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Teaching Course 4

Emergencies in neurology: dealing effectively with syncope and transient loss of consciousness (TLOC) (Level 1)

Why 'TLOC' and not just epilepsy as we are used to?

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Why 'TLOC' and not just epilepsy as we are used to?

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Conflict of Interest

In relation to this presentation and manuscript:

❑ the Author has no conflict of interest in relation to this manuscript.

Contents

I. What is TLOC?

- Syncope before 2001:
  - Sometimes 'wide'
    - subarachnoid haemorrhage, trauma, intoxication, Adams-Stokes attack…
  - Sometimes 'narrow'
    - Vasovagal, cardiac, orthostatic hypotension…

- European Society of Cardiology (ESC)
  - 2001, 2004, 2009, 2018

Transient Loss of Consciousness

Syncope as form of TLOC

ESC 2018 Definition of TLOC

Transient loss of consciousness (TLOC) is a state of real or apparent loss of consciousness with loss of awareness, characterized by amnesia for the period of unconsciousness, abnormal motor control, loss of responsiveness, and a short duration.

- Needs to be determined after the fact
- Through history taking

Building the 'TLOC' concept

History from patient & eyewitness

- Four items
  1. Amnesia; gap in memory
  2. Not responsive to speech or touch
  3. Abnormal motor control
     - Always tendency to fall
     - Flaccid or stiff, movements or still
  4. Short (few minutes)

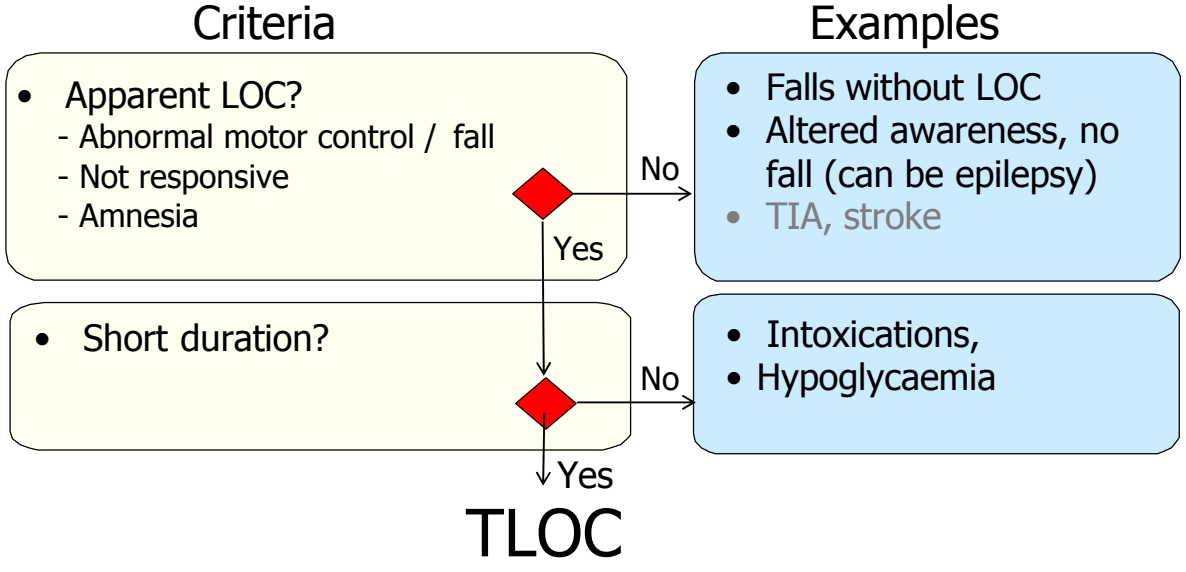
- Who?
  - Patient
  - Eyewitness
  - Patient & eyewitness
  - Patient & eyewitness

Is this TLOC?

- Patient
  - "I was standing washing the dishes. I felt something odd for a few seconds and then I found myself lying on the ground before the sink. I was surprised but felt fine otherwise. The same song was on the radio."
- No eyewitness

- Criteria
  - Amnesia YES
  - Fall YES
  - Unresponsive ?
  - Short YES
- This is TLOC
  - maybe arrhythmic syncope

What if the criteria are not met?

