
Definition and Classification of Epilepsies



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21 November 2020



Outline

- Definition of epilepsy
- Classification of epilepsy



สมาคมโรคลมชักแห่งประเทศไทย
Epilepsy Society of Thailand

ขอเชิญแพทย์และผู้สนใจเข้าร่วมการประชุมวิชาการออนไลน์

ครั้งที่
11

Epilepsy Course for Neurology and Pediatric Neurology Residents

Saturday, 21 November 2020

Time	Program
08:50 - 09:00	Opening Remark ศ.พ. อนันต์ ธีระชัย
09:00 - 09:30	Definition and Classification of Epilepsies พศ. พญ. กุณวรรณ นัคนานนท์
09:30 - 09:40	Break
09:40 - 10:25	Focal epilepsy and seizure semiology พ.ก. พญ. กิ่ง สุธรรณศักดิ์
10:25 - 11:00	Generalized epilepsy syndrome รศ. พ. พ. ชัยยศ อนุศักดิ์ธรรม
11:00 - 11:30	Combined generalized and focal epilepsy syndrome อ. พญ. ปาณิสรา สดุงจิรันธร
11:30 - 12:00	Etiology of epilepsy อ. พ. ศรียงค์ วชิระชัยสุนทร
12:00 - 12:30	Lunch
12:30 - 13:45	Pharmacology in epilepsy พศ. ดร. กานกรรัตน์ สวัสดิ์เสนีย์
13:45 - 14:00	Break
14:00 - 14:30	Natural history and drug-resistant epilepsy พศ. พ. พ. สุศักดิ์ สัมภักดิ์
14:30 - 15:00	Neuroimaging in Epilepsy อ. พญ. เบ็ญจมา เสียมบุญญกุล
15:00 - 15:30	Neuropsychiatric comorbidities อ. พ. พ. ภิষণกร

Sunday, 22 November 2020

Time	Program
08:00 - 08:45	Differential Diagnosis of Seizures อ. พญ. สรिता ชูเนนทการัตน์
08:45 - 09:45	When to Start and How to Select AEDs พ.อ. พญ. พญ. มาลี สักรินทร์สุวรรณ
09:45 - 10:00	Break
10:00 - 10:30	Choosing AEDs in Special Situation รศ. พญ. กนกวรรณ บุณยกุลสิงขร
10:30 - 11:00	Treatment of drug-resistant epilepsy; medications and other treatment options พศ. พ. พ. สรวิศ ธีระวรรณ
11:00 - 11:45	Management of acute seizures and status epilepticus อ. พญ. ชวีรุจน์ หวังเฉลิมเกียรติ
11:45 - 12:30	Presurgical evaluation and epilepsy surgery อ. พ. พ. ธีระเดช ศรีท้าววิเศษ



Definition of epilepsy

Definition of epilepsy

ILAE OFFICIAL REPORT

A practical clinical definition of epilepsy

*Robert S. Fisher, †Carlos Acevedo, ‡Alexis Arzimanoglou, §Alicia Bogacz, ¶J. Helen Cross, #Christian E. Elger, **Jerome Engel Jr, ††Lars Forsgren, ‡‡Jacqueline A. French, §§Mike Glynn, ¶¶Dale C. Hesdorffer, ##B.I. Lee, ***Gary W. Mathern, †††Solomon L. Moshé, ‡‡‡Emilio Perucca, §§§Ingrid E. Scheffer, ¶¶¶Torbjörn Tomson, ###Masako Watanabe, and ****Samuel Wiebe

Epilepsy is a disease of the brain defined by any of the following conditions

1. At least **two unprovoked** (or reflex) seizures occurring **> 24 hr** apart
2. **One unprovoked** (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years
3. Diagnosis of an epilepsy syndrome

Diagnosis ≠ Treatment

Epilepsia 2014, 55(4):475-482

Resolved Epilepsy (หาย)

- Epilepsy → treatment → seizure free (2 yrs in kid vs 4 yrs in adult) → tapering AED
- Task Force ILAE: 1. individuals who had an age-dependent epilepsy syndrome but are now past the applicable age
2. who have remained seizure-free for the last 10 years, with no medicines for the last 5 years
- Resolved epilepsy ≠ Remission ≠ Cure

Epilepsy classification

ILAE 1981

Clinical seizure type

1. Partial (focal, local) seizures

Simple partial sz

- with motor signs
- with somatosensory symptoms
- with autonomic symptoms and signs
- with psychic symptoms

Complex partial sz

- start with SPS followed by impairment of consciousness
- with impairment of consciousness at onset

Partial sz evolving to 2^o gen sz

- SPS → GTC
- CPS → GTC
- SPS → CPS → GTC

2. Generalized sz (convulsive and non-convulsive)

Absence, Myoclonic, Clonic, Tonic, Tonic-clonic, Atonic

3. Unclassified epileptic sz

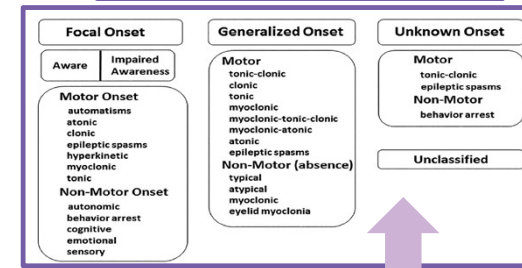
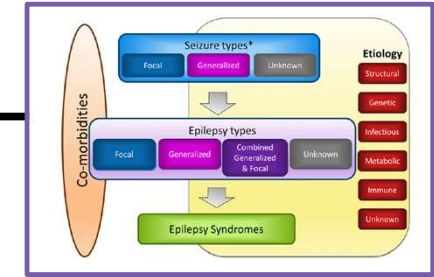
4. Prolonged or repetitive seizure (status epilepticus)

EEG sz type

EEG interictal expression

A 5 axes diagnostic scheme

1. Ictal phenomenology
2. Seizure type
3. Epilepsy syndrome
4. Etiology
5. Impairment



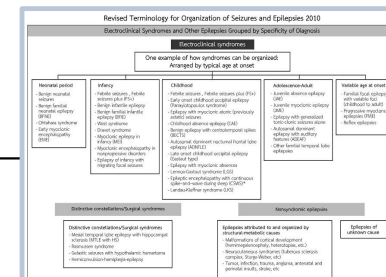
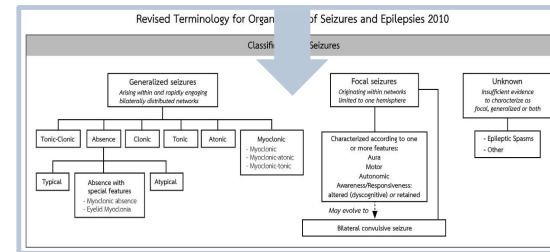
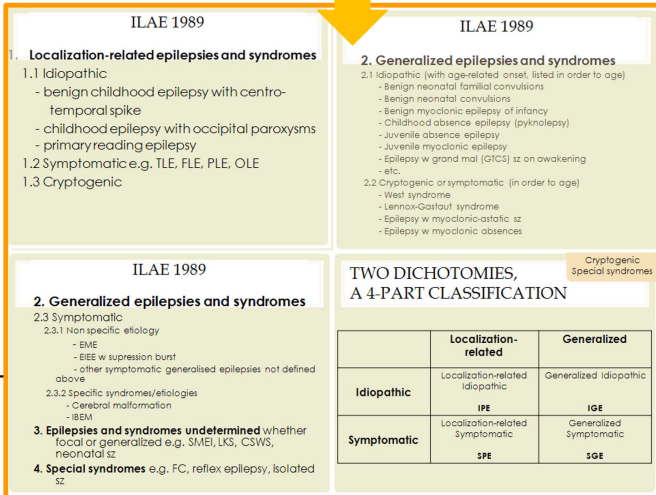
1985

