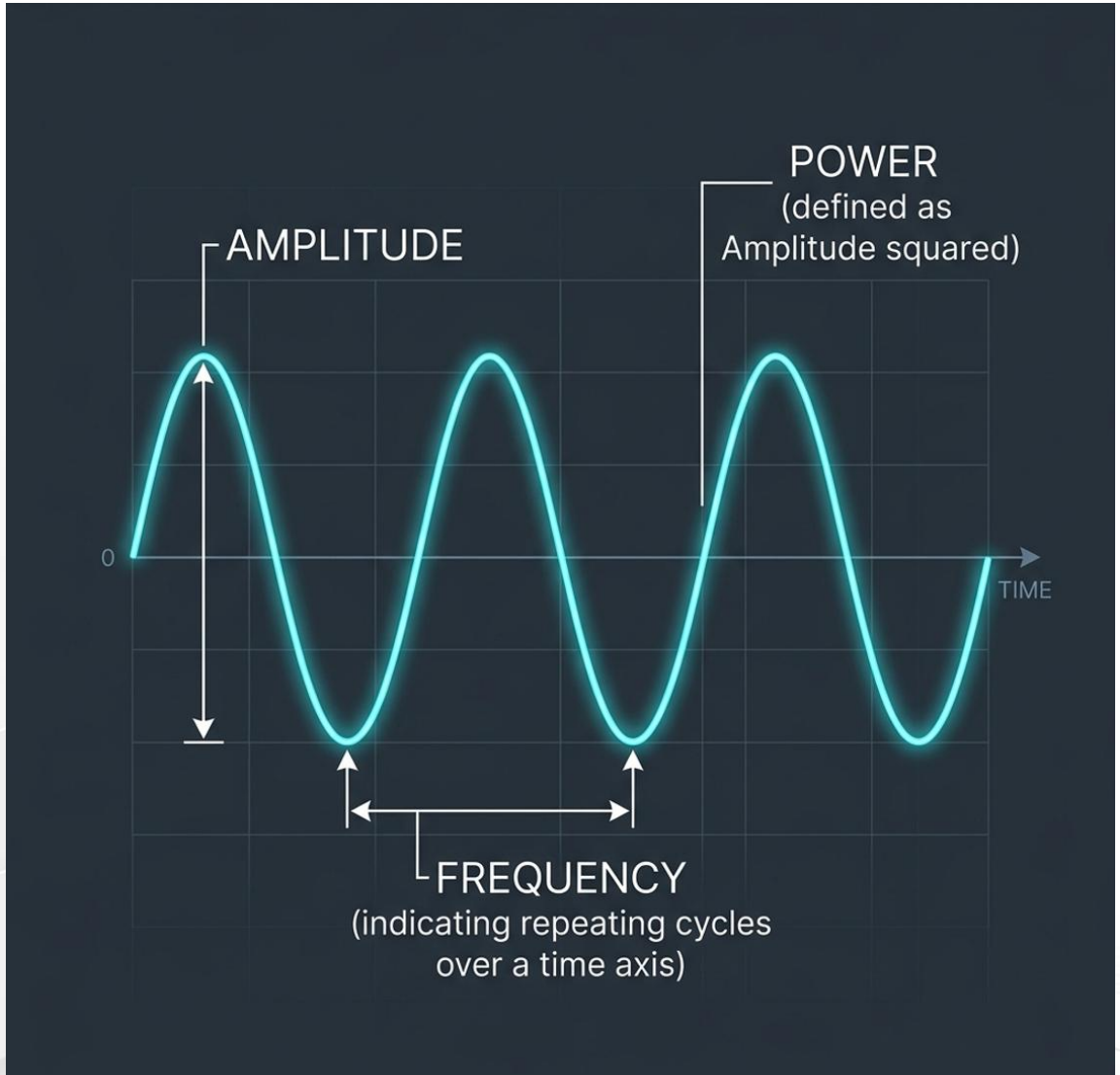
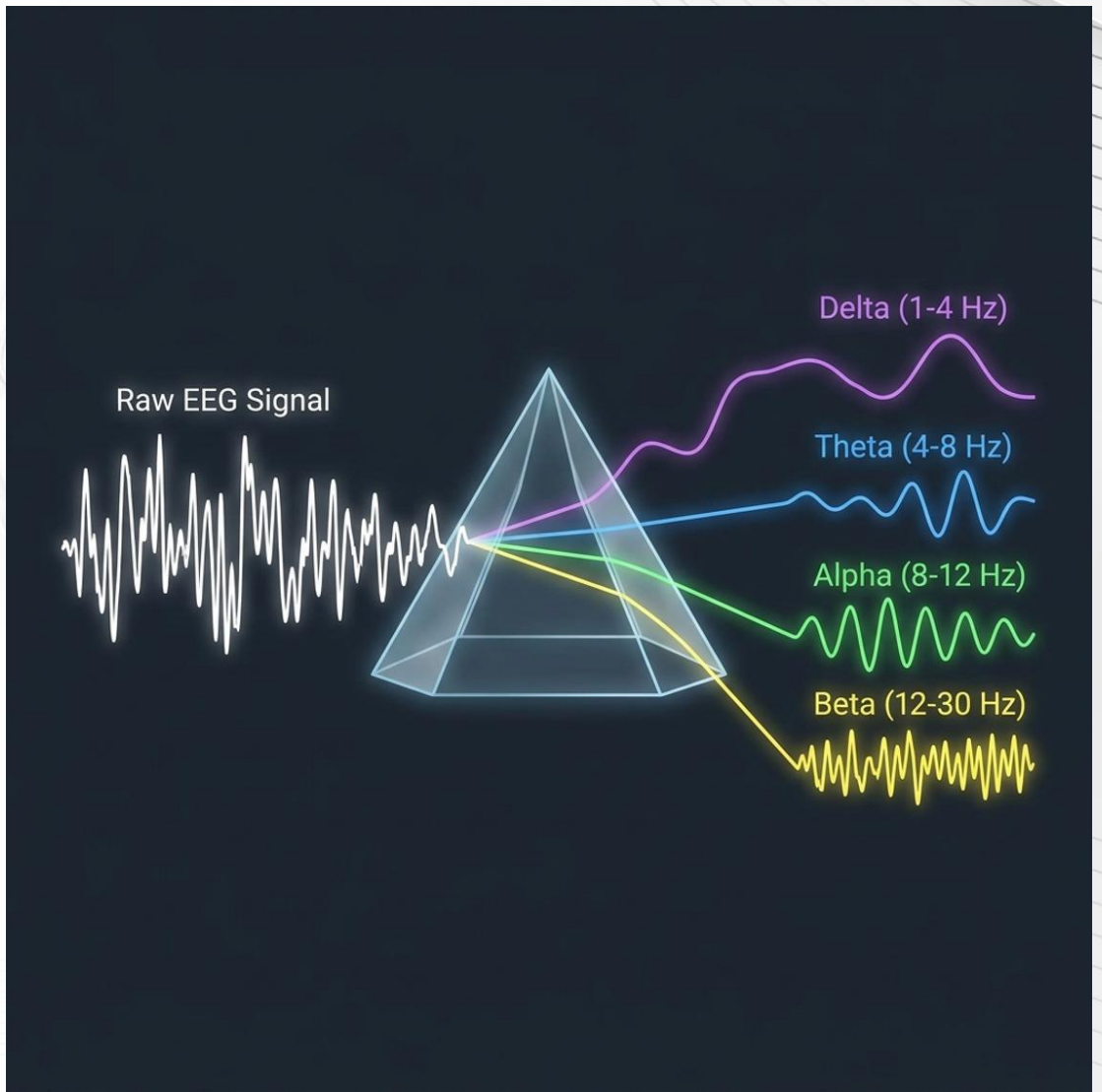
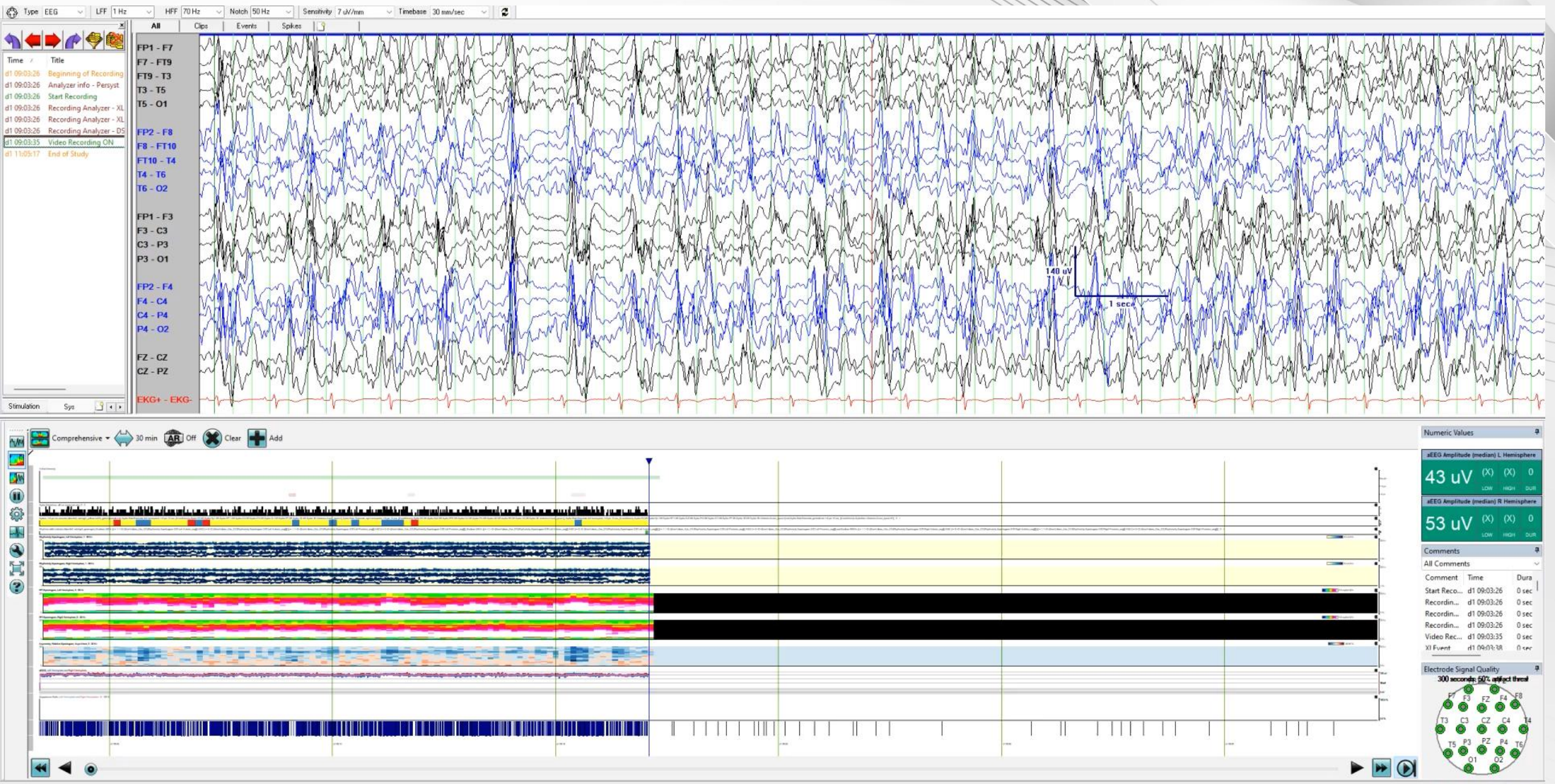
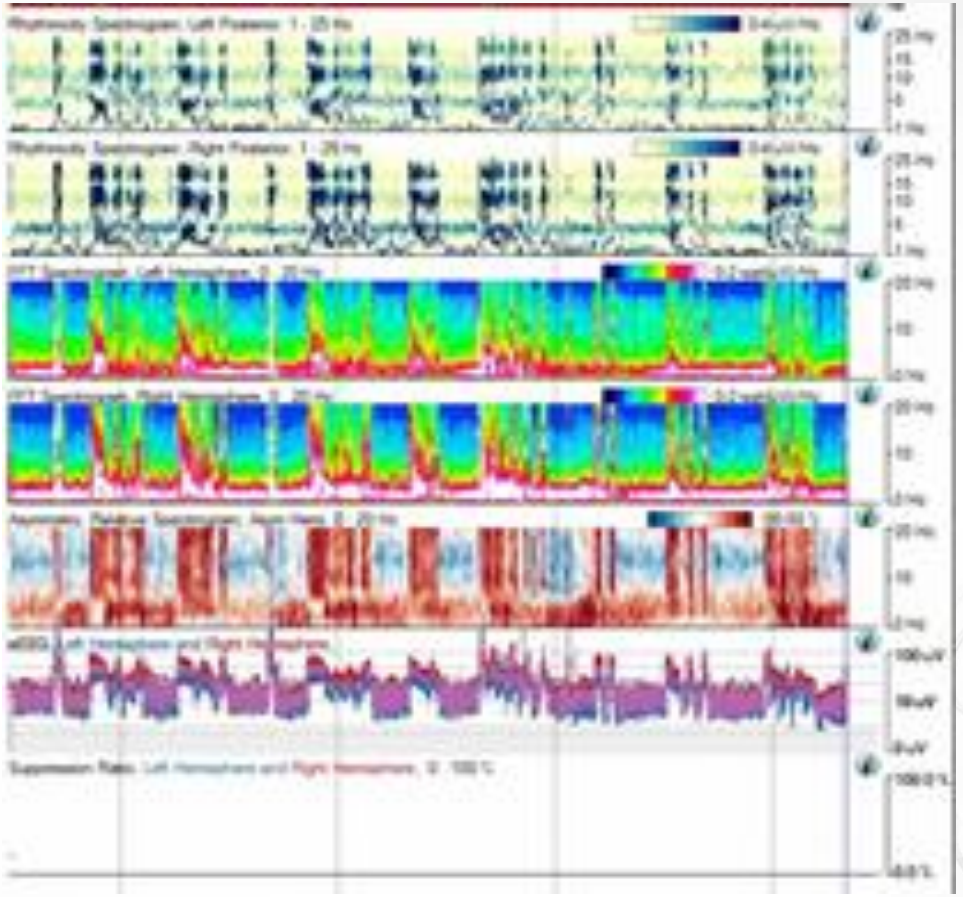
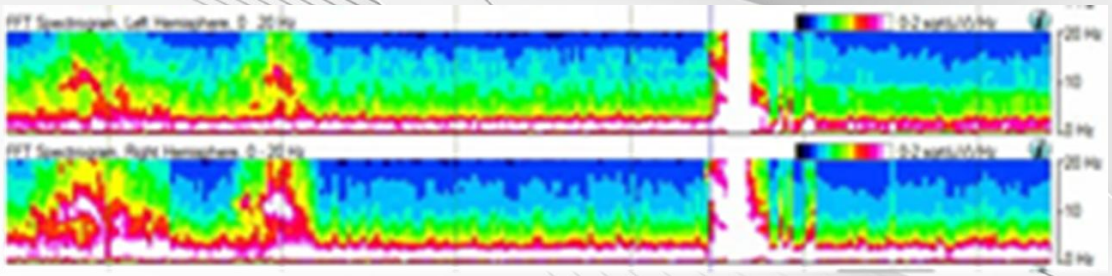
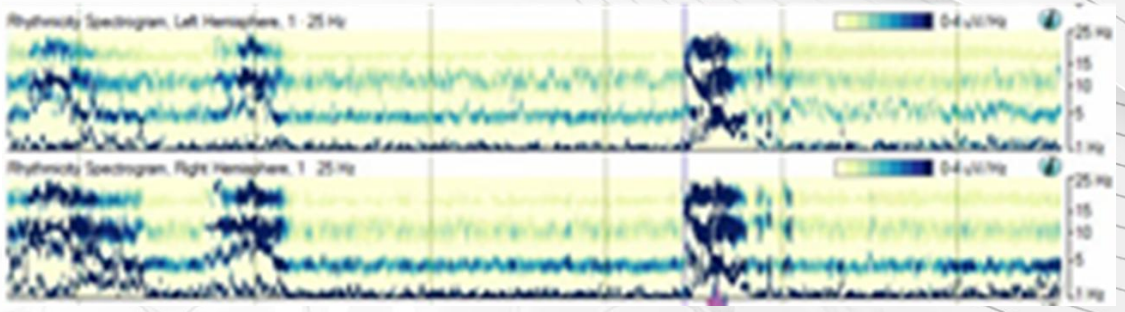

