

The background features abstract, layered green geometric shapes. On the left, a single green triangle points downwards. On the right, a complex arrangement of overlapping, semi-transparent green triangles and polygons creates a dynamic, layered effect. The text is centered in a bold, green, sans-serif font.

Acute states in stomatology

Circulatory collapse

- ▶ Frequent Indications for EMS Dispatch
 - ▶ Under 18 years: 15%
 - ▶ 18-26 years: 25%
 - ▶ 40-59 years: 16-19%
 - ▶ Over 70 years: 23%
- ▶ Collapse and Syncope Are Not Synonyms!!!
 - ▶ Both represent symptoms, not diseases!!!



- ▶ **Syncope**
 - ▶ Sudden, temporary, complete loss of consciousness, associated with a loss of postural tone, followed by a rapid spontaneous recovery.
 - ▶ Caused by a sudden and transient reduction in brain perfusion in areas controlling consciousness.
- ▶ **Collapse**
 - ▶ A broader and less precisely defined term—short-term, sudden loss of consciousness, actual or apparent.
 - ▶ Collapse encompasses syncope as well as syncope-like states, with multiple causes.

Circulatory collapse



- ▶ **Cardiac Arrest**
- ▶ **A. long-term**
- ▶ Without CPR, it leads to death.
- ▶ Oxygen reserves in the brain last up to 10 seconds.
- ▶ Glucose reserves for anaerobic glycolysis last 4-5 minutes.
- ▶ At normal brain temperature, apoptosis and necrosis of neurons occur.
- ▶ Asystole and absence of pulse, loss of consciousness.
- ▶ Loss of electrical and contractile activity.
- ▶ Severe arrhythmias, electrical shock, or acute myocardial infarction (AMI) can cause it.

- ▶ **B. short-term**
- ▶ Includes syncope and syncope-like states
- ▶ Non-syncope-related loss of consciousness



Syncope

- ▶ **B. short-term - syncope, syncope-like states,**
Non-syncope-related loss of consciousness

Tab. 1. Diferenciácia krátkodobej poruchy vedomia

Synkopa	Nesyndropálne straty vedomia	Stavy pripomínajúce synkopu bez straty vedomia (pseudosynkopa)
1) Reflexná synkopa	1) Epilepsia	1) Pády starých ľudí
2) Ortostatická synkopa	2) Metabolické príčiny (hypoglykémia, hypokapnia)	2) Drop attack
3) Postprandiálna synkopa	3) Intoxikácie	3) Katalepsia, narkolepsia
4) Kardiogénna synkopa (mechanická, arytmogénna)	4) Trauma hlavy	4) Psychogénna „synkopa“
5) Vaskulárna synkopa		5) Vertiginózne stavy

Syncope

- ▶ **B. short-term - syncope**, syncope-like states,
Non-syncope-related loss of consciousness
- ▶ **Tab. 1: Differentiation of Short-term Impairment of Consciousness**

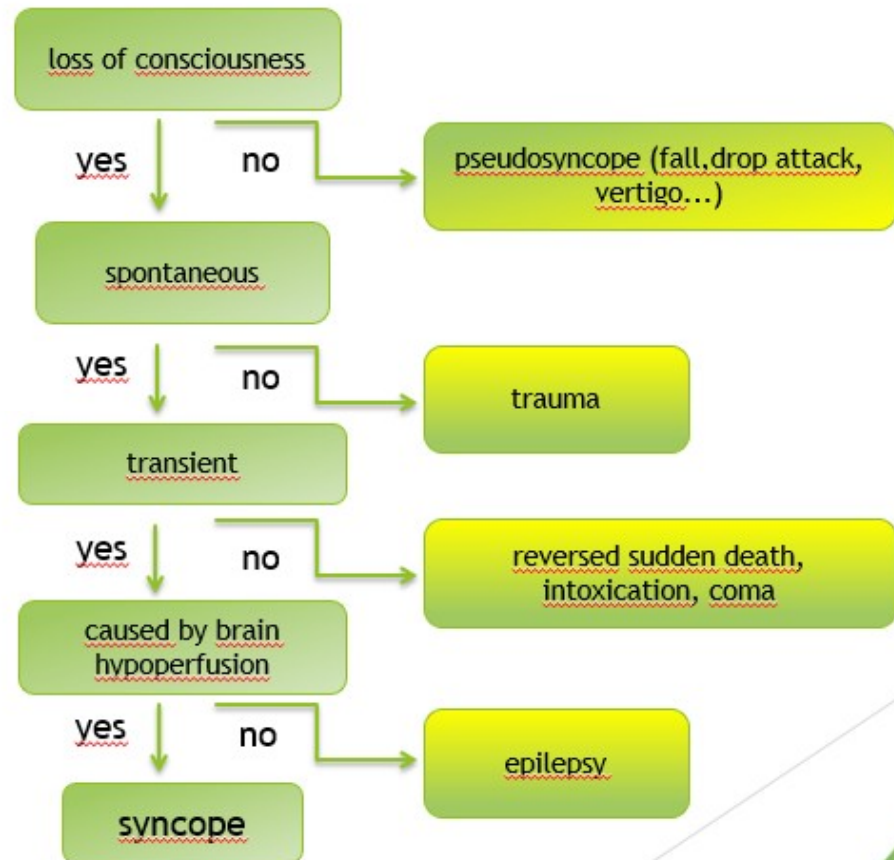
Syncope	Non-syncope-related loss of consciousness	States Resembling Syncope Without Loss of Consciousness
1. Reflex syncope	1. Epilepsy	1. Falls of old people
2. Ortostatic syncope	2. Metabolic causes (hypoglycemia, hypocapnia)	2. Drop attack
3. Postprandial syncope	3. Intoxication	3. Katalepsy, narcolepsy
4. Cardiogenic syncope (mechanic, arhythmogenic)	4. Head injury	4. Psychogenic „syncope“
6. Vascular syncope		5. Vertigo states

