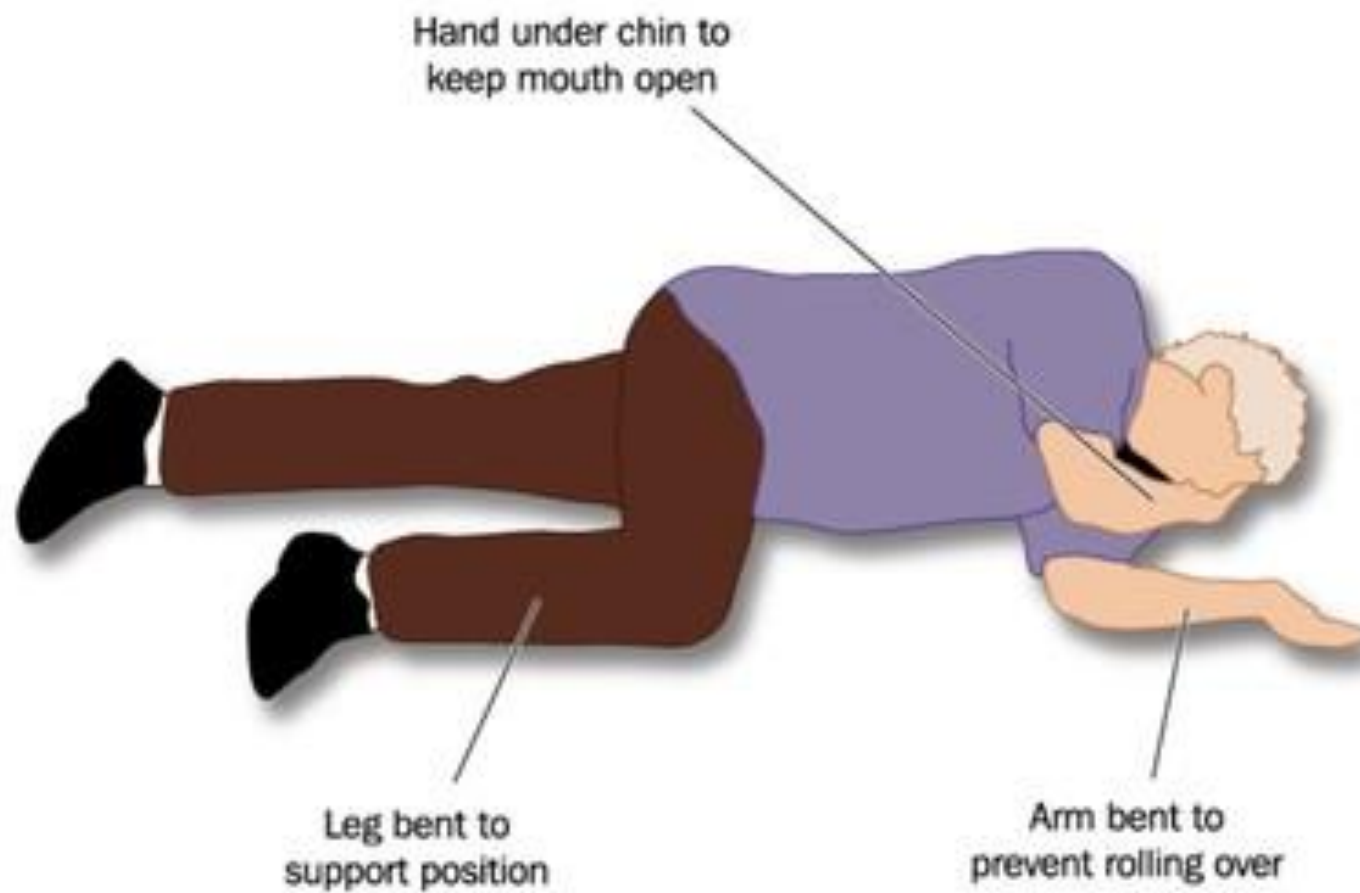
- **A airway:** open airway
- **B breathing: absent or abnormal → CPR immediately**

UNCONSCIOUSNESS + OPEN AIRWAY + NORMAL BREATHING →

- **C circulation:** pulse, blood pressure, color of skin, capillary refill, bleeding
- **D disability:** reactivity and symmetry of pupils, blood glucose level...
- **E examination/exposure** head to toe examination, medical history...

→ **RECOVERY POSITION**
CALL FOR HELP (EMS)
CHECK PATIENT REGULARLY

RECOVERY POSITION



Syncope/Fainting

- **temporary** loss of consciousness and muscle strength, usually related to **insufficient blood flow to the brain**