POWER
(defined as
Amplitude squared)
AMPLITUDE
0
TIME
FREQUENCY
(indicating repeating cycles
over a time axis)

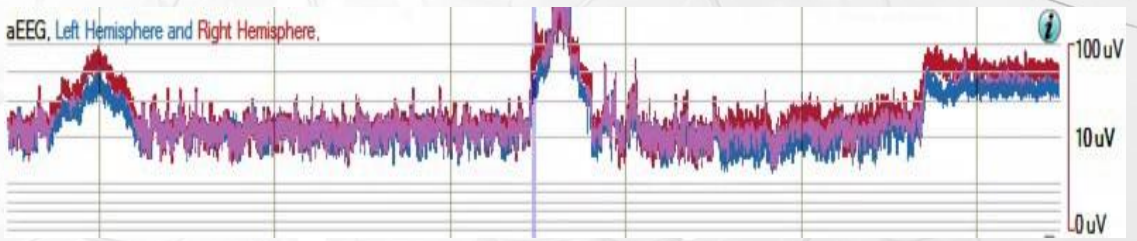

Raw EEG Signal
Delta (1-4 Hz)
Theta (4-8 Hz)
Alpha (8-12 Hz)
Beta (12-30 Hz)

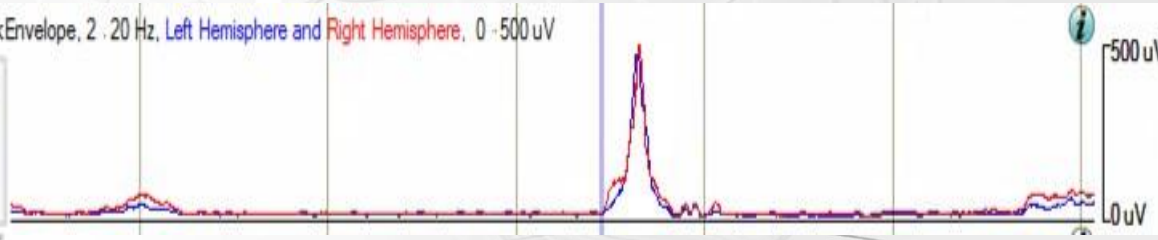

Type EEG
LFF 1 Hz
HFF 70 Hz
Notch 50 Hz
Sensitivity 7 uV/mm
Timebase 30 mm/sec
All
Clips
Events
Spikes
Time
Title
d1 09:03:26 Beginning of Recording
d1 09:03:26 Analyzer info - Persyst
d1 09:03:26 Start Recording
d1 09:03:26 Recording Analyzer - XL
d1 09:03:26 Recording Analyzer - XL
d1 09:03:26 Recording Analyzer - DS
d1 09:03:35 Video Recording ON
d1 11:05:17 End of Study
Stimulation
Sys
FP1 - F7
F7 - FT9
FT9 - T3
T3 - T5
T5 - O1
FP2 - F8
F8 - FT10
FT10 - T4
T4 - T6
T6 - O2
FP1 - F3
F3 - C3
C3 - P3
P3 - O1
FP2 - F4
F4 - C4
C4 - P4
P4 - O2
FZ - CZ
CZ - PZ
EKG+ - EKG-
140 uV
1 sec
Comprehensive
30 min
AR Off
Clear
Add
Numeric Values
aEEG Amplitude (median) L Hemisphere
43 uV
aEEG Amplitude (median) R Hemisphere
53 uV
Comments
All Comments
Comment
Time
Dura
Start Reco... d1 09:03:26 0 sec
Recordin... d1 09:03:26 0 sec
Recordin... d1 09:03:26 0 sec
Recordin... d1 09:03:26 0 sec
Video Rec... d1 09:03:35 0 sec
Electrode Signal Quality
300 seconds; 50% artifact threst
Pinratchada Pinthong
Age: 36 y