Syncope

B. Syncope

- symptom, not disease
- A state of sudden, temporary, short-term loss of consciousness that is not caused by head injury or muscle spasms and is associated with a loss of postural tone
- Transient event
- Rapid spontaneous recovery
- Generalized weakness
- Inability to remain in an upright standing position
- Loss of consciousness of varying degrees
- **Transient brain ischemia** caused by a huge drop in blood pressure (to 50 mmHg) that the body cannot compensate for.

Differential diagnostics of syncope from transient loss of consciousness (according Blanc)



Syncope

▶ A. Non-cardiac

B. Cardiac

Clinical Presentation of Syncope Depends on the Cause

▶ A. Non-cardiac syncope

- without organic heart disease
- Types:
 - organic
 - orthostatic
 - postprandial

▶ B. Cardiac syncope

Organic heart and vascular disease

- Types:
 - cardiac
 - vascular



Classification of syncopal states

▶ A) Reflex syncope

- ▶ 1. vasovagal syncope
- ▶ 2. situational syncope
 - ▶ coughing, sneezing
 - ▶ gastrointestinal (defecation, visceral pain, vomiting)
 - ▶ urination
- ▶ 3. carotic syncope
- ▶ 4. glossopharyngeal and trigeminal syncope

▶ B) Ortostatic syncope

- ▶ 1. failure of ANS (asympaticotonic, orthostatic hypotension)
 - ▶ primary autonomic disorders (Shy-Drager syndrome, Bradburry-egllestone syndrome, Parkinson disease)
 - ▶ secondary autonomic disorders (diabetic neuropathy, amyloidosis, alcoholism)

- ▶ 2. orthostatic hypotension not related to autonomic disorder (symaticotonic orthostatic hypotension)

- ▶ volume depletion (bleeding, diarhoea, dehydration, analbuminemia)
- ▶ vasodilatatory drugs and alcohol
- ▶ endocrine related hypotension states (Addison disease, feochromocytoma, carcinoid, systemic mastocytosis, Verner-Morrison syndrome)

▶ C) Postprandial syncope

▶ D) Cardiogenic syncope - arrhytmogenic

- ▶ sick sinus syndrome
- ▶ AV block
- ▶ paroxysmal supraventricular and ventricular tachycardia
- ▶ defect of implanted cardiostimalator or cardioverter - defibrilator

Classification of syncopal states

▶ E) Cardiogenic syncope - mechanical (organic heart disease)

- ▶ valvular diseases
- ▶ hypertrophic obstructive cardiomyopathy
- ▶ atrial myxoma
- ▶ acute ischemia
- ▶ pericardial effusion/tamponade
- ▶ lung embolism/lung hypertension

▶ F) Vascular syncope

- ▶ aortic dissection
- ▶ steal syndrome (subclavian steal syndrome)
- ▶ vertebrobasilar transient ischemic attack
- ▶ migraine
- ▶ compression of vena cava inferior in pregnancy

Reflex syncope

Abnormal reflex activity

▶ Vasovagal syncope

- ▶ The **most common** type of syncope, occurring in healthy individuals, usually with a **psychogenic origin** (e.g., pain, fear, hunger, suffocation, horror, disgust, seeing blood, venipuncture, etc.).
- ▶ **Vagus nerve stimulation** triggers bradycardia (a **cardioinhibitory response**) and **vasodilation**, leading to **hypotension** (a **vasodepressor response**). This causes reduced venous return to the heart and a decrease in cardiac output, resulting in **autonomic symptoms**.
- ▶ The condition usually resolves quickly when the person lies down, returning to baseline.
- ▶ **Benign** in nature, meaning it is not usually life-threatening and typically does not indicate any underlying heart disease.

▶ Situational syncope

- ▶ coughing, sneezing, defecation, urination, swallowing, vomiting
- ▶ These actions can lead to sudden changes in blood pressure and heart rate, potentially causing a transient loss of consciousness

Reflex syncope

▶ Carotid sinus syndrome

- ▶ **Compression or massage** of the carotid sinus (located in the neck, where the carotid artery branches) stimulates the **baroreceptors**, triggering a **bradycardia** (slow heart rate), **hypotension** (low blood pressure), and a **loss of consciousness** (syncope)
- ▶ The **carotid sinus reflex** can be triggered by activities such as turning the head, wearing a tight collar, or by certain age-related factors (older age), as well as conditions like **atherosclerosis (ATS)** and **hypertension**

▶ Trigeminal Neuralgia

- ▶ A disorder of the **trigeminal nerve**, characterized by intense, stabbing pain, typically on one side of the face.
- ▶ The **trigeminal nerve irritation** leads to an abnormal reduction in **sympathetic tone**, causing **vasodilation**, which in turn can result in **hypotension** and **bradycardia**.
- ▶ The neuralgia also increases **parasympathetic activity**, leading to **hypoperfusion** (reduced blood flow) to the brain.

