

Treatments and their side-effects in neurology

Laszlo Olah

Last lecture in neurology

- Summary
- Treatments
 - Ischemic stroke
 - MS
 - Parkinson disease
 - Epilepsy
 - Headache/Migraine

Treatment of ischemic stroke

- Reperfusion therapy???
- Prevention of complications
 - DVT
 - Pneumonia (aspiration - swallowing test)
 - Bed sore
- Secondary stroke prevention...

Could you tell me antithrombotics????

ANTITHROMBOTICS

ANTIPLATELETS

ANTICOAGULANTS

FIBRINOLYTICS

ANTITHROMBOTICS

ANTIPLATELETS

ASA
(stomach ulcer)

Ticlopidine
(agranulocytosis)

Clopidogrel

ANTICOAGULANTS

FIBRINOLYTICS

ANTITHROMBOTICS

ANTIPLATELETS

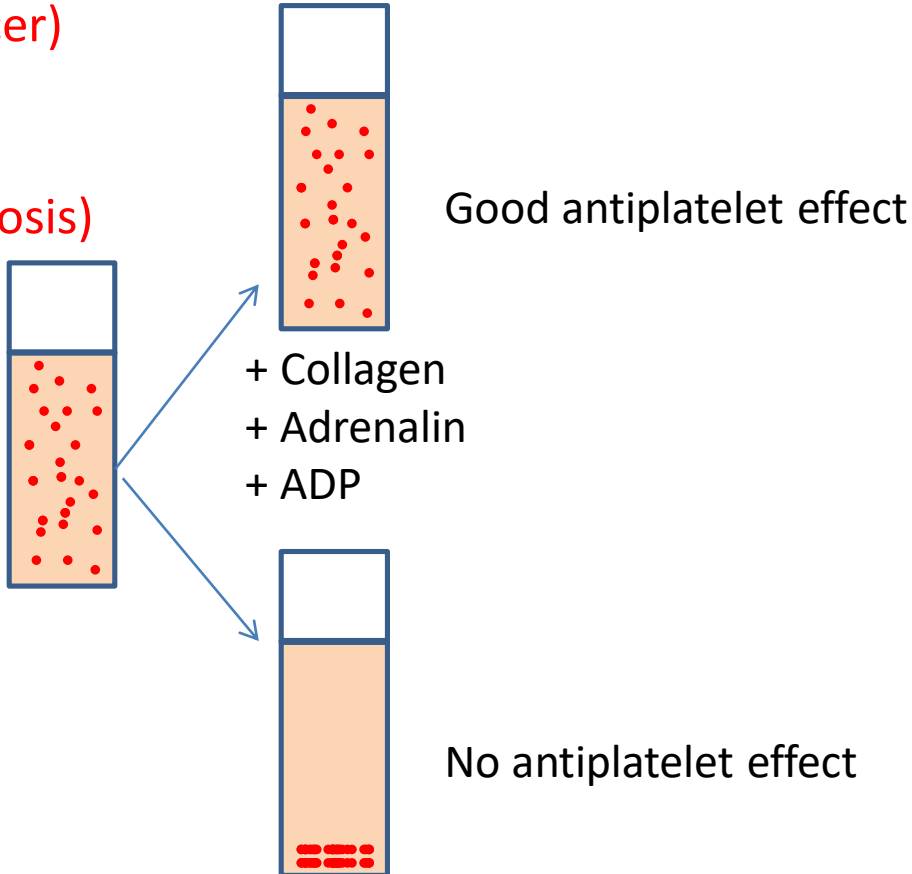
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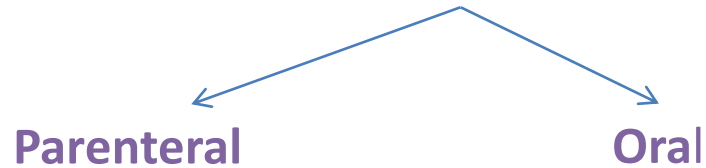
Clopidogrel

ANTICOAGULANTS

Parenteral

Oral

FIBRINOLYTICS



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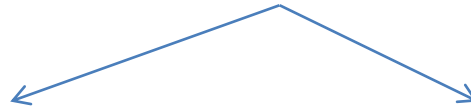
Parenteral

Heparin (APTT, TT)

LMWH (aXa)