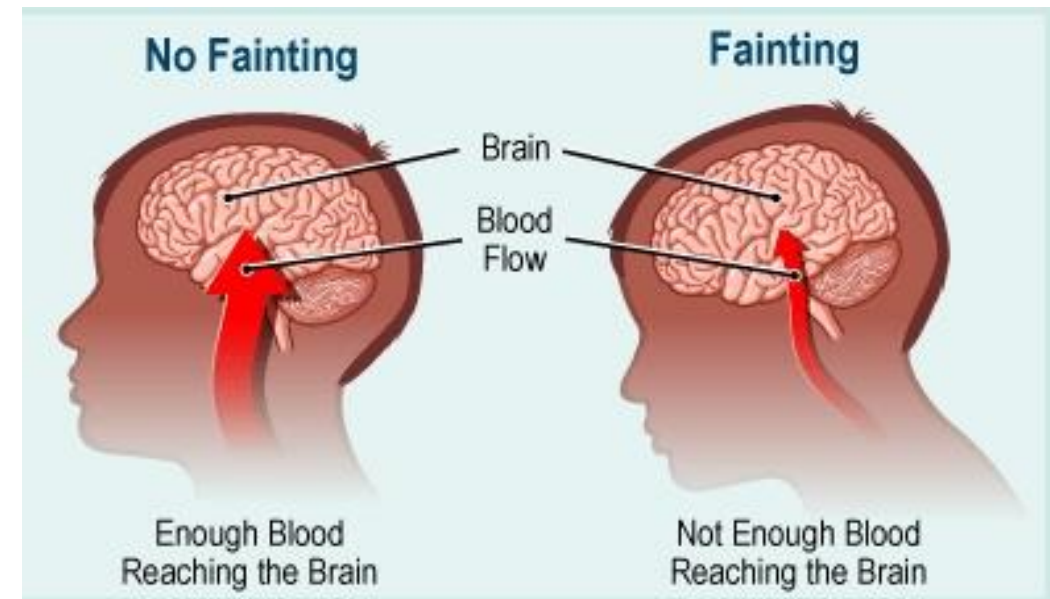
LOSS OF CONSCIOUSNESS

SUDDEN ONSET

SHORT DURATION

SPONTANEOUS AND FULL RECOVERY

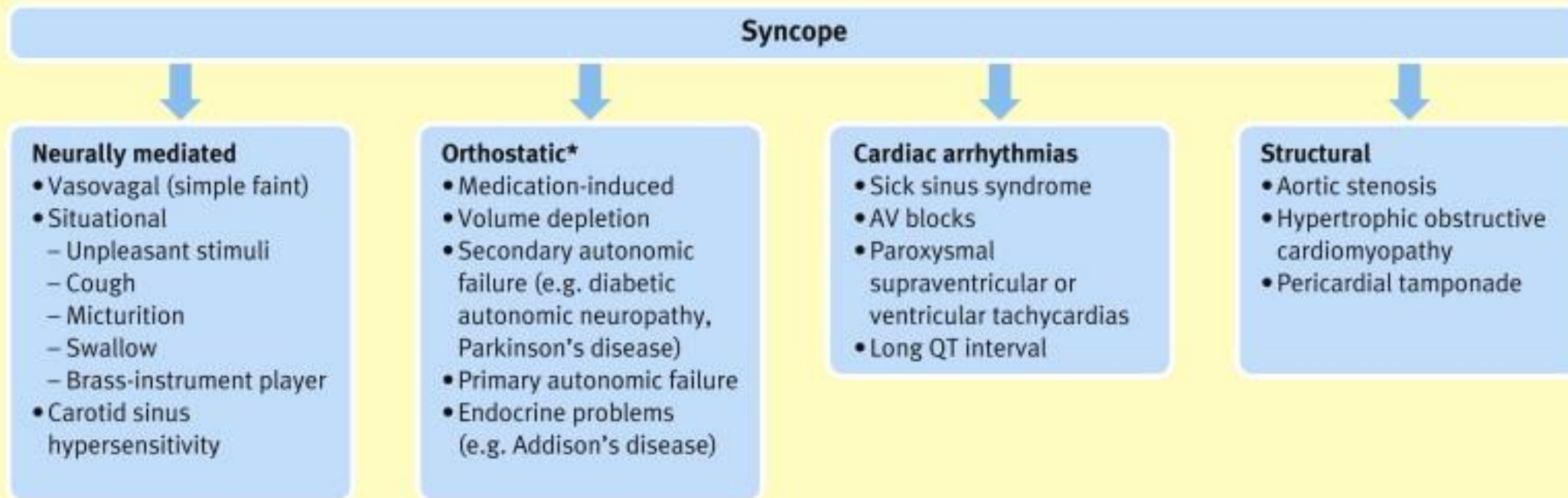
- can be due to several causes, ranging from benign to life-threatening conditions



Warning Signs of a Fainting Spell



The four main types of syncope



* This group mainly refers to postural hypotension (an immediate fall in blood pressure after assuming the upright position) – but also includes the 'elderly dysautonomic pattern' of a slow fall in blood pressure after assuming the upright position or walking around. This is a common cause of syncope/falls in older people who report they 'just go down' without warning. Simple lying and standing blood pressure measurements may be normal. It is usually associated with a low-for-age blood pressure, often in people taking anti-hypertensive medication, a typical history and tilt test response.



- 1** LAY PERSON ON THE BACK

- 2** ELEVATE LEGS TO RESTORE BLOOD FLOW TO THE BRAIN

- 3** LOOSEN TIGHT CLOTHING

- 4** TRY TO REVIVE PERSON, SHAKE OR YELL

- 5** IF PERSON DOESN'T RESPOND CALL 911

- 5** IF PERSON ISN'T BREATHING, START CPR
CONTINUE UNTIL HELP ARRIVES


DO NOT



GIVE PERSON
ANY FOOD OR DRINK



SLAP FACE OR SPLASH WATER
TO TRY TO RETRIEVE PERSON



LEAVE PERSON ALONE

Seizures

- rapid and uncoordinated electrical activity in the brain → abnormalities in **behaviors, movements** (alternating stiffening and jerking of the arms and legs), **sensations** or a **loss of consciousness or altered consciousness level**
- depending on which part of the brain the seizure affects
 - focal/ partial seizures - involve only part of the brain
 - generalized seizures - involve the whole brain



Focal Seizure



Generalized Seizure

Signs and Symptoms of a Seizure



Confusion



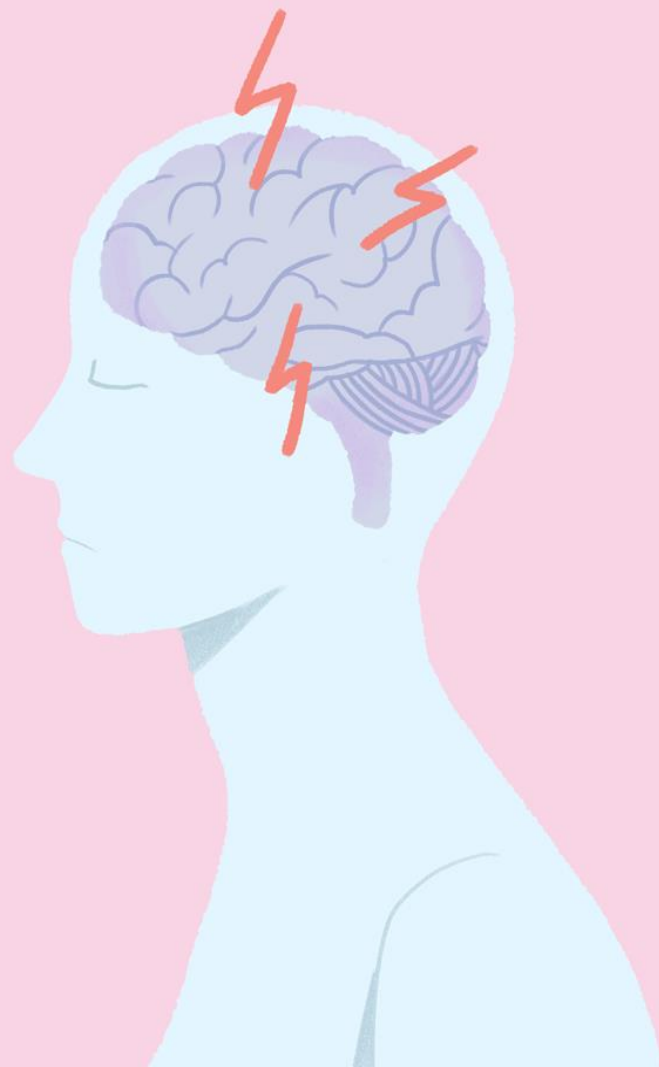
Aura



Sudden falls



Staring



Uncontrollable
jerking movements



Strange sensations
and emotions



Loss of consciousness
or awareness

Causes of seizures

- **Epilepsy**
- Brain injury
- Cerebrovascular disease
- Hypoxemia of any cause
- Central nervous system infections
- Metabolic and toxic conditions (hyponatremia, hypoglycemia, hyperglycemia, renal failure, liver failure...)
- Fever
- Extremely high blood pressure
- Brain tumor
- Drug and alcohol abuse/withdrawal
- Allergies

Epilepsy

- is a disorder of the brain characterized by ***repeated seizures***
- is a ***chronic*** medical condition characterized by 2 or more *unprovoked seizures*

