

Differential Diagnosis of Epileptic Seizures: Not All That Jerks is Epilepsy

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Disclosure Slide

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No shares.



Learning Objectives

- Recognize the clinical characteristics of common differential diagnoses of epileptic seizures such as syncope, dissoziative disorders, parasomnias & paroxysmal movement disorders.
- Use seizure semiology to differentiate epileptic from non-epileptic seizures



Key Message

Not all that jerks is epilepsy



Differential Diagnosis of Epileptic Seizures

- Syncope
- Psychogenic attacks / dissociative disorder
- Paroxysmal dystonia
- Non-epileptic myoclonus
- Startle-reaction
- Migraine
- Cerebrovascular insult (TIA)
- Parasomnias
- Transient global amnesia
- Encephalopathy



Seizure Semiology in Epilepsy

- Correlation of seizure semiology with EEG, MRT, PET, SPECT
- Studies in post-op seizure-free patients
- Identification of symptomatogenic zones with electrical stimulation of the cortex



Differential Diagnosis of Epileptic Seizures

- Syncope

„Falls“

- Atonic seizure

- Cataplexy

- psychogenic non-epileptic seizure

- Absence seizure

„Blank Staring“

- Confusional state

- psychogenic non-epileptic seizure

- Myoclonic syncope

„Jerking“

- Myoclonic seizure

- Clonic seizure

- Tonic-clonic seizure

- psychogenic non-epileptic seizure



Differential Diagnosis Epilepsy vs. Cataplexy

Epileptic fall

- Preceding aura (abdominal, somatosensory, visual, psychic)
- Associated motor phenomena: tonic, atonic, automatisms, clonic, myoclonic
- Commonly loss of consciousness
- Rarely trigger
- < 3 min. duration
- Eyes open

Cataplexy

- No aura
- Sudden atonia
- Preserved consciousness
- Emotional triggers (joy, fear, laughter)
- < 30s duration
- Eyes open



Differential Diagnosis Epilepsy vs. Parasomnias

Nocturnal epileptic seizure

- Preceding aura (abdominal, somatosensory, visual, psychic)
- Associated motor phenomena: tonic, atonic, automatisms, clonic, myoclonic
- Commonly loss of consciousness
- Rarely trigger
- < 1 min. duration
- Eyes open

Parasomnias

- No auras
- Night terror (age 4-12yrs.)
- Sleep walking
- Periodic limb movements
- REM-sleep-behavior disorder (older men, associated with aggressive dreams)
- Triggered by stress
- < 1 min. duration
- Eyes open



Differential Diagnosis Epilepsy vs. Paroxysmal Dystonia

Motor seizure

- Preceding aura (abdominal, somatosensory, visual, psychic)
- Tonic, clonic, automatisms, clonic, myoclonic
- Variable consciousness
- Rarely trigger
- < 3 min. duration
- Eyes open

Paroxysmal dystonia

- No aura
- Tonic, athetotic
- Preserved consciousness
- Typical trigger (kinesiogenic)
- < 30s duration
- Eyes open



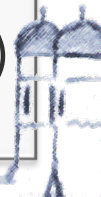
Differential Diagnosis Epilepsy vs. Dissoziative Disorder

Epileptic seizure

- Preceding aura for few seconds (abdominal, somatosensory, visual, psychic)
- Tonic, clonic, automatisms, clonic, myoclonic
- Frequently loss of consciousness
- Eyes open
- Rarely trigger
- Clear start & end
- < 3 min. duration & postictal phase

Dissoziative disorder

- Variabel sensation (typically long duration)
- Variable motor activity (motionsless stare, massive bizarre movements)
- Fluctuating consciousness
- Eyes closed
- Typical trigger (stress)
- Fluctuating course (suggestible)
- Variable duration (seconds to hours)



Differential Diagnosis Epilepsy vs. Syncope

Epileptic fall

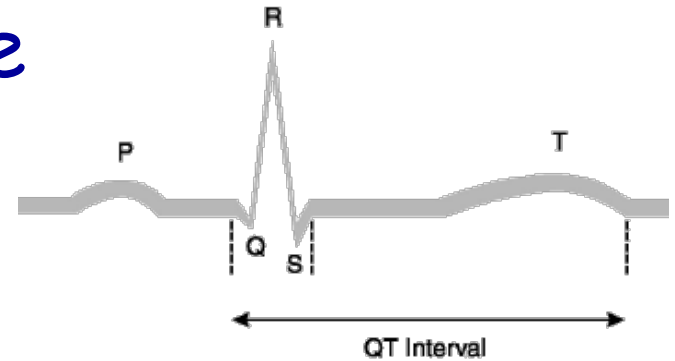
- Preceding aura (abdominal, somatosensory, visual, psychic)
- < 3 min. duration
- Eyes open
- Associated motor phenomena: tonic, atonic, automatisms, clonic, myoclonic
- Postictal confusion for minutes