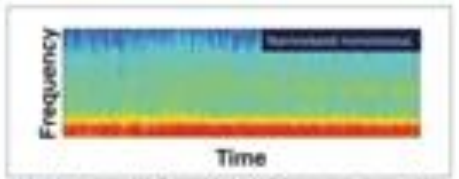


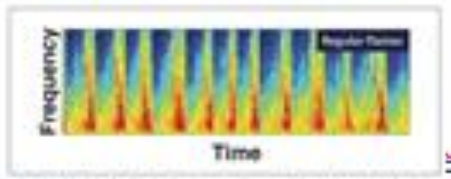


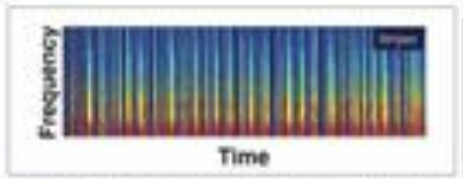

aEEG, Left Hemisphere and Right Hemisphere,
100 uV
10 uV
0 uV

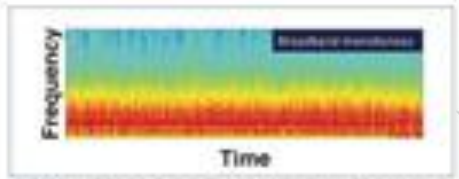

PeakEnvelope, 2 - 20 Hz, Left Hemisphere and Right Hemisphere, 0 - 500 uV
500 uV
0 uV

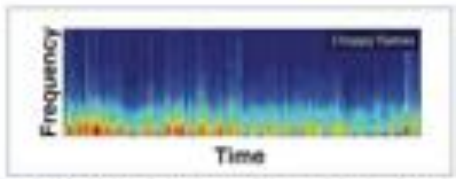

Frequency
Time


Frequency
Time


Frequency
Time


Frequency
Time


Frequency
Time


Frequency
Time

Category	qEEG Trend	Key Parameters & Visuals	Clinical Utility
Frequency	**FFT / CDSA**	Y-axis: Freq (0-20 Hz). Z-axis: Power color scale (warm/cool).	Background shifts; seizure 'flames'
Frequency	**Rhythmicity**	Autocorrelation-based. Yellow to Dark Blue (high rhythmicity).	Seizure detection & evolution tracking
Frequency	**Alpha-Delta Ratio**	Ratio of Alpha to Delta power. Left = Blue, Right = Red.	Symmetric vs. asymmetric ischemia detection
Frequency	**Relative Alpha Var.**	RAV cityscape (variable) vs. prairie (flat). Y-axis: 0-1.	DCI & vasospasm detection (SAH)
Asymmetry	**Asymmetry Spect.**	Hemispheric difference. Red = Right, Blue = Left, White = Sym.	Focal slowing, structural lesions, breach rhythm
Asymmetry	**Asymmetry Indices**	Green vector. Up = Right, Down = Left ('Right is Up').	Hemispheric power shift quantification
Amplitude	**aEEG / Envelope**	Semi-log Y-axis. Median filtering (Envelope).	Seizure peaks; suppressed background ranges
Amplitude	**Suppression Ratio**	Percent of EEG suppressed below voltage threshold.	Cardiac arrest prognostication; burst-suppression

Case 1: The Midnight Seizure Alert?

Clinical History & Presentation

Patient: 70-year-old man.

Admitted for coil embolization of an unruptured anterior communicating artery (Acomm) aneurysm.

Complications: Complicated by intraoperative rupture leading to intraventricular hemorrhage (IVH) and acute obstructive hydrocephalus.

cEEG ordered overnight for evaluation of persistently poor neurological exam.

The qEEG Dilemma

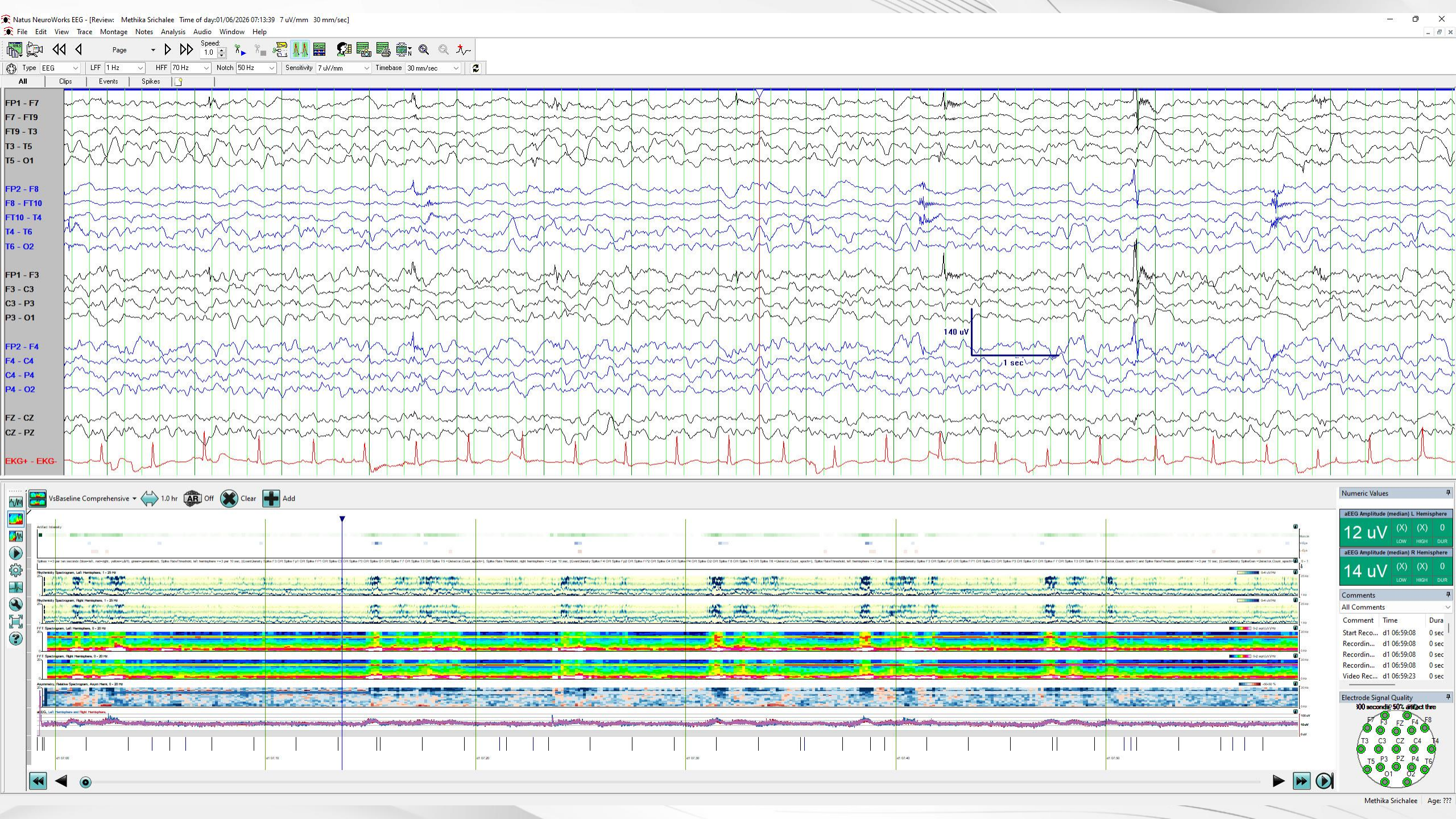
qEEG Trends show repeating, rhythmic, cyclic deviations across FFT, Rhythmicity, and Amplitude trends.

Differential Diagnosis on Trends:

Electrographic Status Epilepticus (looks like repeating seizures)

Cyclic alternating non-epileptiform pattern

Key Visual Difference: Deviations are less 'crisp' and lack the clear frequency/spatial evolution of Case


Natus NeuroWorks EEG - [Review: Methika Srichalee Time of day:01/06/2026 07:13:39 7 uV/mm 30 mm/sec]
File Edit View Trace Montage Notes Analysis Audio Window Help
Page
Speed: 1.0
Type EEG LFF 1 Hz HFF 70 Hz Notch 50 Hz Sensitivity 7 uV/mm Timebase 30 mm/sec
All Clips Events Spikes
FP1 - F7
F7 - FT9
FT9 - T3
T3 - T5
T5 - O1
FP2 - F8
F8 - FT10
FT10 - T4
T4 - T6
T6 - O2
FP1 - F3
F3 - C3
C3 - P3
P3 - O1
FP2 - F4
F4 - C4
C4 - P4
P4 - O2
FZ - CZ
CZ - PZ
EKG+ - EKG-
140 uV
1 sec
VsBaseline Comprehensive
1.0 hr
AR Off
Clear
Add
Numeric Values
aEEG Amplitude (median) L Hemisphere
12 uV
aEEG Amplitude (median) R Hemisphere
14 uV
LOW
HIGH
DUR
Comments
All Comments
Comment Time Dura
Start Reco... d1 06:59:08 0 sec
Recordin... d1 06:59:08 0 sec
Recordin... d1 06:59:08 0 sec
Recordin... d1 06:59:08 0 sec
Video Rec... d1 06:59:23 0 sec
Electrode Signal Quality
300 seconds: 50% artifact thre
F7 F3 FZ F4 F8
T3 C3 CZ C4 T4
T5 P3 PZ P4 T6
O1 O2
Methika Srichalee
Age: ???