Oral

FIBRINOLYTICS



ANTITHROMBOTICS

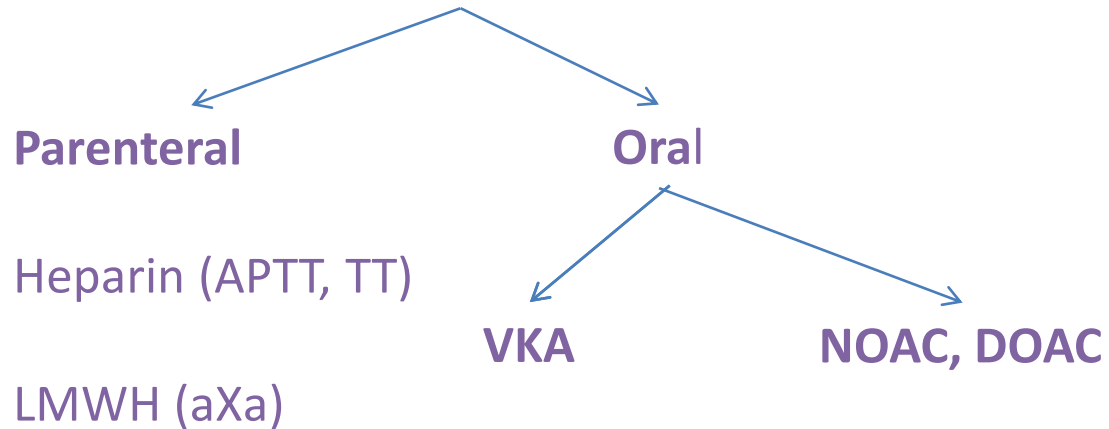
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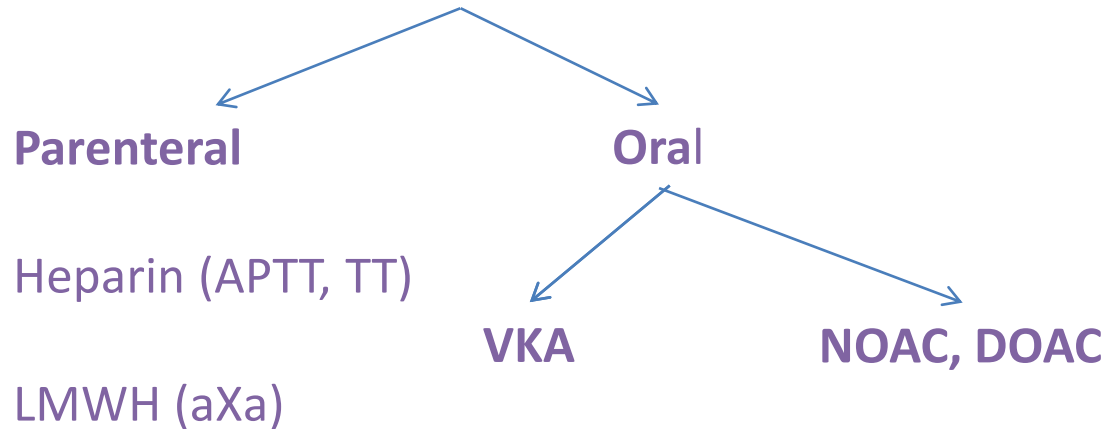
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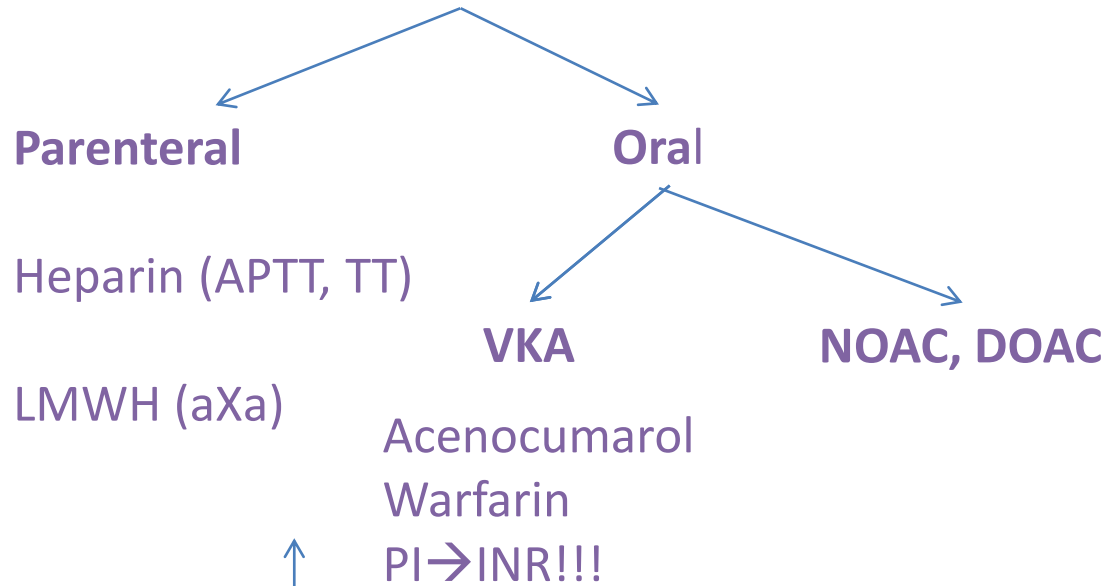
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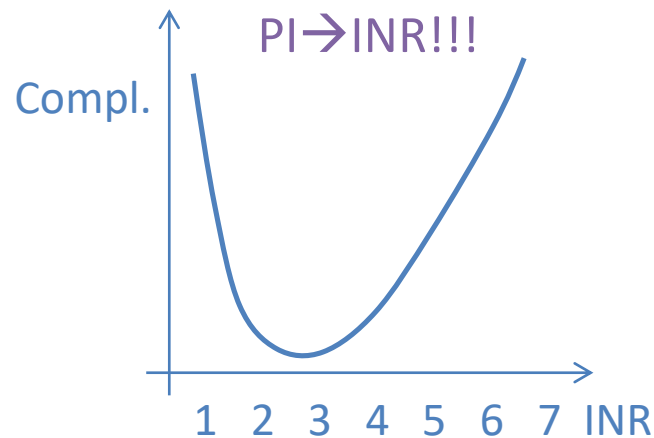
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ANTICOAGULANTS