1989

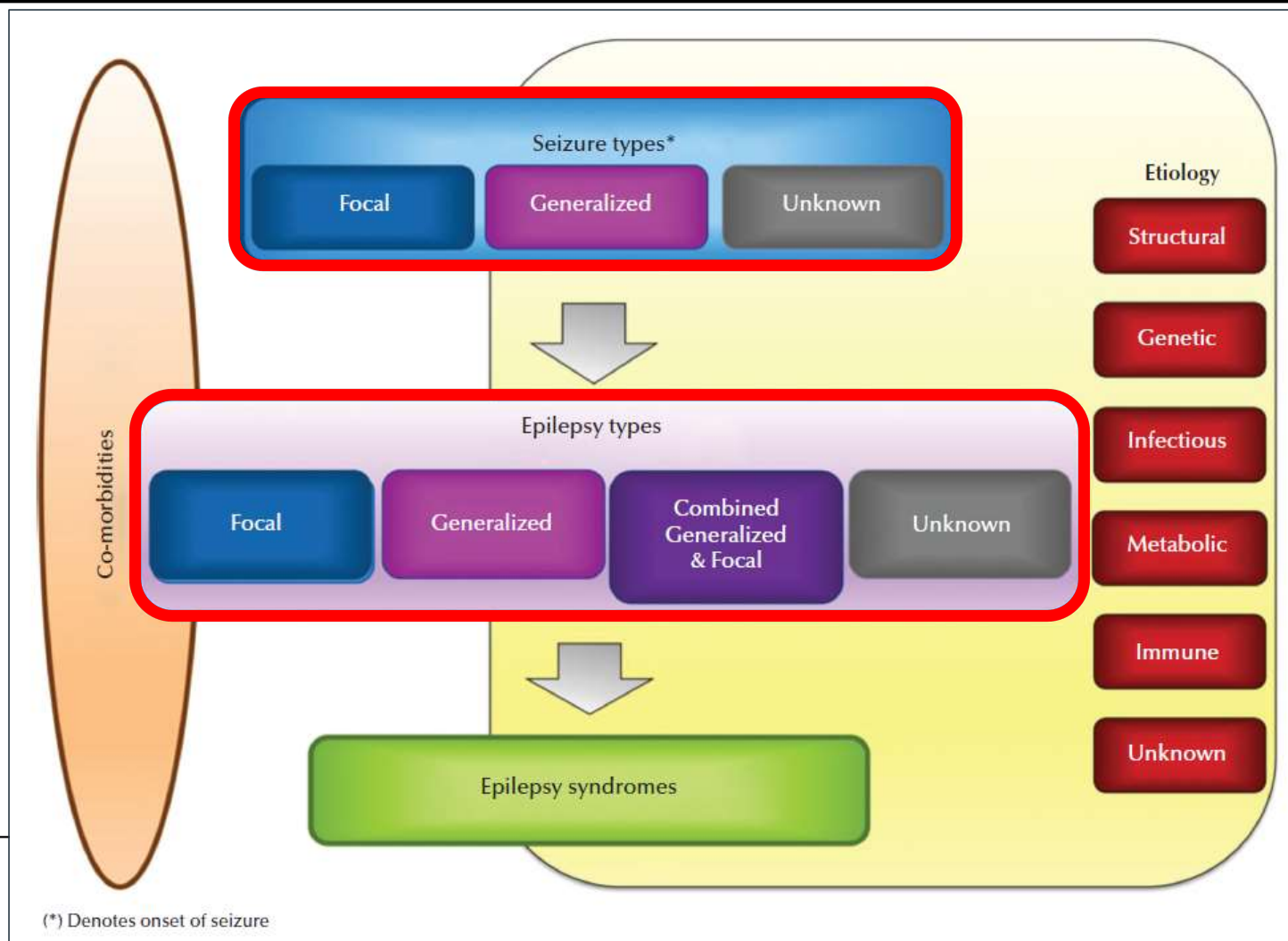
2001

2010-13

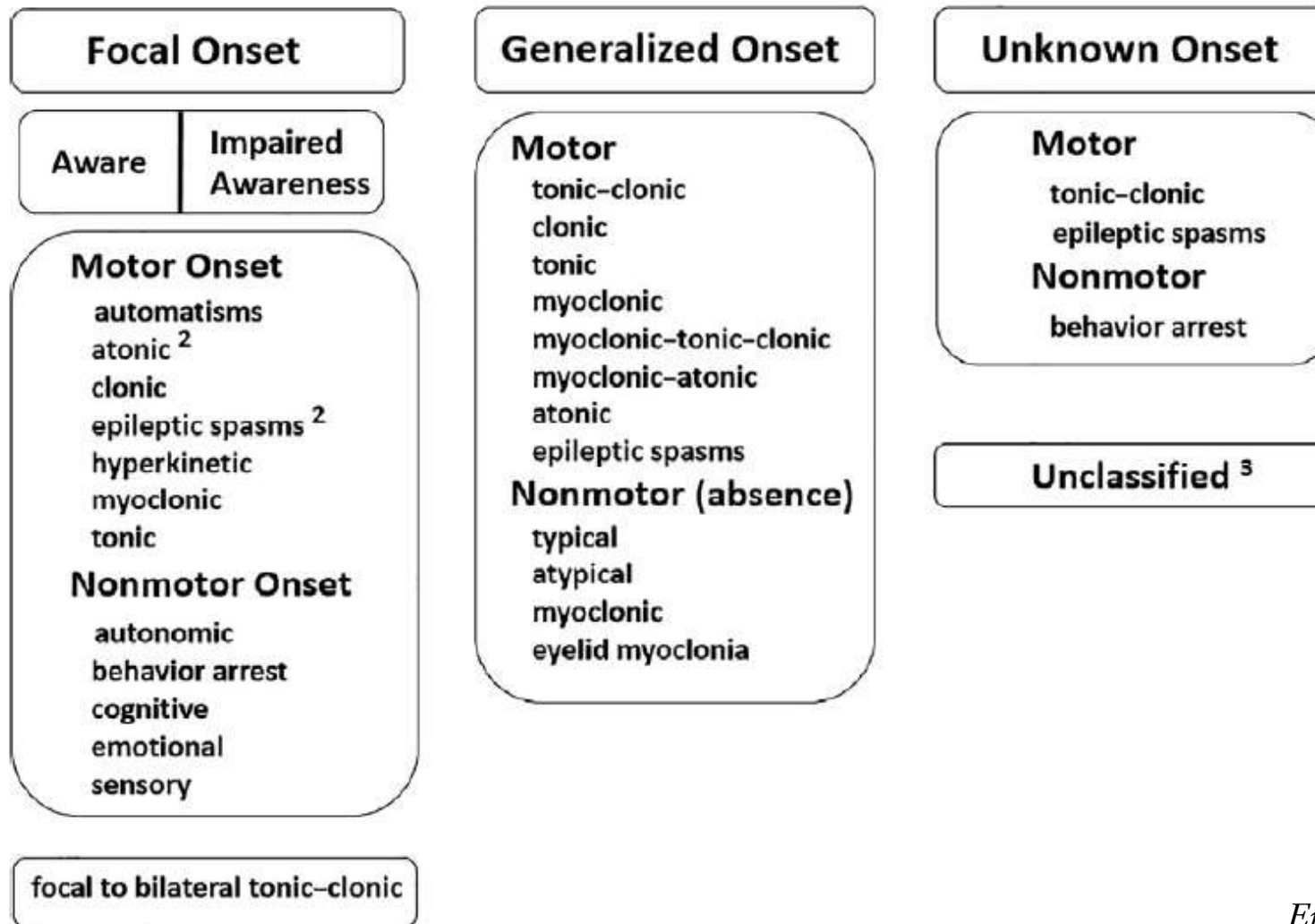
2017

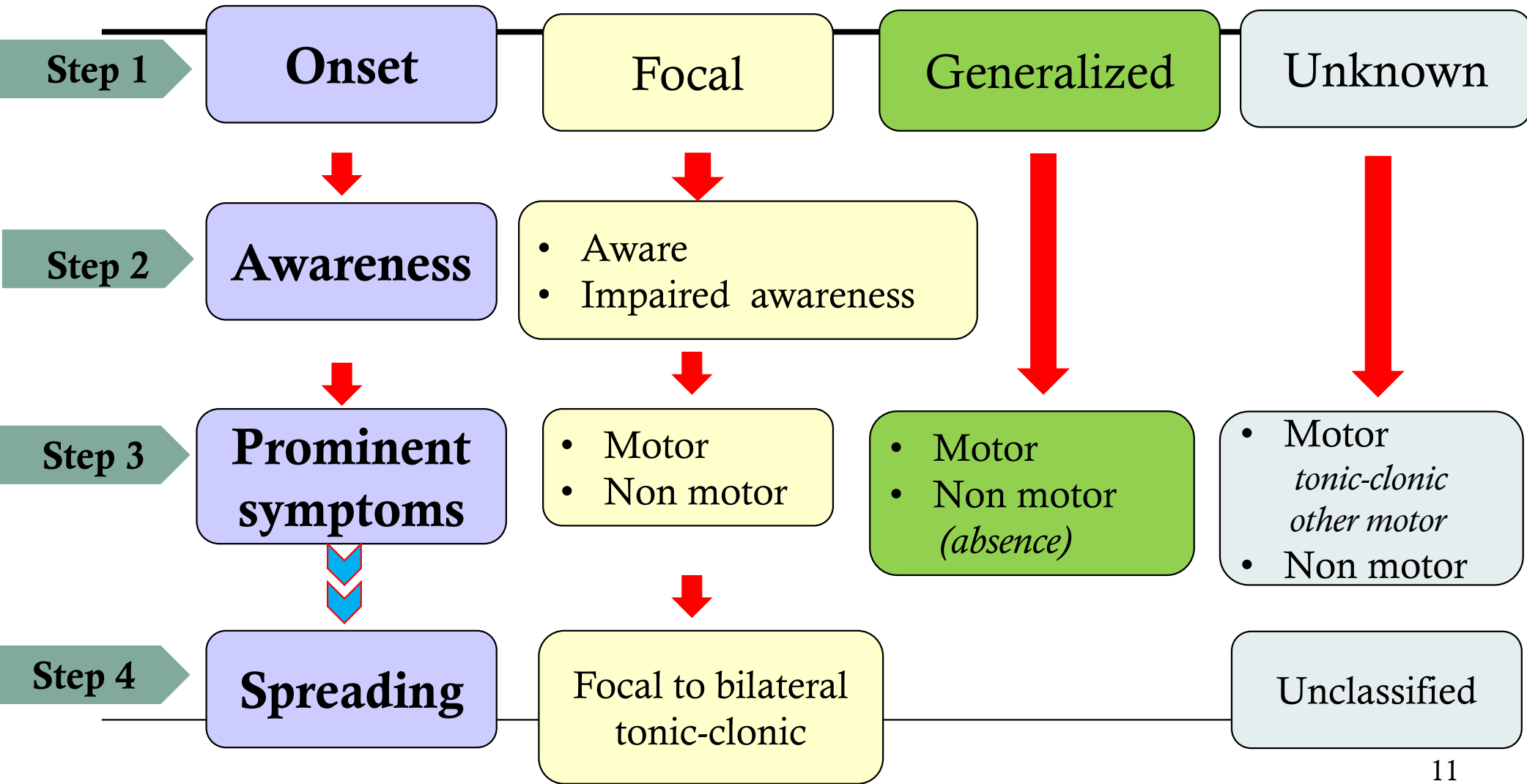


2017: Framework for epilepsy classification



ILAE 2017 Classification of Seizure Types Expanded Version ¹





Step 1

Onset

Focal

Generalized

Unknown

If you have further information (VDO, EEG, MRI, details) in any level, seizure type **can be changed**

Step 4

Spreading

Focal to bilateral tonic-clonic

Unclassified

• Non motor

Step 1

Onset

Focal

