

Neurodiagnostics

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**Laboratory
Blood Samples**



**Neuro-
radiology**



**Cerebrospinal
Fluid**



**Neuro-
physiology**

The NeuroLevel and NeuroExam

Neurological Examination

Cognition

Cranial Nerves

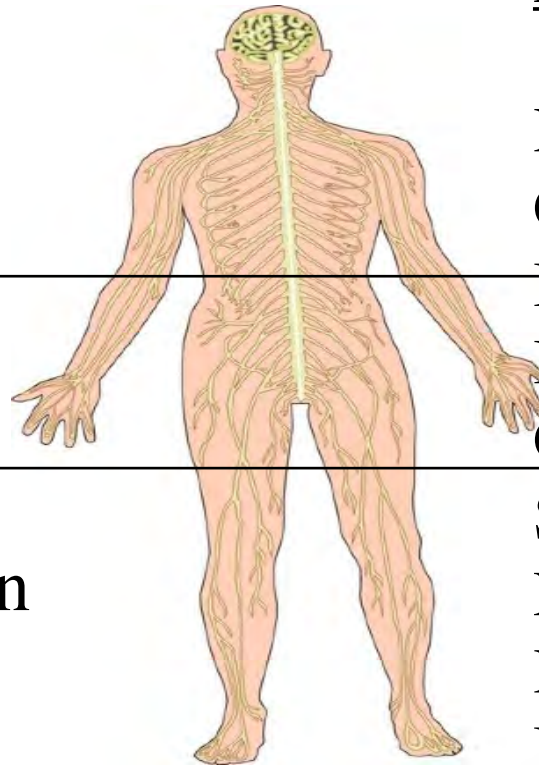
Motor examination

Cordination

Sensory Examination

Reflexes

The Autonomic Nervous System



Neurological Level

Psyche

Cerebral hemispheres

Basal ganglia

Brainstem and cranial nerves

Cerebellum

Spinal cord

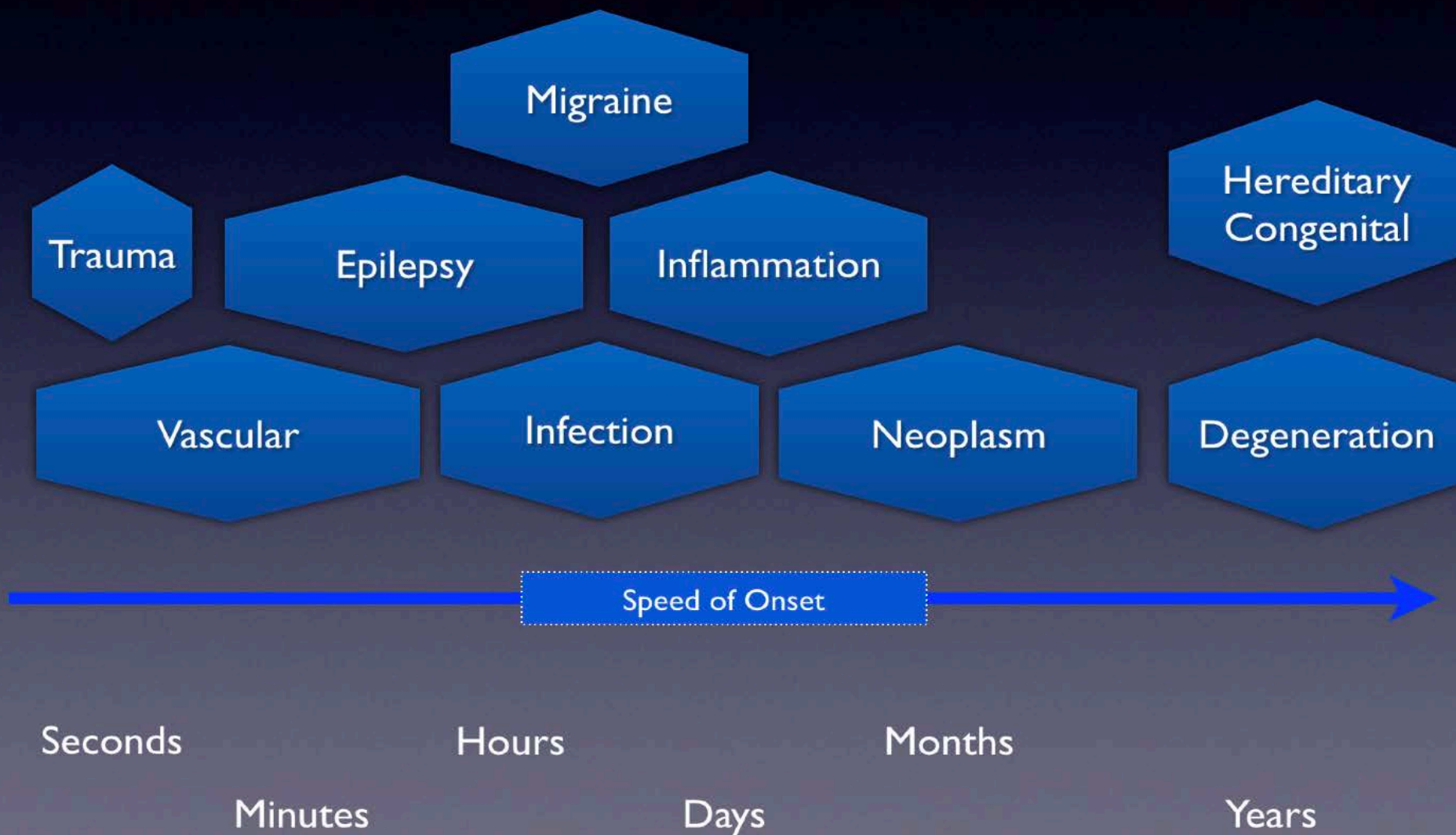
Nerveroot

Peripheral nerve

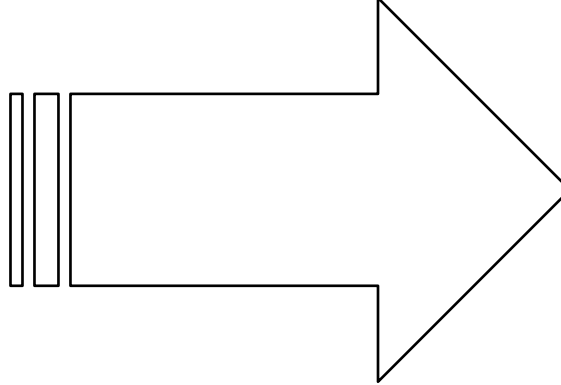
Myoneural junction

Muscle

The Timescale of Neurological Symptoms



Neurodiagnostics



Neurological level

- **Patient history**
- **Examination**
- **Neuroradiology**
 - Computed tomography CT, TT-angiography, Magnetic Resonance Imaging (MRI), MRI-angiography (MRA)
 - Functional MRI, SPECT, PET