▶ Glossopharyngeal Neuralgia

- ▶ This condition affects the **glossopharyngeal nerve**, causing severe, sharp pain in the throat, ear, and tongue
- ▶ Similar to trigeminal neuralgia, it involves irritation of the **sensory nerve endings**:
 - ▶ decrease in sympathetic tonus
 - ▶ vasodilation
 - ▶ hypotension, bradycardia
 - ▶ increase of parasympathetic activity
 - ▶ hypoperfusion of brain

Ortostatic syncope

▶ **Ortostatic / postural hypotension**

- ▶ A drop in systolic blood pressure (SBP) by 20 mmHg (within 3 minutes) upon standing - **Orthostatic Hypotension**
- ▶ Hypotension in positions other than upright - **Postural Hypotension**
- ▶ **Insufficient autonomic nervous system (ANS) activity** characterized by - Decreased sweating, Fixed heart rate, decreased catecholamines, decreased activation of RAA, predominance of vagal vasodepressor effects

▶ **A. autonomic failure (asympathetic)**

- ▶ primary causes - syndromes such Parkinson
- ▶ secondary causes - diabetes mellitus, alcoholism

▶ **B. not related to autonomic dysfunction (sympathetic)**

- ▶ **volume depletion** - diarrhea, dehydration
- ▶ **drug induced** (vasodilatatory drugs) - levodopa, antidepressants, diuretics, alcohol
- ▶ **endocrine related** - Addison disease, pheochromocytoma, carcinoid syndrome

Cardiac syncope

▶ A. Arrhythmogenic

▶ Bradycardic forms

- ▶ Asystole
- ▶ A-V block - Adams-Stokes syndrome
- ▶ SA node dysfunction

▶ Tachycardic forms

- ▶ Any tachycardia with a rapid rate
- ▶ Ventricular tachycardia, flutter, fibrillation
- ▶ Atrial tachycardia
- ▶ Flutter
- ▶ Fibrillation

▶ Pacemaker malfunctions



Cardiac syncope

▶ B. Mechanical (organic)

- ▶ Aortic stenosis and mitral stenosis
- ▶ Obstructive lesions of outflow from left ventricle
- ▶ Primary pulmonary hypertension
- ▶ Obstruction of the pulmonary circulation
- ▶ Pericardial tamponade
- ▶ Disorders of cardiac dynamics

▶ C. Dysfunction of the venous system with reduced venous return

- ▶ Varicose veins of the lower extremities
- ▶ Compression of the inferior vena cava by an enlarged uterus in pregnant women in a supine position
- ▶ Vertebrobasilar insufficiency
- ▶ Migraine

Tab. 3: Differential diagnostics of cardiac and vasovagal syncope based on anamnesis data (Mitro et al, Vnitřní lékařství 2006, 52 (11): 1030-1036)

<i>Relevant anamnesis data</i>	<i>Cardiac syncope</i>	<i>Vasovagal syncope</i>
Personal anamnesis		
Age over 60	+	
Cardiac disease	+	
High blood pressure	+	
Cardiovascular drugs medication	+	
Occurrence of syncope		
In the morning		+
Not related to daytime	+	
Without obvious trigger/cause	+	
Occurrence in the supine position	+	
Triggering factor		
Prolonged standing as a trigger		+
Hunger as a trigger		+
Without obvious trigger	+	
Prodromal symptoms		
Disturbances of vision		+
Sweating		+
Without prodromes	+	
Phase of loss of consciousness		
Pallor during loss of consciousness		+
Bradycardia	+	
Not important anamnesis data		
Occurrence in standing or sitting position	+	+
Emotions as trigger	+	+
Palpitations in prodromal phase	+	+
Nausea in prodromal phase	+	+
Seizures and incontinence during loss of consciousness	+	+
Palpitations/tachycardia upon regaining consciousness	+	+

Non-syncope-related loss of consciousness

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Epilepsy

- An epileptic seizure is a sudden, transient, and involuntary dysfunction of the nervous system of various types. Seizures can affect sensory, motor, or autonomic functions, consciousness, emotional state, behavior, cognition, or memory. (5 minutes)
- Epilepsy, migraine, narcolepsy, panic disorder, trigeminal neuralgia...
- It is the most common condition; it is not a single disease but a large group of diseases and syndromes that manifest as epileptic seizures.
- In children, generalized seizures are more common, while in older adults, focal seizures are more frequent.
- Status epilepticus

➤ Status epilepticus

- An abnormally persistent seizure lasting longer than 30 minutes or a series of seizures lasting more than 30 minutes, during which the patient does not regain consciousness.