Case 2: Encephalopathy and Sparkling Visuals

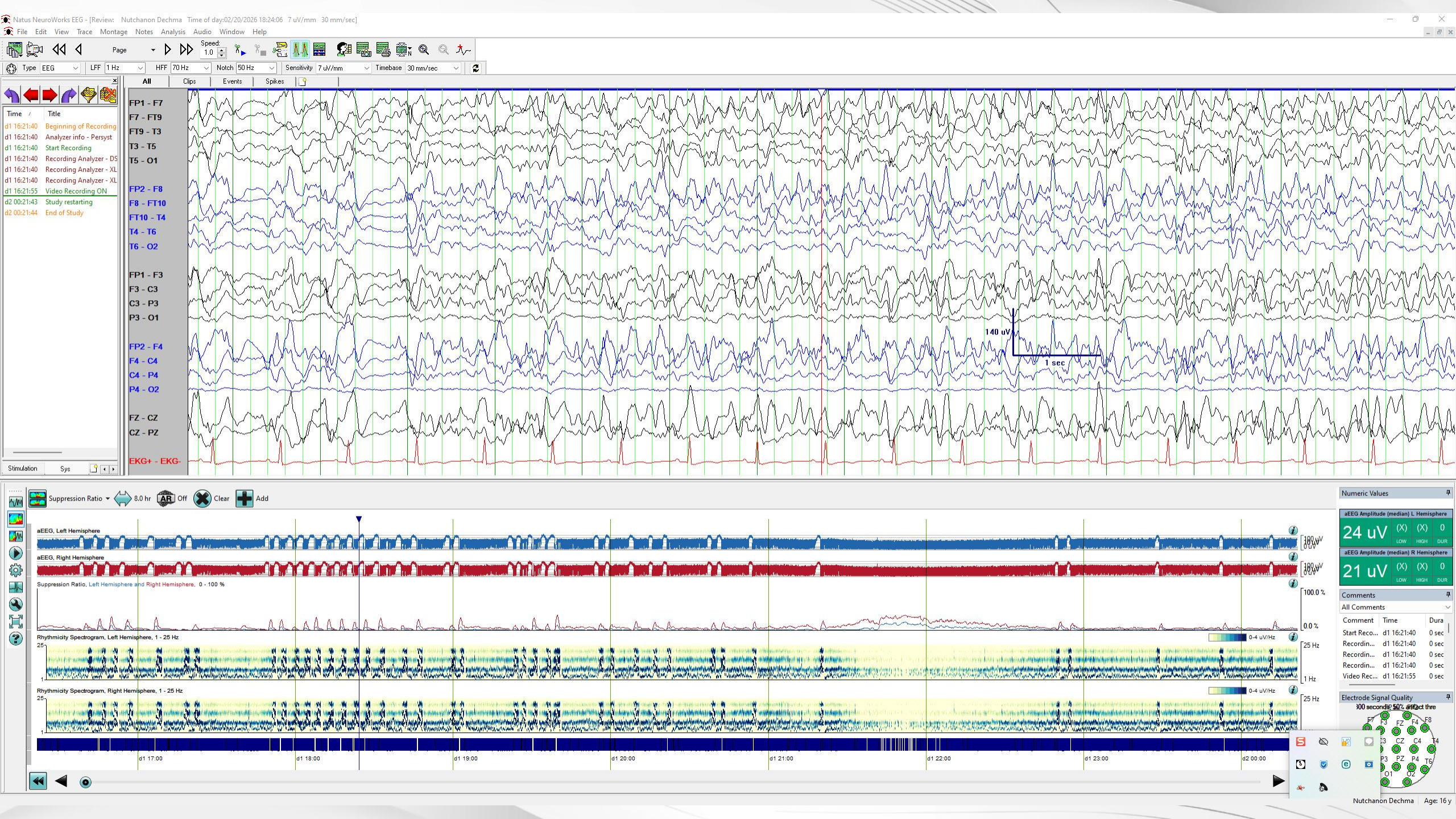
Clinical History & Presentation

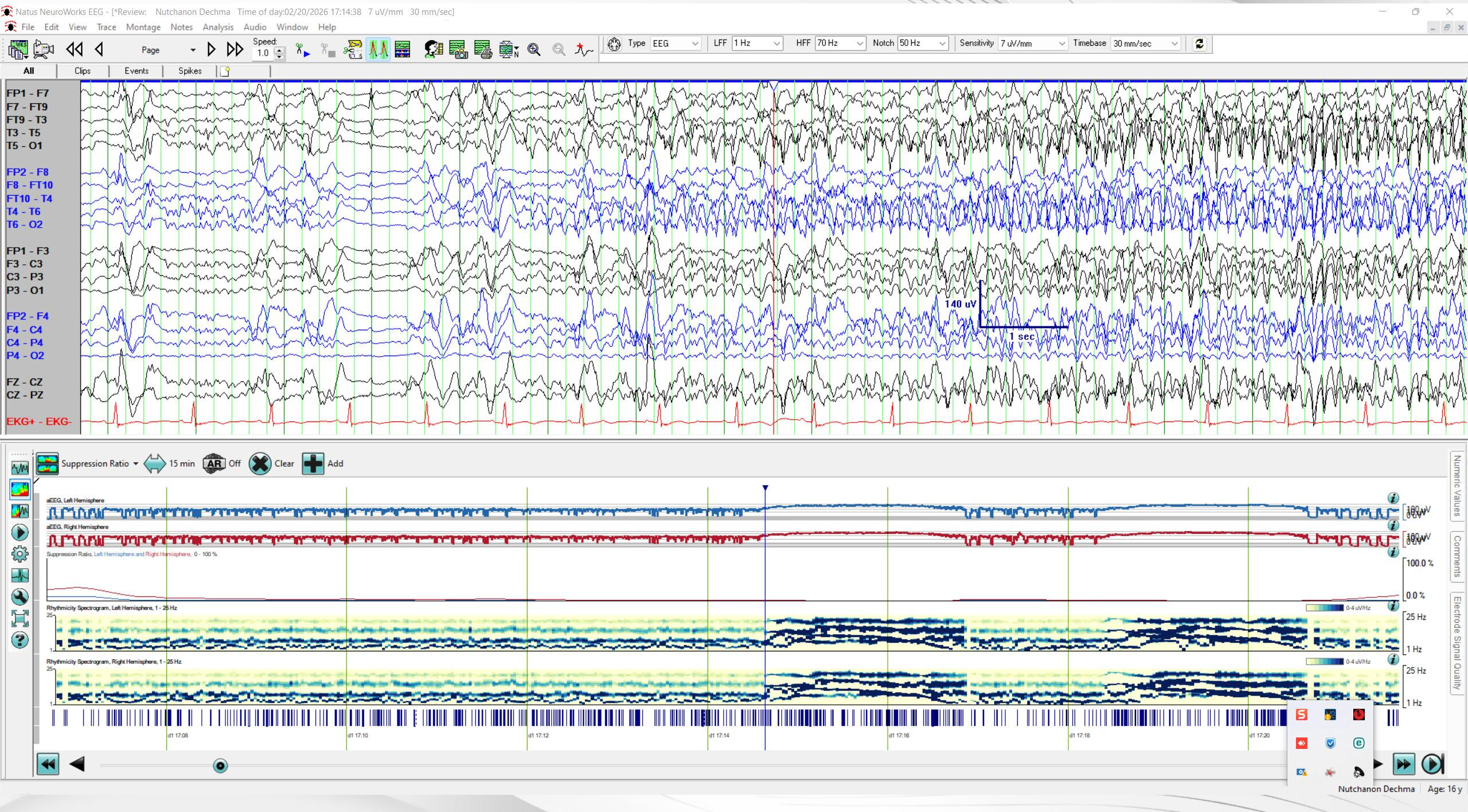
Patient: 25-year-old woman, history of drug-resistant focal epilepsy; missed several medication doses.

Presentation: Encephalopathic, fluctuating 'sparkles' in left visual field, progressing to left arm/leg clonic movements.

Post-Emergency Treatment: Received 1st and 2nd line anti-seizure agents. Clonic movements stopped, but remains deeply encephalopathic.

cEEG connected to evaluate for non-convulsive status epilepticus. First 20 minutes ready for review.


Natus NeuroWorks EEG - [Review: Nutchanon Dechma Time of day:02/20/2026 18:24:06 7 uV/mm 30 mm/sec]
File Edit View Trace Montage Notes Analysis Audio Window Help
Type EEG LFF 1 Hz HFF 70 Hz Notch 50 Hz Sensitivity 7 uV/mm Timebase 30 mm/sec
All Clips Events Spikes
Time Title
d1 16:21:40 Beginning of Recording
d1 16:21:40 Analyzer info - Persyst
d1 16:21:40 Start Recording
d1 16:21:40 Recording Analyzer - DS
d1 16:21:40 Recording Analyzer - XL
d1 16:21:40 Recording Analyzer - XL
d1 16:21:55 Video Recording ON
d2 00:21:43 Study restarting
d2 00:21:44 End of Study
Stimulation Sys
FP1 - F7
F7 - FT9
FT9 - T3
T3 - T5
T5 - O1
FP2 - F8
F8 - FT10
FT10 - T4
T4 - T6
T6 - O2
FP1 - F3
F3 - C3
C3 - P3
P3 - O1
FP2 - F4
F4 - C4
C4 - P4
P4 - O2
FZ - CZ
CZ - PZ
EKG+ - EKG-
140 uV
1 sec
Suppression Ratio 8.0 hr AR Off Clear Add
aEEG, Left Hemisphere
aEEG, Right Hemisphere
Suppression Ratio, Left Hemisphere and Right Hemisphere, 0 - 100 %
Rhythmicity Spectrogram, Left Hemisphere, 1 - 25 Hz
Rhythmicity Spectrogram, Right Hemisphere, 1 - 25 Hz
d1 17:00
d1 18:00
d1 19:00
d1 20:00
d1 21:00
d1 22:00
d1 23:00
d2 00:00
Numeric Values
aEEG Amplitude (median) L Hemisphere
24 uV
aEEG Amplitude (median) R Hemisphere
21 uV
Comments
All Comments
Comment Time Dura
Start Reco... d1 16:21:40 0 sec
Recordin... d1 16:21:40 0 sec
Recordin... d1 16:21:40 0 sec
Recordin... d1 16:21:40 0 sec
Video Rec... d1 16:21:55 0 sec
Electrode Signal Quality
Nutchanon Dechma Age: 16 y


Natus NeuroWorks EEG - [*Review: Nutchanon Dechma Time of day:02/20/2026 17:14:38 7 uV/mm 30 mm/sec]
File Edit View Trace Montage Notes Analysis Audio Window Help
Page
Speed: 1.0
Type EEG
LFF 1 Hz
HFF 70 Hz
Notch 50 Hz
Sensitivity 7 uV/mm
Timebase 30 mm/sec
All
Clips
Events
Spikes
FP1 - F7
F7 - FT9
FT9 - T3
T3 - T5
T5 - O1
FP2 - F8
F8 - FT10
FT10 - T4
T4 - T6
T6 - O2
FP1 - F3
F3 - C3
C3 - P3
P3 - O1
FP2 - F4
F4 - C4
C4 - P4
P4 - O2
FZ - CZ
CZ - PZ
EKG+ - EKG-
140 uV
1 sec
Suppression Ratio
15 min
AR Off
Clear
Add
aEEG, Left Hemisphere
aEEG, Right Hemisphere
Suppression Ratio, Left Hemisphere and Right Hemisphere, 0 - 100 %
100.0 %
0.0 %
Rhythmicity Spectrogram, Left Hemisphere, 1 - 25 Hz
Rhythmicity Spectrogram, Right Hemisphere, 1 - 25 Hz
25 Hz
1 Hz
d1 17:08
d1 17:10
d1 17:12
d1 17:14
d1 17:16
d1 17:18
d1 17:20
Numeric Values
Comments
Electrode Signal Quality
Nutchanon Dechma
Age: 16 y

CAPE Definition (ACNS 2021)

Cyclic Alternating Pattern of Encephalopathy:

Spontaneous, regular alternation between two distinct background patterns (which may include Rhythmic or Periodic Patterns [RPPs]).