FIBRINOLYTICS



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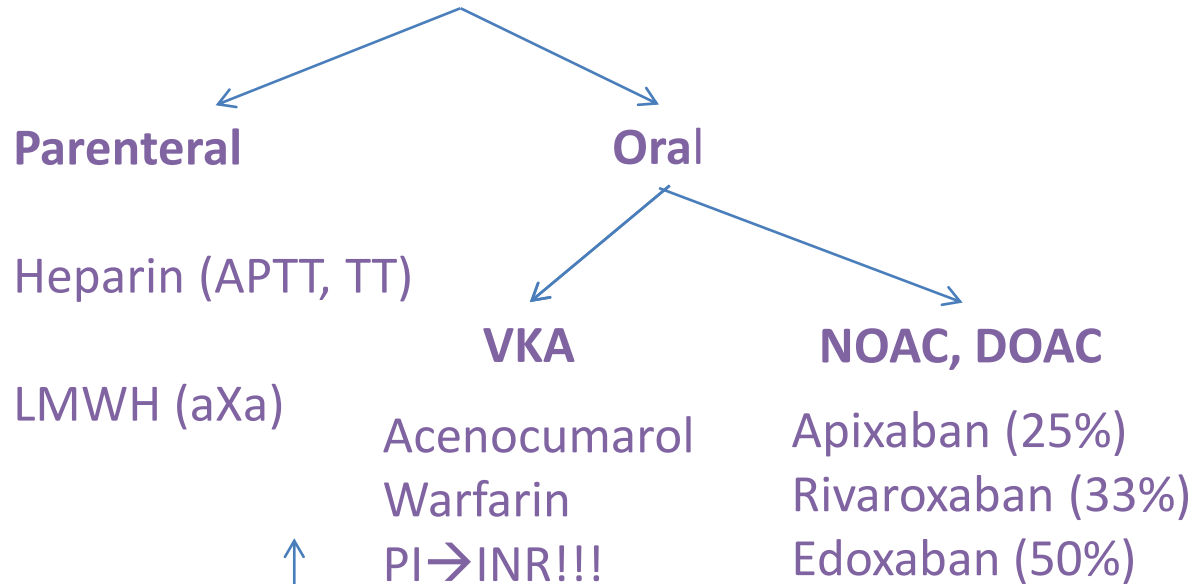
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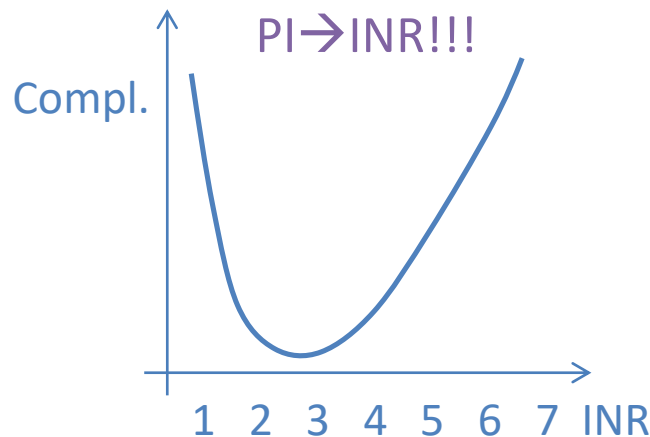
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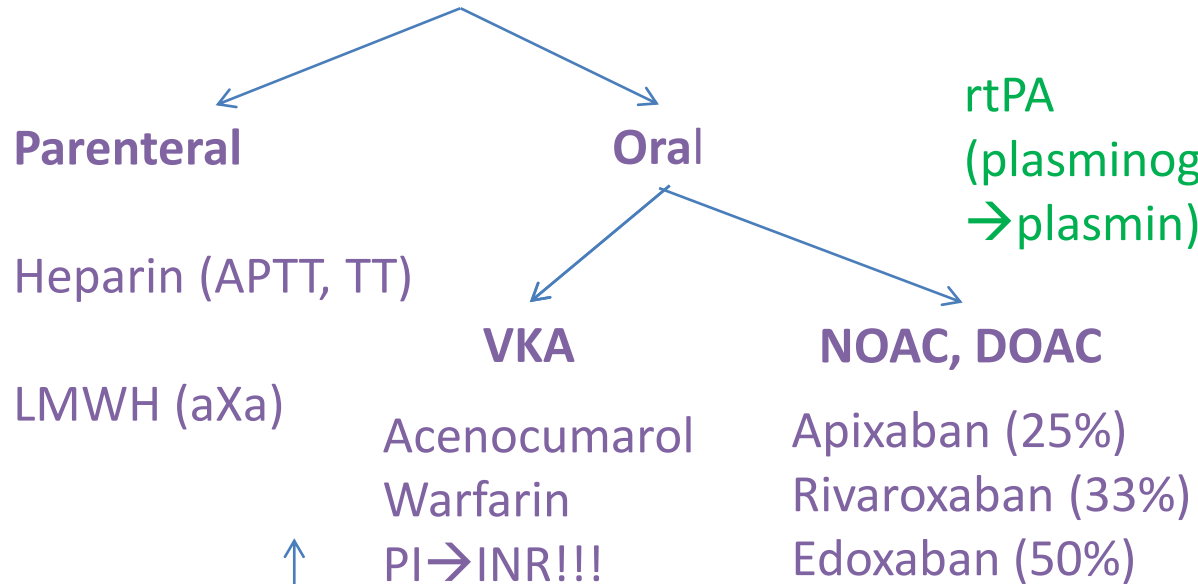
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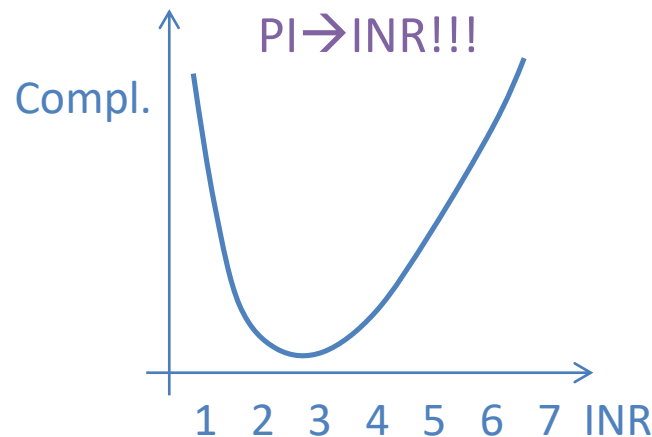
Clopidogrel

