the Child Dental Patient with

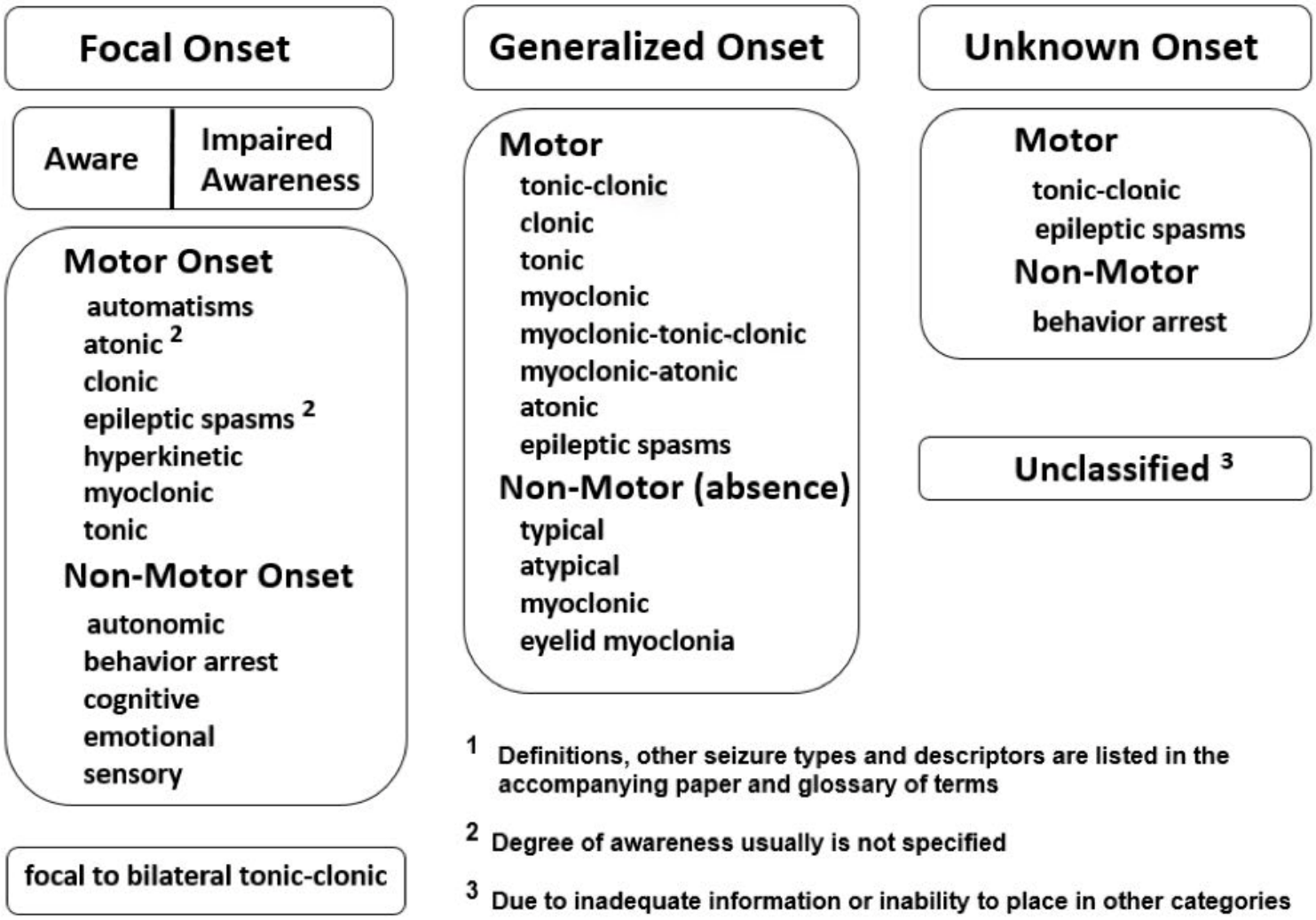
EPILEPSY

ASOCIATIA NATIONALĂ DE STOMATOLOGIE PEDIATRICĂ
A.N.S.P.R.
DIN ROMÂNIA

Epilepsy

- chronic noncommunicable disease
- recurrent seizures (2 or more, unprovoked), which are brief episodes of involuntary movement that may involve a part of the body (partial) or the entire body (generalized)
- sometimes → loss of consciousness and control of bowel or bladder function (WHO)

