Presurgical Evaluation before Epilepsy Surgery

Epilepsy Course for Neurology Resident 2015

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Facts About Epilepsy & Surgery

- Localization-related epilepsy syndromes and partial seizures, with prevalence rates of 50% each among those with epilepsy, are the most common syndromes and seizure types.

- The course of epilepsy can be predicted with reasonable accuracy within the first 2 years of therapy, but early remission does not necessarily predict a favorable long-term outcome.

Jette N & Wiebe S, neurology 2012.

Facts About Epilepsy & Surgery

- Predictors of intractability include high initial seizure frequency, partial seizures or multiple seizure types, age at onset 12, symptomatic generalized epilepsy, neurologic deficits, lesional TLE, and failure to respond to AEDs early on.

Jette N & Wiebe S, neurology 2012.

Facts About Epilepsy & Surgery

- Epilepsy surgery is underutilized worldwide.
- Successful epilepsy surgery is more cost-effective than medical therapy, and greater savings accrue with earlier surgery.
- The most common criteria used to define surgical candidacy are seizure frequency (1 per month) and failure of 2 AEDs.

Jette N & Wiebe S, neurology 2012.

Facts About Epilepsy & Surgery

- Approximately 60%–65% of patients are seizure-free after temporal lobe resection, compared to 40% of patients after extratemporal resection.

- There is uncertainty about the proportion of patients who discontinue AEDs after surgery.

Jette N & Wiebe S, neurology 2012.

Facts About Epilepsy & Surgery

- Epilepsy surgery is associated with specific cognitive changes (most often involving verbal memory and naming in left TLE), but may also improve cognition in some patients.
- There is either improvement or no change in psychiatric outcomes after surgery.
- QOL improves after surgery and is strongly influenced by seizure freedom.
- Improvement is seen after surgery in employment, driving, and relationships.

Jette N & Wiebe S, neurology 2012.

Facts About Epilepsy & Surgery

- Surgical complications are usually minor or transient. Major permanent neurologic complications occur in up to 5% of patients (e.g., contralateral hemiparesis and major visual deficits in up to 2% of patients).

- Mortality appears to be lower if patients are rendered seizure-free after epilepsy surgery.

Jette N & Wiebe S, neurology 2012.

Who should be referred?

- The epilepsy is not controlled with AEDs within 2 years.
- Management is unsuccessful after 2 AEDs.
- The child is aged under 2 years.
- Experiences or is at risk of unacceptable SE from AED.
- There is a unilateral structural lesion.
- There is psychological and/or psychiatric comorbidity.
- There is diagnostic doubt as to the nature of the seizures and/or seizure syndrome.

NICE guideline 2015 & Wiebe S, curr opin. 2013.

Who should be referred?

- A child or adult with these conditions.
- Example of complex syndromes: Rasmussen's encephalitis, tuberous sclerosis, Sturge-Weber syndrome, Landau-Kleffner syndrome, polymicrogyria, hypothalamic hamartoma, Dravet syndrome, Lennox-Gastaut syndrome, West syndrome, Ohtahara syndrome, infantile spasms, epilepsia partialis continua
- Example of complex surgeries: hemispherectomies, multilobar resections, and palliative procedures

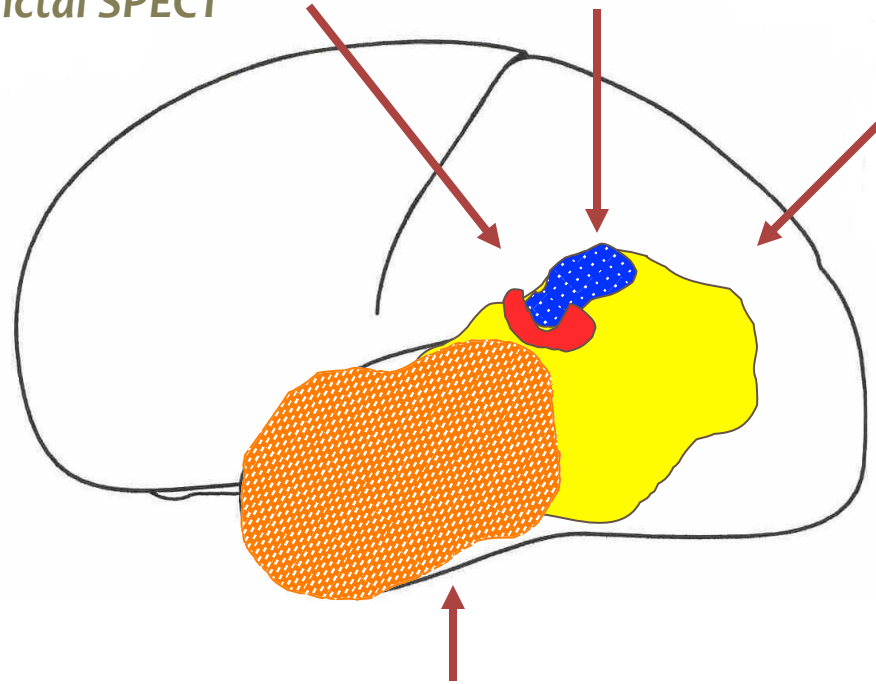
NICE guideline 2015 & Wiebe S, curr opin. 2013.

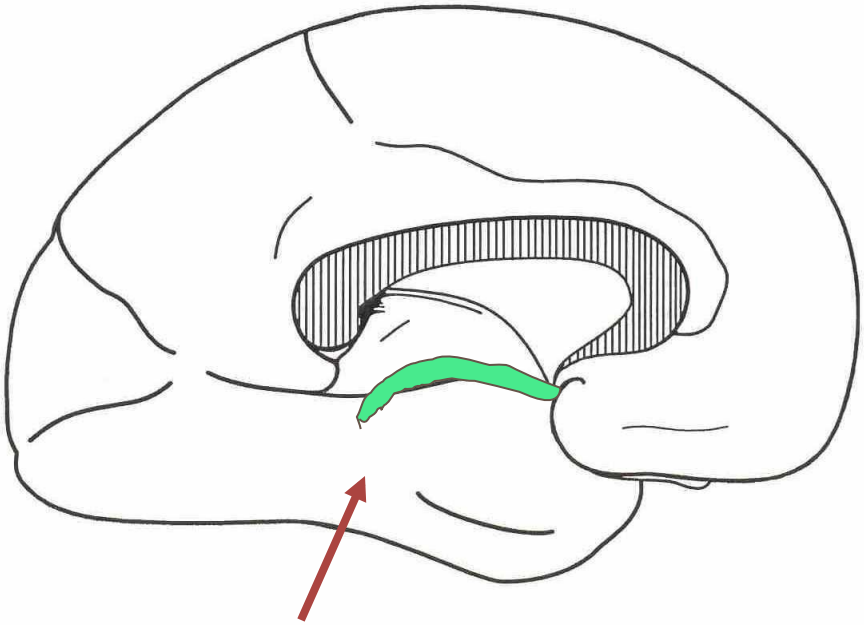
General Concept of Surgery

Ictal onset zone
defined by ***ictal EEG & ictal SPECT***

Epileptogenic lesion
defined by ***MRI***

Functional deficit zone defined by ***neurological examination, WADA & PET***





Irritative zone defined by ***interictal EEG, MEG***

Symptomatogenic zone defined by ***seizure semiology***

Foldvary N, AES 2010.