➤ Patogenesis

- Functional changes in receptors and ion channels, which affect the function of the cell membrane, making it more excitable
- Dysregulation of inhibition and excitation leads to the spread of abnormal activity, its synchronization, and the emergence of pathological paroxysmal activity (discharge on EEG)

➤ Causes

- **Genetic**
- **Structural and metabolic** (injuries, infections, cerebrovascular accidents, tumors)
- **Unknown cause (70%)**

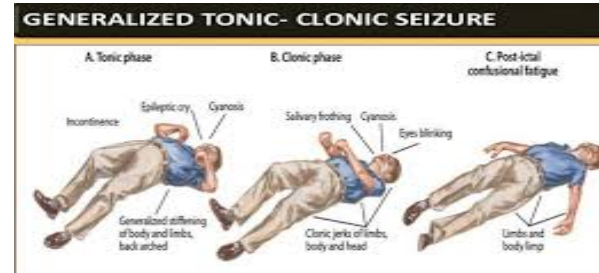
➤ Classifications

- According to the site of origin: generalized and focal.

Classification of Epilepsy

➤ Generalized Epileptic Seizure

- Originates from one area and rapidly spreads bilaterally through neuronal networks
- Quantitative impairment of consciousness



A. Non-convulsive (Absences)

- Older term: petit mal
- Loss of awareness of the surroundings, impaired consciousness, short duration (about 10 seconds), interruption of activity, may include a clonic or tonic component - blinking of eyelids, head drooping, eye deviation, head tilting back... vegetative symptoms such as mydriasis, pallor...

B. Convulsive

- Motor component always present - seizures include tonic, clonic, tonic-clonic, and myoclonic seizures.
- Generalized tonic-clonic seizure (grand mal)



Classification of Epilepsy

- **Focal Epileptic Seizures**

- Originates from the neuronal network of one hemisphere; the source can be narrowly localized or more widely distributed
- Can also arise in subcortical structures
- **A. Without impairment of consciousness and ability to respond**
 - Older term: simple partial seizures (motor or autonomic symptoms present)
 - Older term: aura (subjective sensory or psychological phenomena)
- **B. With impairment of consciousness and ability to respond**
 - Older term: complex partial seizures
- **C. Progressing to a bilateral convulsive seizure**
 - Older term: secondary generalized seizure
 - Includes tonic, clonic, and tonic-clonic components

- **By Localization:**

- Frontal, temporal, parietal, occipital (mesiotemporal)
- Temporal (hallucinations, dream-like states, visual disturbances...)

- **By Cause:**

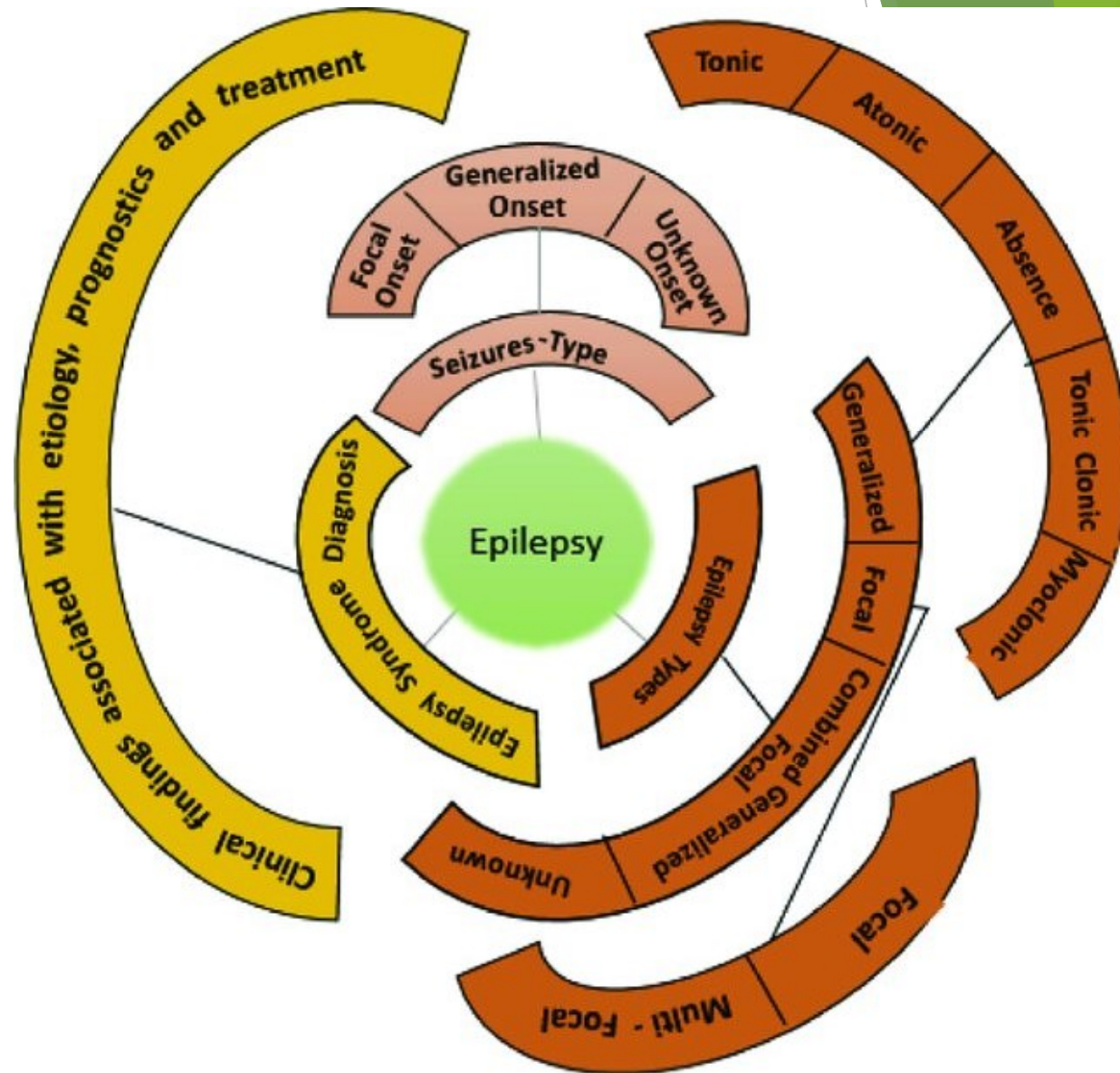
- Genetically conditioned, structurally or metabolically conditioned, unknown cause