Generalized

Unknown

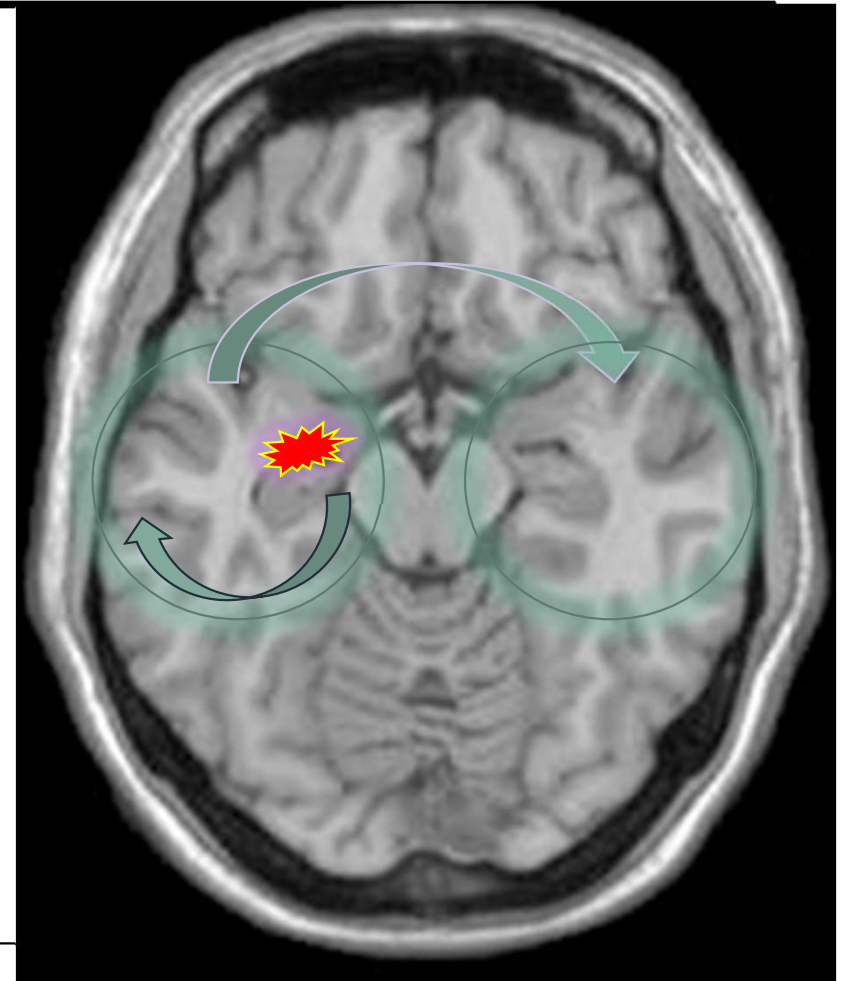


- 80% Confidence level
- Try to look for lateralizing signs

2010

Focal seizures

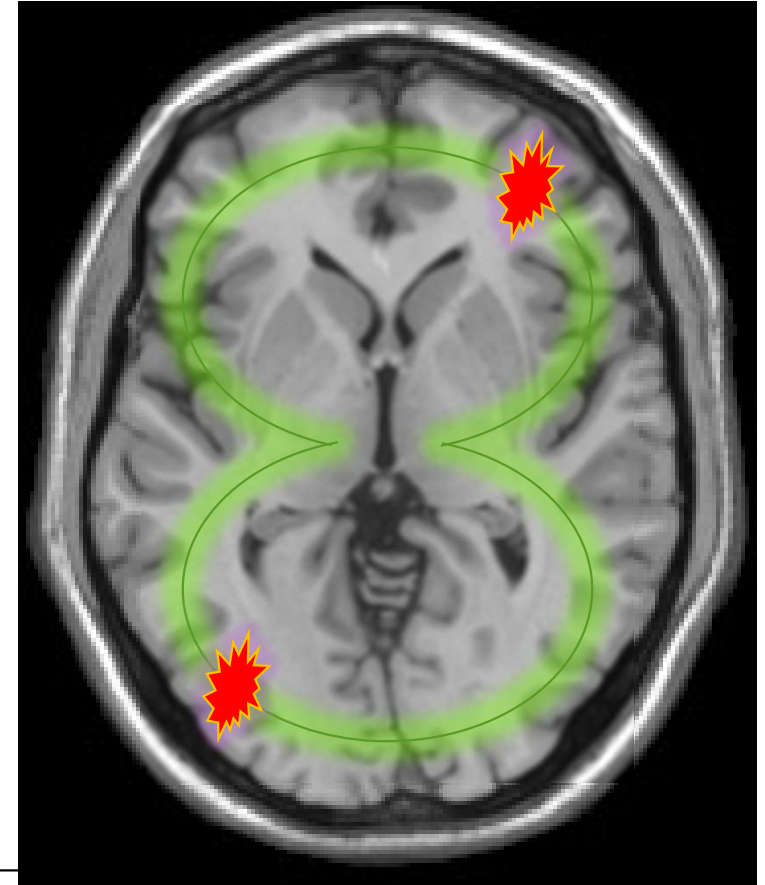
- Originate within networks limited to one hemisphere
- May be discretely localized or more widely distributed



2010

Generalized seizures

- Originate at some point within and **rapidly engage** bilaterally distributed networks
- Can include cortical and subcortical structures but not necessarily the entire cortex