Case JK

A 24-year-old, right handed, female physical therapist.

- **First seizure in April 2009, while traveling by a van she was told to have a convulsion following screaming. She was sent to the hospital nearby and had a CT scan of brain done which was *abnormal* (retrospectively).**

- **In August 2009, she had another convulsion, witnessed to began with *right facial twitching*. At time she had EEG done showing some *sharp waves*. She was then started on Topamax which was subsequently increased up to 300 mg/day.**

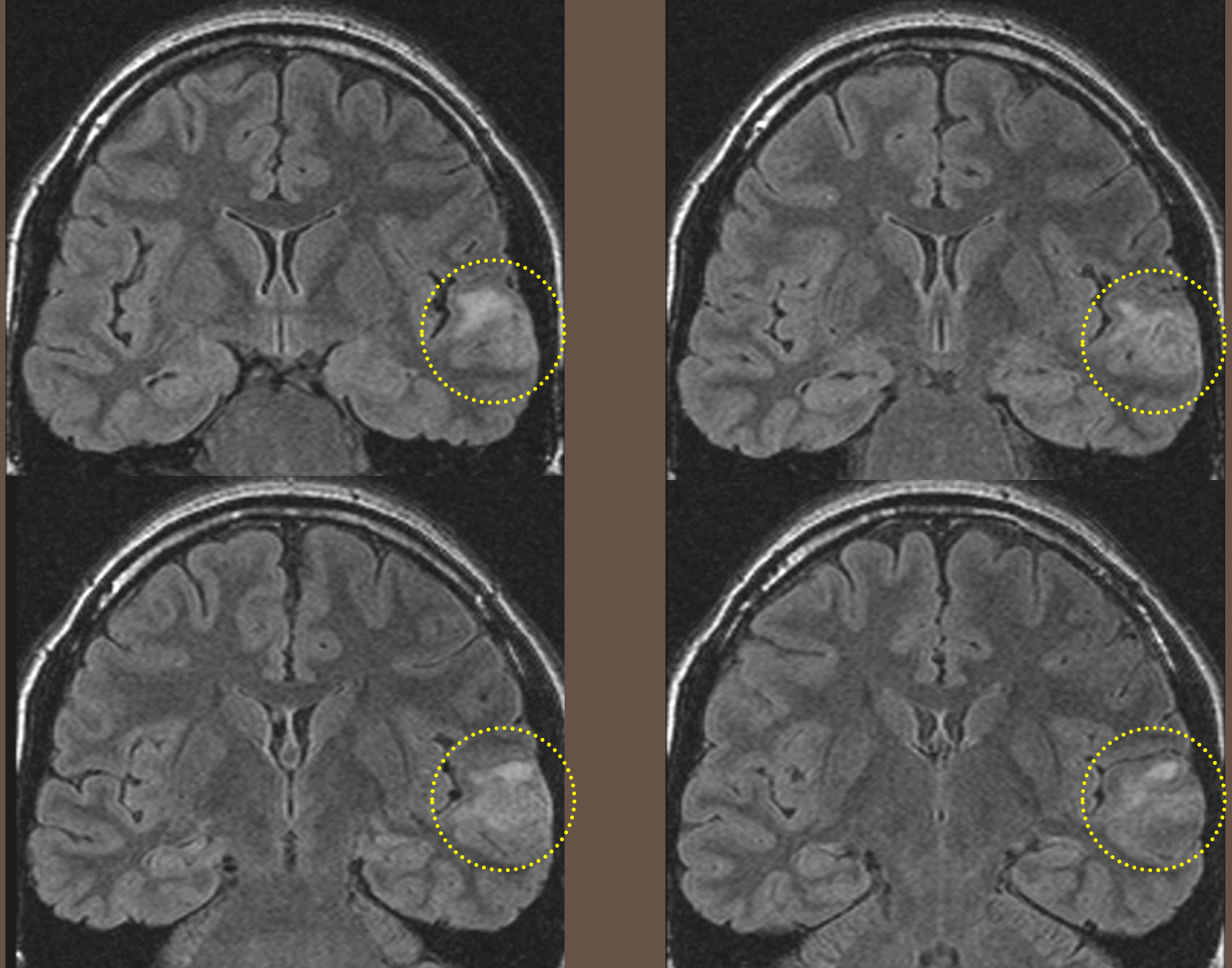
Case JK

- Couple months later, she developed another symptom, described as *losing tracks of time*. Prior to this she would *hear voices* (people talking) and has her right eye twitching.

- Tegretol 200mg BID was added on with no benefit; even that it gave her a hard time (woozy). Until September 2009, she continues having these episodes (4-5 times a month).

Case JK

- Denied seizure as a child, developmental delay, seizure in family, CNS diseases, and head injury.
- Unremarkable past medical and surgical history.
- Previous antiepileptic drugs: Topamax 100-200 mg and Tegretol CR 200 mg BID.