Syncope

- Vasomotor aura (sensation of heat, sweating, shivering, palpitation, nausea, feeling of weakness, recall of falling)
- < 30s duration
- Eyes closed
- Associated motor phenomena: tonic, atonic, automatisms, myoclonic
- No postictal confusion



Long-QT-Syndrome

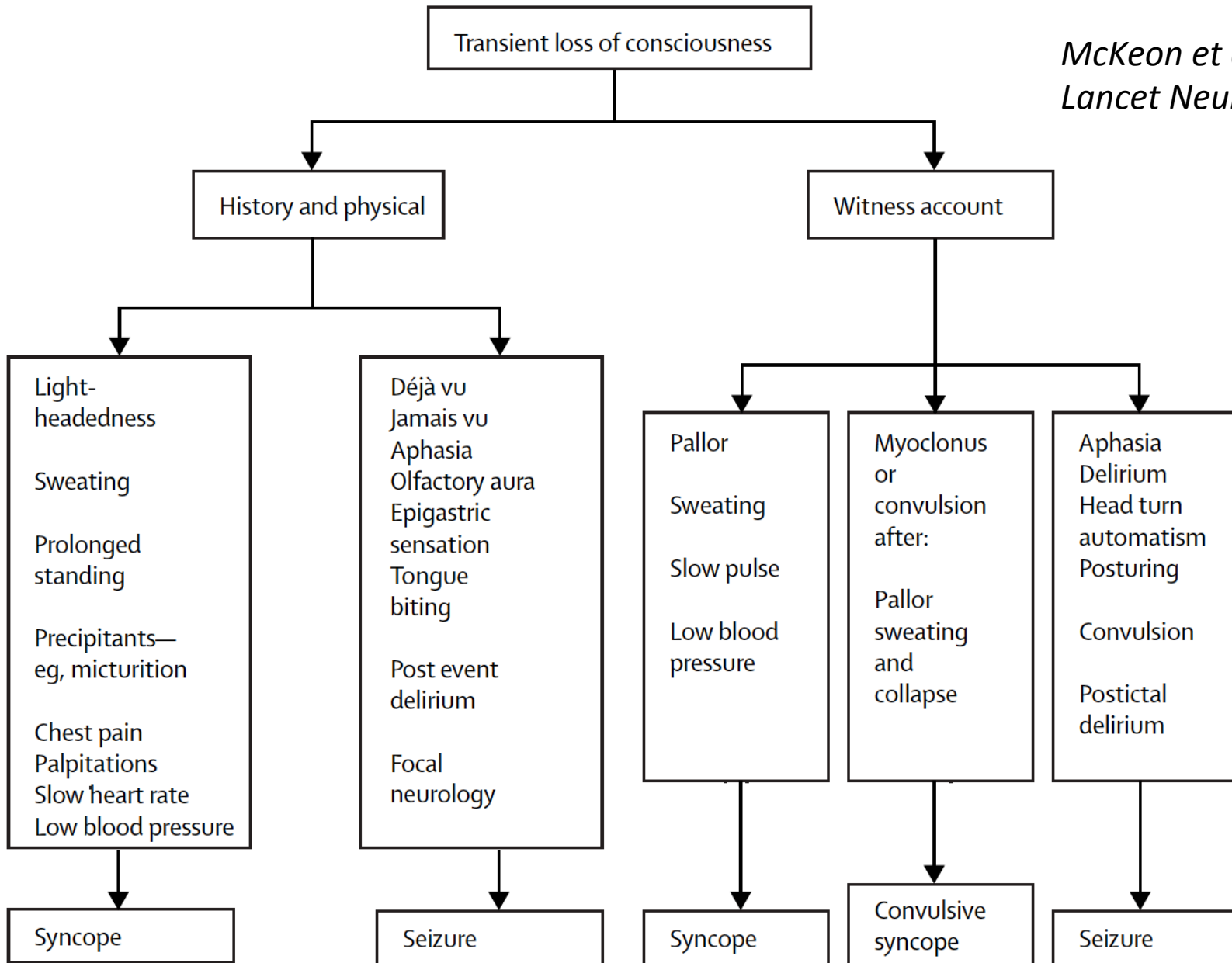


- QT-time > 450 ms
- Ion channel disease with mutations in K^+ channels
→ repolarisation deficit → asystole → cardioresp. failure
- Gene carrier ca. 1 : 5000 – 10.000
50% asymptomatic
- Mortality without treatment 70% in 10 years
- Typ I: bodily exercise
Typ II: “arousal type emotions“
Typ III: without trigger out of rest