Generalized tonic- clonic seizure – grand mal

- +/- aura
- ***tonic phase*** – sudden loss of consciousness, straightening of body and limbs, opisthotonos – extension of body, cca 30 sec, may be apnea, scream at the beginning
- ***clonic phase*** – clonic jerks of body, limbs and head, 30-60 sec or more, cyanosis, tongue biting, sphincter relaxation – incontinence
- ***postictal phase*** – normal breathing, unconsciousness, sleepiness, loss of memory, headache

Tonic phase



Clonic phase



Seizures- First Aid

Do:

- **Protect the** patient from injury (remove harmful objects from nearby)
- **Protect** the patient's head
- **Observe** how long the seizure lasts
- Look for an epilepsy identity card or identity tag – it may give you information about seizures and what to do
- **Recovery position** after the jerking has stopped
- **Stay** with the patient till full recovery
- Be calm and reassuring

Do not:

- **Don't restrain movements**
- **Don't put anything in the patient's mouth**
- Don't try to move the patient unless he is in danger
- Don't give the patient anything to eat or drink until he is fully recovered

Call for an ambulance if any of these things apply:

- it is the **first** seizure
- the seizure lasts for more than **5 minutes**
- patient has one tonic-clonic seizure after another **without regaining consciousness between seizures**
- patient is **seriously injured** during the seizure
- patient has **trouble breathing** after the seizure has stopped

ACTION

Assess

Assess the situation – are they in danger of injuring themselves? Remove any nearby objects that could cause injury

Cushion

Cushion their head (with a jumper, for example) to protect them from head injury

Time

Check the time – if the seizure lasts longer than five minutes you should call an ambulance

Identity

Look for a medical bracelet or ID card – it may give you information about the person's seizures and what to do

Over

Once the jerking has stopped, put them on their side. Stay with them and reassure them as they come round

Never

Never restrain the person, put something in their mouth or try to give them food or drink



Managing seizures

- Don't put anything in their mouth
- Don't restrain them



- Protect their dignity
- If the seizure lasts **more than 5 minutes** phone an ambulance

Febrile seizures

- Seizures associated with fever $> 38^{\circ}\text{C}$
- In children between 6month-6 years – majority 12-18 months
- No connection to epilepsy
- Will not cause any damage to the brain
- Fever – *makes neurons more excitable and $\uparrow$ core temperature*
 - *hyperventilation $\rightarrow$ respiratory alkalosis ($\uparrow$ blood pH) $\rightarrow$ makes neurons and muscle more excitable*
 - *cytokines*
 - *shivering thermogenesis neural pathway immaturity in infants*

Signs And Symptoms Of A Febrile Seizure

Fever



Face may turn blue or red



Eyes rolling upwards



Loss of consciousness



Muscles and limbs jerk in unnatural movements

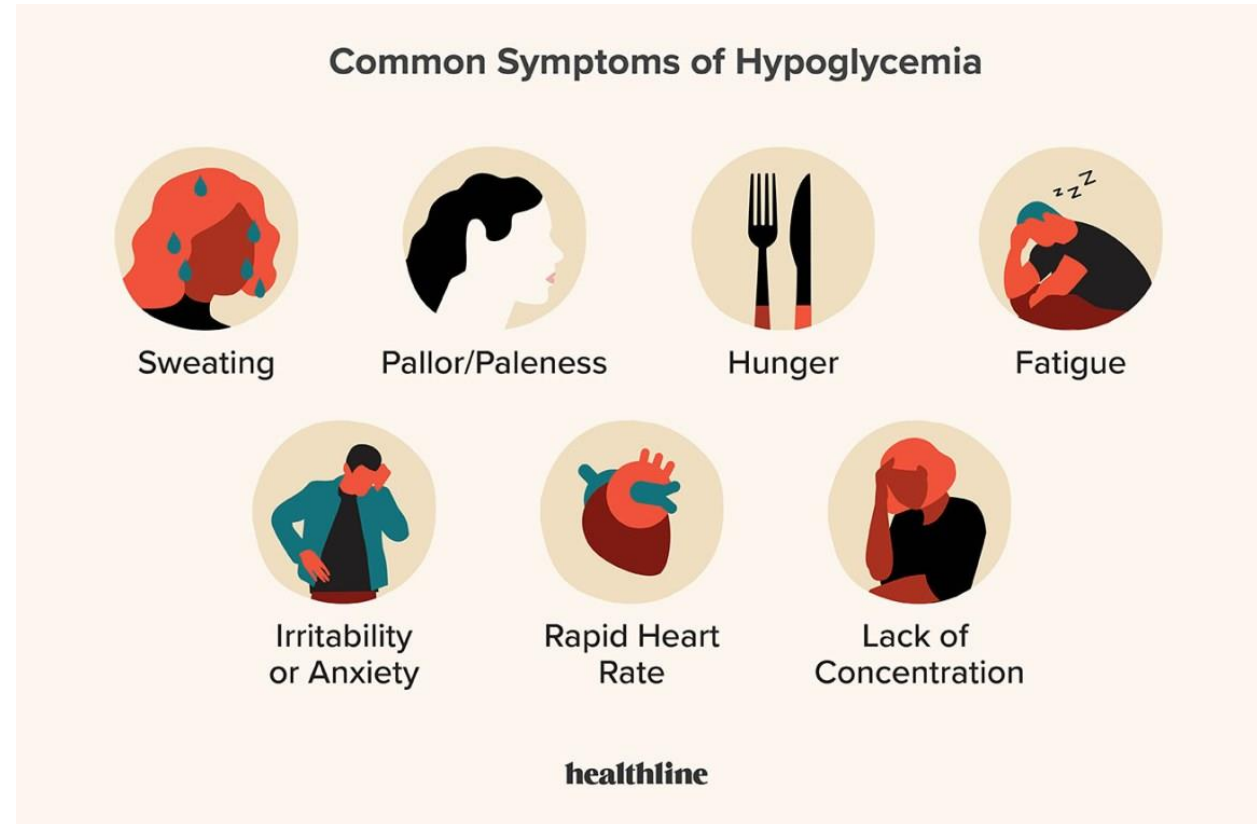


Febrile Seizures – First Aid

- **Do not panic !!!**
- **Protect the child from injury:** clear any objects away from around the baby, place pillows or soft padding around
- Do not restrain the baby or move it unless it is immediate danger
- **Do not put anything in baby's mouth**
- **Cool the baby:** take off the clothes to help the child cool, cool the room
- Place the baby in the **recovery position** to keep the airway open, when the seizure has stopped
- **Antipyretics** – paracetamol/ibuprofen
- **Diazepam** for seizures lasting 5-10 min

Hypoglycemia

- a condition in which blood sugar (glucose) level is lower than normal (3.9 mmol/L)