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SHARP WAVE
SHARP WAVE anterior temporal, FT9
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F7-T3
T3-T5
T5-O1
Fp2-F8
F8-T4
T4-T6
T6-O2
Fp1-F3
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C3-P3
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Fp2-F4
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EEG seizure onset
Staring
Fp1-F7
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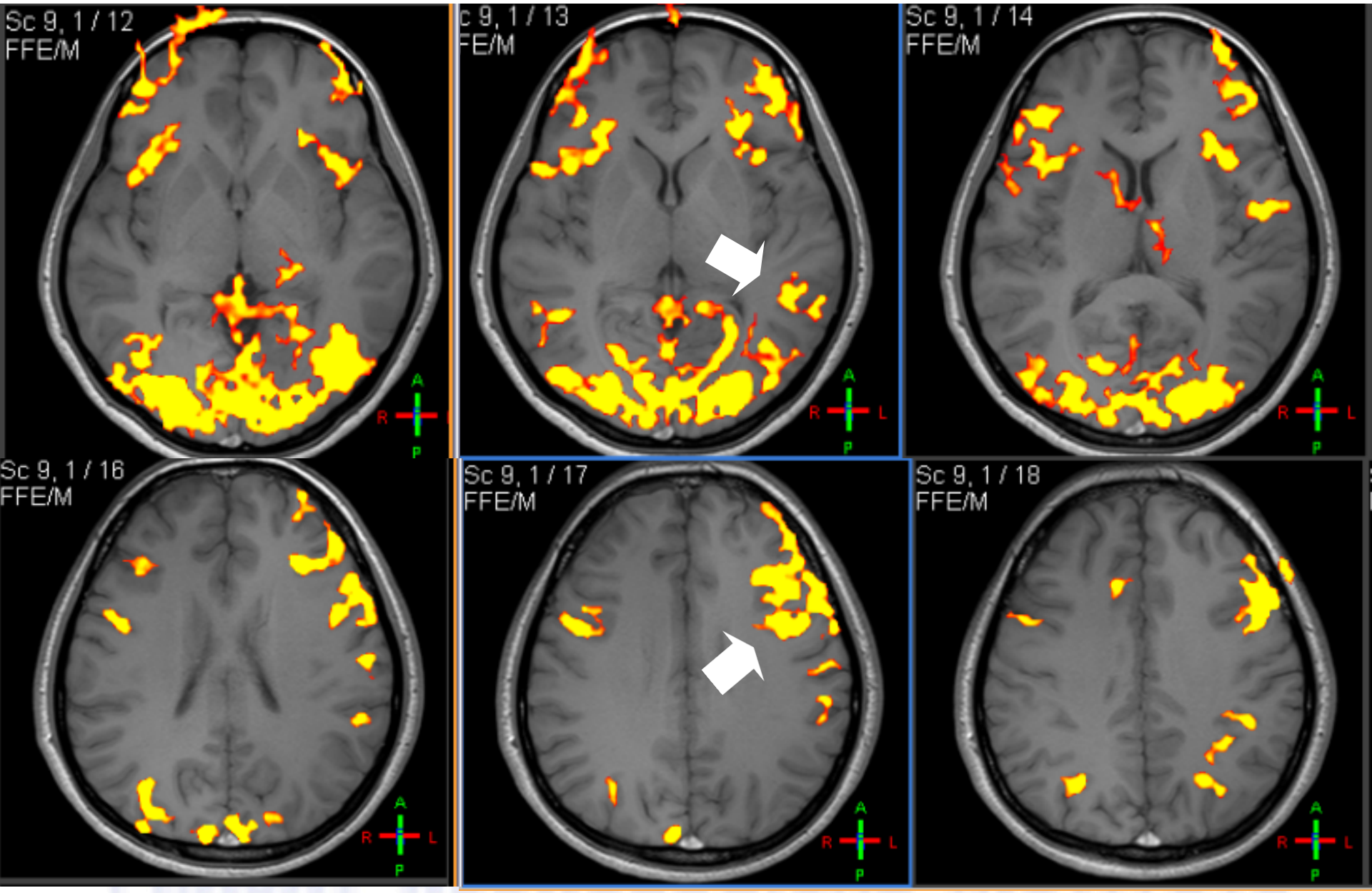
Neuropsychological test