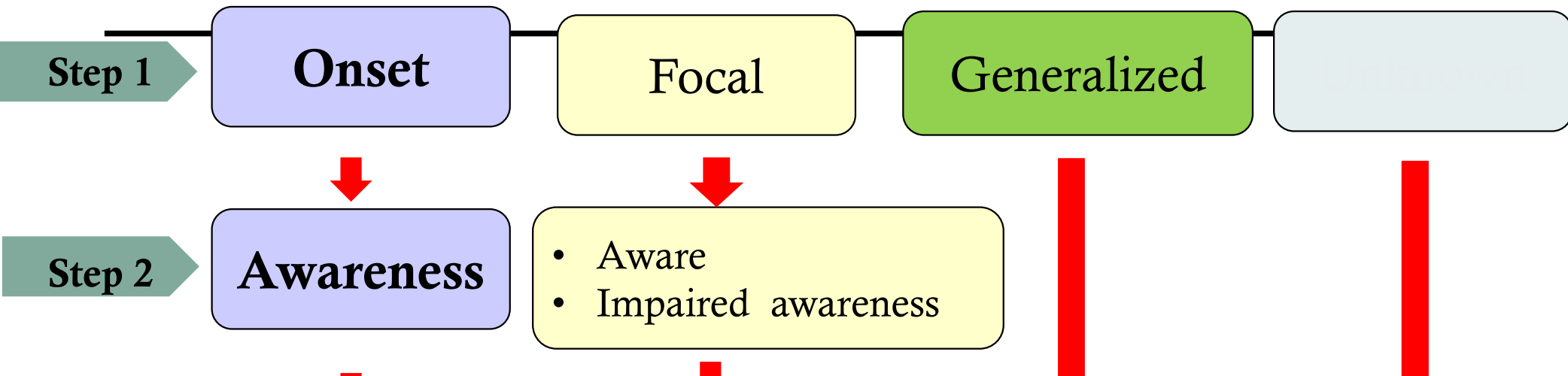
Video: **onset**

Focal

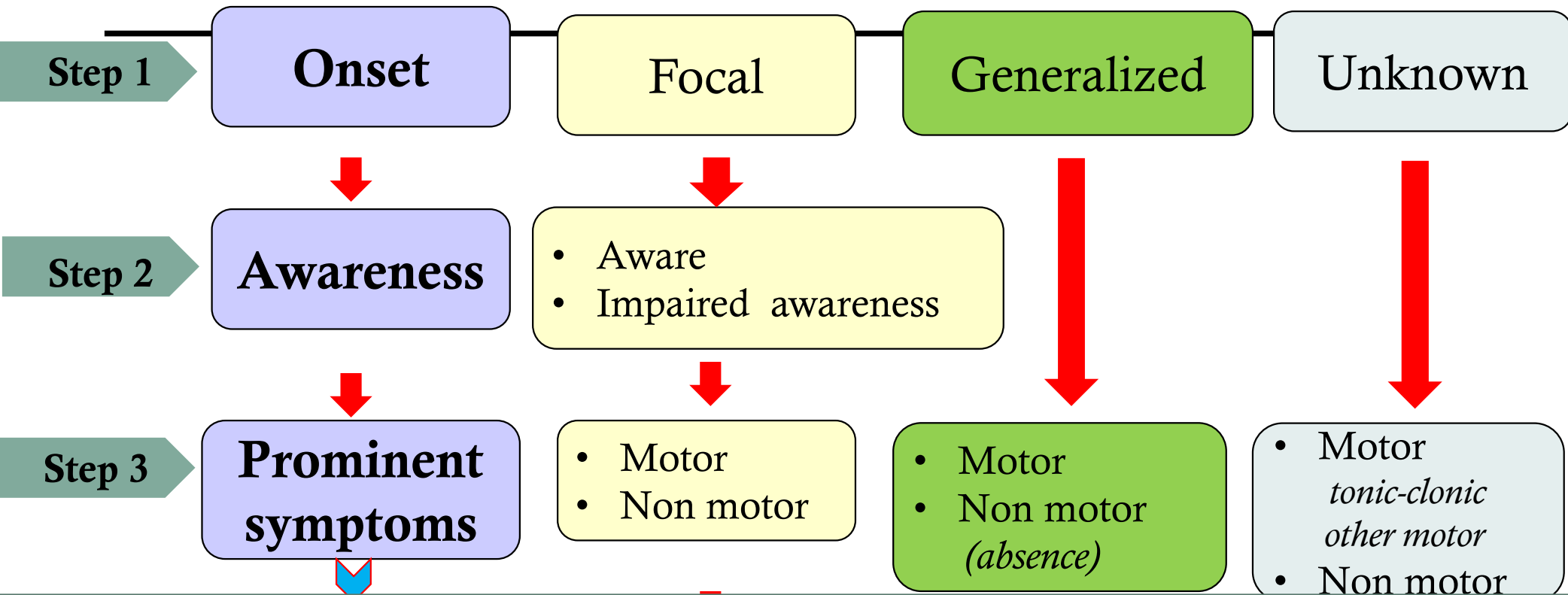


Unknown



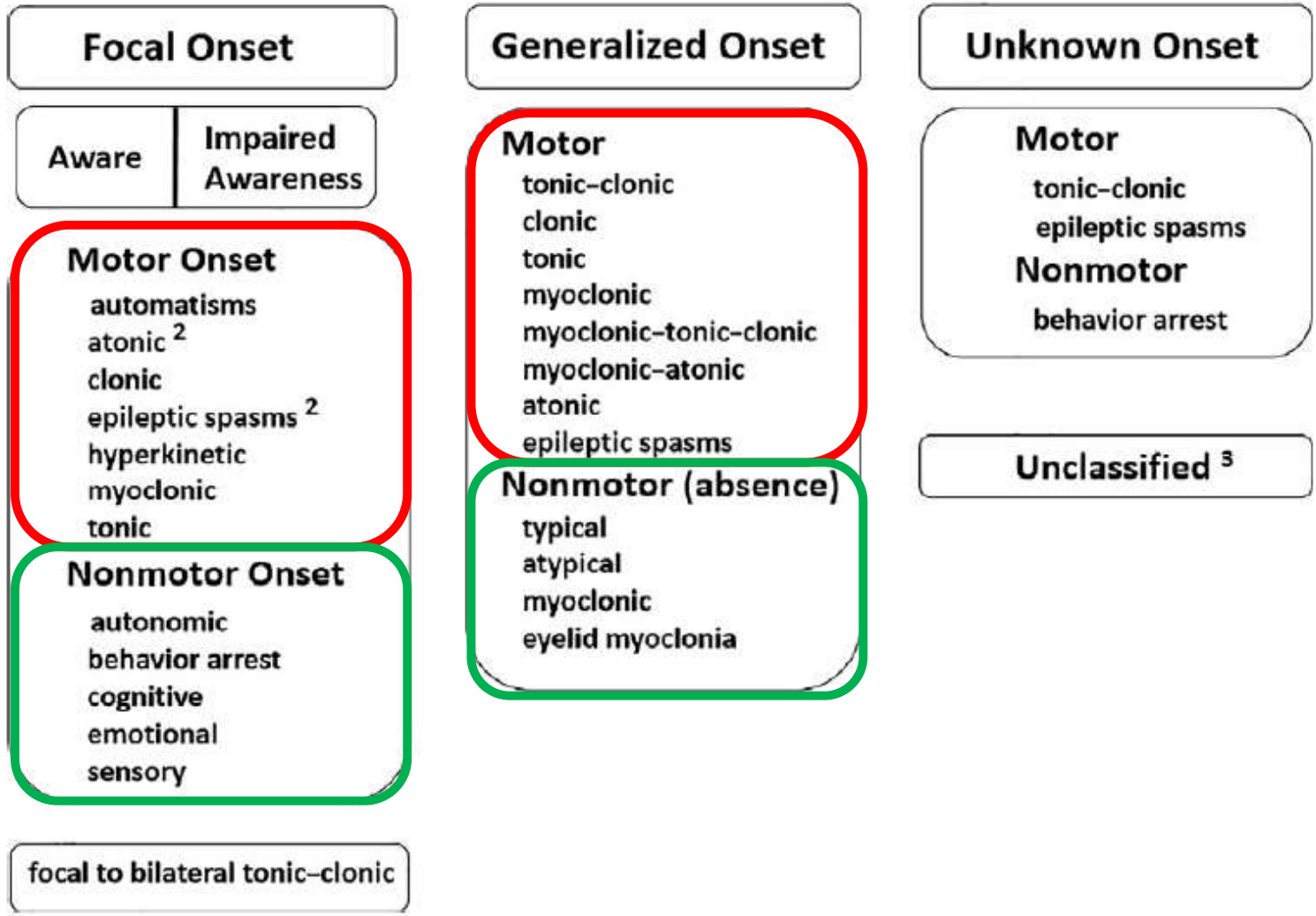


- Awareness = knowledge of self and environment
- Evaluate awareness during ictal period, not post-ictal period
- Can skip this step if we do not have enough information