- **Neurophysiology**
 - EEG = electroencephalography
 - ENMG = electroneuromyography
 - Activation potentials VEP (visual), SEP (sensory), BAEP (braistem)
- Lumbar puncture, cerebrospinal fluid
- Laboratory studies
- Brain or nerve biopsy

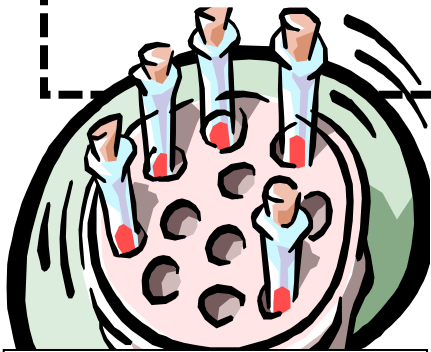
Neurodiagnostiikka (II)

Headache
Confusion
Convulsion Tiredness

Neurological Symptom

Dysphasia
Inattention
Hemiparesis
Ataxia

History ja neurological examination



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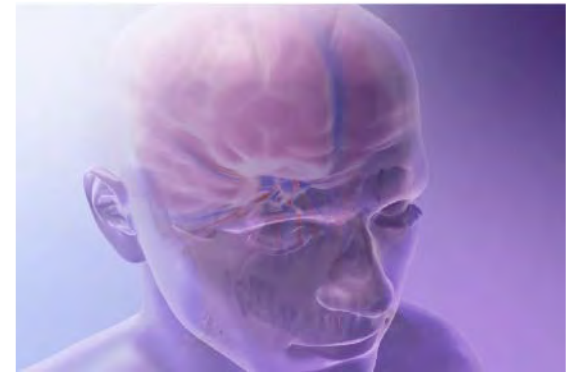
Cerebrospinal
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What Disorder – How to Proceed?

**Patient history
Examination**



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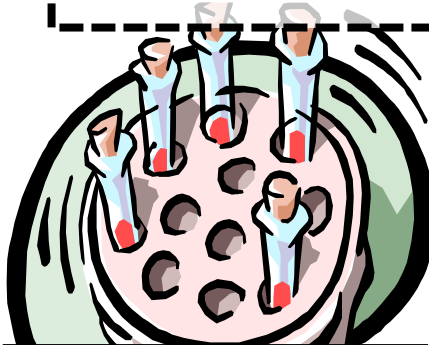
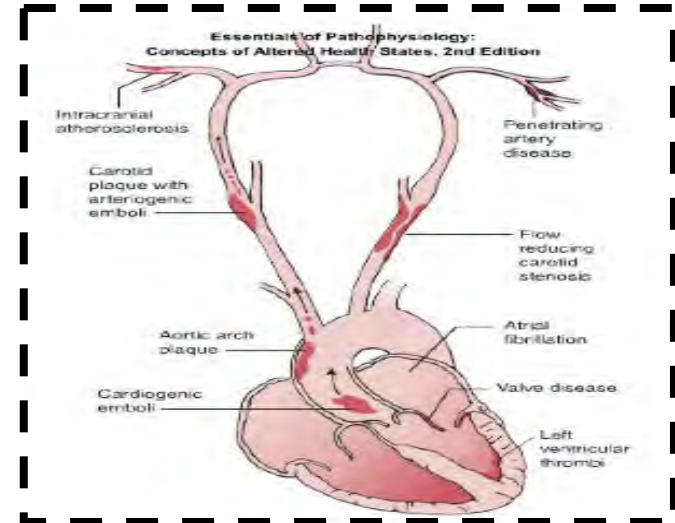
**Cerebrospinal
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Mikä tauti, miten tutkit ?