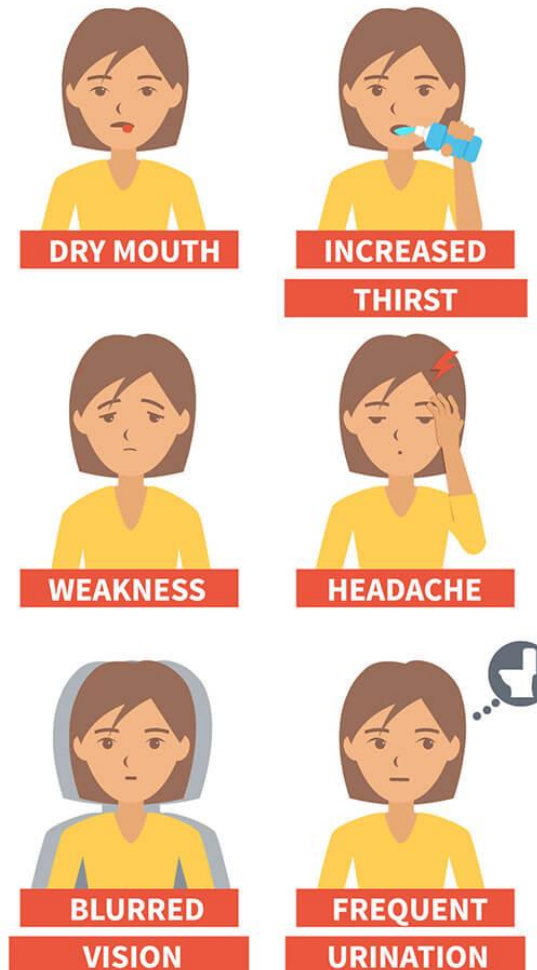
As hypoglycemia worsens, signs and symptoms can include:

- **confusion, abnormal behavior or both, visual disturbances, seizures, loss of consciousness**

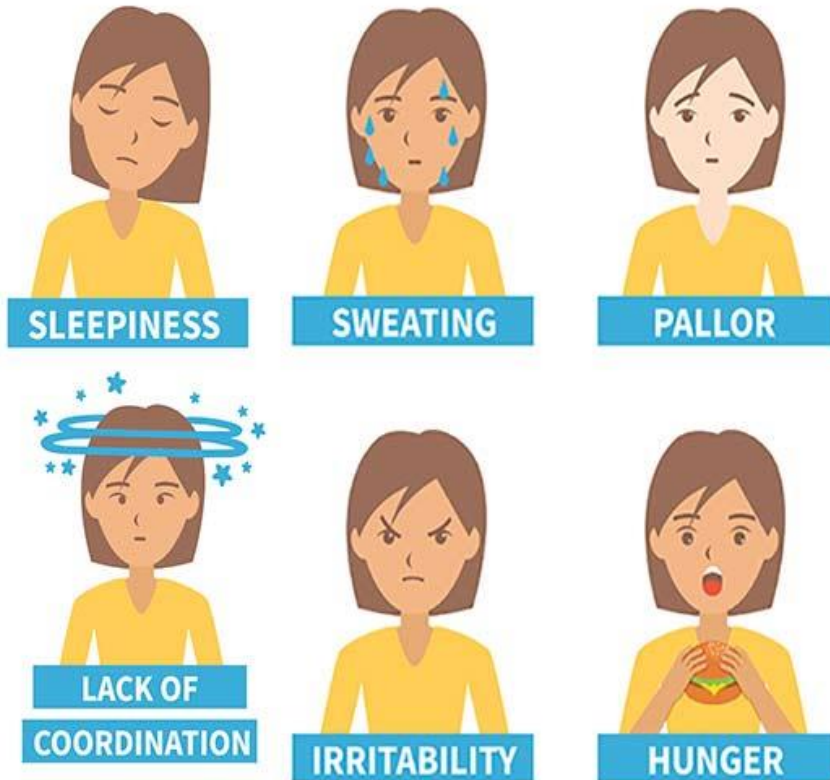
Hyperglycemia

- a high blood sugar (glucose) level
 - common problem for people with diabetes
- if left untreated, hyperglycemia can become severe and lead to **diabetic coma**

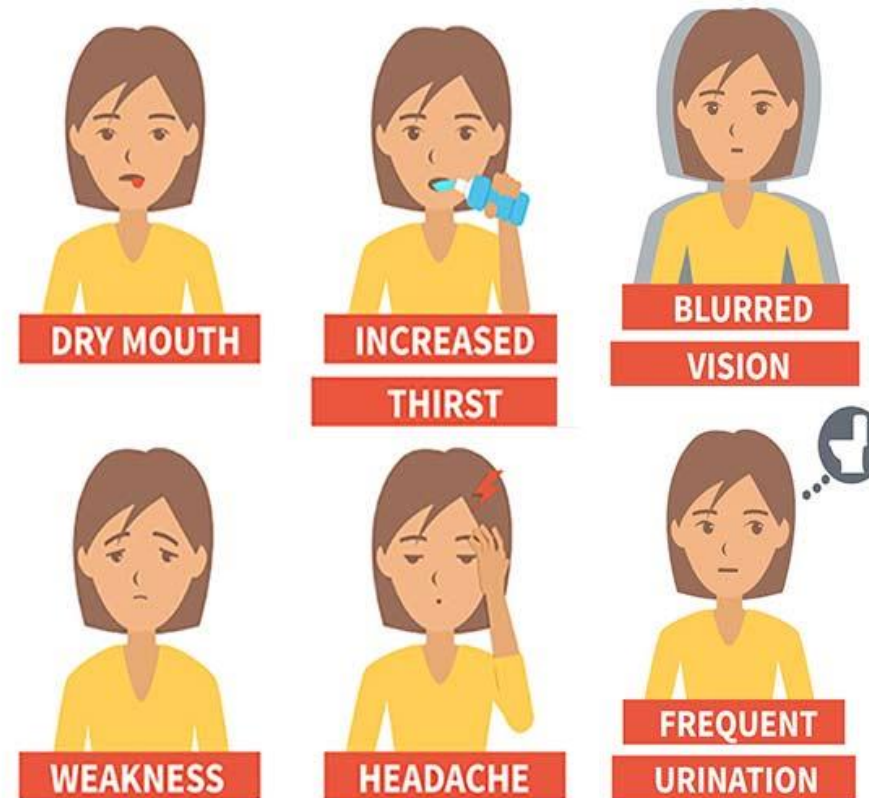
HYPERGLYCEMIA SYMPTOMS



HYPOGLYCEMIA



HYPERGLYCEMIA



Hypoglycemia/Hyperglycemia – First Aid

We suppose **hypoglycemia**

- **conscious:** give **SUGAR** - sweet drink, eat after that!
- **unconscious:** check vital signs- ABCD approach
call for help -155/112
unconscious + breathing → recovery position

Don't play with insulin !!!