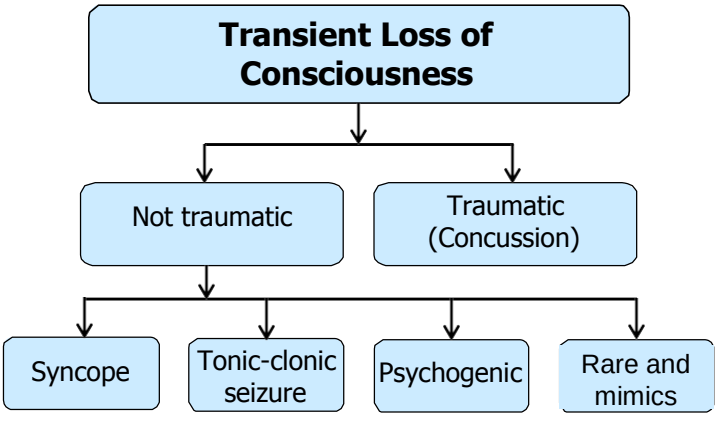


Is this TLOC?

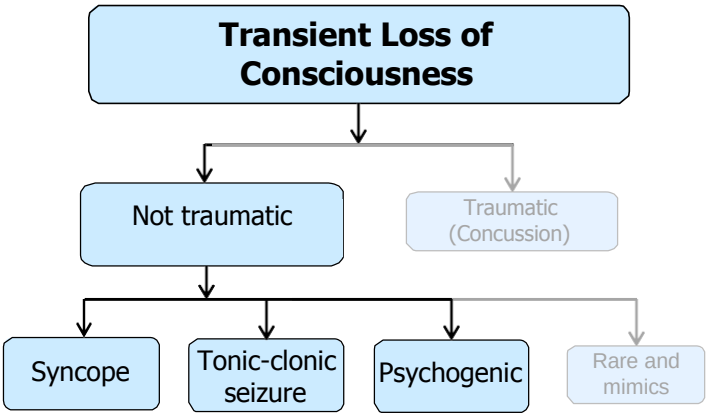
- Man, 19 years:
- "A friend told a joke and I fell on my face; I remember the pain of falling. I heard my friends call an ambulance, but couldn't stop them."
- Friend:
  - "We were laughing and he collapsed. He just lay there; we shook him and called him but he didn't do anything for a minute or two."

- Criteria
  - Amnesia NO
  - Fall YES
  - Unresponsive YES
  - Short YES
- Not TLOC
  - cataplexy, psycchogenic

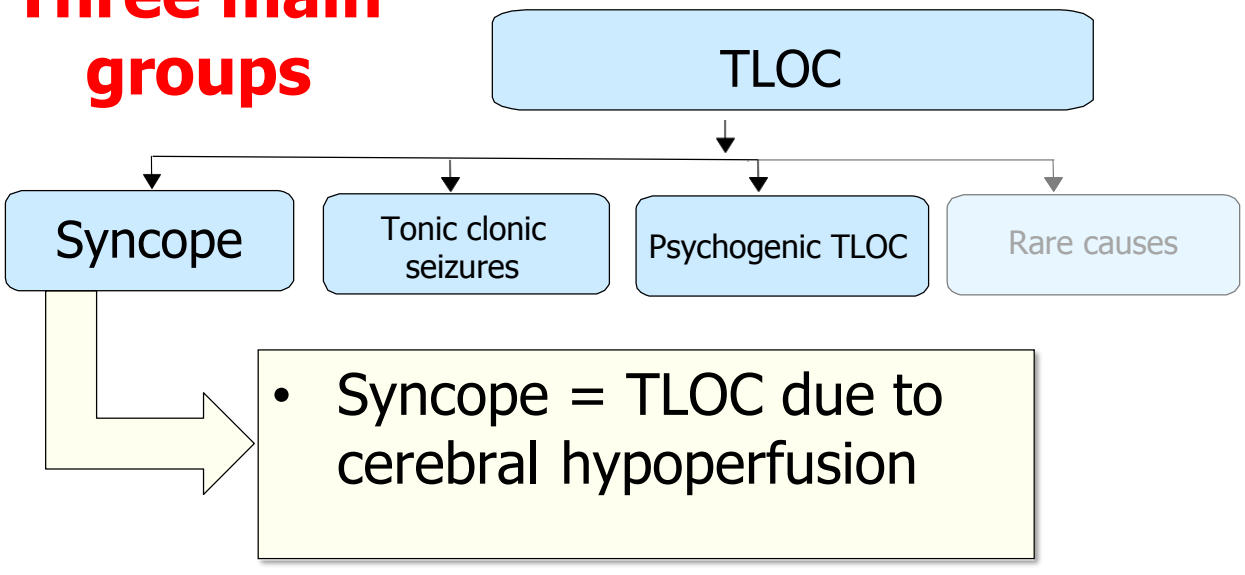
Which disorders fall under TLOC?