จากแบบทดสอบ **WMS –III** พบว่าผู้ป่วยทำคะแนนความจำในแต่ละด้านดังนี้

Primary Indexes	Index Scores	Qualitative Descriptions
Auditory Immediate	83	Low Average
Visual Immediate	71	Borderline
Immediate Memory	73	Borderline
Auditory Delayed	86	Low Average
Visual Delayed	75	Borderline
Auditory Recognition Delayed	100	Average
General Memory	82	Low Average
Working Memory	83	Low Average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Sc 9, 1 / 16
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Sc 9, 1 / 17
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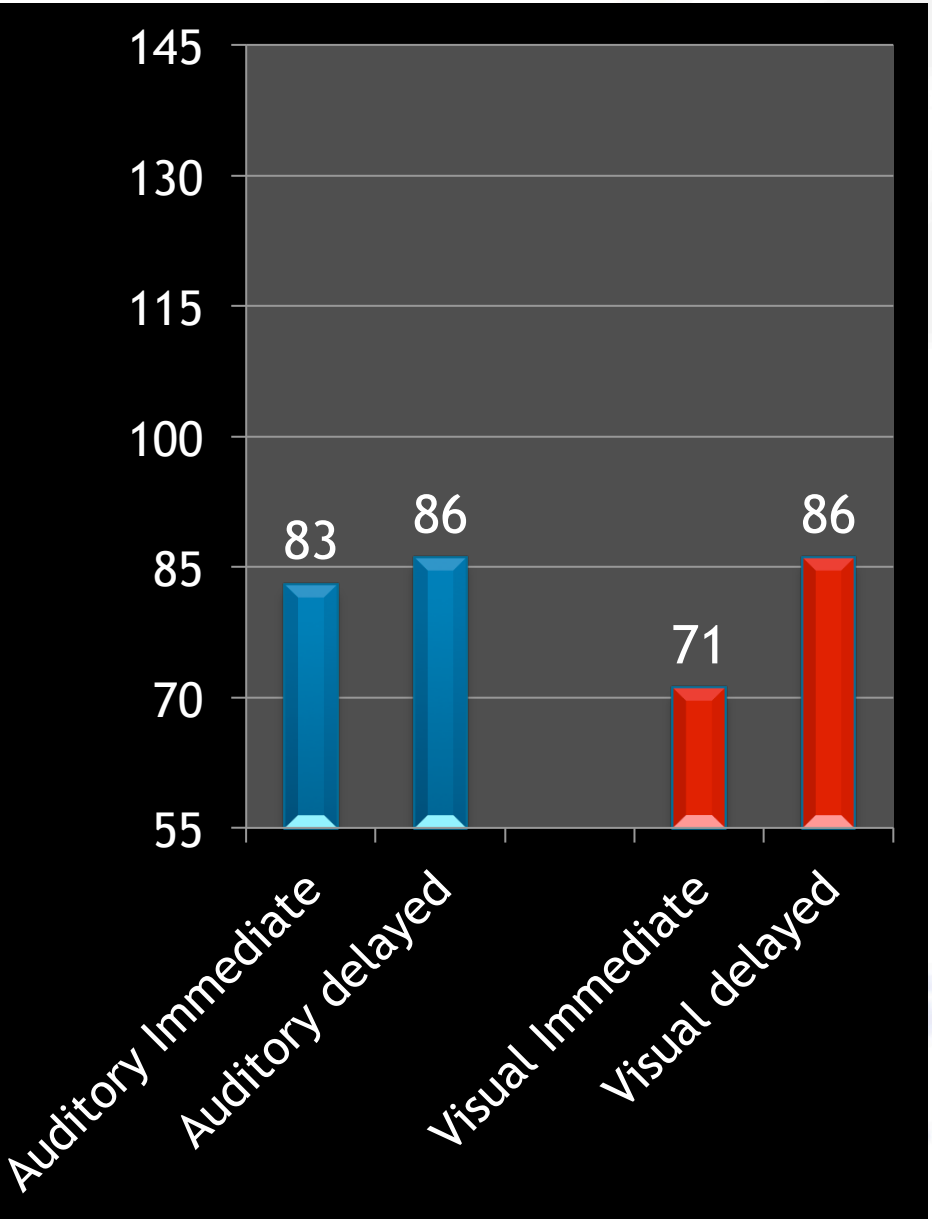
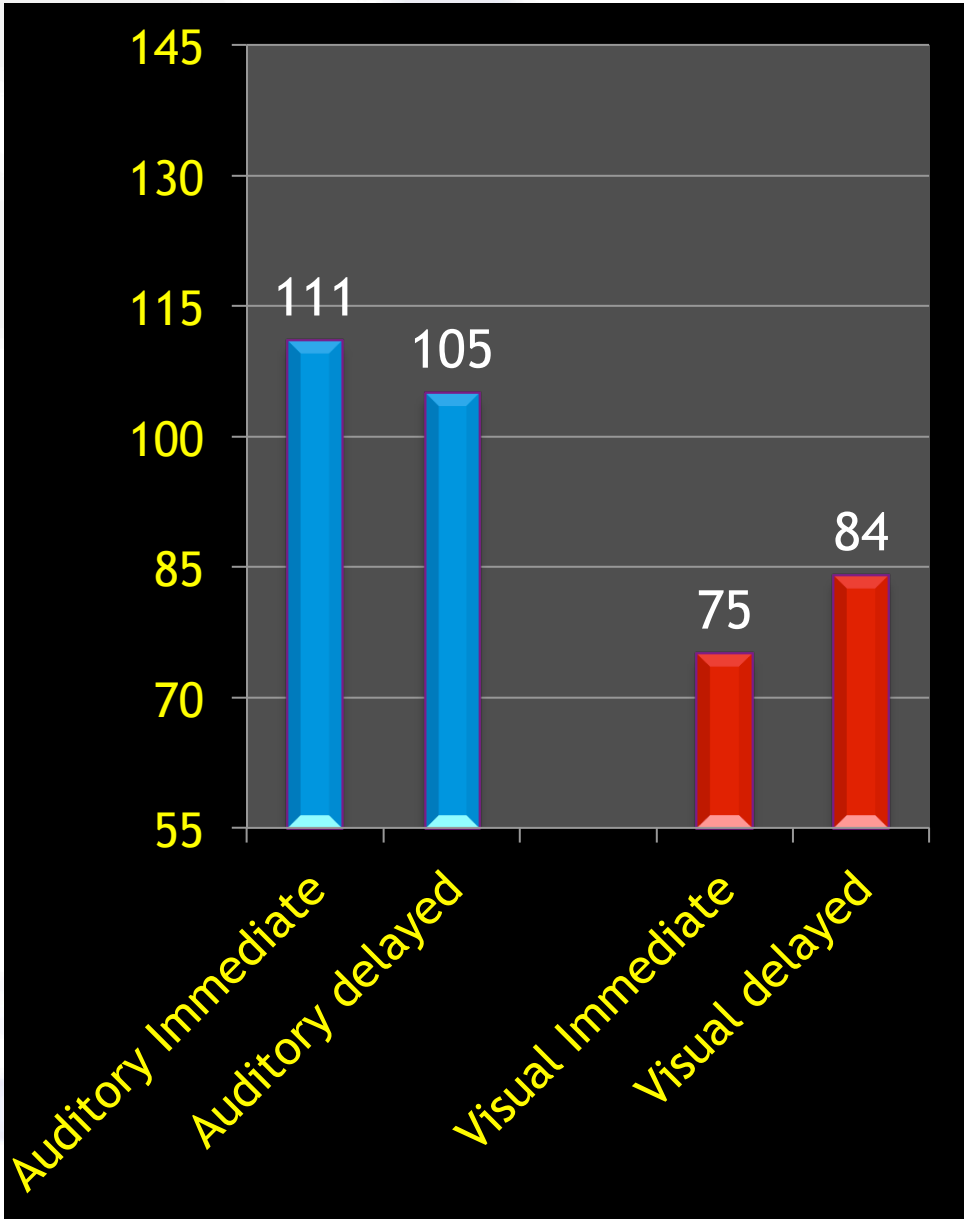
Sc 9, 1 / 18
FFE/M

Case JK

- Post-operative seizure free for 2 years.
- Typical seizures recurred, possibly due to recurrent tumors. After second resection, obtained seizure freedom with continue on AEDs.