- **By Age:**

- Neonatal, infantile, childhood, adolescence-adulthood

Classification (ILAE 2017)

https://www.researchgate.net/publication/325872574_Mutational_screening_of_GABRG2_gene_in_Pakistani_population_of_Punjab_with_generalized_tonic_clonic_seizures_and_children_with_childhood_absence_epilepsy/figures?lo=1



ILAE 2017 EXPANDED CLASSIFICATION OF SEIZURE TYPES

SEIZURE ONSET

FOCAL ONSET

GENERALIZED ONSET

UNKNOWN

Awareness
No awareness

Motor
Automatism
Atonic
Clonic
Epileptic spasm
Hyperkinetic
Myoclonic
Tonic

Non-Motor
Autonomic
Freezing
(behavior arrest)
Cognitive
Emotional
Sensory

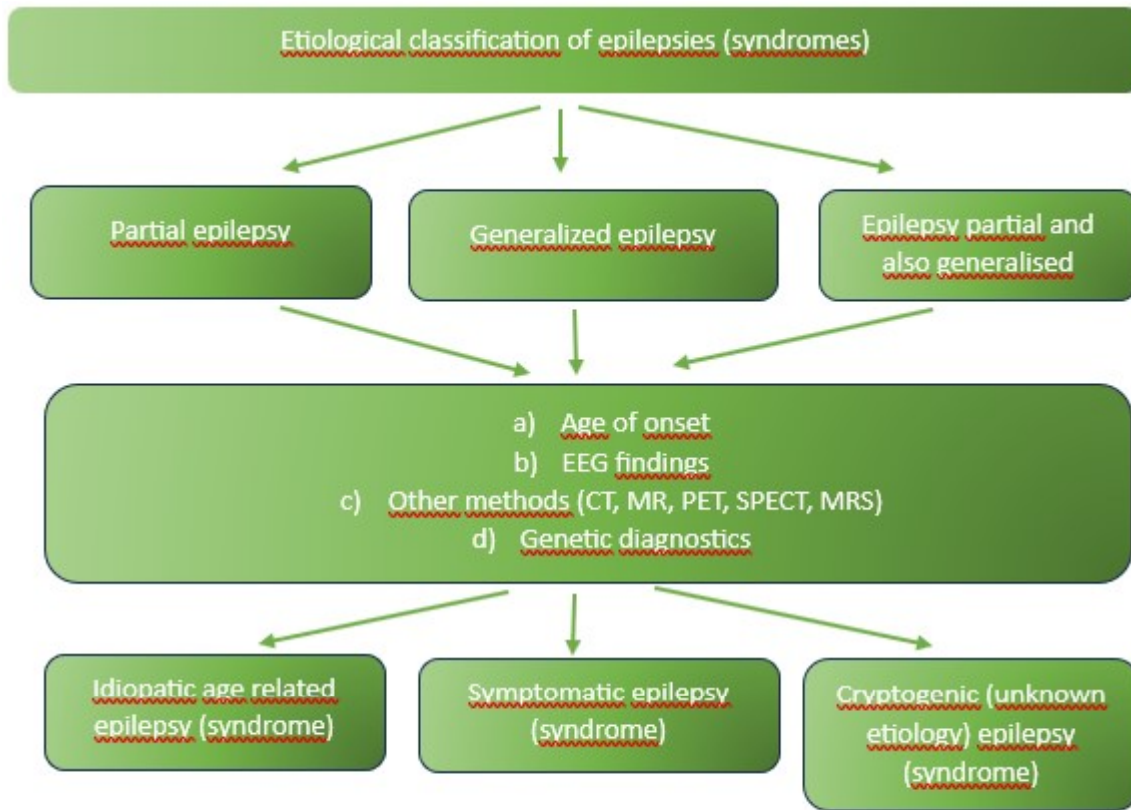
Conversion to bilateral tonic-clonic seizures

Motor
Tonic clonic
Tonic
Clonic
Myoclonic
Myoclonic tonic clonic
Myoclonic atonic
Atonic
Epileptic spasm
Non-motor (absence)
Typical
Atypical
Myoclonic
Eyelid myoclonia