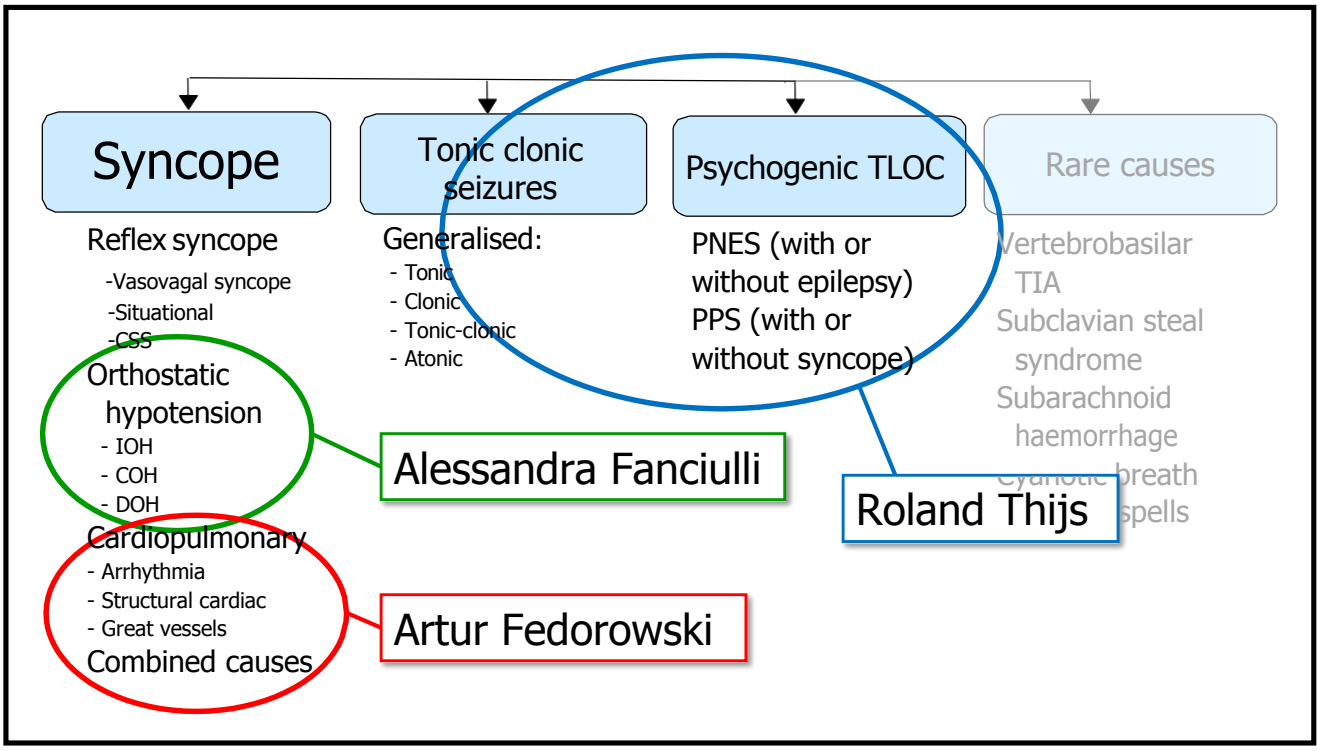


Which disorders fall under TLOC?



Three main groups





II. Should we know about syncope/TLOC?

First response is often "That's not Neurology"

Perhaps not historically, but...