ANTICOAGULANTS



FIBRINOLYTICS

rtPA
(plasminogen →
→ plasmin)



Treatment of ischemic stroke

- Reperfusion therapy???
- Prevention of complications
 - DVT
 - Pneumonia (aspiration - swallowing test)
 - Bed sore
- Secondary stroke prevention...
 - Antiplatelet + statin
 - If carotid stenosis > 70%: Antiplatelet + statin + CEA
 - If atrial fibrillation is present: Anticoagulant

Indication of antithrombotics

ANTIPLATELETS

Atherothrombotic stroke

Lacunar stroke

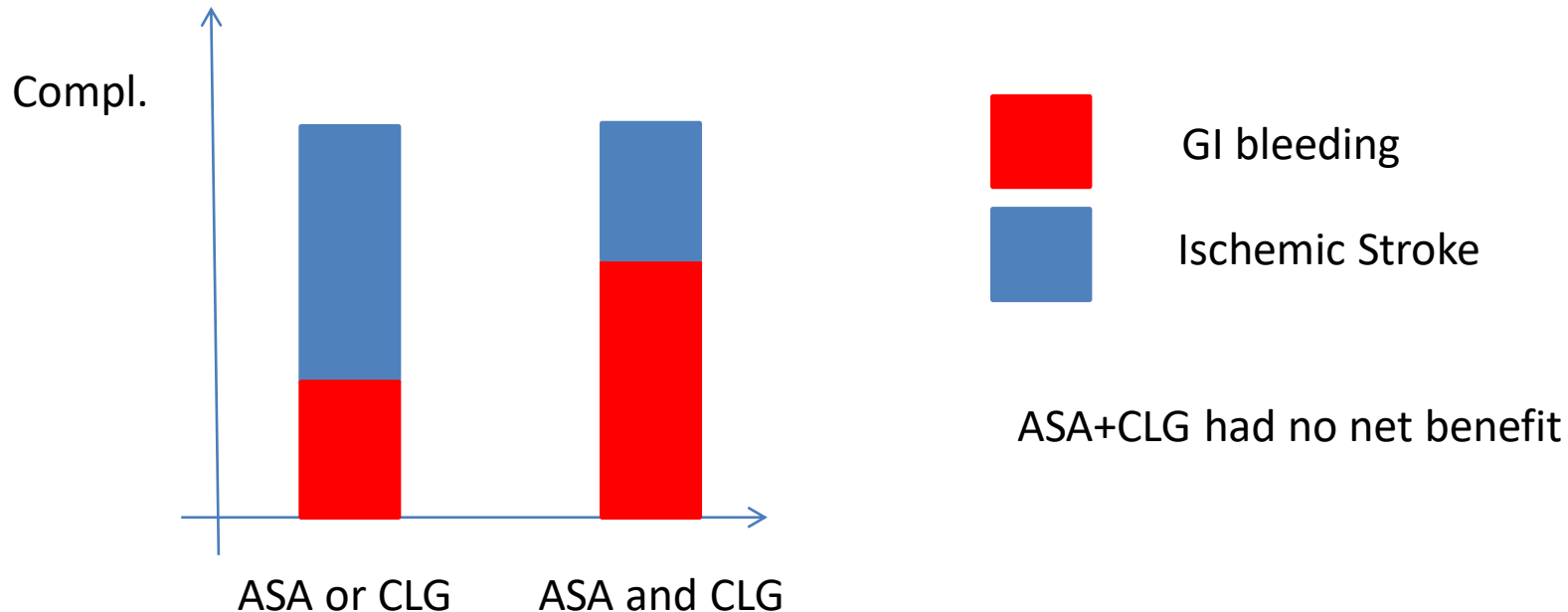
Indication of antithrombotics

ANTIPLATELETS

Atherothrombotic stroke

Lacunar stroke

Dual antiaggregation treatment in stroke?



Indication of antithrombotics

ANTICOAGULANTS

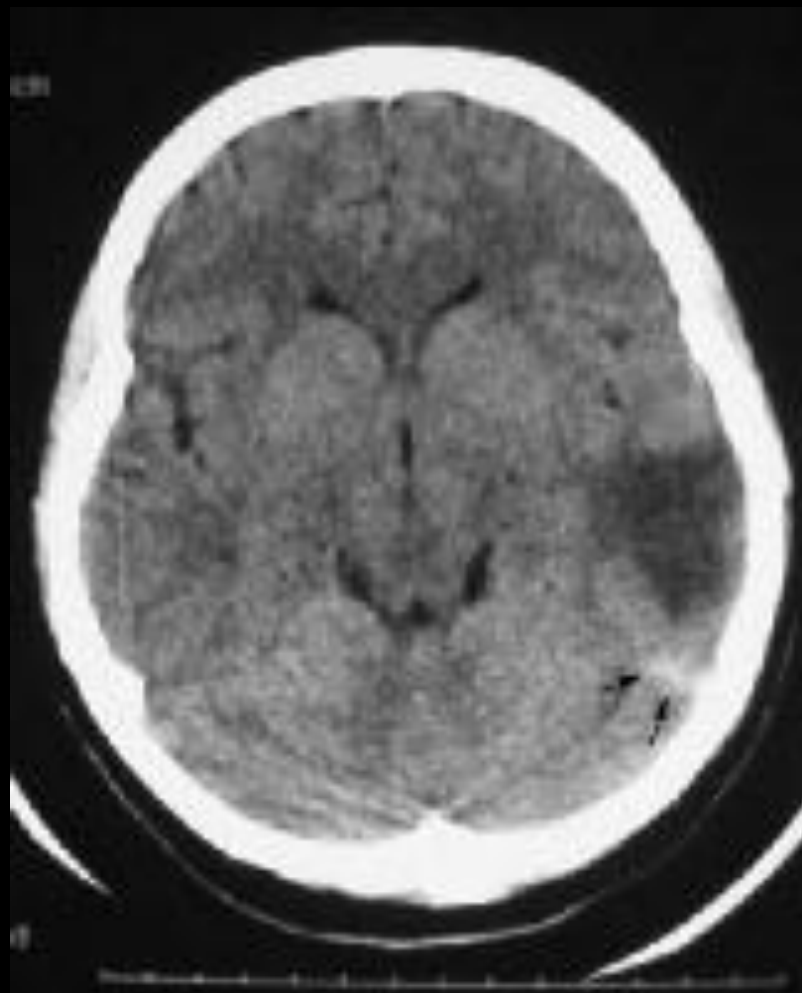
Cardiogen stroke

Prophylaxis (DVT)

Sinus thrombosis

Venous thrombosis

50% - with bleeding!!!