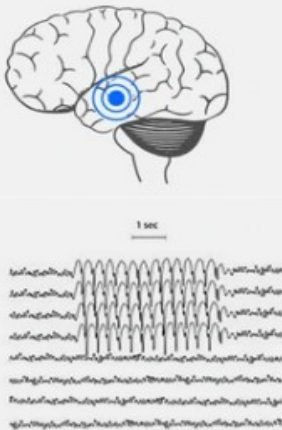
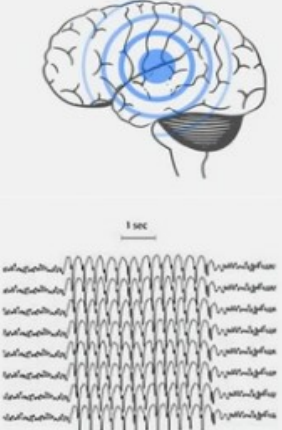
Motor
Tonic- Clonic
Epileptic spasm
Non-motor
Freezing
(Behavior arrest)

Unclassified

https://www.researchgate.net/publication/360087544_Comparison_of_2017_ILAE_and_Semiological_seizure_classifications_before_and_after_video-EEG_monitoring_in_childhood_epilepsy/figures?lo=1



Classification of seizures

Focal-partial seizures Originating within networks limited to one hemisphere	Generalized seizures Originating within bilateral network
 <p>The diagram shows a lateral view of a human brain with a blue circle highlighting a focal area in the left hemisphere. Below it, an EEG trace shows a localized burst of high-frequency electrical activity, with a 1-second scale bar.</p>	 <p>The diagram shows a lateral view of a human brain with blue circles highlighting focal areas in both the left and right hemispheres. Below it, an EEG trace shows a synchronous burst of high-frequency electrical activity across multiple channels, with a 1-second scale bar.</p>

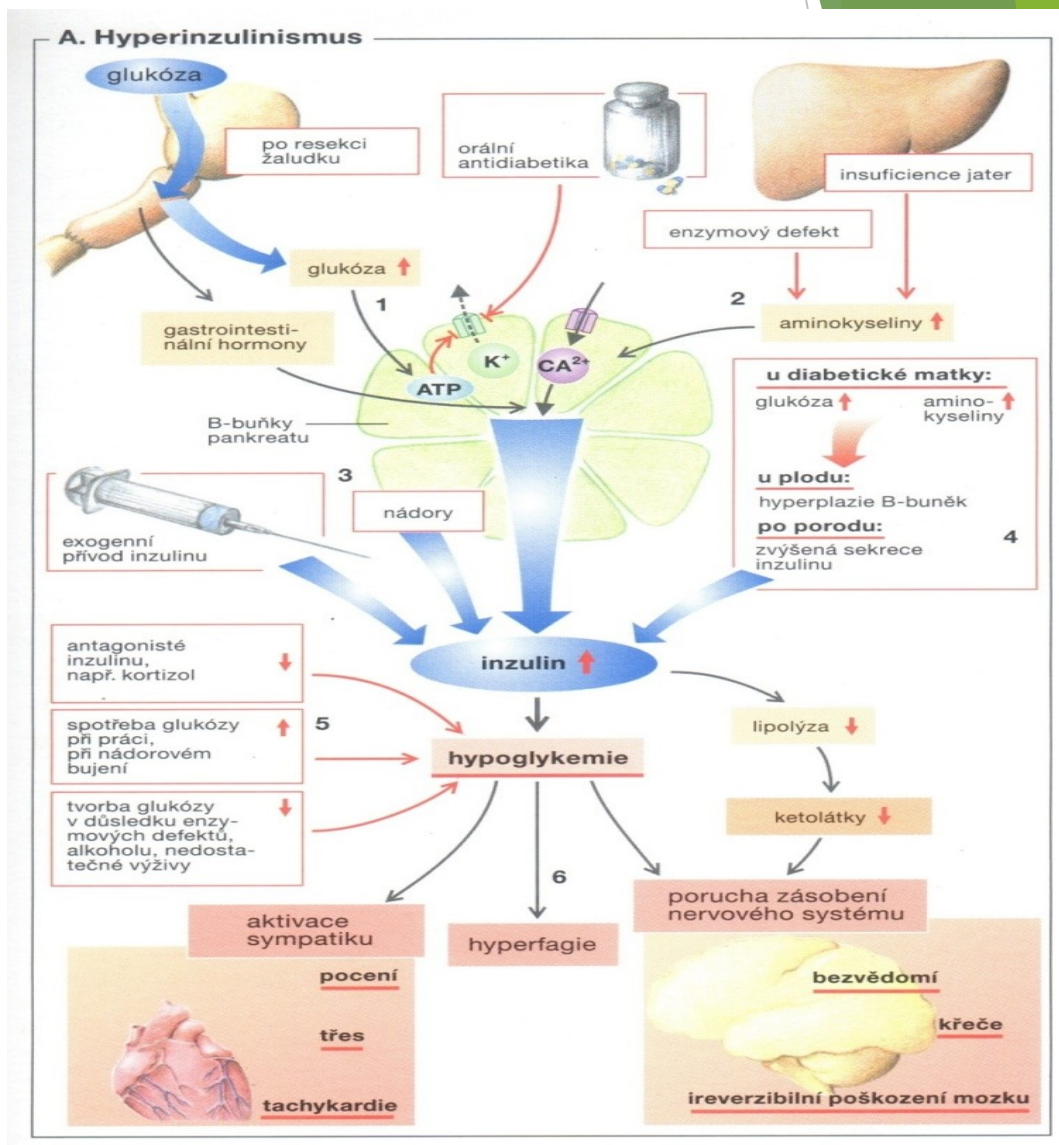
Non-syncopal related loss of consciousness