Patient history Examination



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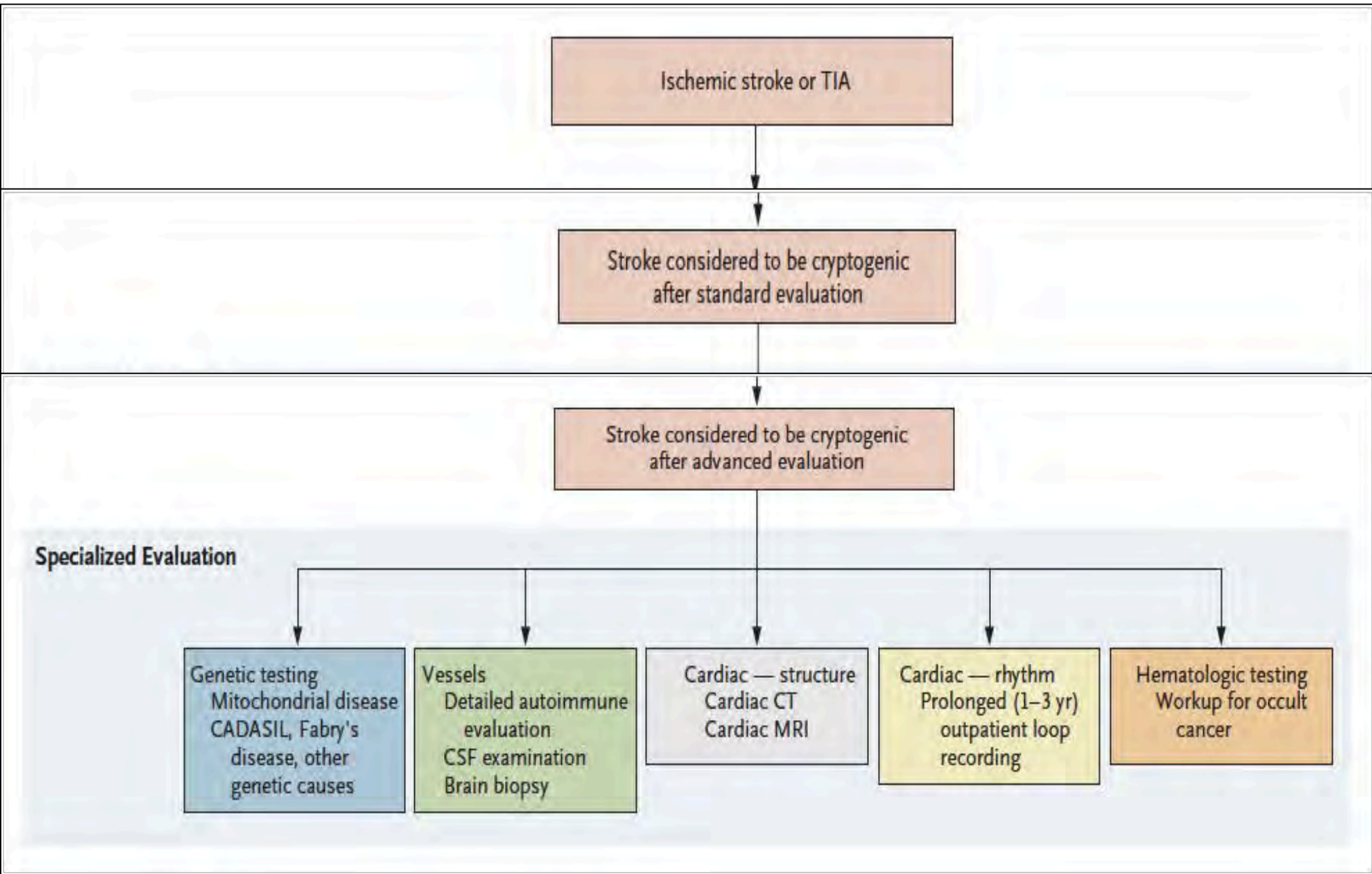
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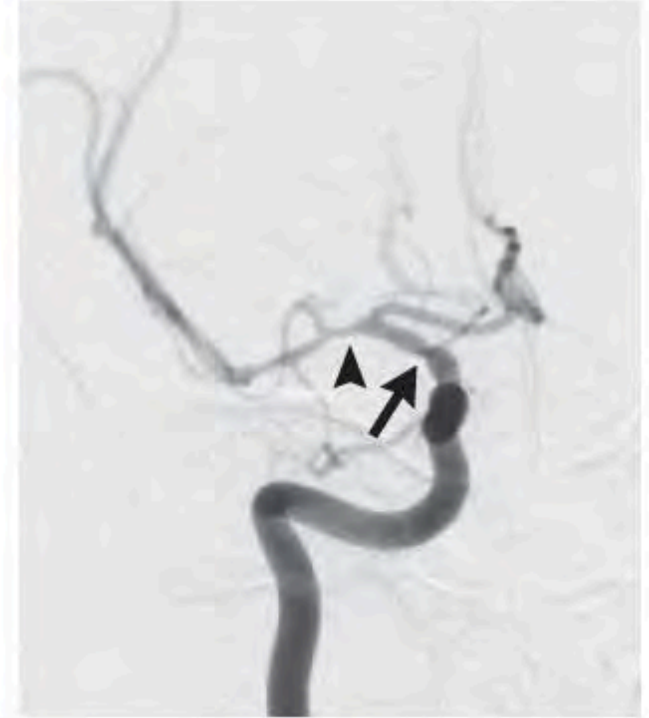
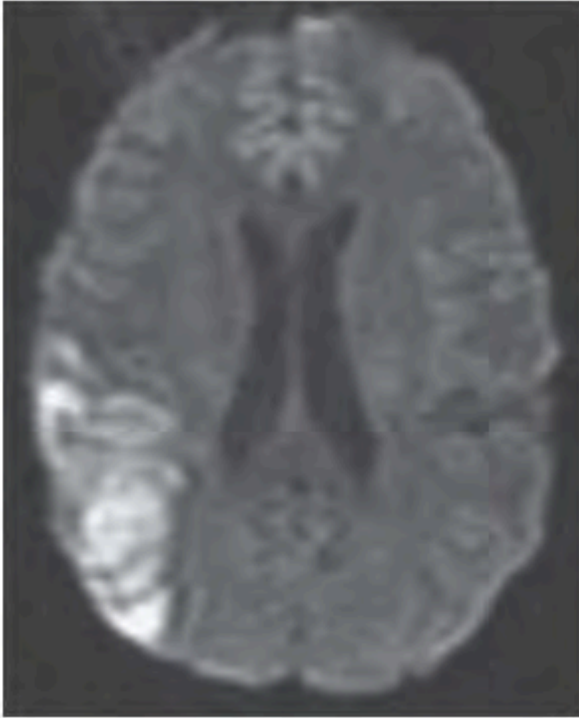
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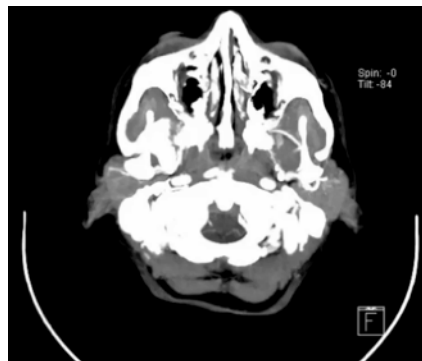
Neuro-
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Nonatherosclerotic Arteriopathy and the Reversible Cerebral Vasoconstriction Syndrome