1. ...it is about unconsciousness
2. ...it is about the autonomic nervous system

Six year old girl with 'morning convulsions'

- Two recent spells; last one:
  - Normal school day. Belly pain after visiting toilet. Mother cradled here in arms. Then…
  - Very pale, dramatic jerks of arms, stiff. Seemed to suffocate. Eyes wide open. M thought she would die. 1-2 minutes. Incontinent urine (no tongue bite). Deep sleep for one hour.

- What do your colleagues aim for: **syncope or seizure?**

Six year old girl with 'morning convulsions'

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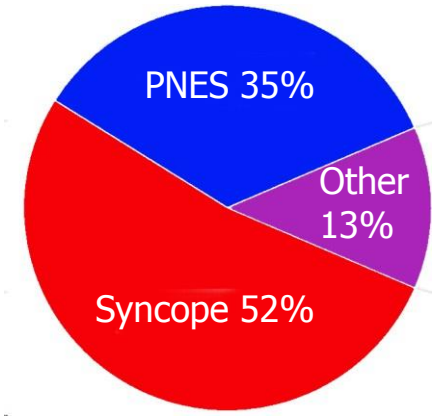
- **Red:** more seizure than syncope
- Purple: Equivocal
- Blue: more syncope than seizure

Misdiagnosis of epilepsy

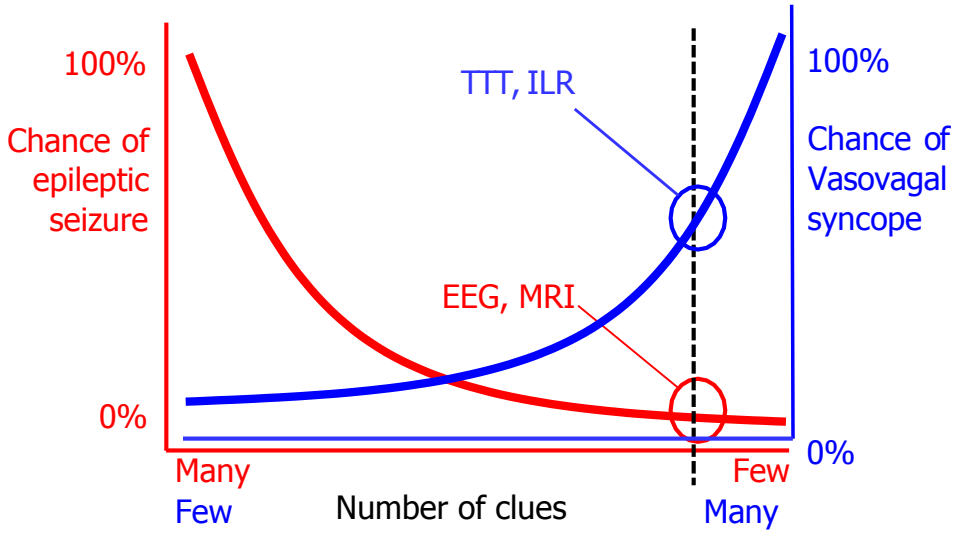


- Systematic review 27 studies[1]
  - 26 studies: 1249/6912 (mean 18%, range 2-71%)
- Main reasons
  - False interpretation of EEG[2]
  - Inadequate history[2]
  - No knowledge of other conditions[3]

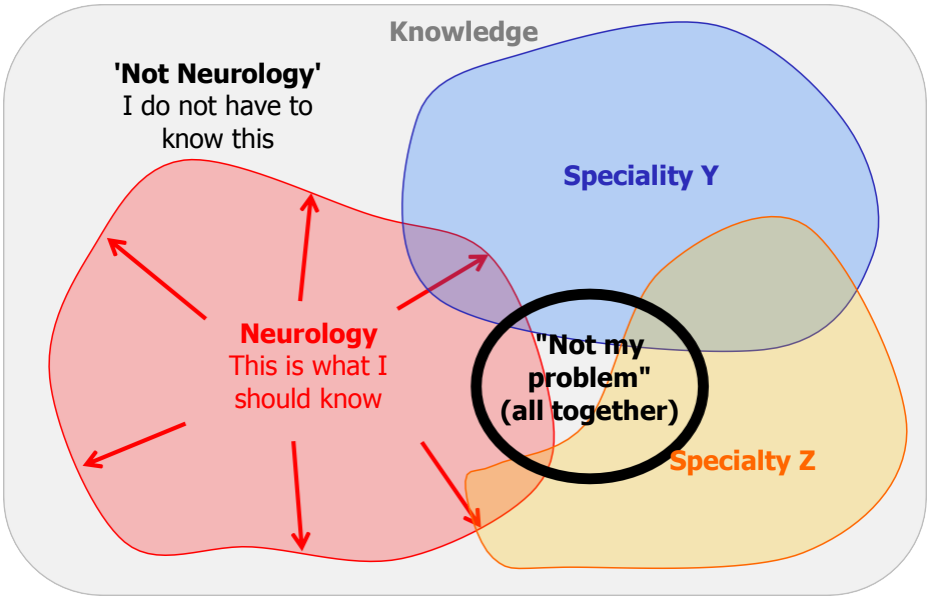
1 Xu et al. Seizure 2016; 41: 167–174; 2 Oto. Seizure 2017; 44: 143-146; 3 Chitre Paediatrics Child health 23;6: 237-242