Differential Diagnosis Epilepsy vs. Syncope

*McKeon et al.,
Lancet Neurol 2006*



Factors Most Strongly Predictive of Seizures

	Sensitivity	Specificity	Likelihood Ratio	P-Value (Chi-Square)
Cut tongue	0.451	0.973	16.460	< 0.001
Head turning	0.431	0.968	13.481	< 0.001
Unusual posturing	0.353	0.973	12.880	< 0.001
Bedwetting	0.235	0.964	6.447	< 0.001
Blue color observed by bystanders	0.326	0.944	5.813	< 0.001
Limb jerking noted by others	0.686	0.877	5.566	< 0.001
Prodromal trembling	0.294	0.941	4.951	< 0.001
Prodromal preoccupation	0.078	0.982	4.284	0.002
Prodromal hallucinations	0.078	0.982	4.284	0.002
Behaviors not recalled	0.529	0.868	3.998	< 0.001
LOC associated with stress	0.569	0.849	3.773	< 0.001
Muscle pain	0.157	0.954	3.433	0.004
Prodromal deja vu	0.137	0.959	3.341	0.009
Observed unresponsiveness	0.765	0.749	3.045	< 0.001
Postictal confusion	0.941	0.690	3.031	< 0.001
Postictal headaches	0.490	0.836	2.982	< 0.001
Prodromal mood changes	0.235	0.918	2.863	0.002
Observed abnormal behaviors	0.922	0.671	2.803	< 0.001

Sheldon et al., JACC 2002



Factors Most Strongly Predictive Against Seizures

	Sensitivity	Specificity	Likelihood Ratio	P-Value (Chi-Square)
Presyncopal spells before LOC	0.275	0.274	0.378	< 0.001
Self-reported high blood pressure	0.098	0.690	0.316	0.002
Presyncope with hot/warm	0.078	0.731	0.291	0.004
Presyncope with needle	0.039	0.863	0.286	0.052
Prodromal vertigo	0.059	0.785	0.274	0.010
Any presyncope	0.235	0.137	0.273	< 0.001
Presyncope after exercise	0.078	0.712	0.273	0.002
Hypertension (physician reported)	0.078	0.708	0.268	0.002
Warmth before a spell	0.078	0.662	0.232	< 0.001
Any chest pain	0.098	0.543	0.215	< 0.001
Nausea before a spell	0.059	0.722	0.211	0.001
Remembered loss of consciousness	0.118	0.425	0.204	< 0.001
Presyncope prolonged sitting/standing	0.059	0.676	0.181	< 0.001
Diaphoresis before a spell	0.059	0.653	0.169	< 0.001
Chest pain before a spell	0.020	0.872	0.153	0.025
Palpitations before LOC	0.039	0.662	0.116	< 0.001
Dyspnea before LOC	0.020	0.763	0.083	< 0.001
Coronary heart disease	0.020	0.749	0.078	< 0.001
LOC with prolonged sitting/standing	0.020	0.603	0.049	< 0.001

Sheldon et al., JACC 2002



Diagnostic Questions to Differentiate Seizures & Syncope

Question	Points (If Yes)
At times do you wake with a cut tongue after your spells?	2
At times do you have a sense of deja vu or jamais vu before your spells?	1
At times is emotional stress associated with losing consciousness?	1
Has anyone ever noted your head turning during a spell?	1
Has anyone ever noted that you are unresponsive, have unusual posturing or have jerking limbs during your spells or have no memory of your spells afterwards? <i>(Score as yes for any positive response)</i>	1
Has anyone ever noted that you are confused after a spell?	1
Have you ever had lightheaded spells?	-2
At times do you sweat before your spells?	-2
Is prolonged sitting or standing associated with your spells?	-2



Score For Diagnosing Seizures vs. Syncope

Point score ≥ 1 was associated with a sensitivity of 94% and specificity of 96% for correct diagnosis

	Regression Coefficient (SE)	p Value	Points
Waking with cut tongue	6.85 (2.03)	0.001	2
Abnormal behavior noted	3.82 (1.37)	0.005	1
LOC with emotional stress	3.97 (1.30)	0.002	1
Postictal confusion	3.52 (1.33)	0.008	1
Head turning during LOC	3.67 (1.43)	0.010	1
Prodromal deja vu/jamais vu	2.75 (1.43)	0.055	1
Any presyncope	-4.70 (1.34)	< 0.001	-2
LOC \leq prolonged standing or sitting	-5.37 (1.71)	0.002	-2
Diaphoresis before a spell	-5.73 (1.80)	0.001	-2