ILAE 2017 Classification of Seizure Types Expanded Version [1]



1 Definitions, other seizure types and descriptors are listed in the accompanying paper and glossary of terms

2 Degree of awareness usually is not specified

3 Due to inadequate information or inability to place in other categories

Source: https://www.epilepsy.com/article/2016/12/2017-revised-classification-seizures

Epilepsy - Seizure episodes

- Abnormal and excessive electrical discharges in a group of brain cells
- Variations:
  - ❑ Lapses of attention
  - ❑ Muscle jerks
  - ❑ Convulsions
- Frequency: < than 1/year – several/day
- Duration: few seconds– few minutes
- Post-ictal state: drowsiness, confusion, nausea, hypertension, headache

Epilepsy - Incidence

- 49 cases per 100 000 people in developed countries
- 139 cases per 100 000 people in low- and middle- income countries
- 80% of people with epilepsy live in low- and middle- income countries
- 5-7 cases per 10 000 – children from birth to 15 years old
- More common in men

Epidemiology in Romania for the 0-17 years old age group (2007)

- Incidence: 70 new cases per 100 000 children annually
- Active epilepsy prevalence: 4.5-5%

DRAVET SYNDROME FOUNDATION

Dravet syndrome, also known as Severe Myoclonic Epilepsy of Infancy (SMEI), is a rare and catastrophic form of intractable epilepsy that begins in infancy, with an estimated incidence rate of 1:16,000 to 1:21,000

https://www.dravetfoundation.org/

Etiology

Young Infants

- Hypoxia/ birth asphyxia
- Perinatal intracranial trauma
- Metabolic disturbances*
- Congenital brain malformations
- Infections

Children and adolescents

- Idiopathic
- Trauma
- Infections

Adults

- Idiopathic
- Head injury
- Alcohol abuse
- Brain tumors
- Cerebrovascular disease (malformations)

*e.g. phenylketonuria, porphyria, acidosis, dehydration, water intoxication, hyperglycemia, hypoglicemia

Epilepsy and genes

Some types of **epilepsy** have both **inherited** and **genetic causes**.

In general, if a person's mother, father or sibling has epilepsy, their **risk of developing epilepsy** by the age of 40 is less than 1 in 20.

***De novo* mutagenesis** is increasingly being recognized as an important mechanism in some epilepsies, particularly epileptic encephalopathies.

IMPORTANT: Not all epilepsies that are due to **genetic** causes are inherited.

80% of patients with **Dravet Syndrome,** a.k.a. Severe Myoclonic Epilepsy of Infancy (SMEI), **have a mutation in their SCN1A gene.**

Seizure precipitants or triggers

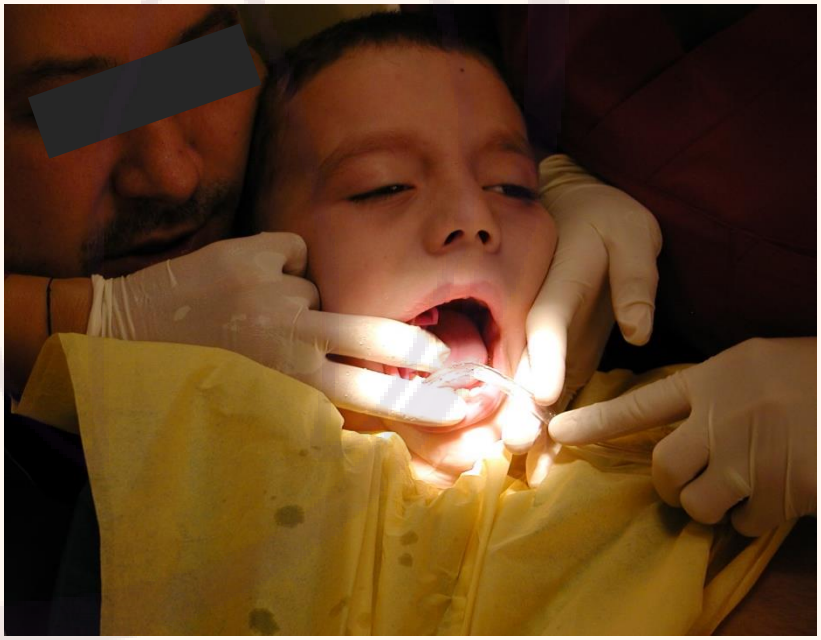
- Fever
- Infection
- Metabolic disturbance
- Hormonal disturbance
- Photosensitivity
- Sleep deprivation
- Hunger
- Stress – DENTAL TREATMENT???