DIABETES FIRST AID

Steps to recognise and combat a diabetic emergency



IF A CASUALTY IS UNCONSCIOUS:

- 1 Follow DRSABCD
- 2 Call triple zero (000) for medical assistance



IF CASUALTY IS CONSCIOUS & SIGNS SUGGEST LOW BLOOD SUGAR:

- 1 Give them sugary drinks or foods in 15 minute intervals until they recover or medical assistance arrives
- 2 Seek medical assistance if required



IF CASUALTY IS CONSCIOUS & SIGNS SUGGEST HIGH BLOOD SUGAR:

- 1 Seek medical assistance
- 2 Give them sugar-free fluids to drink if help is delayed

Anaphylactic reaction

Allergy - an abnormal reaction of the immune system to an ordinarily harmless substance called an antigen (**allergen**) caused by liberation of histamine out of mast cells – usually at the local level

Anaphylaxis - a severe, potentially life-threatening **allergic reaction**

- the **whole body is affected (generalized response)**, often within minutes of the exposure to the allergen

Anaphylactic shock - a rare but severe allergic reaction that can be deadly without adequate and quick treatment, blood pressure drops so low that cells (and organs) don't get enough oxygen



Mild, localized
symptoms



Generalized allergic
reaction



Anaphylaxis



Severe
anaphylaxis

Life-threatening signs and symptoms

Airway

- swelling of tongue,
- difficulty talking and/or hoarse voice
- swallowing difficulties



Breathing

- difficult/noisy breathing
- wheeze or persistent cough



Circulation

- pale and floppy (young children)
- shock (pale, clammy)
- persistent dizziness
- collapse
- loss of consciousness



Other signs and symptoms

Skin

- hives
- welts
- swelling of lips, face, eyes



Gastrointestinal

- abdominal pain
- cramps
- diarrhoea
- vomiting



Nervous System

- anxiousness
- confusion
- agitation

Anaphylactic reaction- First Aid

ACTION FOR MILD TO MODERATE ALLERGIC REACTION

- For insect allergy - *flick out sting if visible*
- *Stay with the person, call for help and locate adrenaline (epinephrine) injector*
- *give antihistamines if available*

ACTION FOR ANAPHYLAXIS

- **LIE DOWN, standing not allowed**
- if breathing difficulties allow to sit with legs outstretched
- if unconscious - recovery position
- **GIVE ADRENALINE INJECTOR**
- *Call for ambulance*
- Further adrenaline may be given if no response after 5 minutes
- Be prepared to start CPR



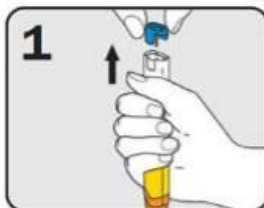
Mild to moderate allergic reactions (such as hives or swelling) may not always occur before severe allergic reactions (anaphylaxis).

ALWAYS give adrenaline injector **FIRST**, if someone has **SEVERE AND SUDDEN BREATHING DIFFICULTY** (including wheeze, persistent cough or hoarse voice), even if there are no skin symptoms. **THEN SEEK MEDICAL HELP.**

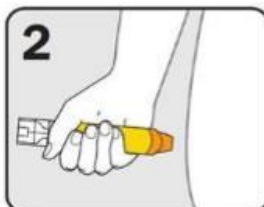


How to give EpiPen®

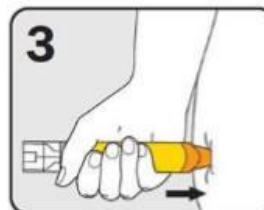
adrenaline (epinephrine) autoinjectors



1. Form fist around EpiPen® and PULL OFF BLUE SAFETY RELEASE



2. Hold leg still and PLACE ORANGE END against outer mid-thigh (with or without clothing)

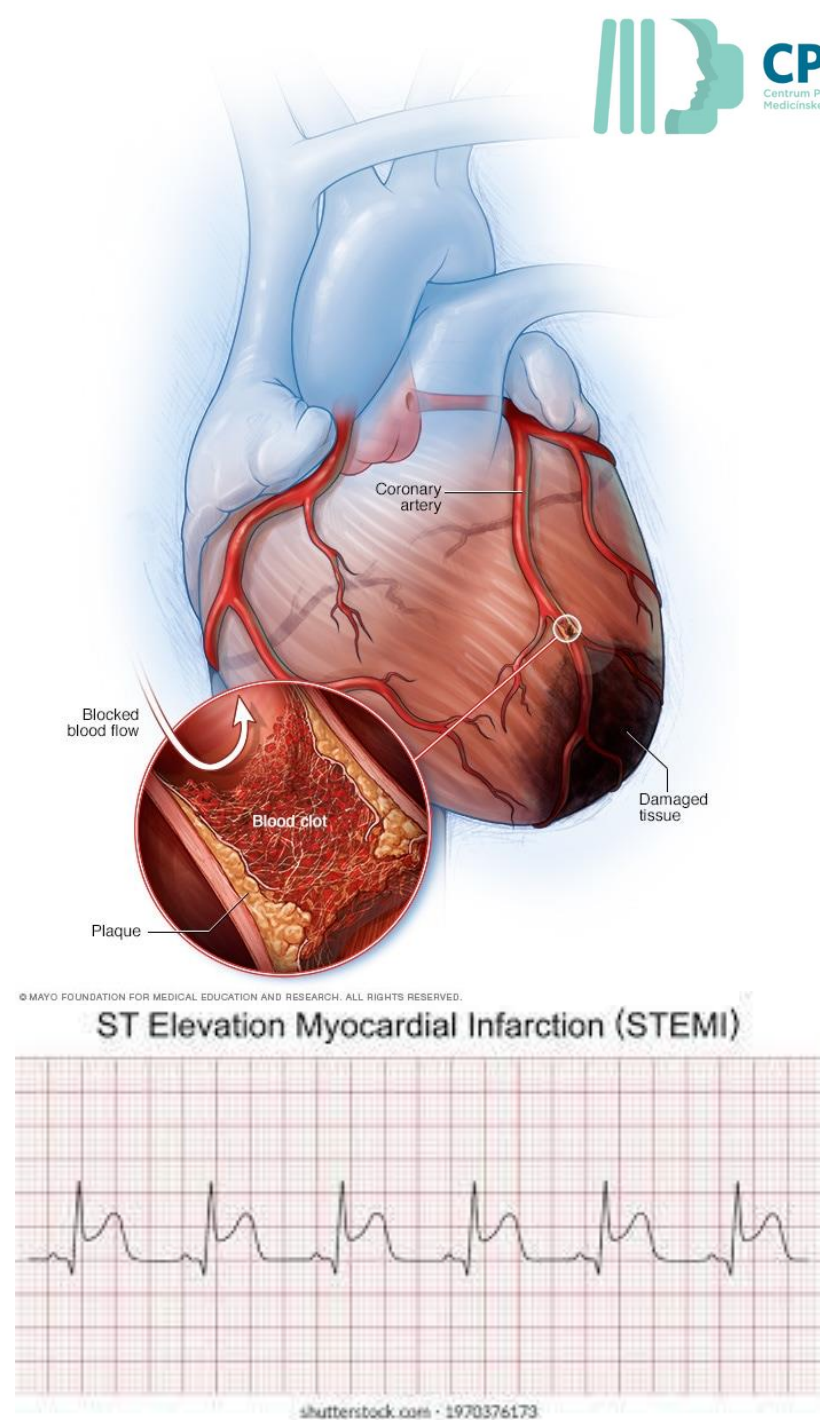


3. PUSH DOWN HARD until a click is heard or felt and hold for 3 seconds REMOVE EpiPen®



Heart Attack/Myocardial Infarction

- limited or absent blood flow through the coronary arteries (stenosis/occlusion)
- the blockage is most often a buildup of fat, cholesterol and other substances, which form a plaque in the arteries that feed the heart (coronary arteries) – atherosclerosis (plus thrombosis over the ruptured plaque)
- the interrupted blood flow can damage or destroy part of the heart muscle