Duration: Each pattern must last at least 10 seconds.

Repetition: Must alternate spontaneously for at least six cycles.

Clinical Features & Clinical Pitfalls

Pattern A: Lower amplitude theta/delta encephalopathic background.

Pattern B: Higher amplitude delta slowing with overriding faster frequencies.

Common Etiologies: Subarachnoid hemorrhage, IVH, toxic-metabolic encephalopathy (e.g., uremia - where the FFT deviations look like literal 'capes').

The Seizure Mimic Pitfall: Because it alternates regularly, it looks like status on trends. However, it is non-epileptiform. Treating CAPE with anesthetics leads to dangerous over-sedation, hypotension, and delayed awakening.

Case 2 :

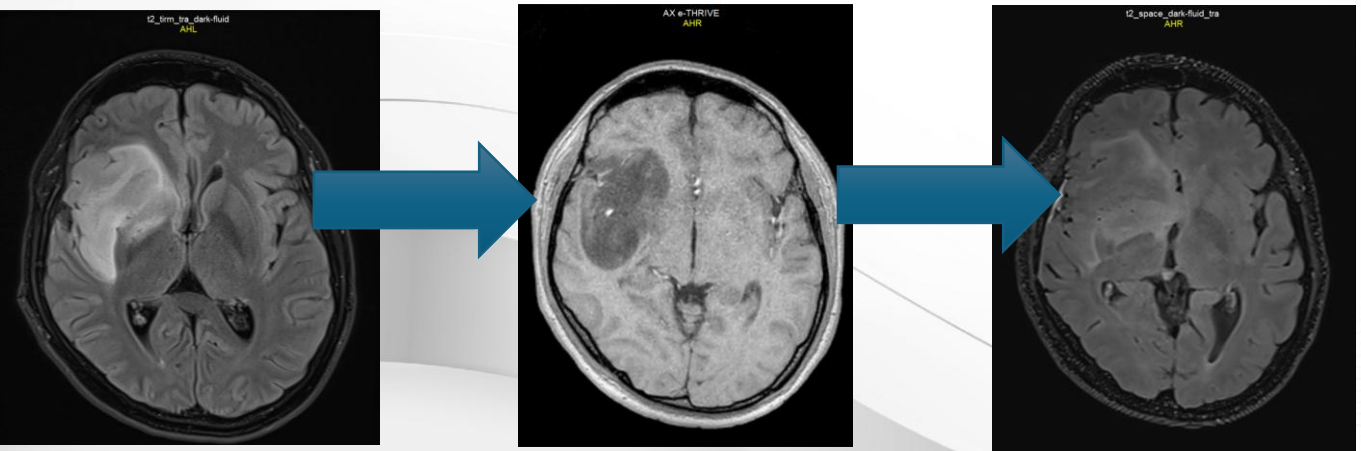
EST 30th ANNIVERSARY ANNUAL MEETING

Clinical History

30-year-old man with recurrent right temporo-insular astrocytoma and focal epilepsy

Initially presented with focal seizures characterized by epigastric aura and impaired awareness Underwent three tumor resections, lost to follow-up for two years

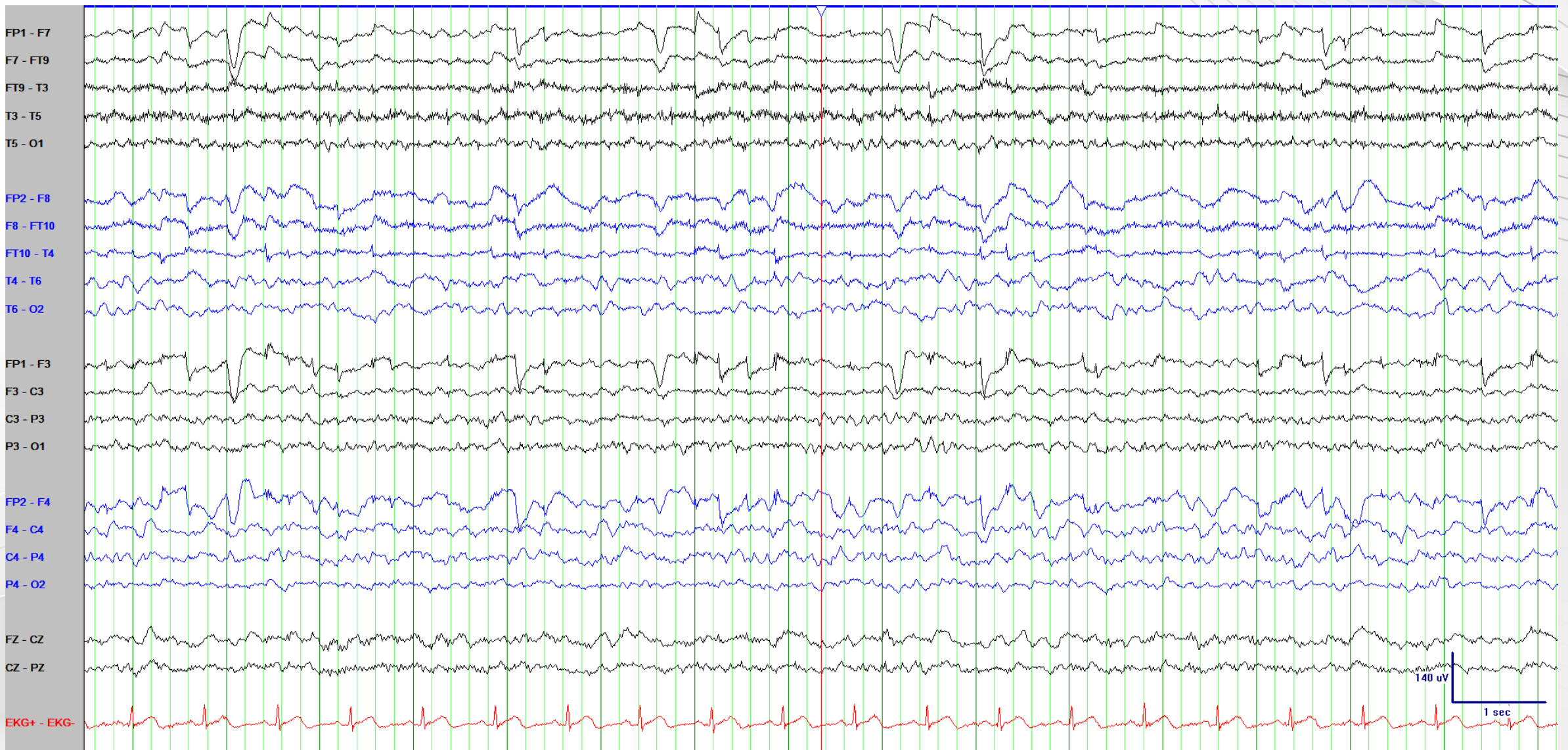
MRI in June 2026 demonstrated marked tumor progression, with multiple enhancing right fronto-insular lesions and extension across the midline into the left anterior temporal region