No knowledge of other conditions

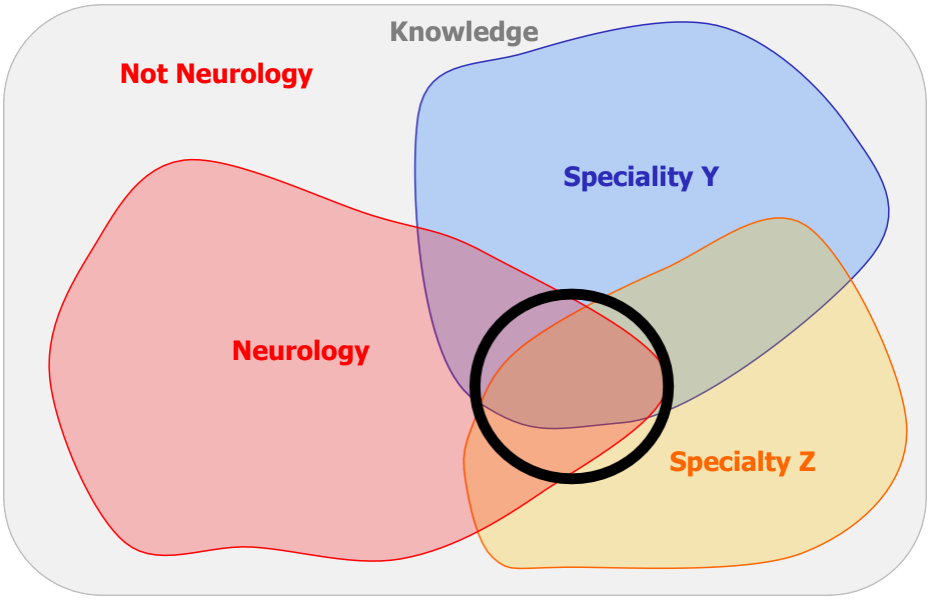
Contented to search for epilepsy only



The limits of specialisation



Rethink the limits



Better care for epilepsy and syncope

Can a neurologist afford to not know the differential diagnosis of epilepsy?

Cardiologist:	cardiac syncope
Internist:	low blood pressure
Geriatrician:	falls
Paediatrician:	TLOC
ER physician:	TLOC

The suggested solution

- Neurologists should know...
  - ...Vasovagal syncope (reflex syncope) really well
    - Because it is common
  - ...Cardiac danger signs
    - because of the danger

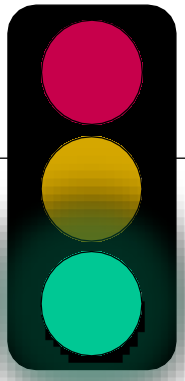
- Shouldn't this be in the neurology curriculum?
  - It already is in the Netherlands...