Symptoms

- **Pain, Pressure, Tightness** in chest or arms that may spread to neck, jaw or back
- Sweating
- Shortness of breath
- Nausea/vomiting
- Dizziness
- Anxiety



SIGNS AND SYMPTOMS OF **HEART ATTACK**



**SHORTNESS
OF BREATH**



CHEST PAIN



**NAUSEA OR
VOMITING**



ANXIETY



SWEATING



DIZZINESS

Heart Attack- First Aid

- **Call the ambulance immediately!**
- Have the person sit down, rest, and try to keep calm
- Loosen any tight clothing
- Give one **ASPIRIN** tablet (300mg) – to inhibit blood clots
CHEW and SWALLOW!!! – to get into the bloodstream faster
- Ask to take his angina medication, if he has some (nitroglycerine)
- **Keep monitoring the patient** - level of responsiveness
- **Be prepared to start CPR** , if patient becomes unresponsive

WHAT TO DO WHEN SOMEONE IS HAVING A HEART ATTACK

1. Call 999/112 for emergency help

➤ Tell them you suspect a heart attack



2. Sit them down

➤ Comfortably, with knees bent



3. Give them aspirin

➤ 300mg dose to chew.*

*Do not give aspirin if the person is under 16 or allergic. Help them use their angina medication if they have it.



Learn first aid.

Help save lives.

Be the difference.

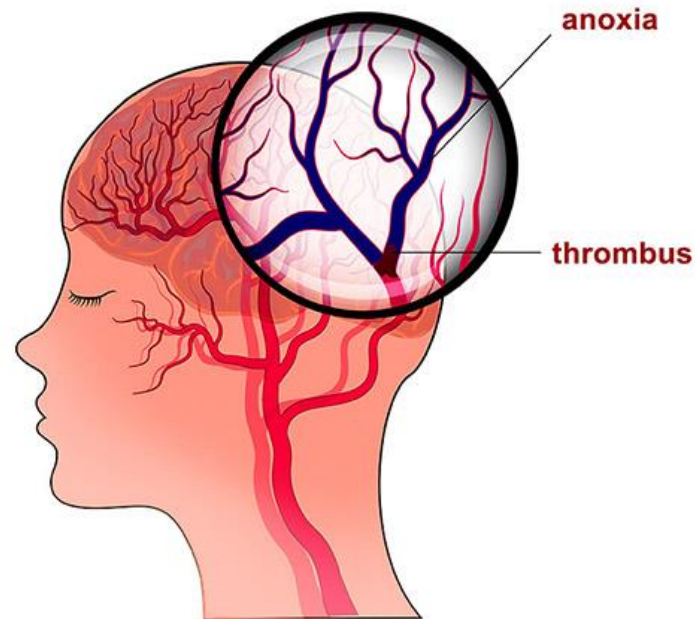
sja.org.uk



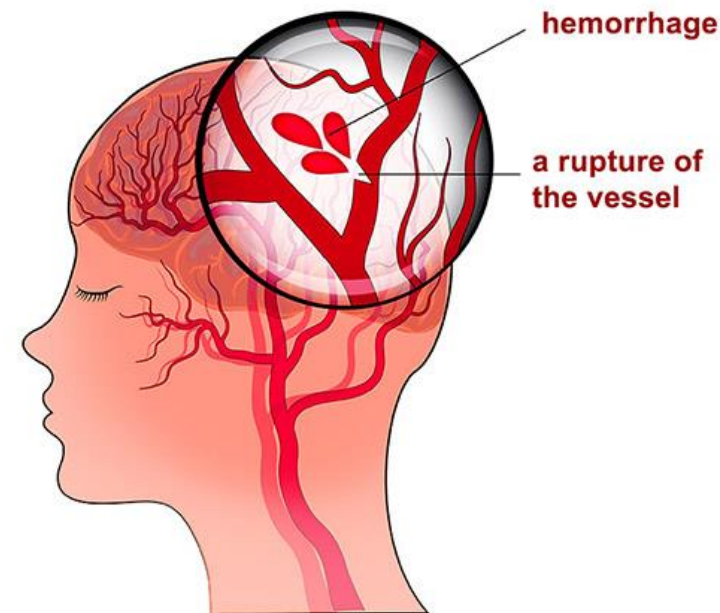
Stroke

- **medical condition that happens when the blood supply to part of the brain is cut off → results into brain cell death → the brain stops functioning properly**
- **serious life-threatening medical condition**
- **Ischemic stroke** – blood supply is stopped because of a blood clot (85% of all cases) – most often mid cerebral artery that provides blood for the motor and sensory
- **Hemorrhagic stroke** – vessel ruptures and bleeds into the surrounding brain (15% of all cases)