Pre-Post neuropsychology score





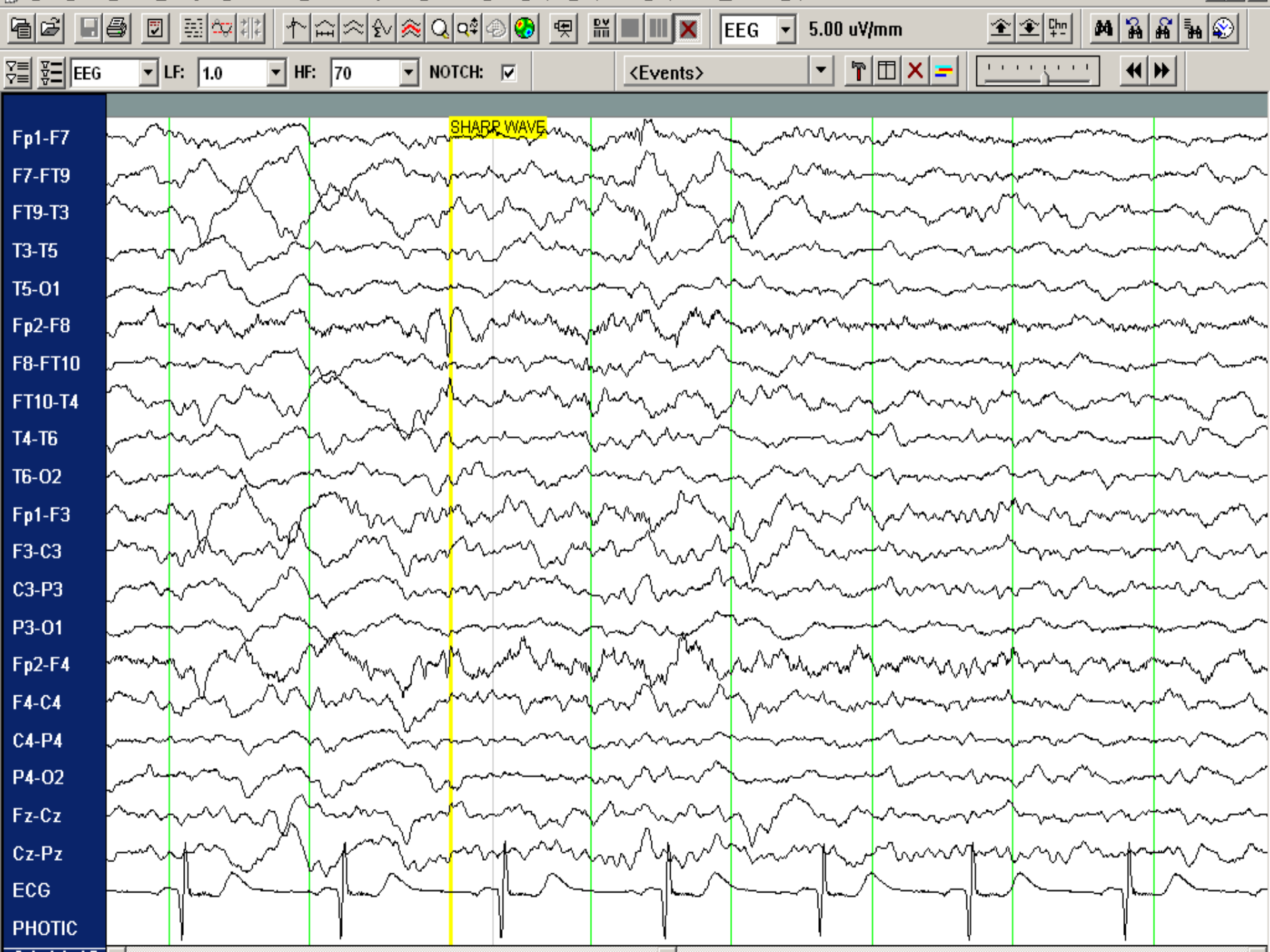
Case CW

A 34 years old, left handedness, male architect.

- **Seizure started at age 26 beginning with palpitation and dizziness. He would then stare and become unresponsive. He often had his mouth pull on *one side (??)*. This would follow by drooling and stiffening of both arms. His wife has witnessed him having leg movements (bicycling) upon the end of seizure. Seizures usually last about 5 minutes.**