Saver JL. CLINICAL PRACTICE. Cryptogenic Stroke. N Engl J Med. 2016;374(21):2065-74.



Patient is confused –
what do you need to study?

**Patient history
Examination**



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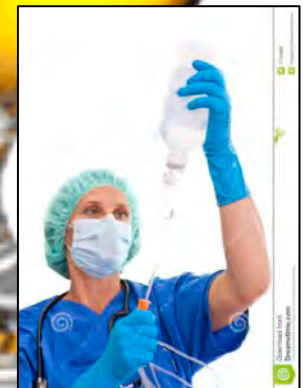
Infection

Medicine, drug, intoxication, withdrawal

Disorders of fluid balance

Trauma – including operations

Intracranial pathology



"STONED"-mnemonic

S = sugar, stroke, seizure

T = trauma, temperature

O = organ failure

N = iNfection, neoplasm

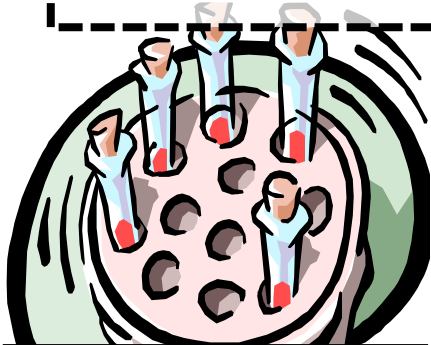
E = endocrine

D = drugs, dietary deficiency

Look for asymmetry - ie. focal signs

What Disorder – How to Proceed?