Yes, we should know TLOC

1. It is neurology
   - (it's also cardiology, etc.)
2. Better epilepsy care
   - Through less misdiagnosis
3. Main instrument is history taking
   - Which we do anyway
4. It is rewarding
   - VVS: Few visits, contented patients

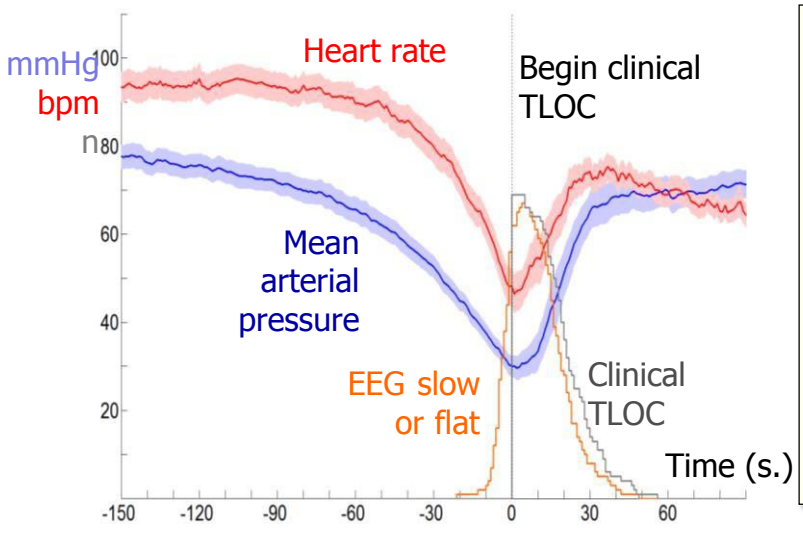
III. Reflex syncope

- 'Autonomic activation'
  - Sweating, pallor, nausea
  - **Vasovagal syncope**
  - Trigger: pain, anxiety, standing
- Situational syncope
  - micturition, defaecation, coughing, swallowing, stretching...
- Carotid sinus syncope
  - pressure on carotid sinus



- **ESC guidelines 2018**
- No tests!
- Diagnosis is secure

Vasovagal syncope (VVS)



- Pathophysiology
  - Most important:
    - Venous pooling legs, abdomen
    - Low blood pressure
    - Vagal action: low heart rate

van Dijk, Thijs, et al. Brain 2014; 137: 576-585

? Will this kill him?

Boy, 13 years

Has fainted after standing in hot room or after pain: first nauseous and pale, then LOC ~30 s. Mother and sister same spells.

Now nauseous at party. Friends kept him upright, then LOC ~60 s. Eyes open, snored. Friend's mother (doctor) 100% certain of absent heart beats for ~20 s. Then red face, quick recovery.

- What is it?

1. Hereditary arrhythmia; may die suddenly
2. Vasovagal asystole; may die suddenly
3. Vasovagal asystole; no sudden death
4. Vasovagal; asystole was mistake

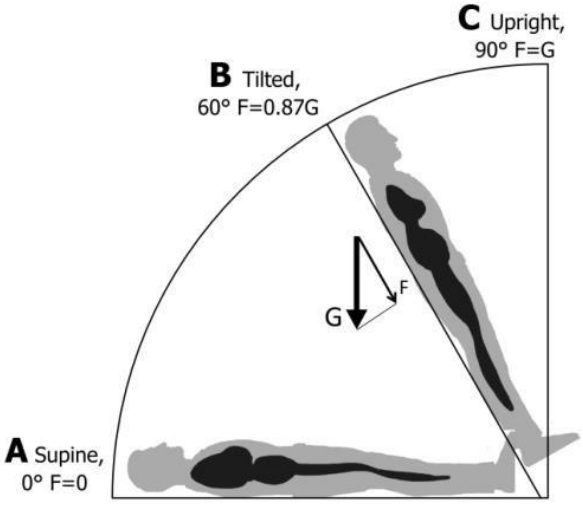
Will this kill him?