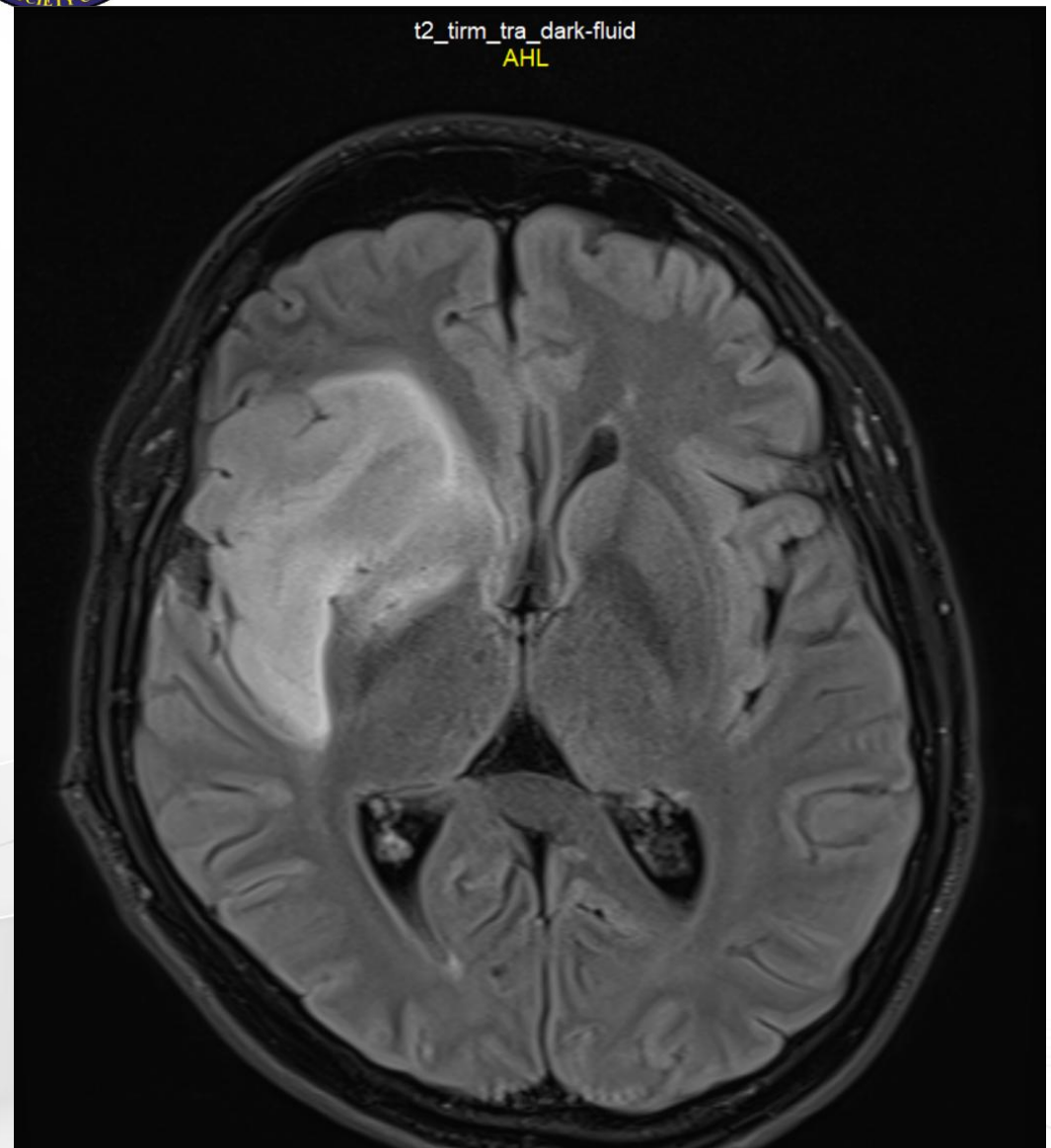


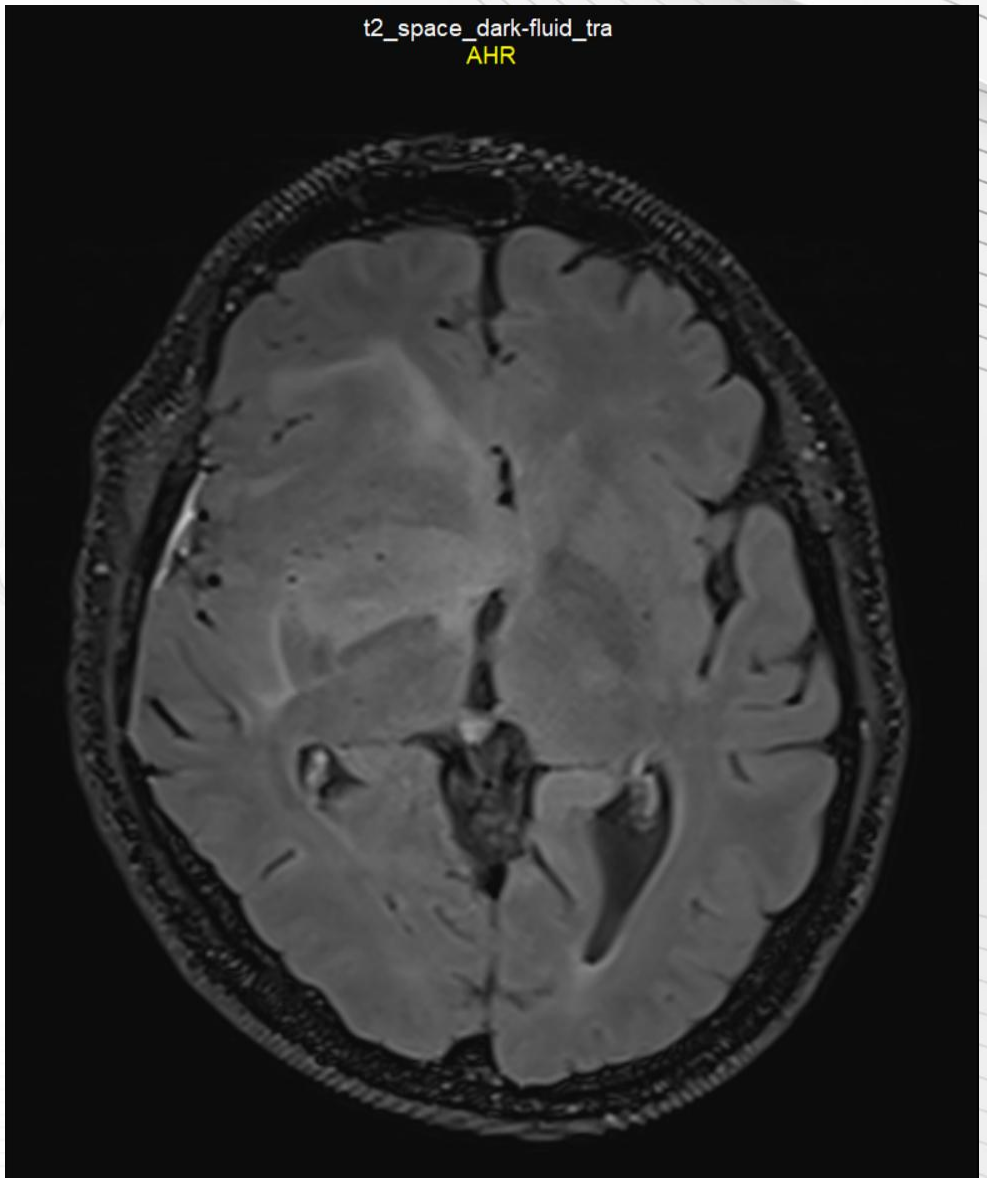
Electrophysiological Challenge

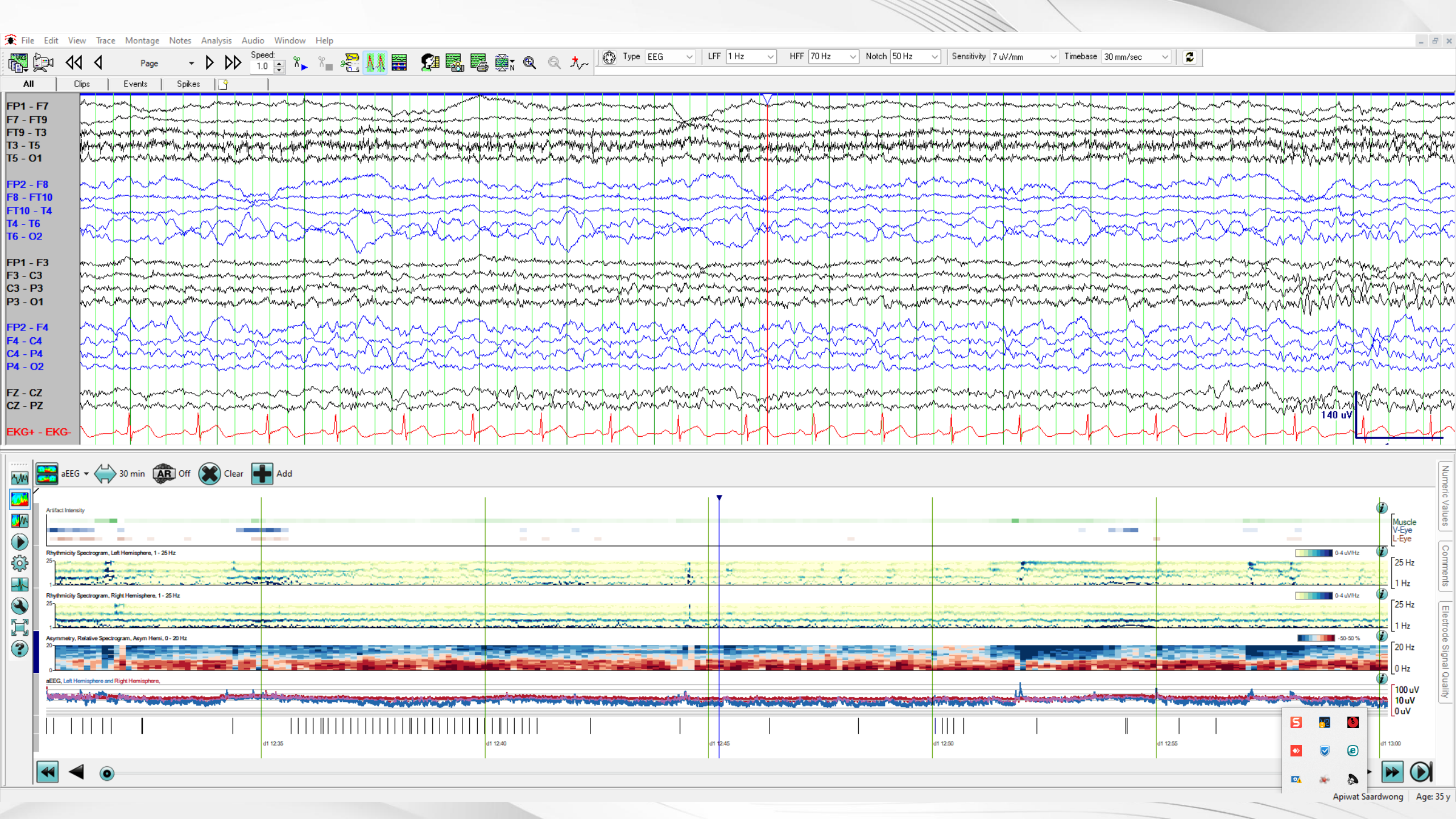
Developed worsening neurological deficits and increased seizure activity after surgery
Continuous EEG (cEEG) monitoring was initiated to detect subclinical seizures and guide further management