Case CW

- Denied epilepsy risk factors.
- No significant past medical and surgical history.
- Previous antiepileptic drugs: polytherapy including Dilantin, Depakine, Keppra, Tegretol and Topamax at optimal dosage with questionable benefit???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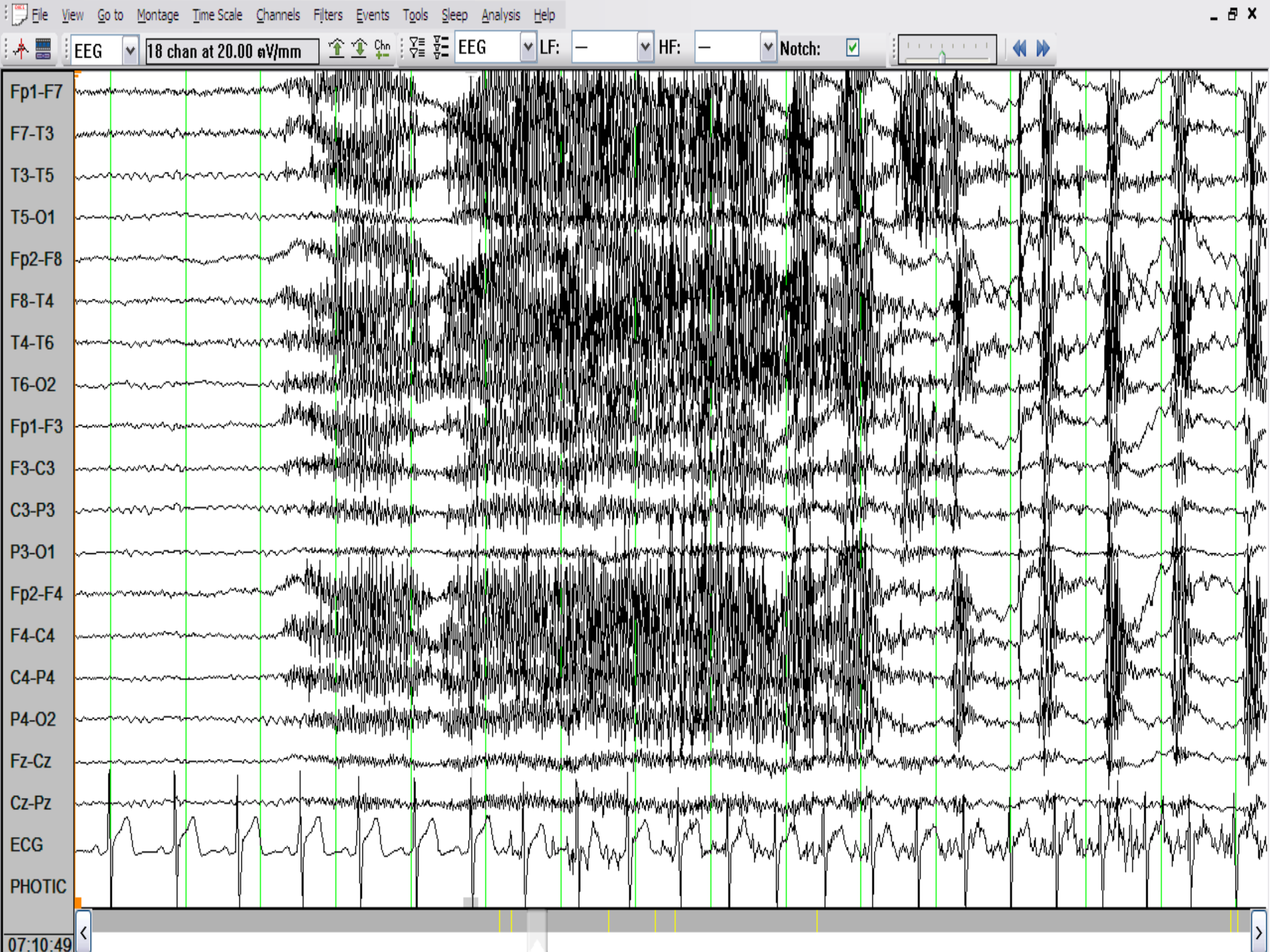