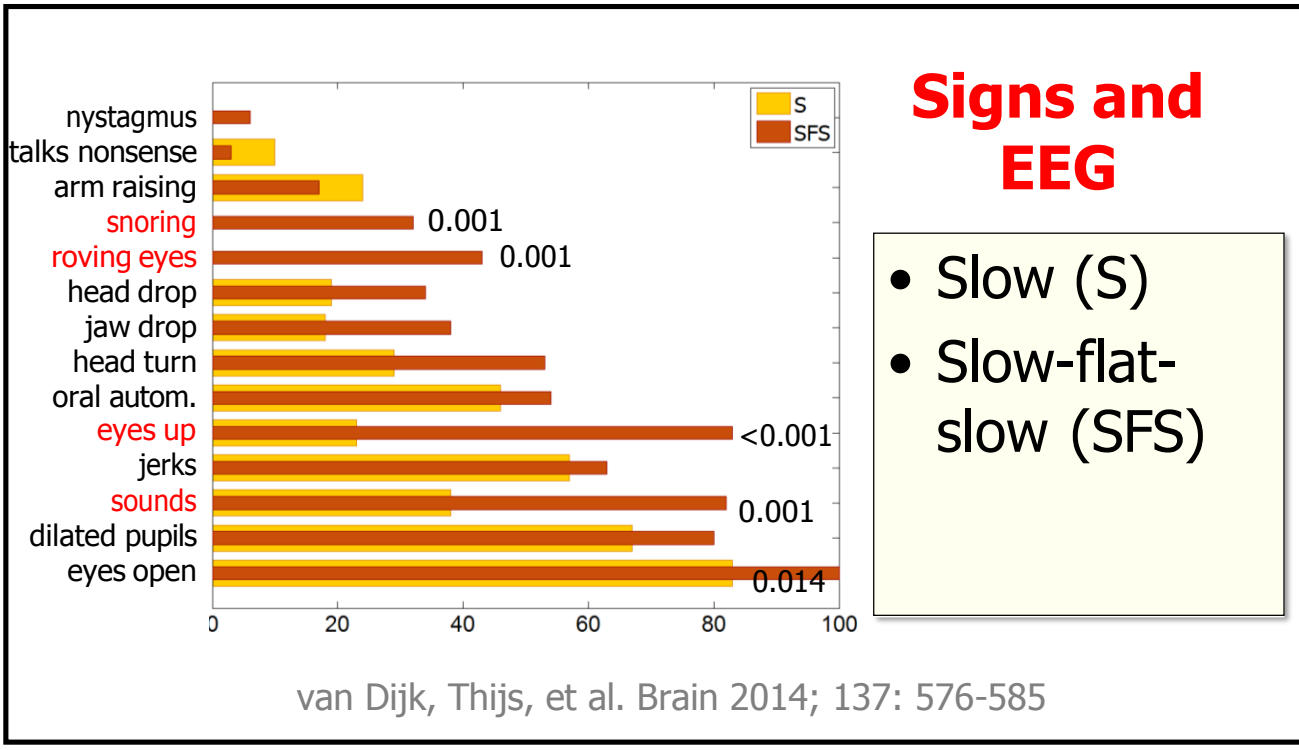
1. Hereditary arrhythmia; may die suddenly
2. Vasovagal asystole; may die suddenly
3. **Vasovagal asystole; no sudden death**
4. Vasovagal; asystole was mistake

- Asystole in VVS
  - Who?
    - Always in children <~6 years
    - Common in adults
  - What?
    - Not life-threatening!
    - No evidence for poor prognosis of long duration
    - Long asystole ≠ pacemaker

Tilt Table Test

- 60-70° head up tilt
  - Blood flows down
    - (too much in those with VVS)
- Aims
  - Provoke complaints
  - Prove pathophysiology
  - Therapy! Teach counter manoeuvres





Signs and EEG

- Slow (S)
- Slow-flat-slow (SFS)

van Dijk, Thijs, et al. Brain 2014; 137: 576-585

Therapy VVS

- On complaint recognition
  - Lie down, sit down, 'counter manoeuvres'
- If susceptible to long standing:
  - Drink ½ L water quickly
- Always
  - Plenty water and salt
- Drugs (very rarely)
  - Midodrin, fludrocortison
- Pacemaker (extremely rarely)

IV Syncope vs. seizure

1: Triggers

- Syncope is often triggered, epilepsy rarely
- Triggers differ!
  - Epilepsy
    - Flashing lights, various cognitive tasks,...
  - Syncope (by cause)
    - pain, fear, standing
    - exercise, supine
    - fever, water in face, alarm clock

Syncope vs. seizure 2

TLOC with flaccid immobility

- No posture or jerks at all?
- Not an epileptic seizure
  - No need for brain MRI or EEG
  - This is syncope or psychogenic pseudosyncope (PPS)
    - (No jerks in 81% PPS and 40% VVS)

Tannemaat, van Niekerk, Reijntjes, Thijs, Sutton, van Dijk; Neurology 2013; 81: 1-7 / Benbadis Epilepsy & Behavior 2009; 15-21

Syncope vs. seizure 3

What does NOT help?