Not rarely it is misdiagnosed



Source: J Neurosci Nurs © 2005 American Association of Neuroscience Nurses

MS - relapse

MS - relapse

- Steroid – methylprednisolon

MS - relapse

- Steroid – methylprednisolon – 1 g

MS - relapse

- Steroid – methylprednisolon – 1 g – 5 days
 - Euphoria
 - Stomach ulcer (PPI, H2 rec. Blocker)
 - Hypokaliaemia – K⁺
 - Hypertension
 - Hyperglycaemia (insulin)
 - Osteoporosis (D3 vit. + Ca)
 - Cushingoid shape

Indication of steroid treatment in neurology

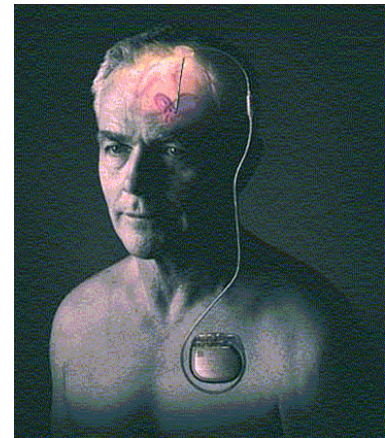
- MS relapse
- Myositis
- Myasthenia gravis (Be careful!!!)
- Inflammatory (immun)neuropathy
 - CIDP, but not in GBS!!!
- Vasogen (peritumoral) oedema
- Cerebral vasculitis
 - Giant cell arteriitis

IVIg

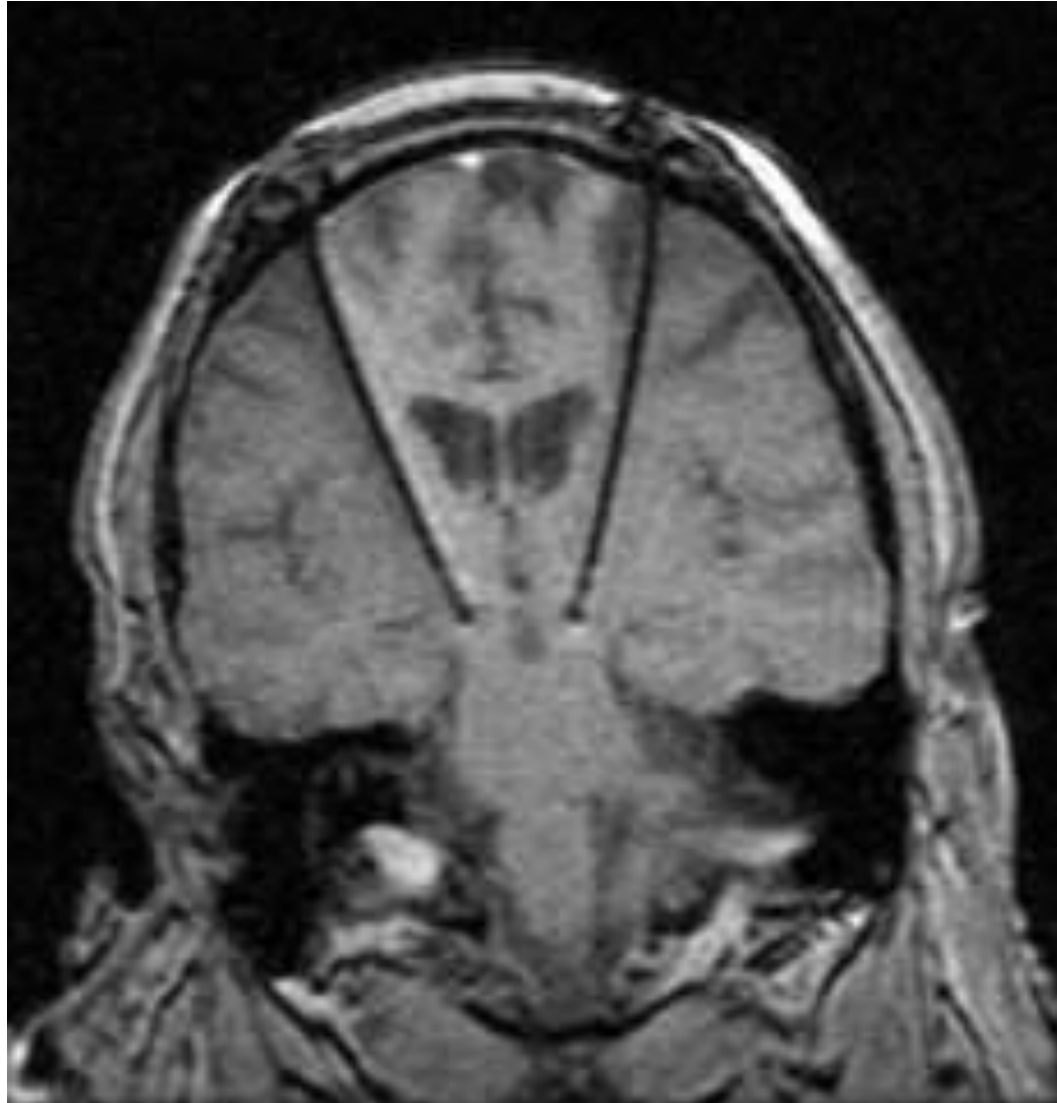
- Side effects
 - Allergy
- Indication
 - Guillain-Barre syndrome
 - CIDP
 - Myasthenia gravis