EST 30th ANNIVERSARY ANNUAL MEETING




t2_tirm_tra_dark-fluid
AHL

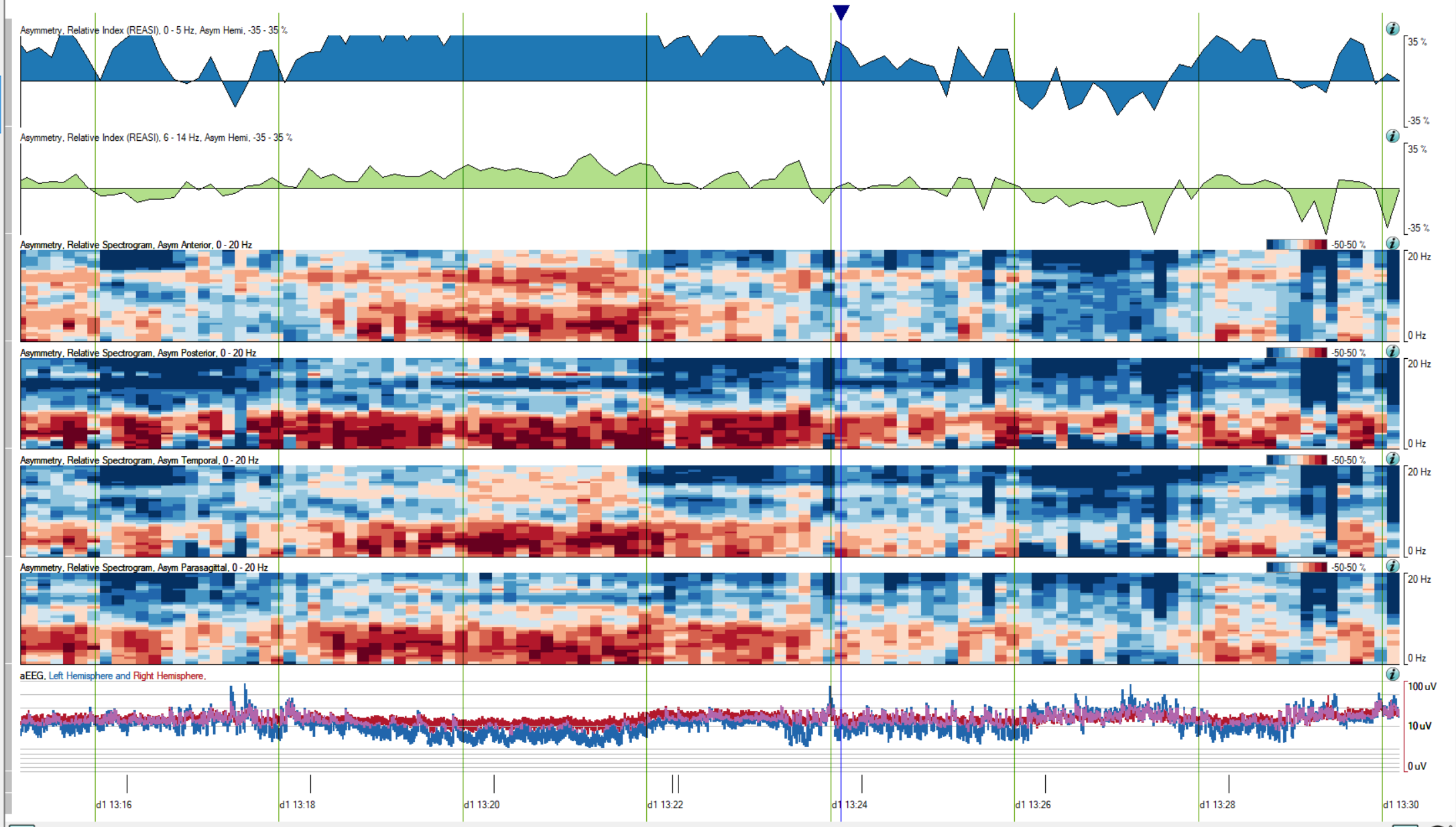

t2_space_dark-fluid_tra
AHR


File Edit View Trace Montage Notes Analysis Audio Window Help
Page
Speed: 1.0
Type EEG
LFF 1 Hz
HFF 70 Hz
Notch 50 Hz
Sensitivity 7 uV/mm
Timebase 30 mm/sec
All
Clips
Events
Spikes
FP1 - F7
F7 - FT9
FT9 - T3
T3 - T5
T5 - O1
FP2 - F8
F8 - FT10
FT10 - T4
T4 - T6
T6 - O2
FP1 - F3
F3 - C3
C3 - P3
P3 - O1
FP2 - F4
F4 - C4
C4 - P4
P4 - O2
FZ - CZ
CZ - PZ
EKG+ - EKG-
140 uV
aEEG
30 min
AR Off
Clear
Add
Artifact Intensity
Muscle
V-Eye
L-Eye
Rhythmicity Spectrogram, Left Hemisphere, 1 - 25 Hz
Rhythmicity Spectrogram, Right Hemisphere, 1 - 25 Hz
Asymmetry, Relative Spectrogram, Asym Hemi, 0 - 20 Hz
aEEG, Left Hemisphere and Right Hemisphere,
100 uV
10 uV
0 uV
Numeric Values
Comments
Electrode Signal Quality
Apiwat Saardwong
Age: 35 y

Persyst - Modify Template Mode - [Saardwong, Apiwat ; Station: Pni-record8; Date: 2026.07.15; Start: 12:29:51; Duration: 01:00:19; File: Saardwong~ Api_871dc6]

Asymmetry | 15 min | AR Off | Clear | Add

Open
Show EEG
Show Trends
Split Screen
Process
Show Patient
Preferences
Spike Review
Tools
Full Screen
Help



Numeric Values

aEEG Amplitude (median) L Hemisphere

16 uV	(X) LOW	(X) HIGH	0 DUR

aEEG Amplitude (median) R Hemisphere

16 uV	(X) LOW	(X) HIGH	0 DUR

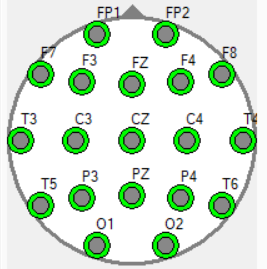
Comments

All Comments

Comment	Time	Dura
Start Reco...	d1 12:30:11	0 sec
Recordin...	d1 12:30:11	0 sec
Recordin...	d1 12:30:11	0 sec
Recordin...	d1 12:30:11	0 sec
Video Rec...	d1 12:30:11	0 sec
Saardwon...	d1 12:30:20	0 sec
Eyes Open	d1 12:30:44	0 sec
Cont.slow...	d1 12:30:59	0 sec
Eyes Closed	d1 12:31:11	0 sec
C3 test	d1 12:31:26	0 sec
T4 test	d1 12:31:38	0 sec
PDR 9-10	d1 12:32:19	0 sec
Saardwon...	d1 12:32:20	0 sec
Saardwon...	d1 12:34:21	0 sec

Electrode Signal Quality

Last 300 seconds, 50% artifact threshold



Video Player

Case 4: Neuroprognostication after Cardiac Arrest

Case Outline: Post-Cardiac Arrest

Patients: Two patients, admitted following out-of-hospital cardiac arrest. Connected to cEEG as part of post-arrest monitoring.

Clinical Outcome: Both patients eventually developed progressive cerebral edema, herniated, and died.

Research Window: Retrospective review of qEEG trends during the hours preceding clinical herniation.

qEEG Timeline vs. Clinical Herniation

Patient 1:

qEEG Changes (14:00 Day 1): Drop in high/low frequency power, loss of rhythmicity, rising suppression ratio, and asymmetry shift to Left hemisphere.

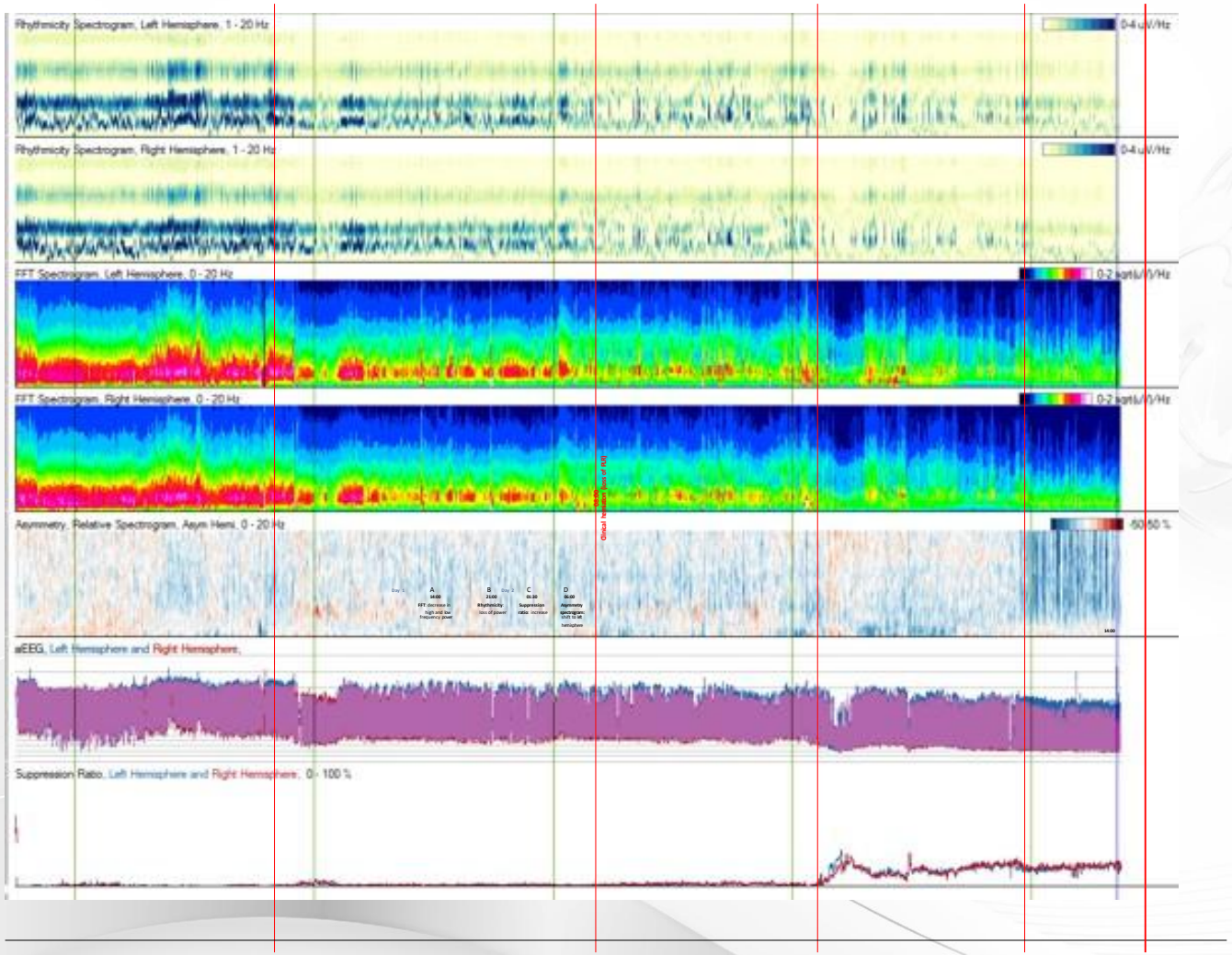
Clinical Sign (08:00 Day 2): Loss of pupillary light reflex (PLR), right pupil first. Lead time: 20 hours.