	Seizure	Syncope
Incontinence	yes	yes
Eyes open*	yes	yes
Presence of jerks	yes	yes
Fatigue, sleep	yes	yes

* When are they closed?

Syncope vs. seizure 4

What does help?

	Seizure	Syncope
Jerks	One minute **>20**	A few seconds **<10**
Tone	mostly stiff	mostly flaccid
Tongue bite	yes (**side**)	rare (tip)
Recovery	minutes, **confusion**	seconds, no confusion

The '10/20' rule

Home video

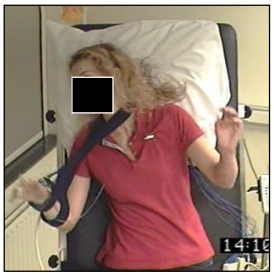
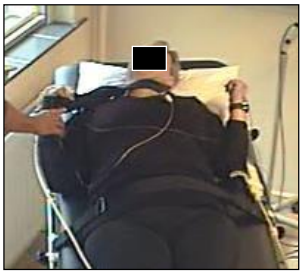
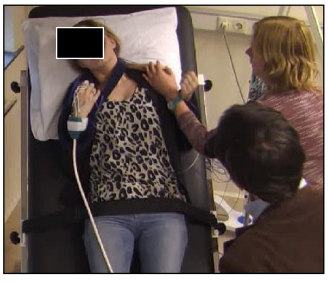
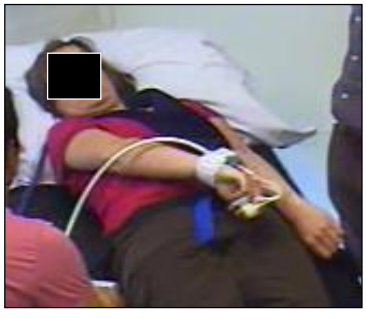
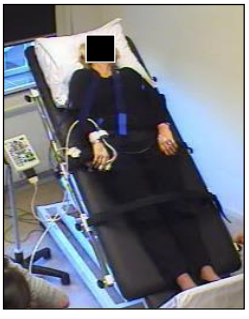
Tilt table test

- Epileptic seizure
  - Coarse, rhythmic, 1 min., **20-100**

- Syncope
  - Fine, irregular, 10 s., **0-10**

Shmuely, Van Dijk, Thijs. Neurology 2018

'Tonic Posture' in syncope

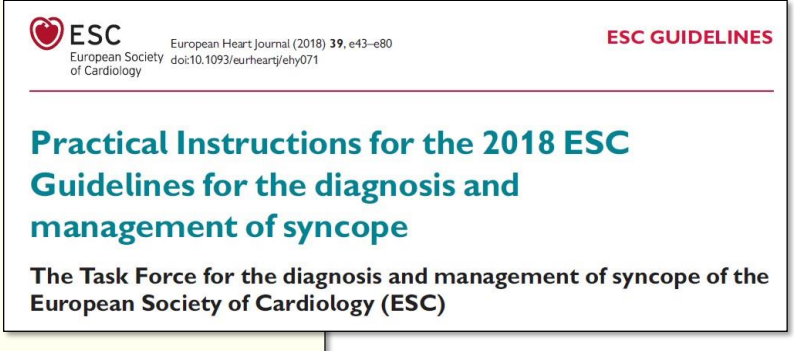
Shmuely, van Dijk, Thijs. Neurology 2018; 90: e1339-e1346

- Postures
  - 31/47 Flexion
  - 2/47 extension
- While EEG flat
  - Deep hypoperfusion

V. How to move on?

- Learn what to ask
- Form a 'Syncope Unit'
  - Any specialty can head it
  - Include cardiology, neurology

Kenny et al. Syncope Unit: ... Europace 2015; 17: 1325-1340


ESC European Society of Cardiology

European Heart Journal (2018) 39, e43–e80
doi:10.1093/eurheartj/ehy071

ESC GUIDELINES

Practical Instructions for the 2018 ESC Guidelines for the diagnosis and management of syncope

The Task Force for the diagnosis and management of syncope of the European Society of Cardiology (ESC)