Treatment of Parkinson disease

- Medication (symptomatic treatment)
 - Compensation of loss of dopamin
- DBS – surgical or non-medical treatment, neurostimulation
 - (subthalamic nucleus, thalamus, GPi)

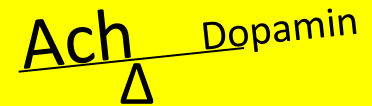


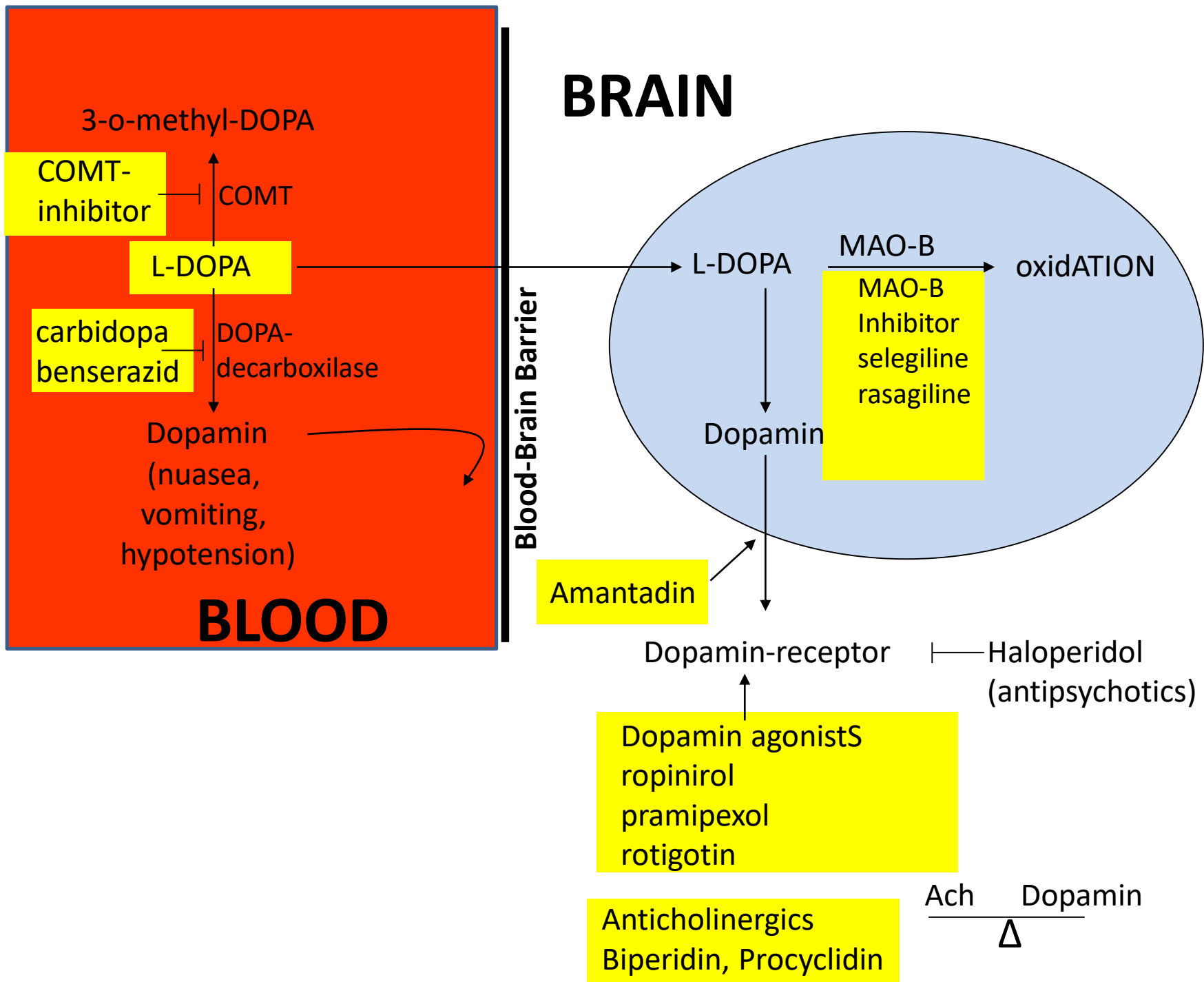