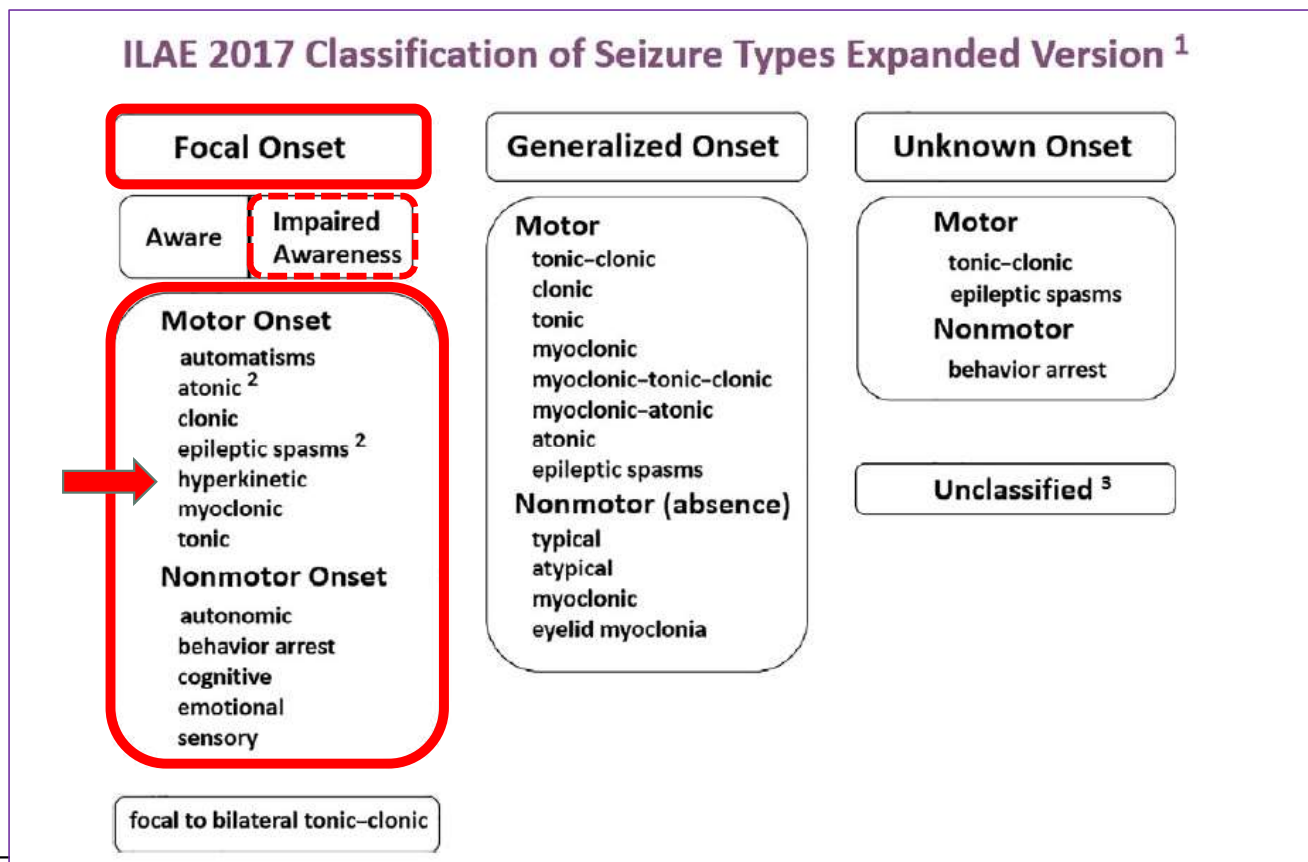


- Earliest symptom
- Motor **vs** Non motor

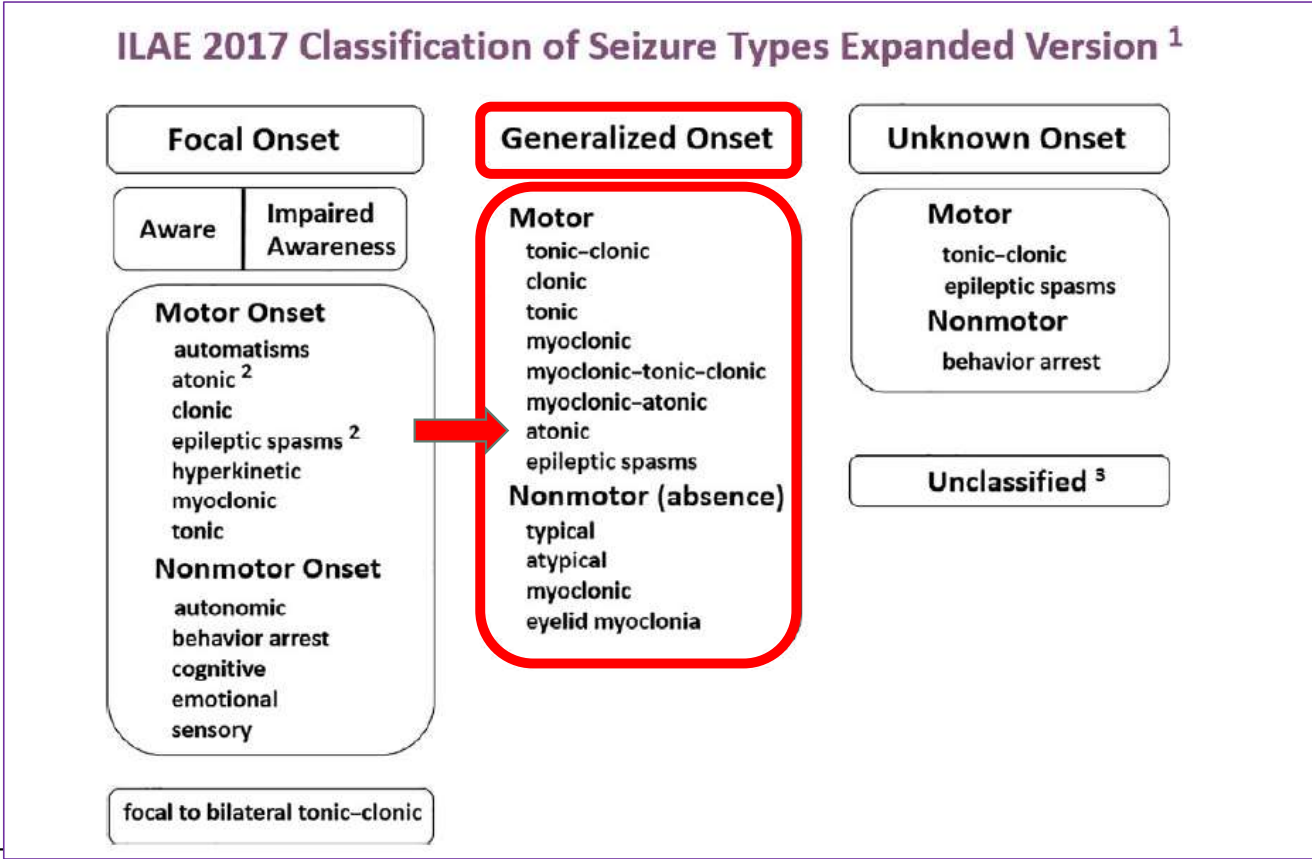
ILAE 2017 Classification of Seizure Types Expanded Version ¹



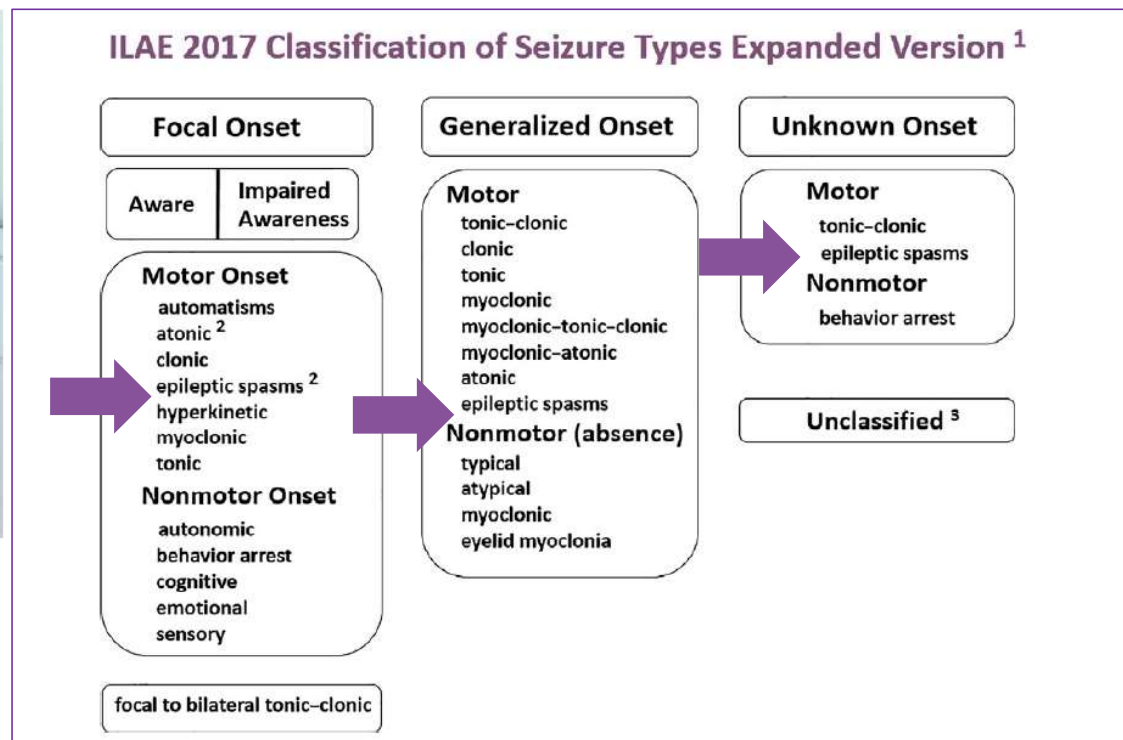
Prominent symptoms: motor vs non motor onset