Signs and symptoms

- Temporary symptoms:
  - loss of awareness/consciousness
  - disturbance of movement, sensation (hearing, vision, taste), mood, other cognitive functions
- Physical problems: bruising, fractures
- Psychological problems: anxiety, depression
- Risk of premature death: falls, drowning, burns, prolonged seizures

Associated features

- Cognitive impairments that affect language, memory, attention and other abilities important for normal development
- Mental disability 5-83%
- Physical disability 23-54%



Children

- Behavioural problems
- Low self-esteem
- Poor self-image
- Long-lasting dependency
- Negative personality characteristics

Adolescents

- Might try to stop their medication
- Poor performance at school, fewer outings
- Weight gain/loss
- Anorexia
- Drinking, smoking, substance abuse
- Depression
- Sexual abuse
- Suicide

Epilepsy- related oral features in children (1)

HIGH RISK OF ORAL DISEASES!

- **Periodontal:** - Gingival overgrowth
  - Complication of antiepileptic drugs, mostly from phenytoin
  - Favorized when plaque levels are high
  - Spontaneously remision 1-6 months of phenytoin withdrawal
  - In extreme cases →delayed tooth eruption, misalignment of teeth, compromised appearance, halitosis
- **Caries:** high risk, especially patients taking syrup-based medicine for a long time

Epilepsy- related oral features in children (2)

- **Trauma:** falls associated with seizures
  - Laceration of soft tissues
  - Tongue injuries
  - Fractures of the skull
  - Subluxation of TMJ
  - Fractures, subluxation, avulsion of teeth

- **Oral complications:** related to antepileptic drugs
  - Ulcerations
  - Stomatitis
  - Glossitis
  - Clotting problems-hematomas, excessive bleeding

Drug interactions

1. Inhibition of **phenytoin's** metabolism and increase of its plasma concentration
    - Metronidazole
    - Antifungal agents (e.g. fluconazole, miconazole)
    - Aspirin
    - Non-steroidal anti-inflammatory drugs
2. Inhibition of **carbamazepine's** and **sodium valproate's** metabolism
    - Erythromycin
3. Paracetamol (acetaminophen) may decrease effectiveness of **lamotrigine** (Gastrup et al, 2015)
4. Carbamazepine (**tegretol)** may increase the potential hepatotoxicity of acetaminophen and decrease its pharmacologic effects.
5. Midazolam has an altered effect in case of concurrent intake of carbamazepine.

It is always a GOOD IDEA to CHECK POTENTIAL DRUG INTERACTIONS before prescribing a drug to a patient taking anti-epileptic drugs.