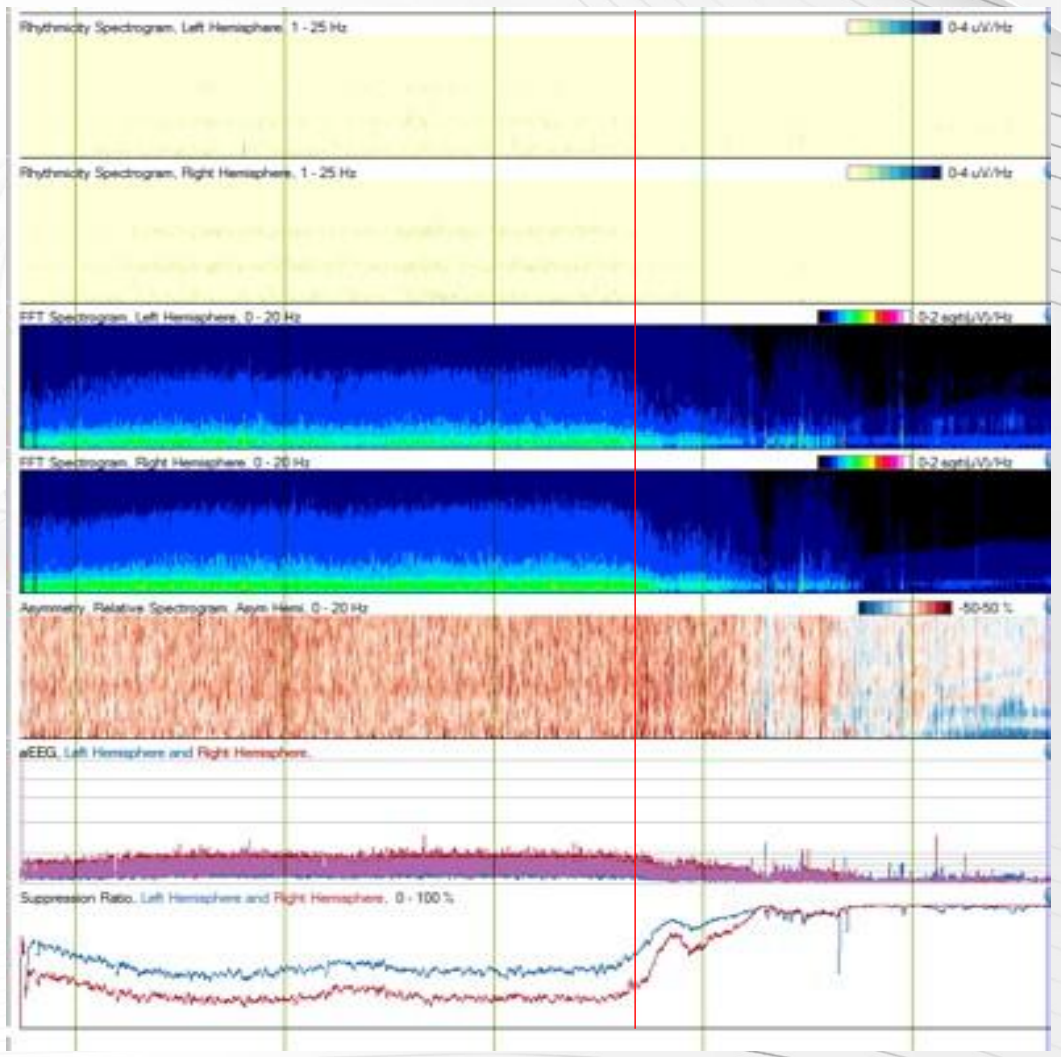
Patient 2:

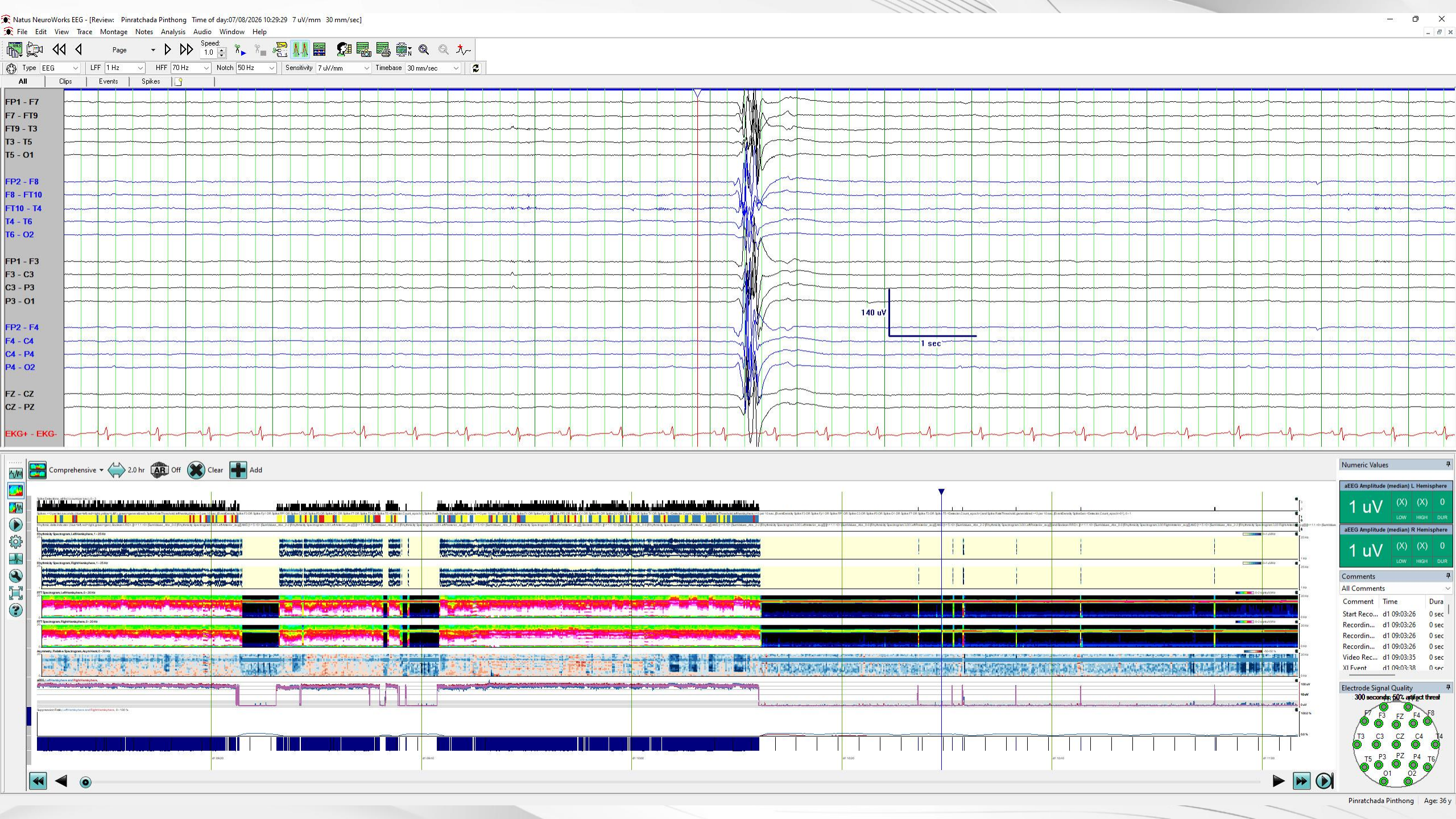
qEEG Changes (14:00): Dropout of power in FFT across all frequencies, rising suppression ratio, and declining aEEG amplitude.

Clinical Sign (20:00): Loss of pupillary light reflex. Lead time: 6 hours.

Clinical Insight: qEEG trends can act as a continuous early warning system for progressive edema, preceding clinical signs by hours.


Rhythmicity Spectrogram, Left Hemisphere, 1 - 20 Hz
0-4 uV/Hz
Rhythmicity Spectrogram, Right Hemisphere, 1 - 20 Hz
0-4 uV/Hz
FFT Spectrogram, Left Hemisphere, 0 - 20 Hz
0-2 log(uV)^2/Hz
FFT Spectrogram, Right Hemisphere, 0 - 20 Hz
0-2 log(uV)^2/Hz
Asymmetry, Relative Spectrogram, Asym Hemi, 0 - 20 Hz
-50-50 %
aEEG, Left Hemisphere and Right Hemisphere,
Suppression Ratio, Left Hemisphere and Right Hemisphere, 0 - 100 %


Rhythmicity Spectrogram, Left Hemisphere, 1 - 25 Hz
0-4 uV/Hz
Rhythmicity Spectrogram, Right Hemisphere, 1 - 25 Hz
0-4 uV/Hz
FFT Spectrogram, Left Hemisphere, 0 - 20 Hz
0-2 log(uV)^2/Hz
FFT Spectrogram, Right Hemisphere, 0 - 20 Hz
0-2 log(uV)^2/Hz
Asymmetry, Relative Spectrogram, Asym Hemi, 0 - 20 Hz
-50-50 %
aEEG, Left Hemisphere and Right Hemisphere,
Suppression Ratio, Left Hemisphere and Right Hemisphere, 0 - 100 %


Natus NeuroWorks EEG - [Review: Pinratchada Pinthong Time of day:07/08/2026 10:29:29 7 uV/mm 30 mm/sec]
File Edit View Trace Montage Notes Analysis Audio Window Help
Page
Speed: 1.0
Type EEG
LFF 1 Hz
HFF 70 Hz
Notch 50 Hz
Sensitivity 7 uV/mm
Timebase 30 mm/sec
All
Clips
Events
Spikes
FP1 - F7
F7 - FT9
FT9 - T3
T3 - T5
T5 - O1
FP2 - F8
F8 - FT10
FT10 - T4
T4 - T6
T6 - O2
FP1 - F3
F3 - C3
C3 - P3
P3 - O1
FP2 - F4
F4 - C4
C4 - P4
P4 - O2
FZ - CZ
CZ - PZ
EKG+ - EKG-
140 uV
1 sec
Comprehensive
2.0 hr
AR Off
Clear
Add
Numeric Values
aEEG Amplitude (median) L Hemisphere
1 uV
aEEG Amplitude (median) R Hemisphere
1 uV
Comments
All Comments
Comment
Time
Dura
Start Reco... d1 09:03:26 0 sec
Recordin... d1 09:03:26 0 sec
Recordin... d1 09:03:26 0 sec
Recordin... d1 09:03:26 0 sec
Video Rec... d1 09:03:35 0 sec
Electrode Signal Quality
300 seconds, 50% artifact threshold
Pinratchada Pinthong
Age: 36 y