Two Types of Stroke

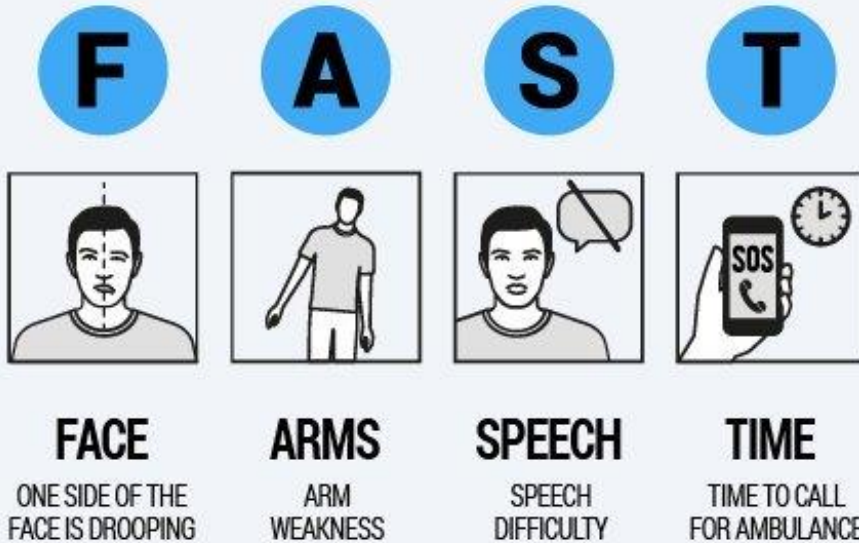


Ischemic Stroke

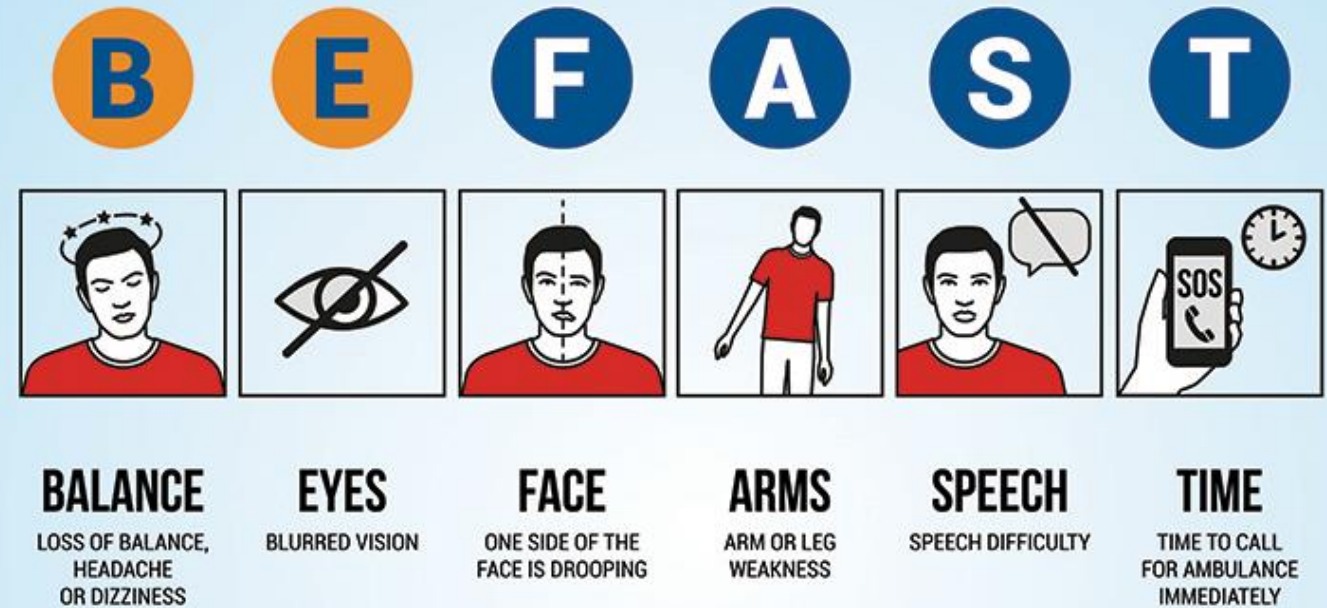


Hemorrhagic Stroke

Stroke is the No. 5 cause of death and a leading cause of disability



CALL 911 IMMEDIATELY



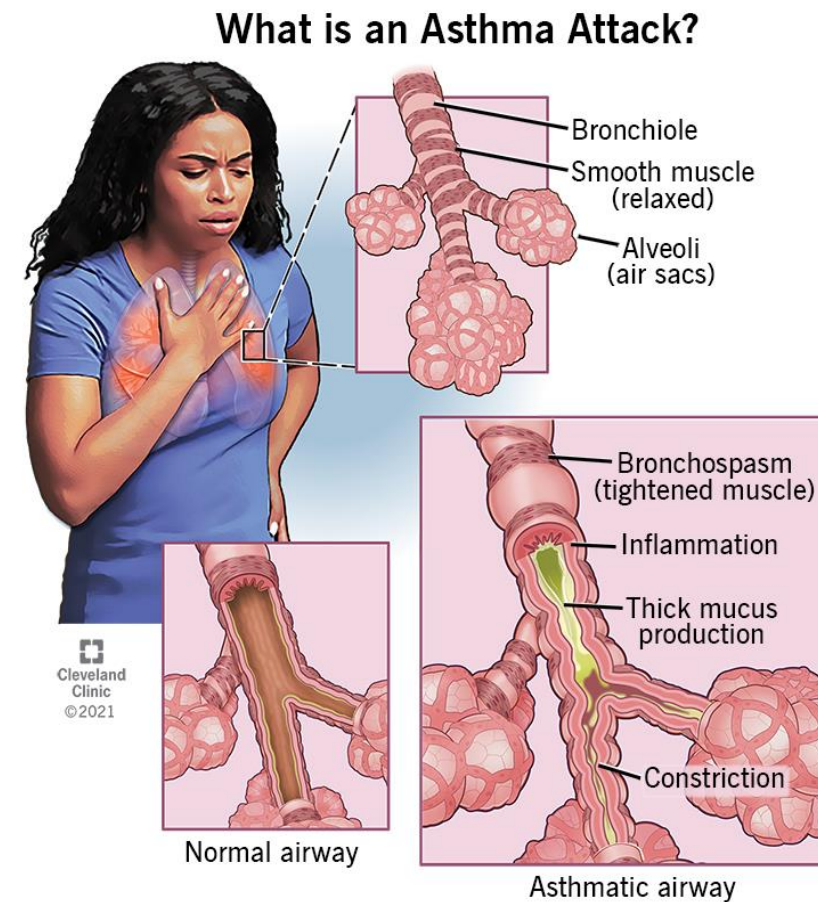
Stroke – First Aid

- mark the time of first symptoms
- **call emergency services immediately!**
- put person in the safe, comfortable position
- loosen any constrictive clothing
- talk in a calm, reassuring way
- cover the patient with a blanket to keep them warm
- don't give the patient any food or liquid
- **check breathing** – if absent or abnormal – **be prepared to start CPR**
- observe the person for any change in condition

Asthma Attack

Asthma - chronic inflammatory disease of airway and lungs, characterized by **hyperreactivity** of airway to various stimuli and **recurrent, paroxysmal, episodes of wheezing, dyspnea and cough**

Asthma attack - is a sudden worsening of asthma symptoms caused by the tightening of muscles around airways - bronchoconstriction