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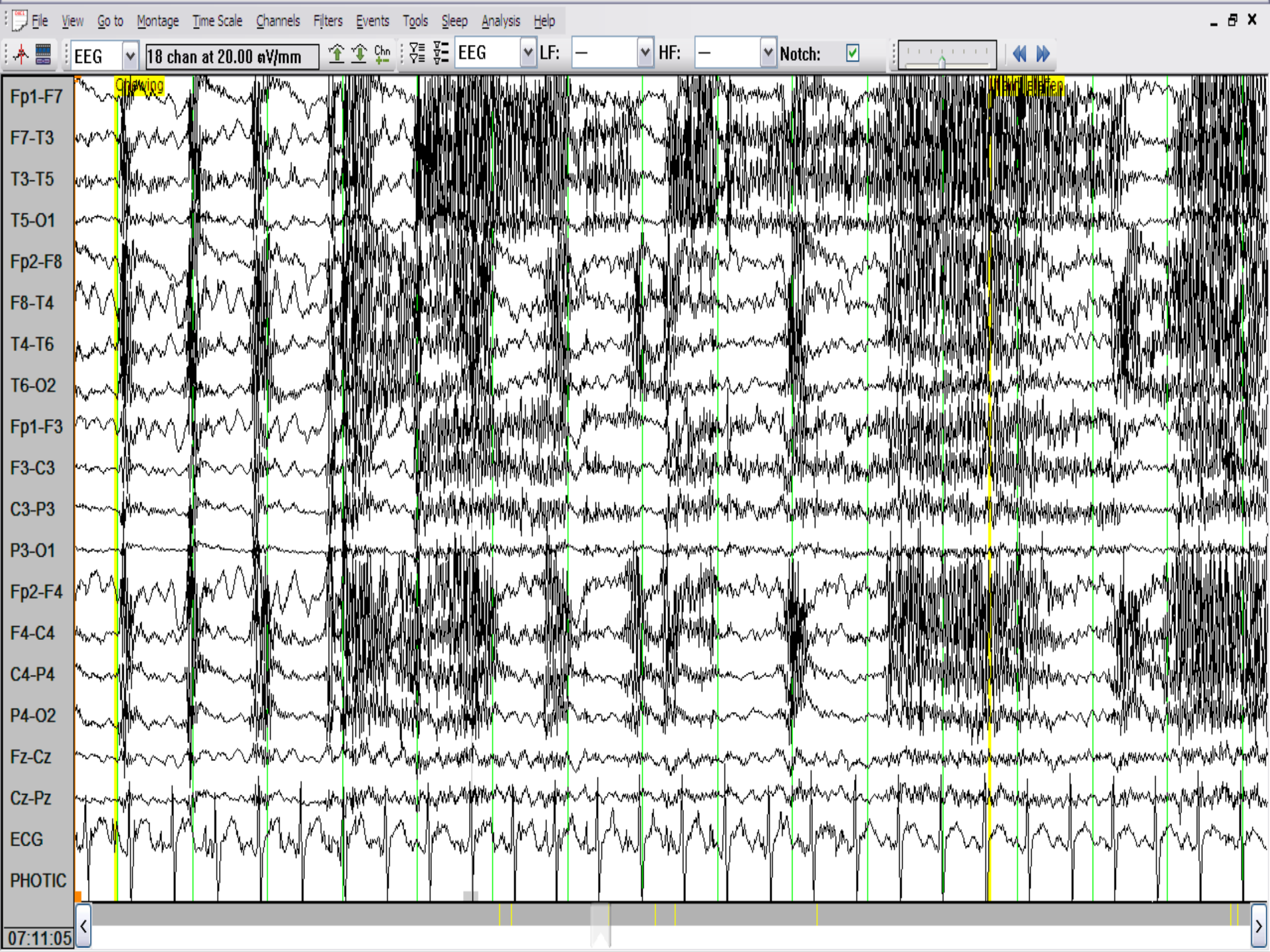
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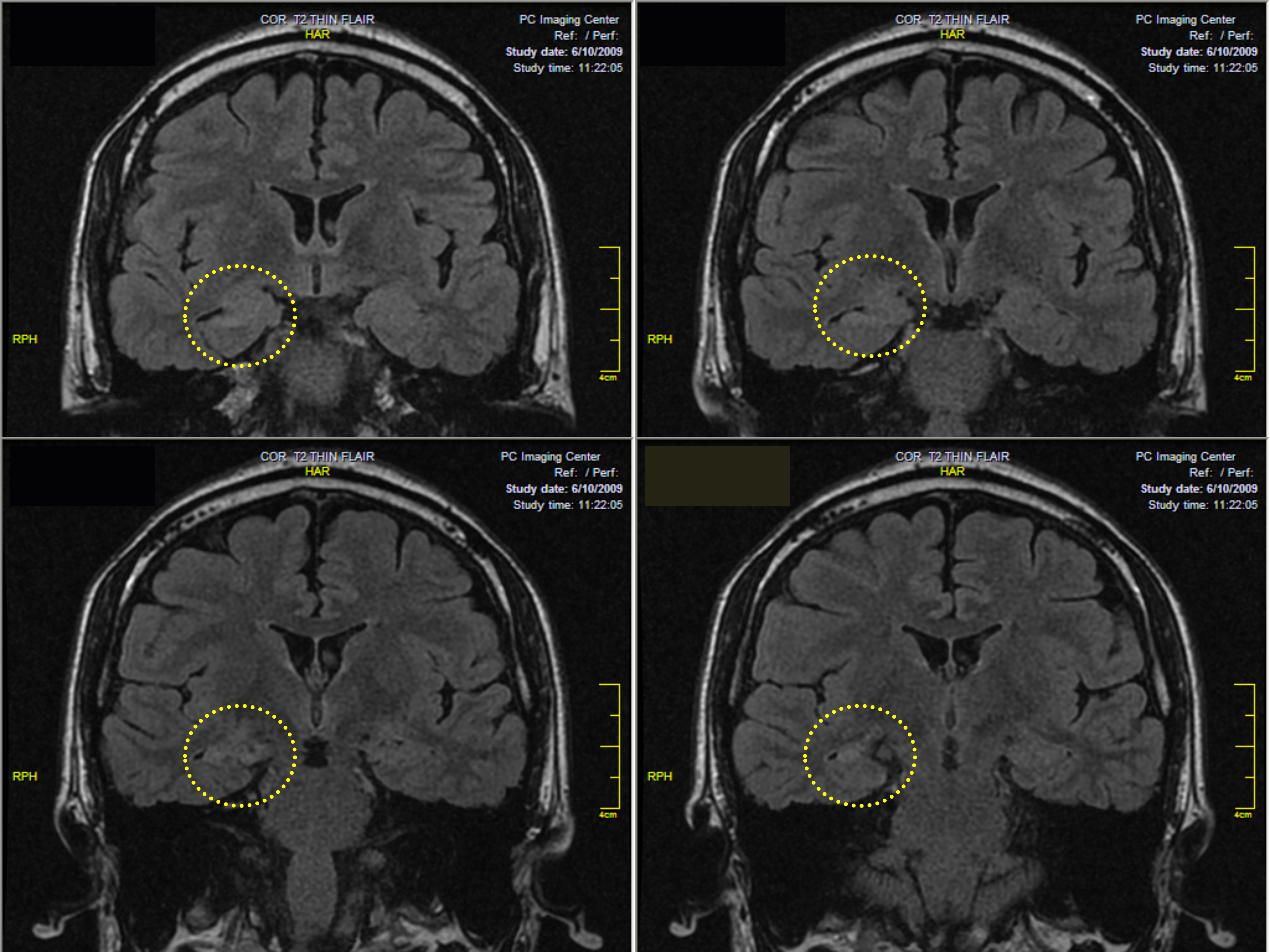
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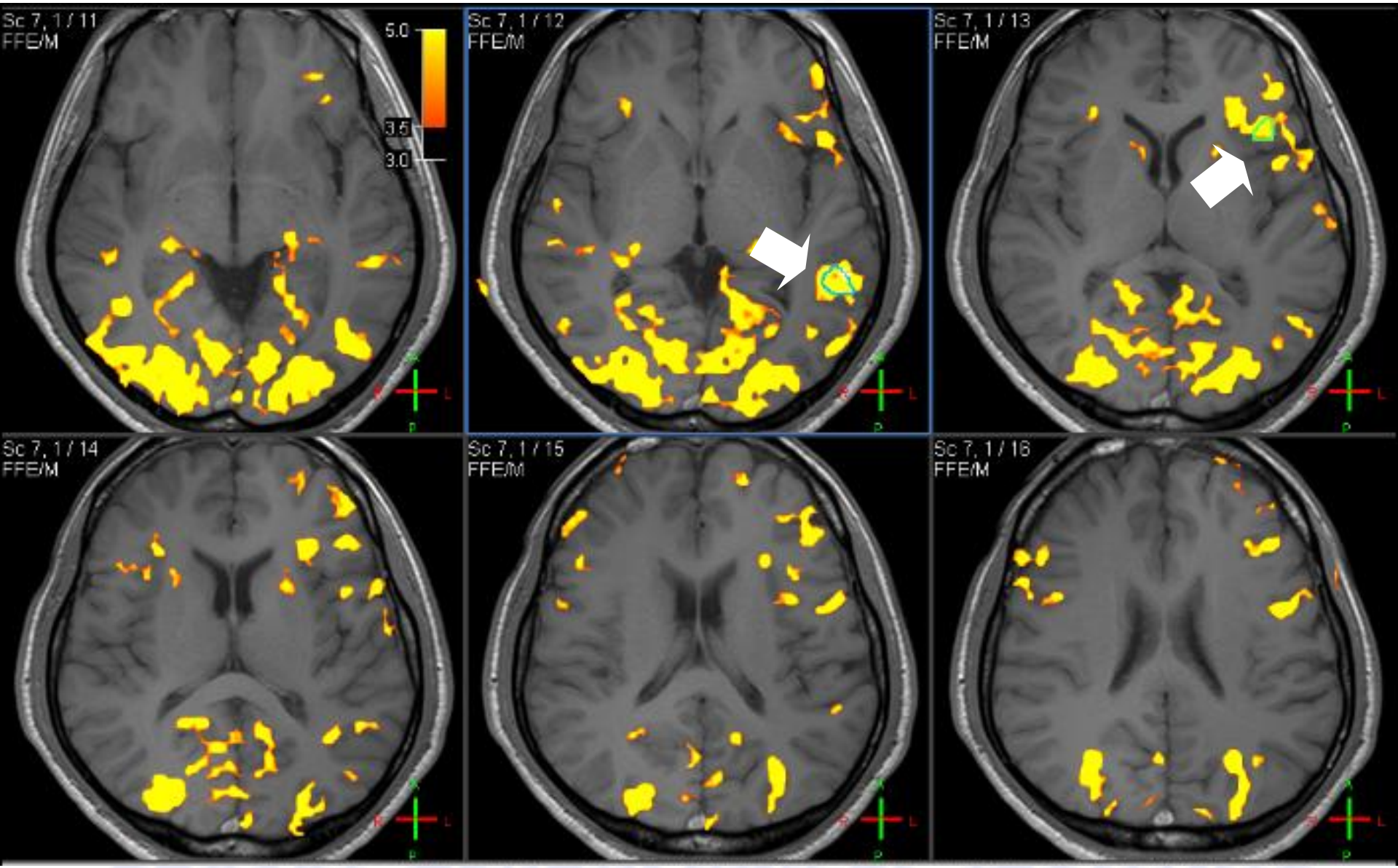
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Sc 7, 1 / 13