Prominent symptoms: motor vs non motor onset

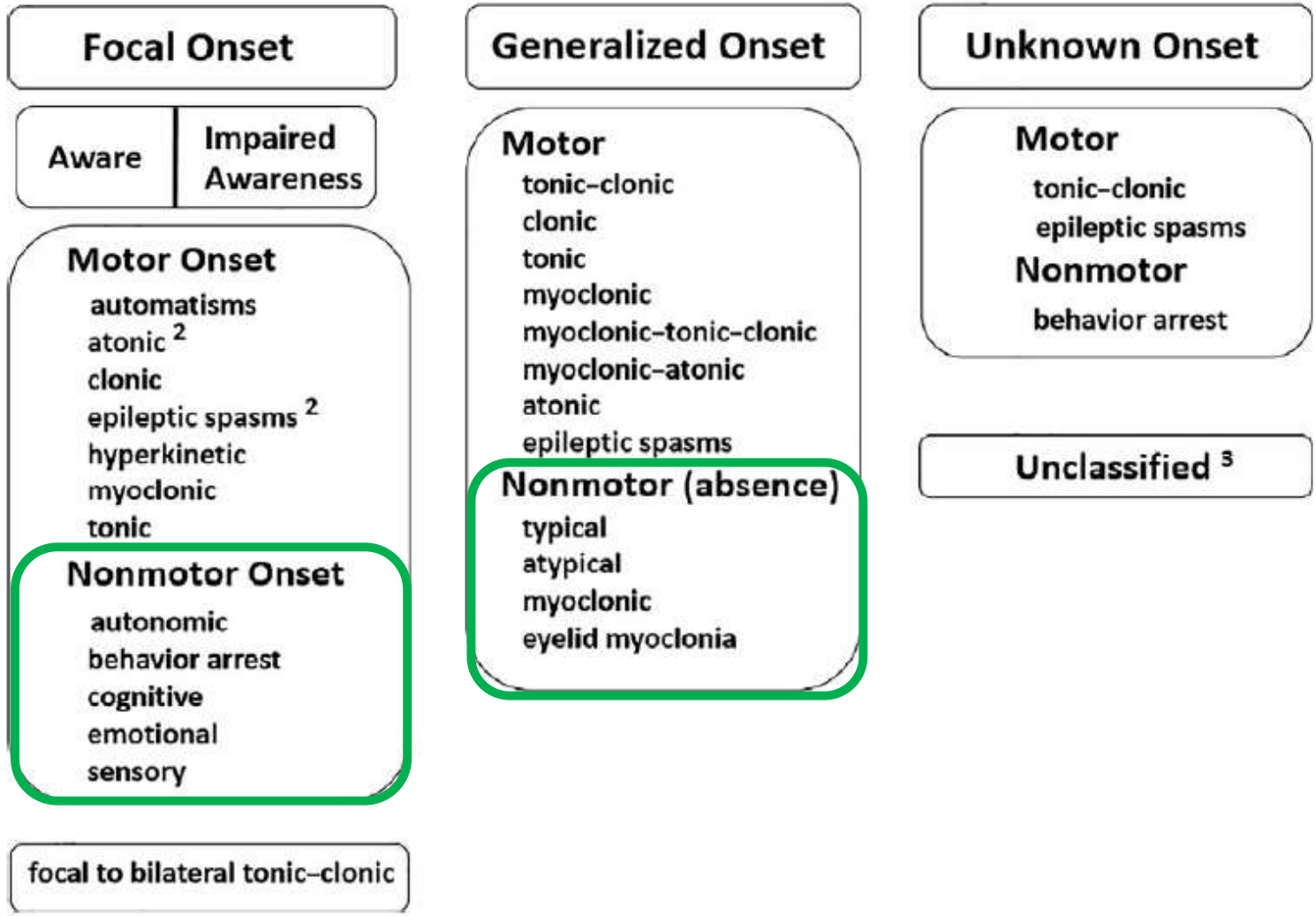


Prominent symptoms: motor **vs** non motor onset




EEG will help clarify focal or generalized onset of epileptic spasms₂₂

ILAE 2017 Classification of Seizure Types Expanded Version ¹



Focal **non-motor** seizure

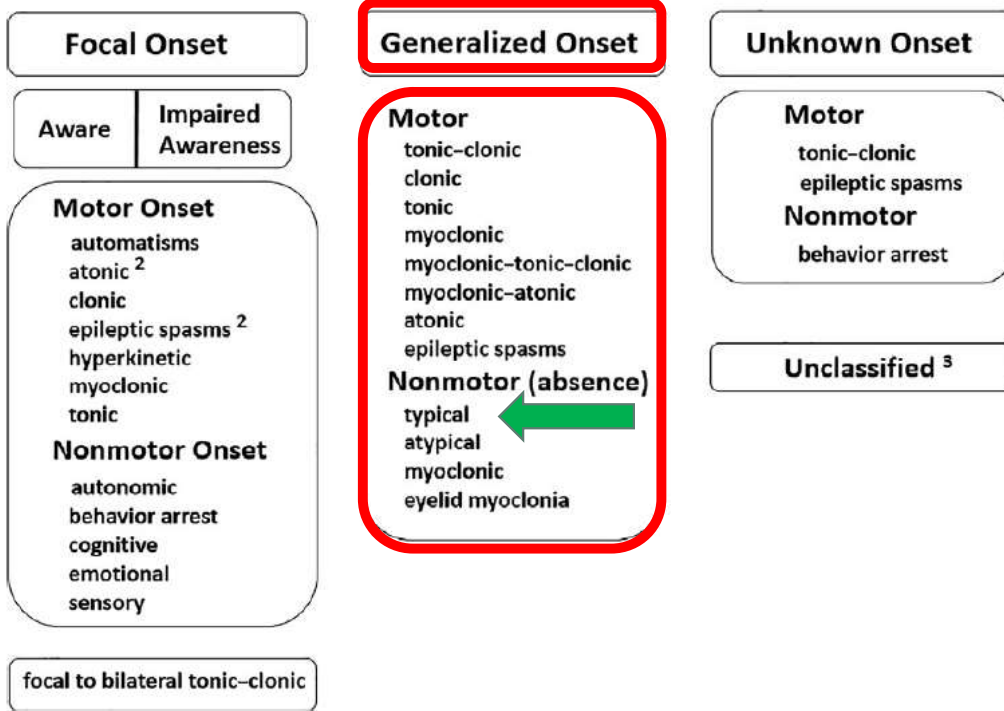
(Hx taking+ VDO + EEG+ imaging)

Autonomic	Behavior arrest	Cognitive	Emotional	Sensory
:Asystole :Bradycardia :Tachycardia :Flushing :Nausea :Vomiting :Palpitation :Piloerection :etc		:Acalculia :Aphasia :Attention impairment :Déjà vu :Dysphasia :Hallucination :Memory impairment : etc	:Agitation :Anger :Anxiety :Fear :Laughing :etc	:Auditory :Gustatory :Hot-cold sensation :Olfactory :Somatosensory :Vestibular :Visual :etc

What would you describe this video?

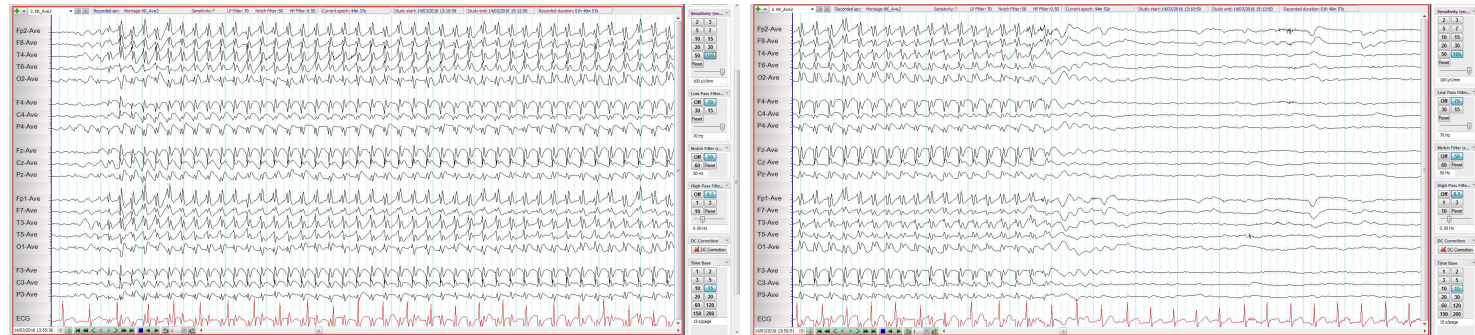


ILAE 2017 Classification of Seizure Types Expanded Version ¹



Generalized **non-motor** seizure (absence)

Do you need EEG ?