Side effects of drugs used in epilepsy (1)

- **Phenytoin (Dilantin):** fever, nausea, mental confusion, coarse facies, acne, hirsutism, erythema multiforme, hepatitis, gastric distress, megaloblastic anemia, *gingival overgrowth* (hyperplasia)
- **Carbamazepine (Tegretol):** allergic reactions (rash), ulcerations, *xerostomia*, *glossitis*, *stomatitis*, high risk of microbial *infections*, *delayed healing*, *excesive bleeding*
- **Valproate (Depakote):** weight gain, liver toxicity, gastrointestinal disturbances, *clotting problems* (altered bleeding time)

Side effects of drugs used in epilepsy (2)

- **Lamotrigine:** allergic reactions (rash)
- **Phenobarbital:** drowsiness, rash, ataxia
- **Clonazepam (Klonopin):** drowsiness, ataxia, depression, tremor, hair loss, hirsutism
- **Primidone (Mysoline):** gastric disturbances, nausea, vomiting, anorexia, dermatitis, blood dyscrasias

Barriers related with the dental care

- Dentists refuse to treat patients with disabilities (treatment is more time consuming, physical and emotional involvement)
- Architectural, geographical, organizational, communication related factors
- Significant social stigma attached to epilepsy

Dental care for the child with epilepsy - FOCUS on:

- **Early contact with the team;** behaviour management (Tell-Show-Feel-Do technique)
- **Appointments:** short, relaxed environment, in the morning when patients → well-rested, less stressed
- **Avoid exposure to triggers →** may initiate an epileptic seizure:
  - light from the dental chair (directed into mouth, dark glasses for eye protection)
  - loud sounds

  ! Take thorough anamnesis → identify potential triggers
- **Prevention:**
  - Rigorous oral hygiene especially for people taking phenytoin
  - Fluoride and chlorhexidine varnishes, pastes, gels
  - Diet control (avoid sugary food, drinks)
  - Regular check-ups, careful treatment planning to avoid dental pain and oral infections

In case of epileptic seizure in the dental office (1)

- Stop the treatment session
- Protection from further injury: remove the instruments and dental tampons, move the equipment, recline the dental chair to the supine position
- Avoid putting your fingers in patient's mouth→ might be bitten or broken
- Loose patient's tight clothes
- Sometimes after a seizure patients sleep deeply→ recovery position and monitored. They can go home accompanied.

In case of epileptic seizure in the dental office (2)

- Episodes > 3 minutes or if they stop and start again→ drug administration:

  ➡ ***Diazepam*** 10-20 mg i.m. or ***Midazolam*** 10 mg i.m. into the front of the thigh / Midazolam in the buccal sulcus for rapid absorption

- Oxygen → not necessary during short episodes
- If episodes continue / restart after drug administration→ call 112/emergency, oxygenotherapy

Important for the paediatric dentist (1)

- Check that the patient has taken his antiepilepsy medication
- Check the drug history at each visit→ frequent changes= poor control
- Complete medical and seizure history
- Patient should not be excessively tired, has eaten normally before treatment
- Treat only emergencies until seizure control has improved

Important for the paediatric dentist (2)

- Clotting screen before performing major surgery on patients taking valproate
- If possible, substitution of syrup-based drugs with sugar-free medicine
- Tooth avulsion: avoid re-implantation. If tooth can’t be found→ chest RX (inhaled/swallowed)

Important for the paediatric dentist (3)

- Inhalation sedation with nitrous oxide/intravenous sedation with benzodiazepine: reduce stress
- Attention when sedating patients that are taking benzodiazepines (incl. clobazam, clonazepam): high tolerance to midazolam/additive effect→over-sedation
- Flumazenil is **contraindicated:** reverses the effect of benzodiazepines taken on a regular basis
- In case of patients treated under G.A.: maintain anticonvulsivant therapy throughout perioperative period

Important for the orthodontist

- Fixed appliances are preferable to removable
- Removable appliances must have good retention and strength
- Early interception of increased overjet (by myofunctional therapy) should be considered whenever appropriate in order to reduce risk of dental trauma on permanent incisors
- Mouthguards= useful in a prodromal phase before a seizure/when patient experiences an aura. Should cover the palate, extend into the buccal sulci for proper retention.
- Occlusal splints for TMJ's treatment must have good retention

Let's practice non ignorance…

- Popular belief that epilepsy is contagious → hesitation on helping persons having seizures and are in danger (near an open fire, in the water)
- Stigma associated with epilepsy → great influence on the education of children and young people

These conditions may lead to isolation

→ Violation of human rights: discrimination in the workplace, social ostracism