Patient history
Examination



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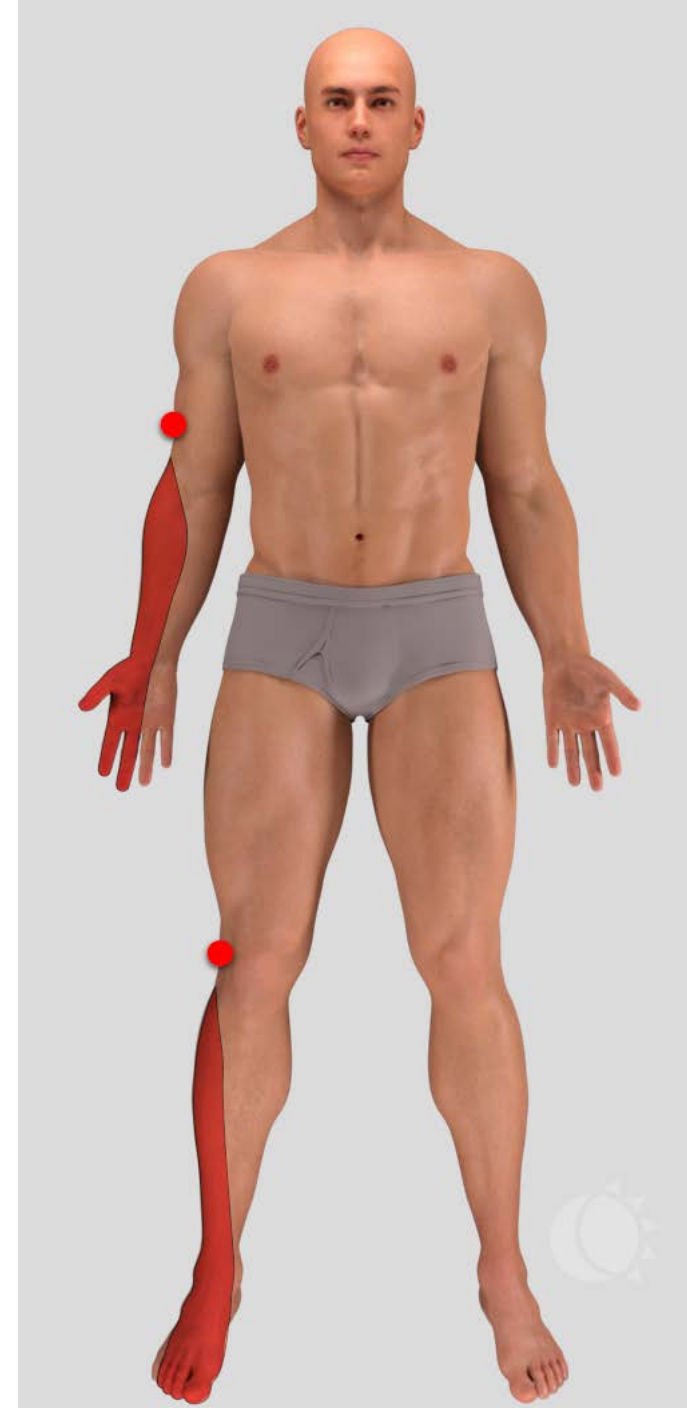
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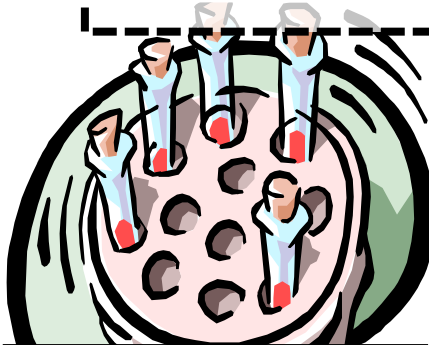
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Problem with Balance – How to Proceed?

**Patient history
Examination**



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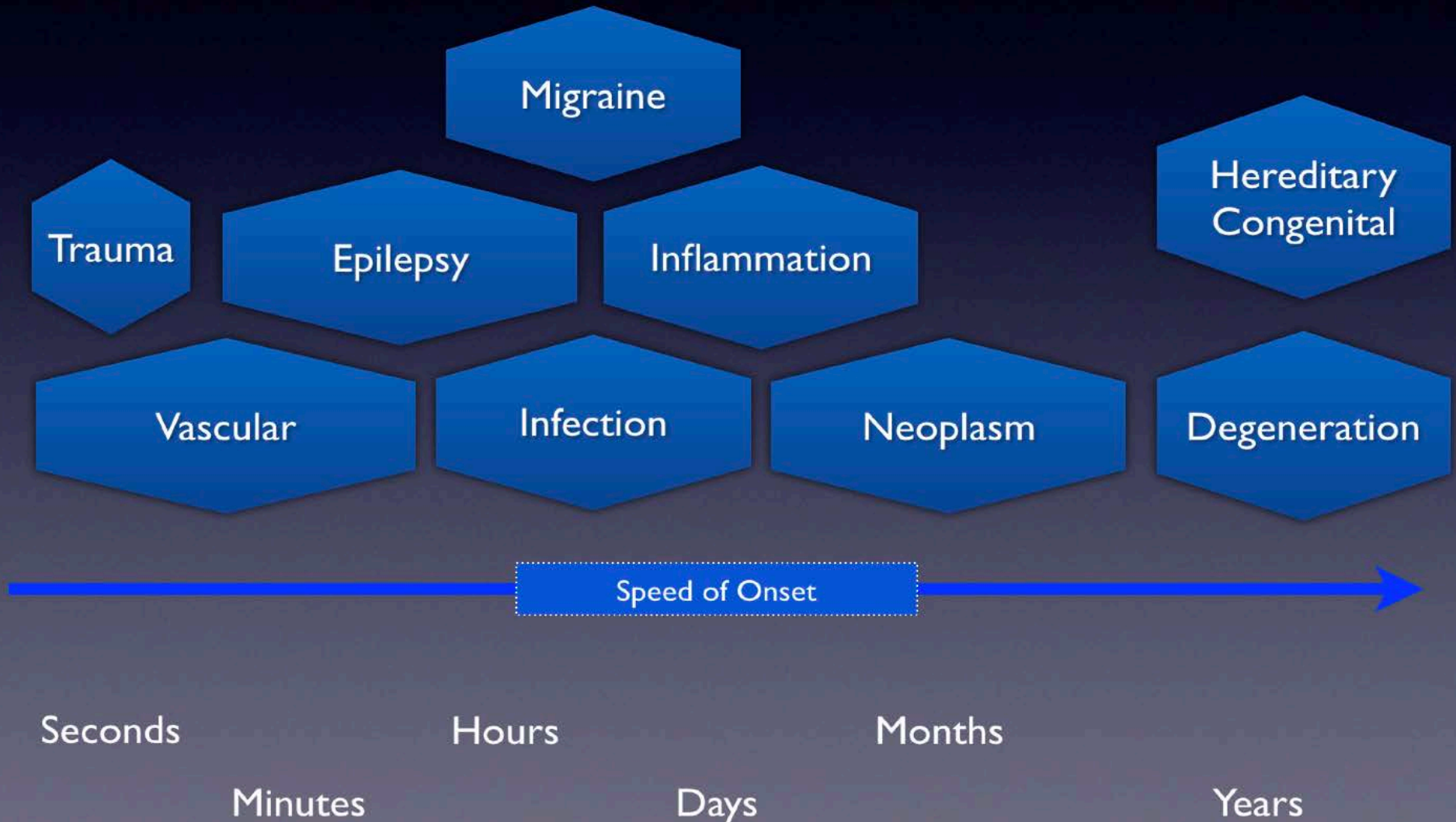