- ▶ 2. Metabolic, hormonal, effects of drugs, intoxications, head trauma
 - ▶ Hypoglycemia, DM (Diabetes Mellitus)
 - ▶ Adrenocortical insufficiency
 - ▶ Diabetes insipidus
 - ▶ Effects of barbiturates and other drugs
 - ▶ Alcohol poisoning



Hypoglycemia

- ▶ Diabetes mellitus
- ▶ Insulin
- ▶ Hypoglycemia
- ▶ Insulin antagonists:
 - ▶ glucocorticoids
 - ▶ adrenaline
 - ▶ glucagone
 - ▶ somatotropine
- ▶ glucose consumption



Aspiration

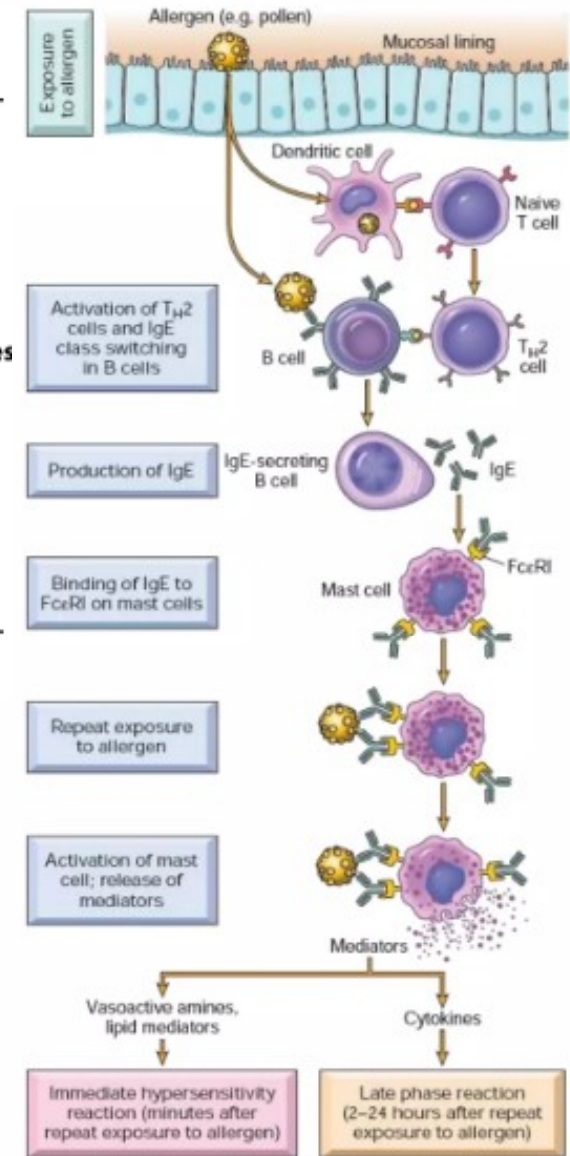
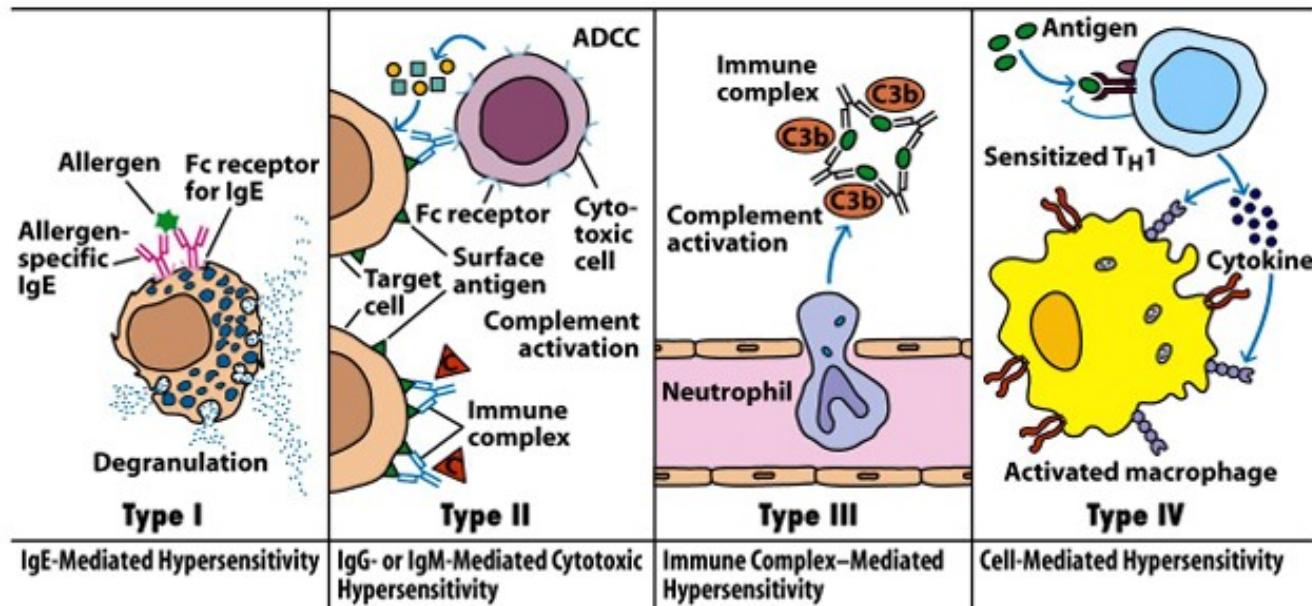
- ▶ **Inhalation of a foreign body causing obstruction in the airways:**
 - ▶ Acute shortness of breath, irritating cough, cyanosis, unconsciousness, death by suffocation
 - ▶ Tooth, part of a dental prosthesis, small instrument, impression material, aspiration of vomit
 - ▶ Stridor, shortness of breath, cyanosis, hypoxemia, restlessness
 - ▶ Cough, suction device, head tilt forward, and Gordon maneuver (5x between the scapulas)
- ▶ Heimlich maneuver - epigastrium
- ▶ Triple maneuver: head tilt, jaw thrust, mouth opening