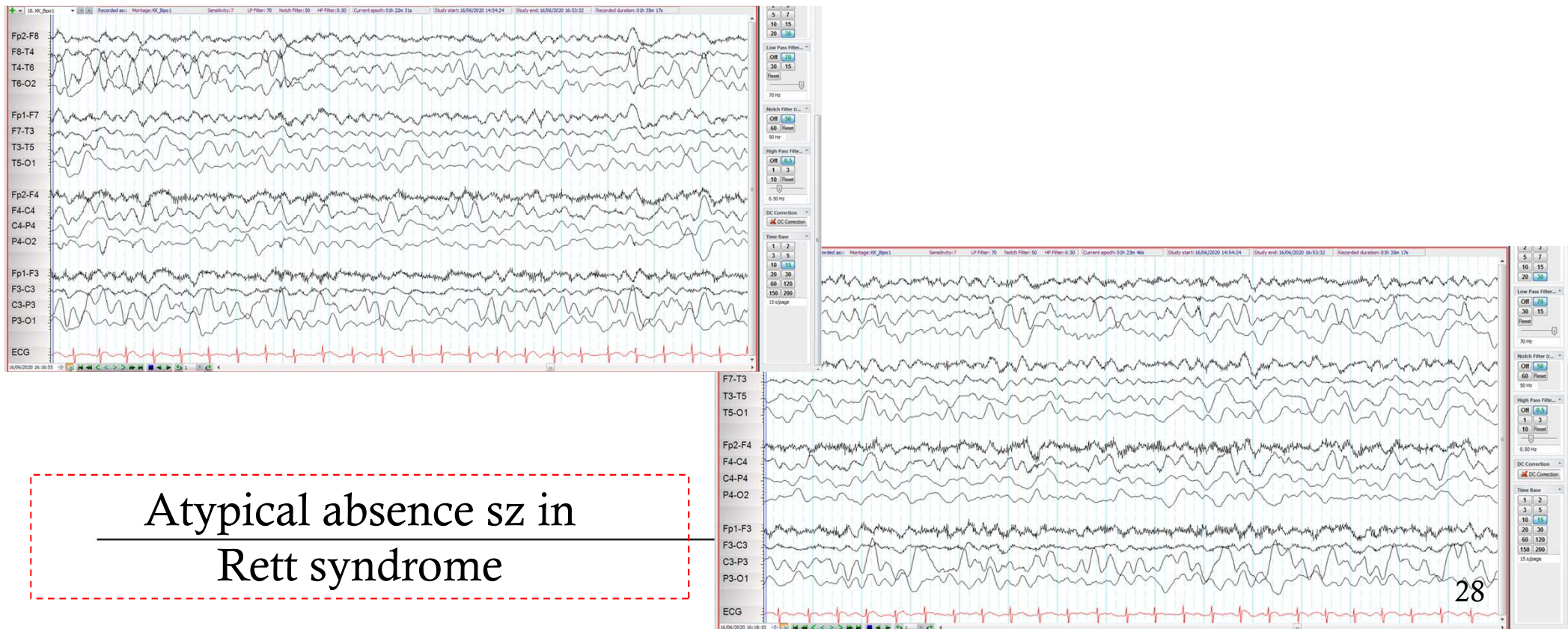


Gen non-motor **atypical absence** : need Hx + EEG



EEG during non-ictal period

Baseline EEG of atypical absence @ underlying epilepsy syndrome/clinical syndrome



Atypical absence sz in
Rett syndrome

From **previous** evaluation



ILAE 2017 Classification of Seizure Types Expanded Version ¹

Focal Onset

Aware Impaired Awareness

Motor Onset

automatisms
atonic ²
clonic
epileptic spasms ²
hyperkinetic
myoclonic
tonic

Nonmotor Onset

autonomic
behavior arrest
cognitive
emotional
sensory

focal to bilateral tonic-clonic

Generalized Onset

Motor

tonic-clonic
clonic
tonic
myoclonic
myoclonic-tonic-clonic
myoclonic-atonic
atonic
epileptic spasms

Nonmotor (absence)

typical
atypical
myoclonic
eyelid myoclonia

Unknown Onset

Motor

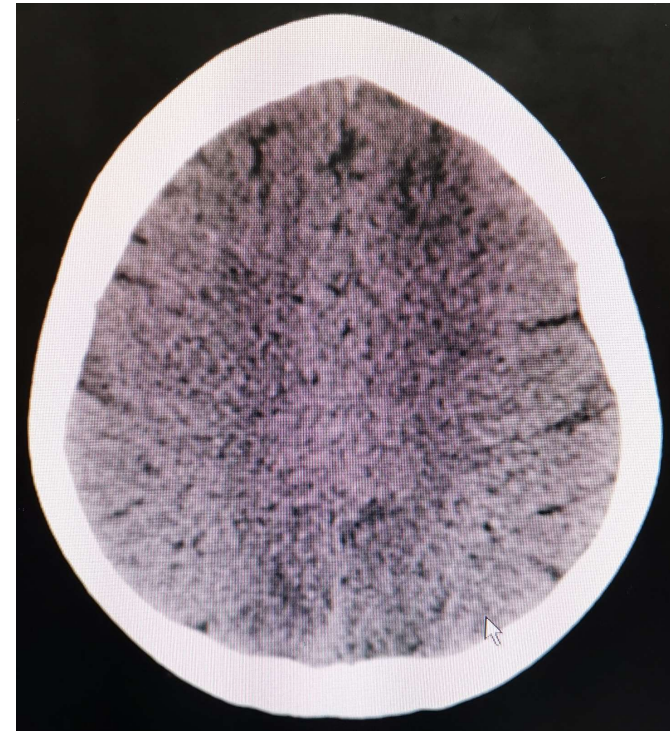
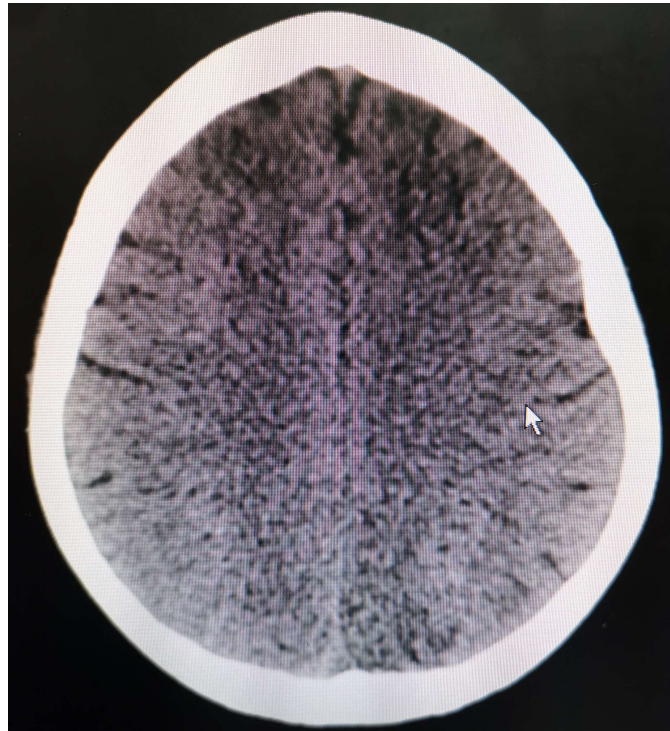
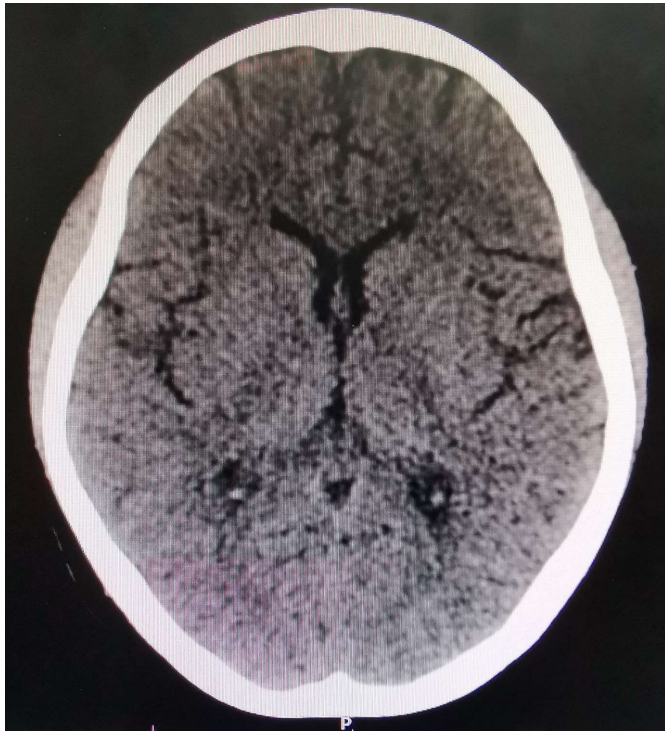
tonic-clonic
epileptic spasms

Nonmotor

behavior arrest

Unclassified ³

Imaging



From previous evaluation but now **changing to**



ILAE 2017 Classification of Seizure Types Expanded Version ¹

Focal Onset

Aware Impaired Awareness

Motor Onset

automatisms
atonic ²
clonic
epileptic spasms ²
hyperkinetic
myoclonic
tonic

Nonmotor Onset

autonomic
behavior arrest
cognitive
emotional
sensory

focal to bilateral tonic-clonic

Generalized Onset

Motor

tonic-clonic
clonic
tonic
myoclonic
myoclonic-tonic-clonic
myoclonic-atonic
atonic
epileptic spasms