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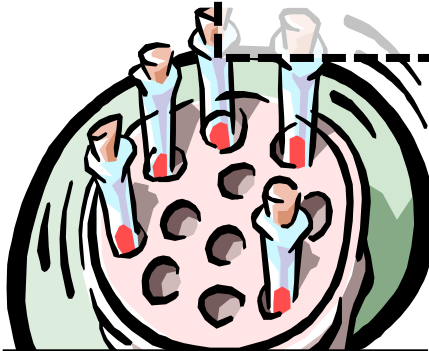
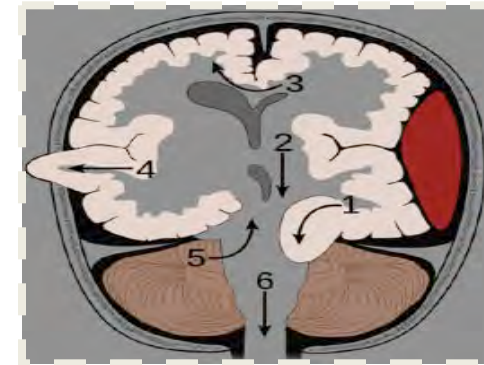
**Neuro-
physiology**

The Timescale of Neurological Symptoms



When are you really in a hurry?

Patient history Examination



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Epidural hematoma

Brain herniation

Increased ICP

Basilar thrombosis