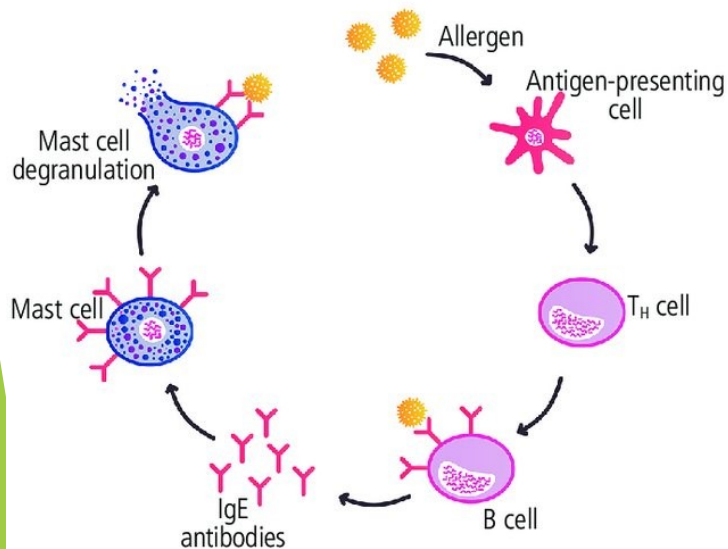
Anaphylaxis

- ▶ Acute, life-threatening condition
- ▶ Rapid release of mediators (histamine, serotonin, bradykinin) from mast cells and basophils due to an antigen-antibody reaction
- ▶ Vasodilation, drop in blood pressure, increased vascular permeability, plasma loss, hypovolemia, reduced venous return
- ▶ Hypoxemia, bronchospasm, laryngeal edema
- ▶ Rapid progression, cardiovascular and respiratory symptoms
- ▶ Itching and tingling of lips, face, erythema, generalized pruritus, dizziness, feeling of anxiety, headache, nausea, vomiting, upper airway and lower airway obstruction, respiratory insufficiency, suffocation
- ▶ Chest pain, hypotension, tachycardia, palpitations
- ▶ **Therapy:** Adrenaline, Corticosteroids, Antihistamines

Hypersensitivity



<https://njms.rutgers.edu/sgs/olc/mci/prot/2009/Hypersensitivities09.pdf>



https://www.researchgate.net/publication/329559946_Mast_Cells_as_Key_Players_in_Allergy_and_Inflammation/figures?lo=1

<https://www.slideshare.net/slideshow/type-i-hypersensitivity-reaction/53887746>

Local anesthesia

- ▶ Reversibly inhibit nerve impulse conduction through nerve fibers by blocking sodium channels in nerve fiber membranes
 - ▶ **Examples:** Procaine, Tetracaine, Mesocaine, Lidocaine
 - ▶ **Toxicity to the cardiovascular system (CVS):** Increased vasodilation
 - ▶ Adrenaline is added as a vasoconstrictive agent
 - ▶ **CVS effects:** Tachycardia, increased blood pressure, arrhythmia, glaucoma, diabetes mellitus
- ▶ **Quincke's edema:**
 - ▶ Non-inflammatory, rapidly developing edema of the face, lips, eyes, and larynx
- ▶ **Anaphylactic shock:**
 - ▶ Triggered by drugs or allergens
 - ▶ **Symptoms:** Restlessness, anxiety, shortness of breath, drop in blood pressure, tachycardia, unconsciousness, rash, swelling



Local anesthesia

▶ Toxic Reaction

- ▶ Causes: High dose, injection into a blood vessel, liver metabolism issues
- ▶ **CNS Symptoms:** Euphoria, restlessness, tremors, twitching, tonic-clonic seizures, tachycardia, later drop in blood pressure, bradycardia, cardiac arrest, and circulatory failure

▶ Allergic Reaction

- ▶ Mechanism: Antigen-antibody reaction
- ▶ Symptoms: Itching, swelling, difficulty swallowing, shortness of breath, spasmodic breathing

▶ Local Complications

- ▶ Nerve injury
- ▶ Vessel injury
- ▶ Muscle injury
- ▶ Infection introduction during anesthetic administration
- ▶ Needle breakage during injection