

# ACNS Standardized Critical Care EEG Terminology 2021: Reference Chart

## A. EEG Background

Symmetry	Background EEG frequency	PDR	Continuity	Reactivity	State Changes	Cyclic Alternating Pattern of Encephalopathy (CAPE)	Voltage	AP Gradient	Breach effect
Symmetric	Beta	Present Specify frequency	Continuous: <1% periods of suppression (<10 μV) or attenuation (≥10μV but <50% of background voltage)	Reactive	Present with normal stage N2 sleep transients	Present	High ≥150 μV	Present	Present
Mild asymmetry <50% Voltage OR 0.5-1 Hz Frequency	Alpha	Absent		Unreactive	Present but with abnormal stage N2 sleep transients	Absent	Normal ≥20 to <150 μV	Absent	Absent
Marked asymmetry ≥50% Voltage OR >1 Hz Frequency	Theta	Unclear	Nearly continuous: 1-9% periods of suppression attenuation	SIRPIDs only	Present but without stage N2 sleep transients	Unknown/unclear	Low 10 to <20 μV	Reverse	Unclear
	Delta		Discontinuous: 10-49% periods of suppression or attenuation	Unclear	Absent		Suppressed <10 μV		
<b>Localization of Bursts (G/ L/ BI/ UI/ Mf)</b> <b>Highly Epileptiform Bursts (Present or Absent)</b> <b>Identical Bursts (Present or Absent)</b>		If Burst-suppression or Burst-attenuation then specify if: ←		Unknown					
			Burst-suppression or Burst-attenuation: 50-99% periods of suppression or attenuation						
			Suppression: >99% periods of suppression or attenuation						

## B. Sporadic Epileptiform Discharges

Prevalence
<b>Abundant</b> ≥1/10s
<b>Frequent</b> ≥1/min but <1/10s
<b>Occasional</b> ≥1/h but <1/min
<b>Rare</b> <1/h

## C. Rhythmic and Periodic Patterns (RPPs)

Main term 1	Main term 2
<b>G</b> <i>Generalized</i> - Optional: Specify frontally, occipitally, or midline predominant; or generalized, not otherwise specified.	<b>PD</b> <i>Periodic Discharges</i>
<b>L</b> <i>Lateralized</i> - Optional: Specify unilateral, bilateral asymmetric, or bilateral asynchronous - Optional: Specify lobe(s) most involved or hemispheric	<b>RDA</b> <i>Rhythmic Delta Activity</i>
<b>BI</b> <i>Bilateral Independent</i> - Optional: Specify symmetric or asymmetric - Optional: Specify lobe(s) most involved or hemispheric	<b>SW</b> <i>Spike and Wave</i> OR <i>Polyspike and Wave</i> OR <i>Sharp and Wave</i>
<b>UI</b> <i>Unilateral Independent</i> - Optional: Specify unilateral, bilateral asymmetric, or bilateral asynchronous for each pattern - Optional: Specify lobe(s) most involved	
<b>Mf</b> <i>Multifocal</i> - Optional: Specify symmetric or asymmetric - Optional: Specify lobe(s) most involved or hemispheric	

### Major modifiers

### Minor modifiers

Prevalence	Duration	Frequency	Phases <sup>1</sup>	Sharpness <sup>2</sup>	Voltage (Absolute)	Voltage (Relative) <sup>3</sup>	Stimulus Induced or Stimulus Terminated	Evolution <sup>4</sup>	Onset	Triphasic <sup>5</sup>	Lag	Polarity <sup>2</sup>
Continuous ≥90%	Very long ≥1 h	4 Hz	>3	Spiky <70 ms	High ≥150 μV	>2	SI <i>Stimulus Induced</i>	Evolving	Sudden ≤3 s	Yes	A-P <i>Anterior-Posterior</i>	Negative
		3.5 Hz	3									
Abundant 50-89%	Long 10-59 min	3 Hz	2	Sharp 70-200 ms	Medium 50-149 μV	≤2	ST <i>Stimulus Terminated</i>	Fluctuating	Gradual >3 s	No	P-A <i>Posterior-Anterior</i>	Positive
		2.5 Hz										
Frequent 10-49%	Intermediate duration 1-9.9 min	2 Hz	1	Sharply contoured >200 ms	Low 20-49 μV		Spontaneous only	Static			No	Dipole
		1.5 Hz										
Occasional 1-9%	Brief 10-59 s	1 Hz		Blunt >200 ms	Very low <20 μV		Unknown					Unclear
		0.5 Hz										
Rare <1%	Very brief <10 s	<0.5 Hz										