Status epilepticus

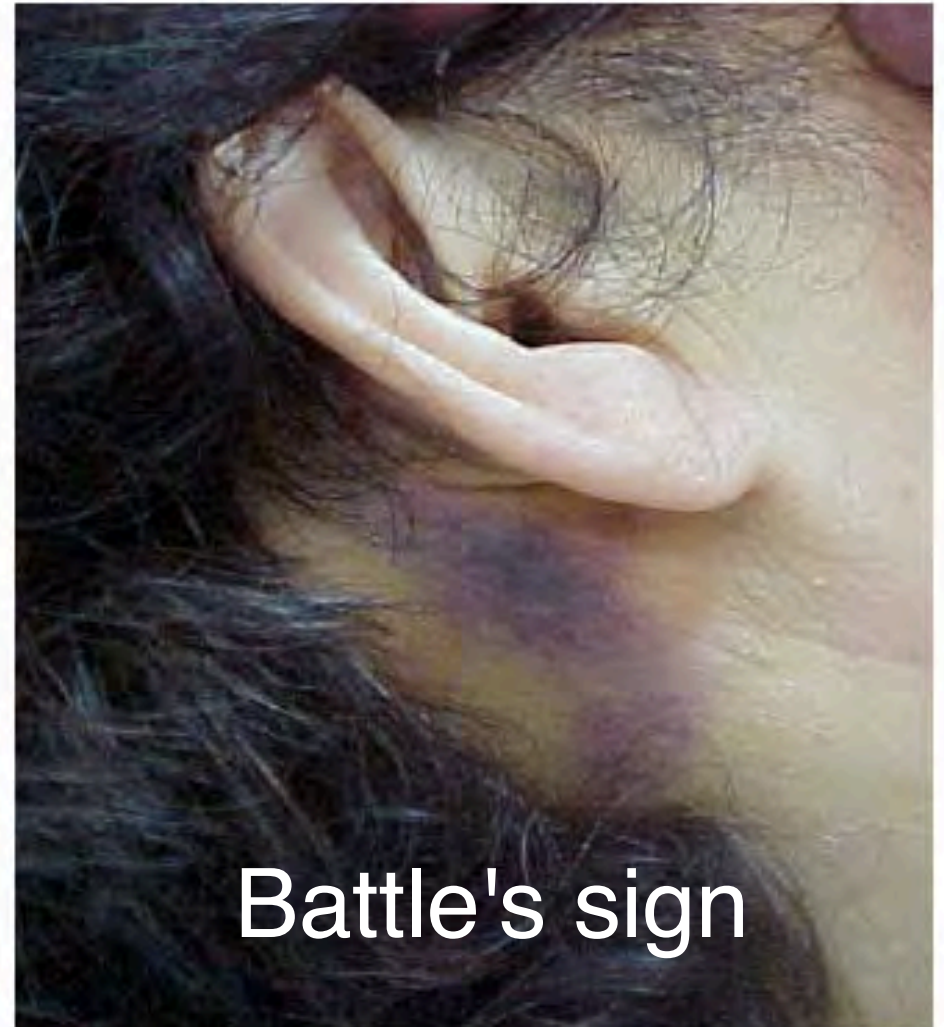
Bakterial meningitis



ICP = IntraCranial Pressure



Raccoon eyes



Battle's sign

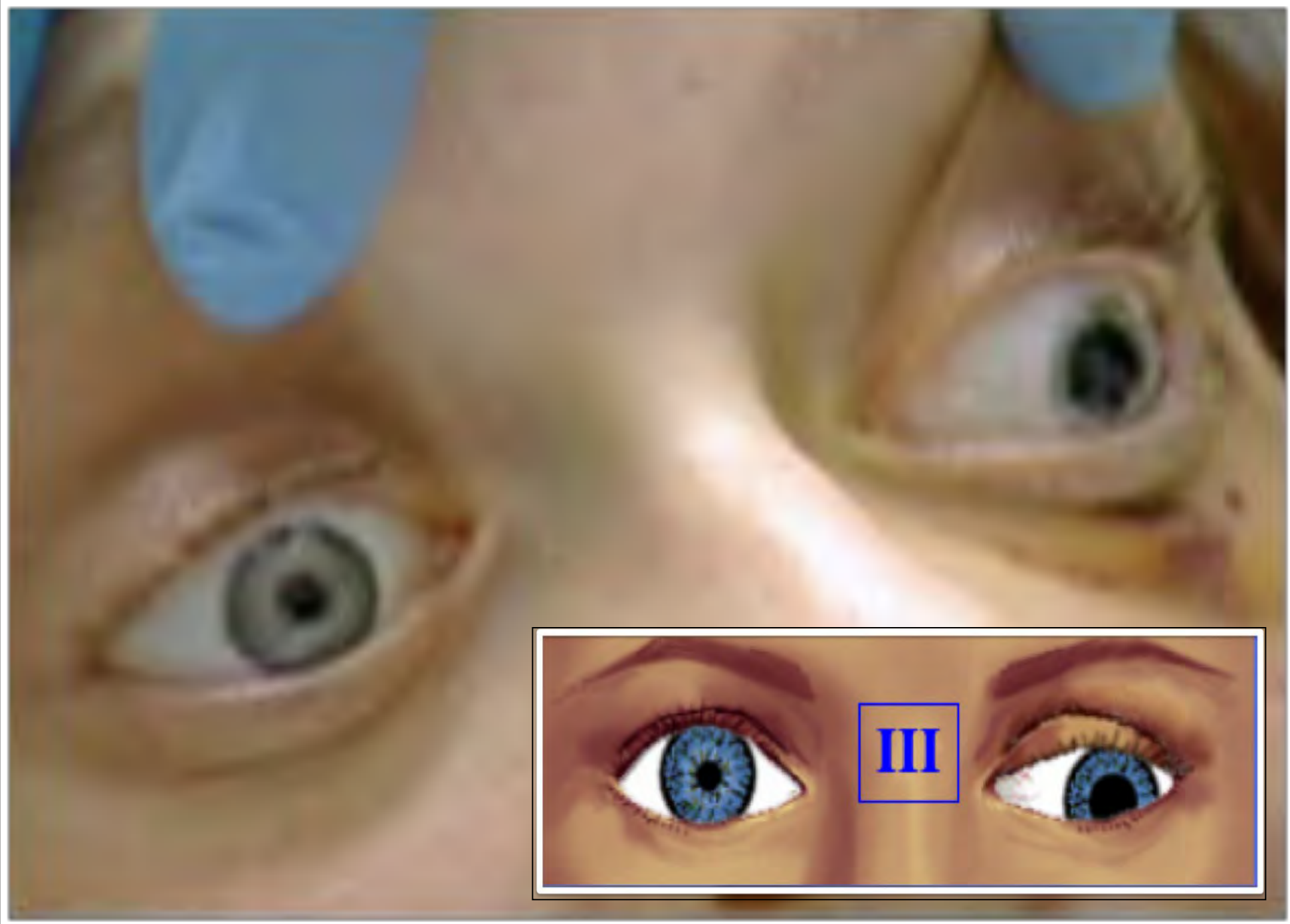
David Greer. Clinical Evaluation of Coma. AAN Cyllabus 2017 (Boston)

Signs of Trauma



Battle's sign

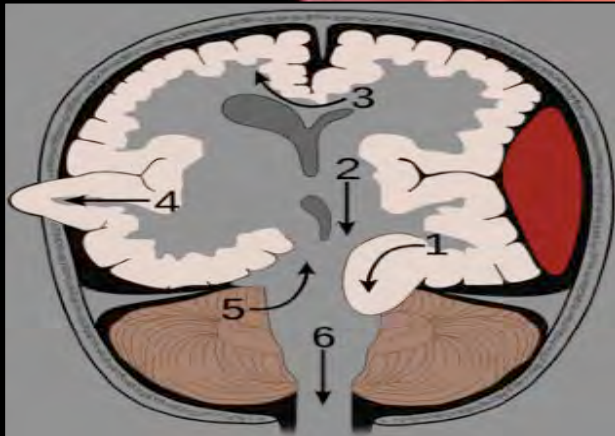
<http://rightatrium.tumblr.com/image/9880779895>