The patient has seizures if the point score is ≥ 1 , and syncope if the point score is < 1



Differential Diagnosis Epilepsy vs. Syncope

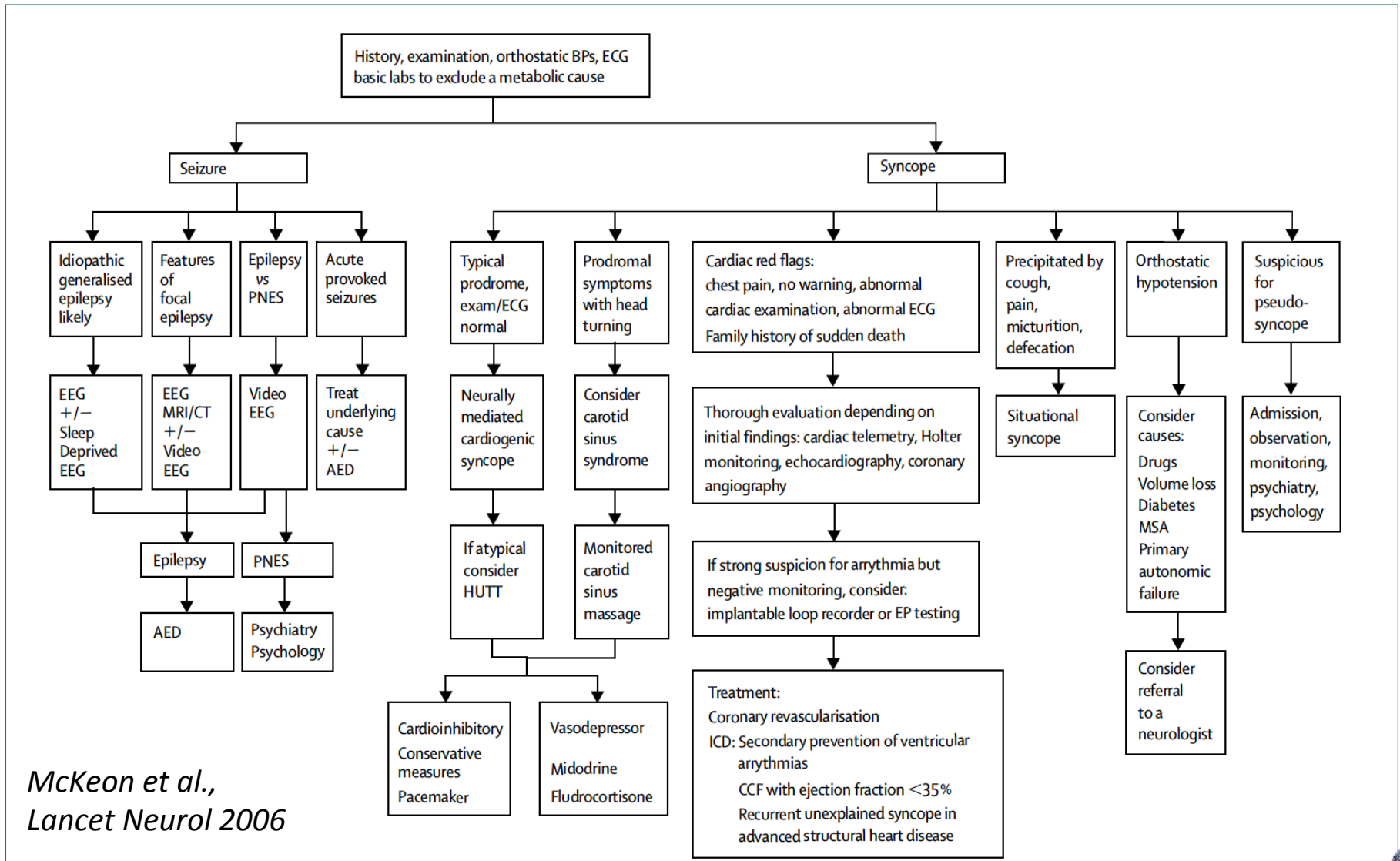


Figure 2: An algorithm of diagnostic considerations in evaluating the patient with a paroxysmal loss of consciousness

BPs=blood pressure, systolic; ECG=electrocardiogram; AED=antiepileptic drug; PNES=psychogenic non-epileptic seizures; EEG=electroencephalography; HUTT=head-up tilt test; EP=electrophysiology; ICD=implantable cardiac defibrillators; CCF=congestive heart failure; MSA=multiple-system atrophy

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