Nonmotor (absence)

typical
atypical
myoclonic
eyelid myoclonia

Unknown Onset

Motor

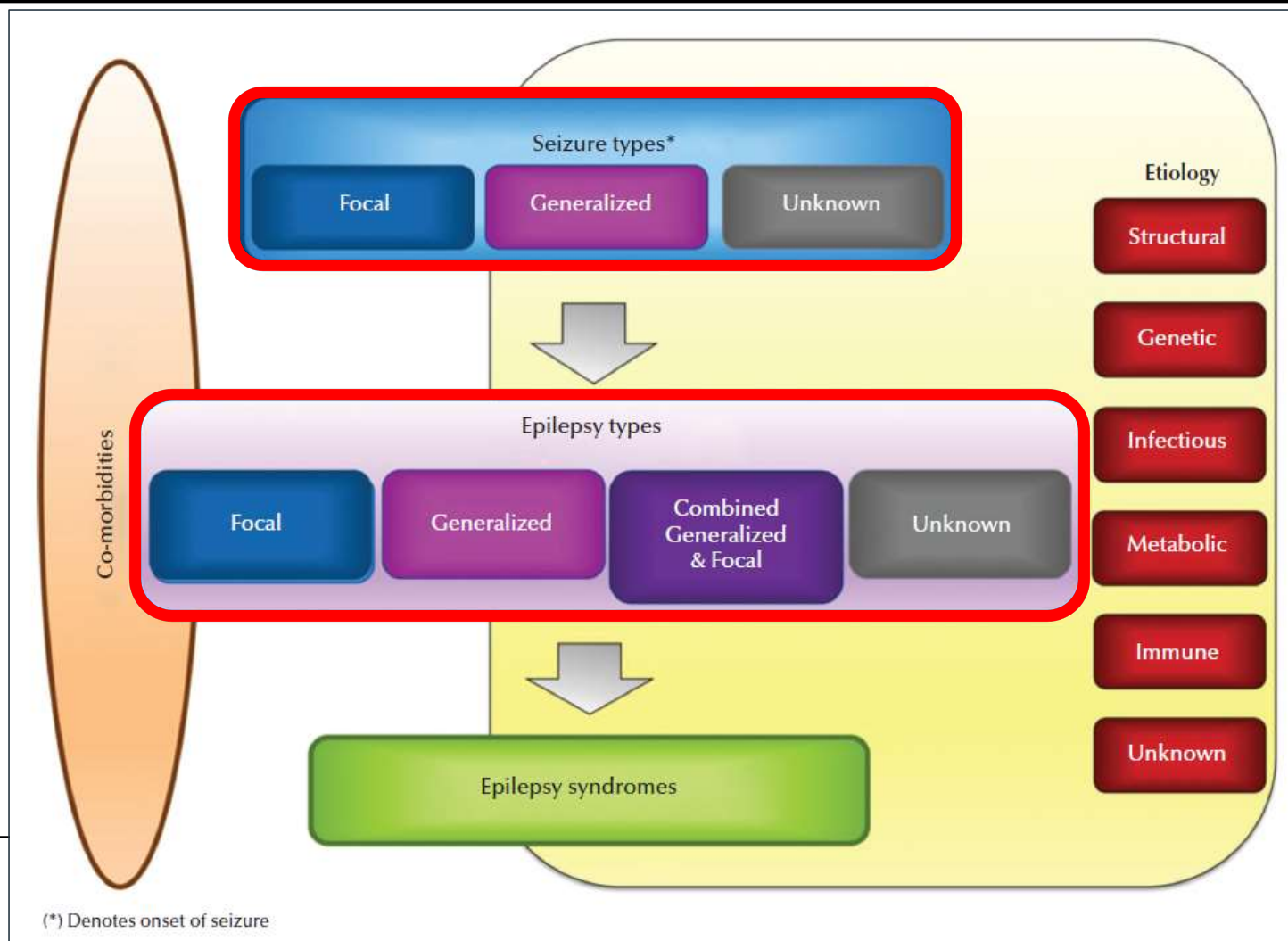
tonic-clonic
epileptic spasms

Nonmotor

behavior arrest

Unclassified ³

2017: Framework for epilepsy classification



A definition and classification of status epilepticus – Report of the ILAE Task Force on Classification of Status Epilepticus

*†‡Eugen Trinka, §Hannah Cock, ¶Dale Hesdorffer, #Andrea O. Rossetti, **Ingrid E. Scheffer, ††Shlomo Shinnar, ‡‡Simon Shorvon, and §§Daniel H. Lowenstein

Epilepsia, 56(10):1515–1523, 2015
doi: 10.1111/epi.13121

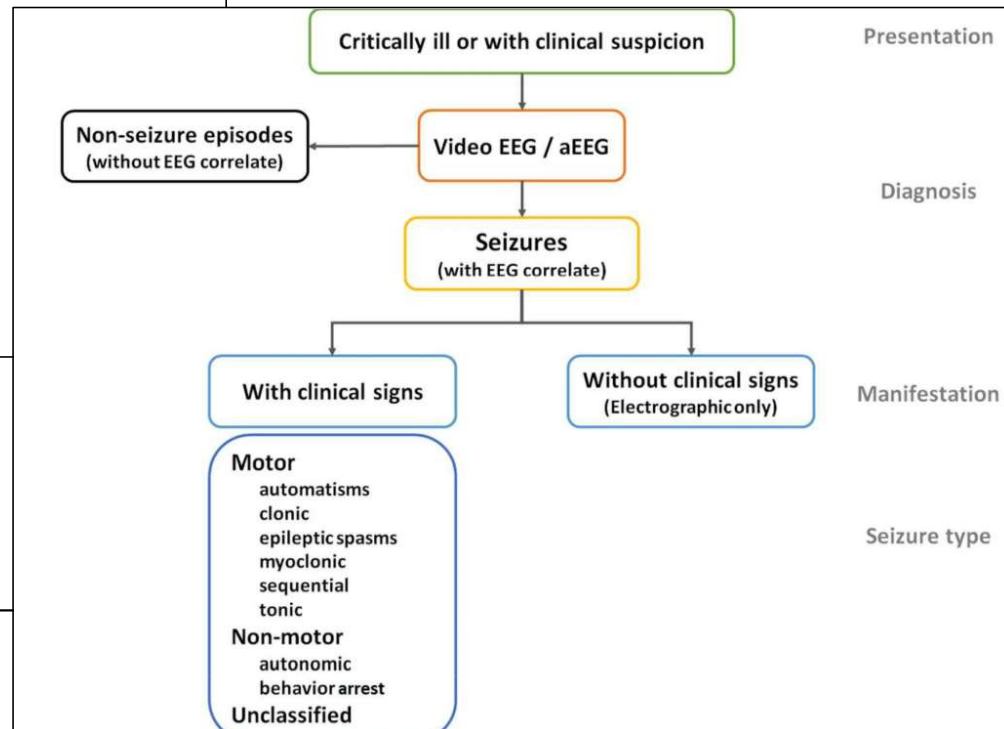
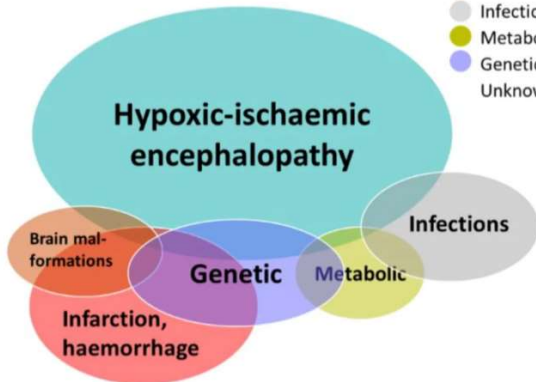


Eugen Trinka is professor and chairman of Department of Neurology, Paracelsus Medical University Salzburg Austria.

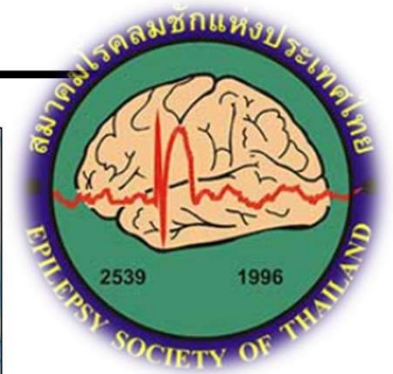
NEONATAL SEIZURE CLASSIFICATION (ONGOING)

Etiology of Neonatal Seizures

- Hypoxic-ischaemic encephalopathy (35-45%)
- Infarctions & haemorrhage (20-30%)
- Brain malformations (5-10%)
- Infections (5-20%)
- Metabolic disorders (7-20%)
- Genetic / epilepsy syndromes (6-10%)
- Unknown /other (10%)



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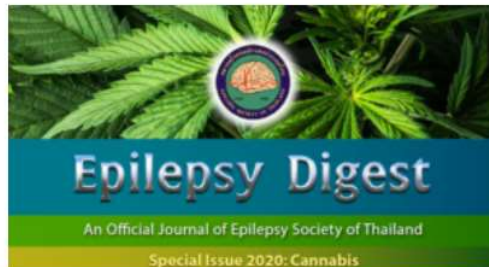


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Epilepsy Digest 2020: Special issue, Cannabis

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