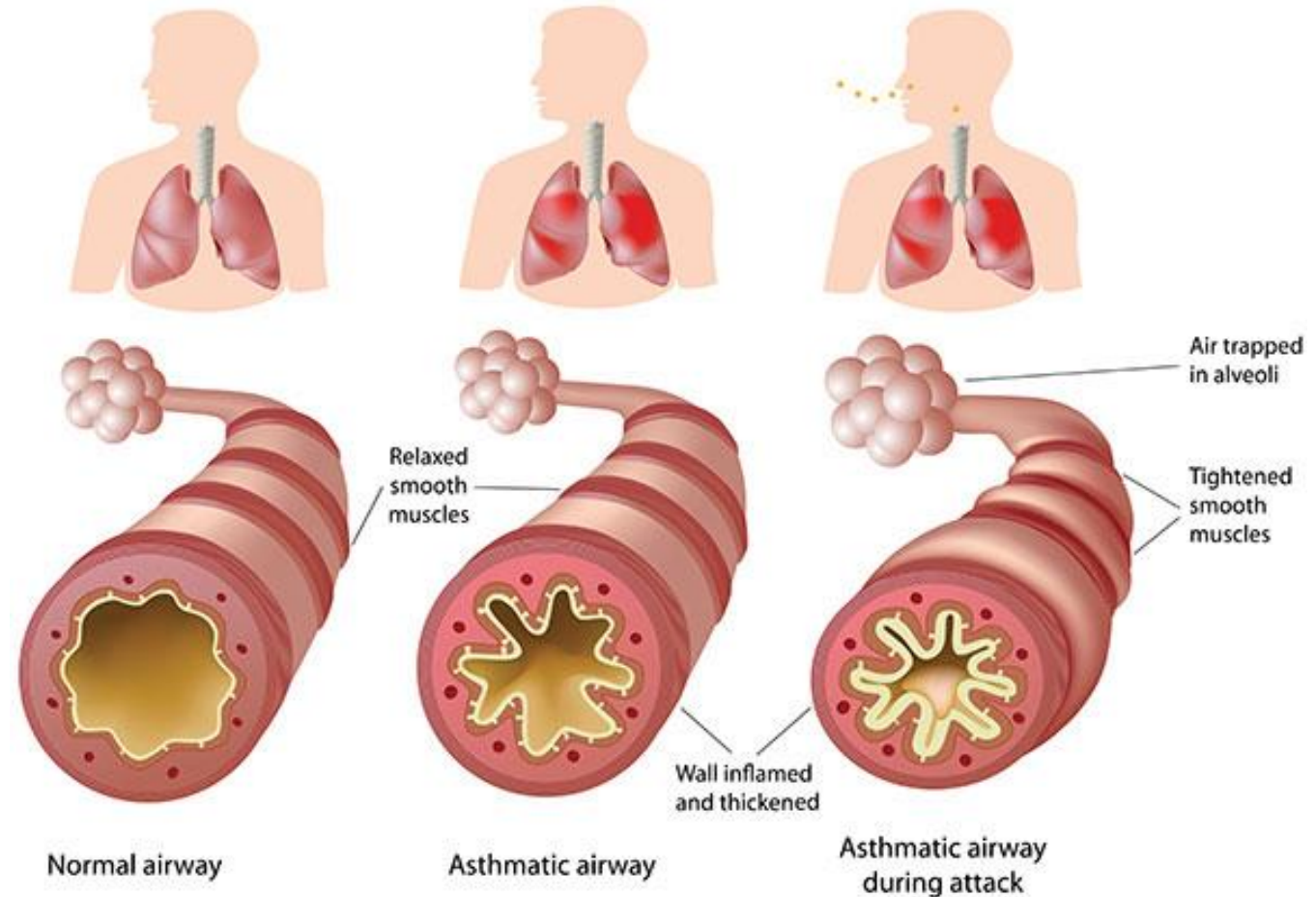
During an asthma attack, there is
a

bronchospasm

inflammation: the lining of
airways becomes swollen

mucus production

Asthma and Your Airways



ASSESSING THE SEVERITY OF AN ASTHMA ATTACK

MILD

- Cough
- Soft wheeze
- Minor difficulty breathing
- No difficulty speaking in sentences



MODERATE

- Persistent cough, loud wheeze
- Obvious difficulty breathing
- Able to speak in short sentences



SEVERE

- Very distressed, anxious
- Gasping for breath
- Able to speak only a few gasping words in only one breath
- Pale and sweaty
- May have blue lips



Status asthmaticus is a long-lasting and severe asthma attack that does not respond to standard treatment

- asthma symptoms continue and respiratory function declines, despite standard treatments
- can lead to respiratory failure, prolonged hospitalization, and even death
- requires immediate and aggressive treatment

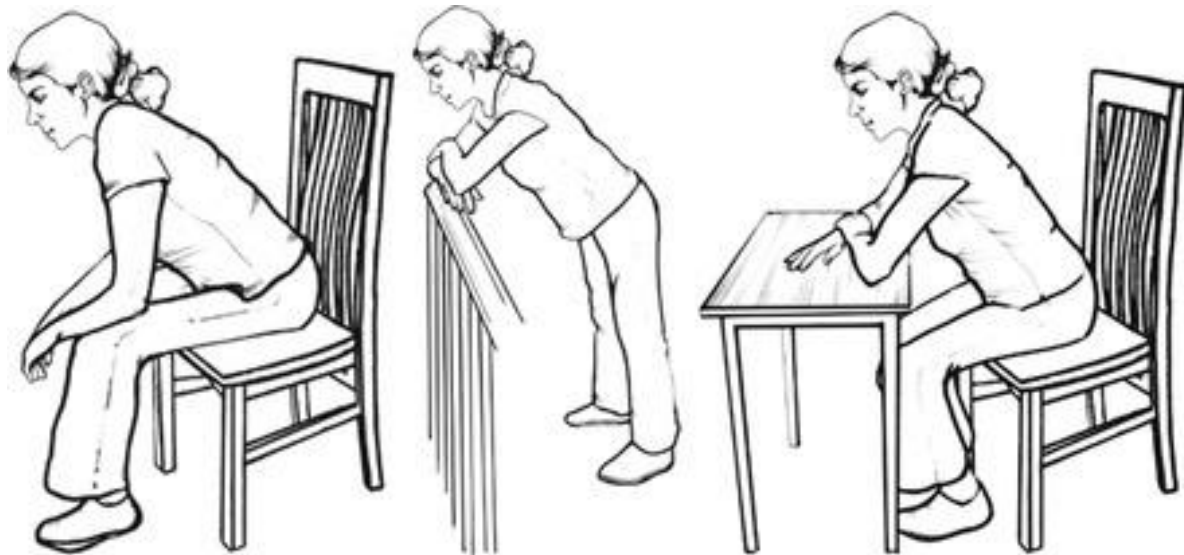
Symptoms:

- Difficulty breathing
- Profuse sweating
- Trouble speaking
- Extreme fatigue and weakness
- Abdominal, back, or neck muscle pain
- Panic
- Confusion
- Blue-tinted lips or skin (cyanosis)
- Loss of consciousness

Asthma Attack – First Aid

- Sit the patient upright
- Reassure patient, stay calm
- Loosen any tight clothing, provide fresh air
- Short-acting beta-agonists via inhaler or nebulizer (salbutamol-Ventolin) 4puffs – 4 minutes waiting – 4puffs
- Call emergency number if no improvement

Positions to Ease Breathlessness





1

Sit the person upright



2

Give **4** separate puffs of blue/grey reliever puffer

- **Shake** puffer
- Put **1 puff** into spacer
- Take **4 breaths** from spacer

Repeat until **4** puffs have been taken

Remember: **shake, 1 puff, 4 breaths**

OR give 2 separate doses of a Bricanyl inhaler (age 6 & over)
or a Symbicort inhaler (over 12)



3

Wait **4** minutes

If there is no improvement, give **4 more separate puffs of blue/grey reliever** as above

OR give 1 more dose of Bricanyl or Symbicort inhaler



4

If there is still no improvement dial
Triple Zero (000) for an ambulance

Keep giving **4** separate puffs every **4** minutes
until emergency assistance arrives

OR 1 dose of Bricanyl or Symbicort every 4 minutes –
up to 3 more doses of Symbicort