Papilledema



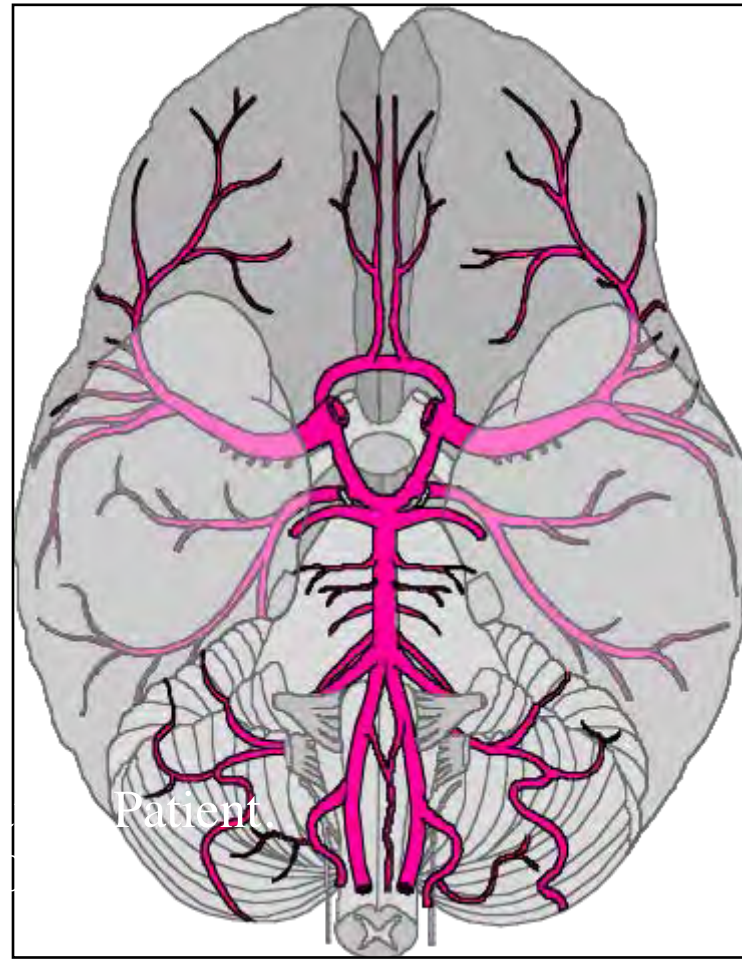
**Optic nerve
papilla swollen**



**Extravasation of
blood**

**Blurred blood vessels
behind the edema**

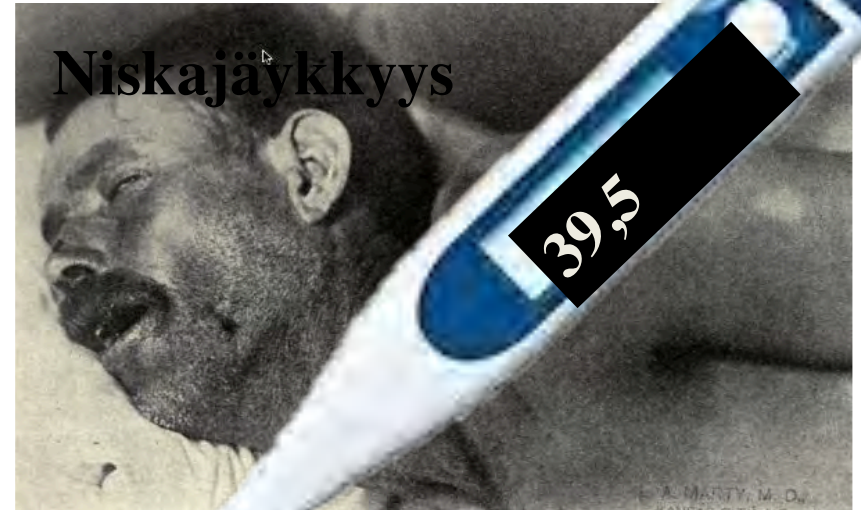
Locked-in-syndrome



Severe destruction of the pons – no movement from the eyes down

Meningitis

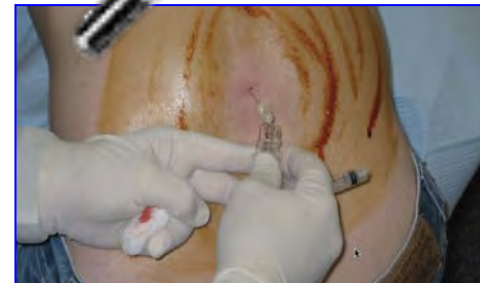
Patient history Examination



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Fever
Headache
Meningism
Confusion



Exam 1

Exam 2

Exam 3



Know the Bug Before Choosing the Drug

Start medication within 30 minutes

Patient in unconscious – what do you do?

Patient history Examination



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