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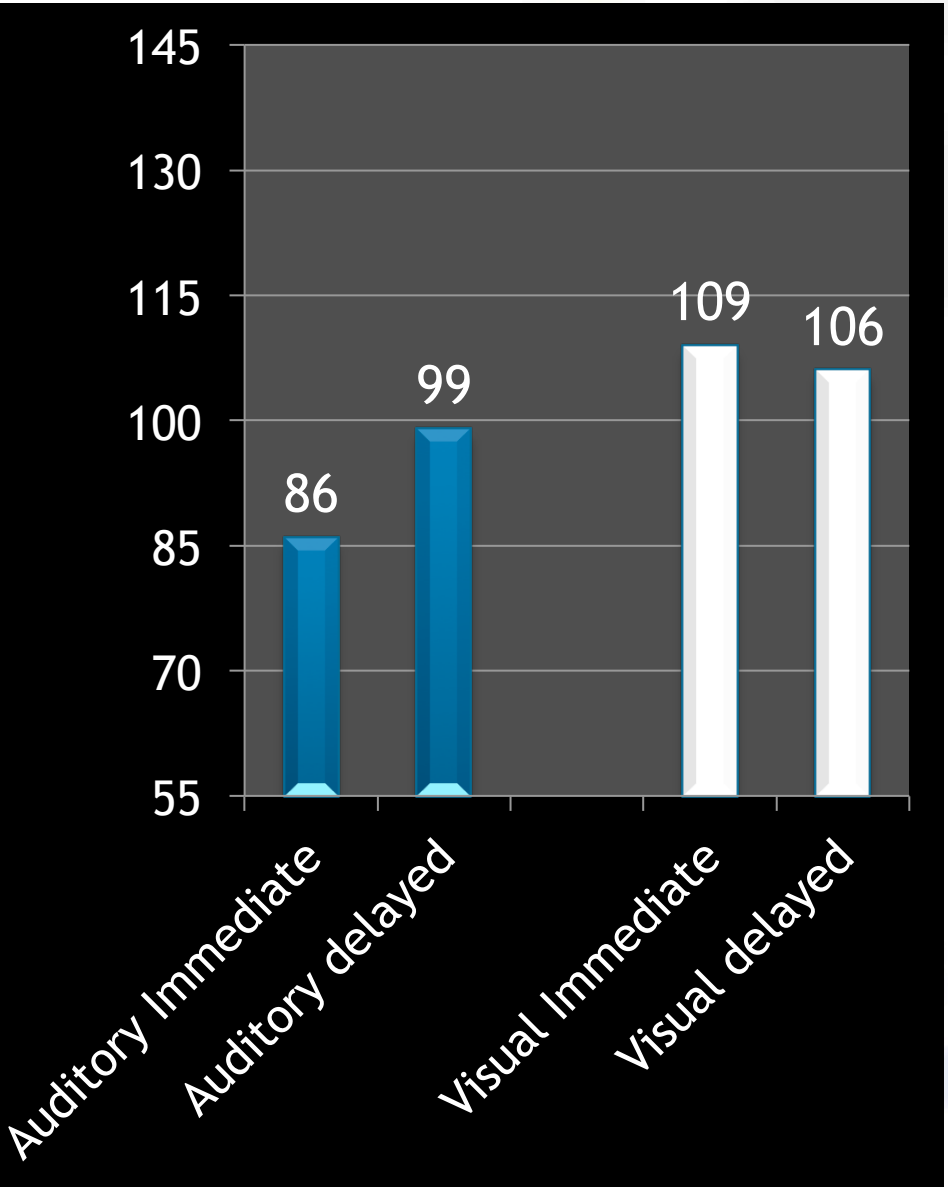
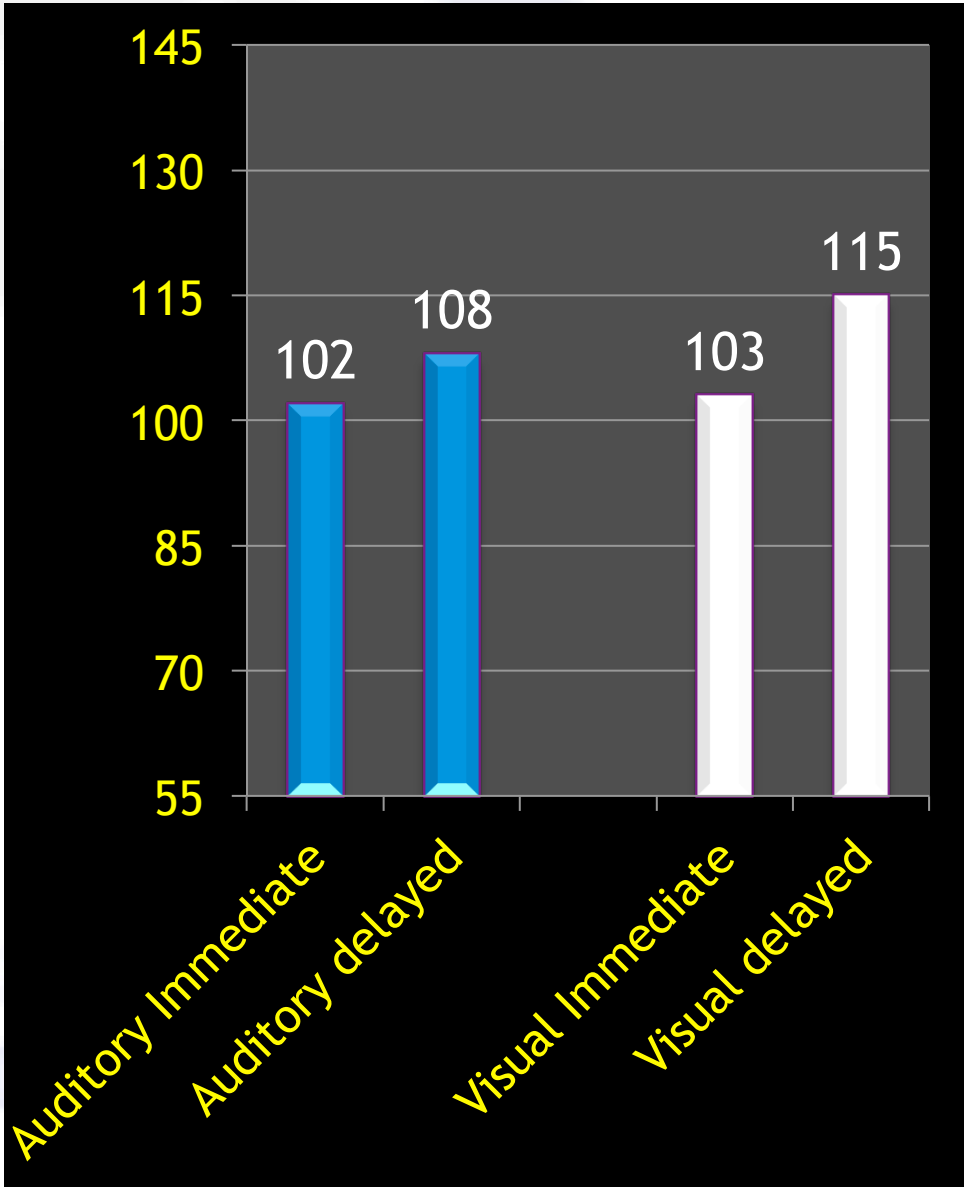
Sc 7, 1 / 14
FFE/M
Sc 7, 1 / 15
FFE/M
Sc 7, 1 / 16
FFE/M

Case CW

- Post-operative seizure free 4 years.
- Was already taken off AEDs for 2 years.

Pre-Post neuropsychology score





สถาบันประสาทวิทยา

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