### Plus (+) Modifiers

<b>No +</b>
<b>+F</b> <i>Superimposed fast activity – applies to PD or RDA only</i> <b>EDB (Extreme Delta Brush): A specific subtype of +F</b>
<b>+R</b> <i>Superimposed rhythmic activity – applies to PD only</i>
<b>+S</b> <i>Superimposed sharp waves or spikes, or sharply contoured – applies to RDA only</i>
<b>+FR</b> <i>If both subtypes apply – applies to PD only</i>
<b>+FS</b> <i>If both subtypes apply – applies to RDA only</i>

NOTE 1: Phases: Applies to PD and SW only, including the slow wave of the SW complex

NOTE 2: Sharpness and Polarity: Applies to the predominant phase of PD and the spike or sharp component of SW only

NOTE 3: Relative voltage: Applies to PD only

NOTE 4: Evolution: Refers to frequency, location or morphology

NOTE 5: Triphasic: Applies to PD or SW only

## D. Electrographic and Electroclinical Seizures

### Electrographic Seizure (ESz)

Either:

- A) Epileptiform discharges averaging >2.5 Hz for ≥10 s (>25 discharges in 10 s), OR
- B) Any pattern with definite evolution and lasting ≥10 s

### Electroclinical Seizure (ECSz)

Any EEG pattern with either:

- A) Definite clinical correlate time-locked to the pattern (of any duration), OR
- B) EEG and clinical improvement with a parenteral (typically IV) anti-seizure medication

### Electrographic Status Epilepticus (ESE)

An electrographic seizure for either:

- A) ≥10 continuous minutes, OR
- B) A total duration of ≥20% of any 60-minute period of recording.

### Electroclinical Status Epilepticus (ECSE)

An electroclinical seizure for either

- A) ≥10 continuous minutes, OR
- B) A total duration of ≥20% of any 60-minute period of recording, OR
- C) ≥5 continuous minutes if the seizure is convulsive (i.e., with bilateral tonic-clonic motor activity).

**Possible ECSE:** An RPP that qualifies for the IIC (below) that is present for ≥10 continuous minutes or for a total duration of ≥20% of any 60-minute period of recording, which shows EEG improvement with a parenteral anti-seizure medication **BUT** without clinical improvement.

## E. Brief Potentially Ictal Rhythmic Discharges (BIRDs)

Focal (including L, BI, UI or Mf) or generalized rhythmic activity >4 Hz (at least 6 waves at a regular rate) lasting ≥0.5 to <10 s, not consistent with a known normal pattern or benign variant, not part of burst-suppression or burst-attenuation, without definite clinical correlate, and that has at least one of A, B or C below:

**Definite BIRDs** feature either:

- A. Evolution (“evolving BIRDs”) OR
- B. Similar morphology and location as interictal epileptiform discharges or seizures in the same patient

**Possible BIRDs** are

- C. Sharply contoured but without (a) or (b) above

## F. Ictal-Interictal Continuum (IIC)

1. Any PD or SW pattern that averages >1.0 Hz but ≤2.5 Hz over 10 s (>10 but ≤ 25 discharges in 10 s); OR
  2. Any PD or SW pattern that averages ≥0.5 Hz and ≤1 Hz over 10 s (≥5 and ≤10 discharges in 10 s), and has a plus modifier or fluctuation; OR
  3. Any lateralized RDA averaging >1 Hz for at least 10 s (at least 10 waves in 10 s) with a plus modifier or fluctuation;
- AND
4. Does not qualify as an ESz or ESE.