DBS, Neurostimulation

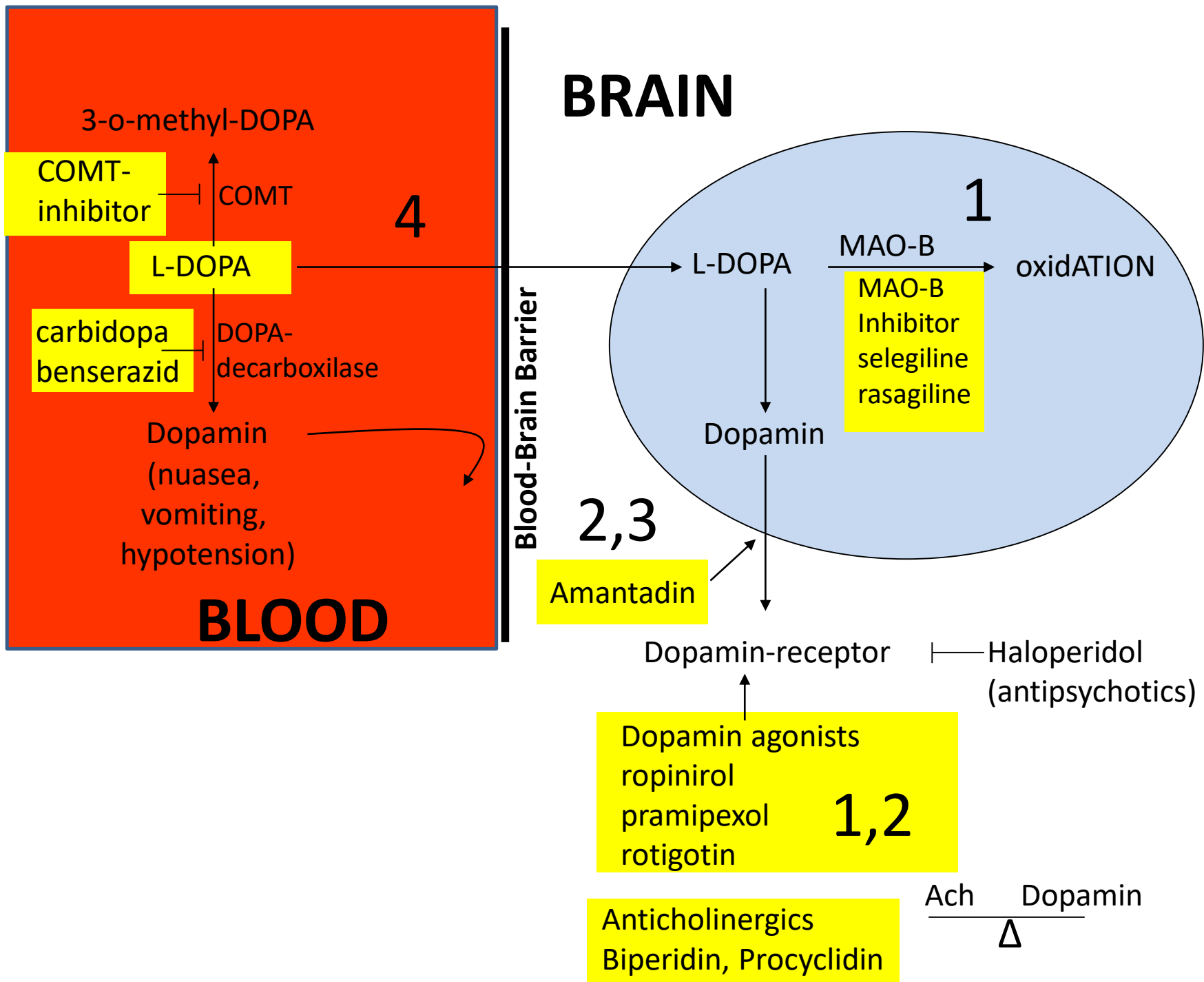


Parkinson disease – Medication

- MAO-inhibitors (selegiline, rasagiline)
- Dopamin agonists
 - Ergot alkaloids (bromocriptine – D2 rec stimulation)
 - Non-ergot alkaloids (pramipexol, ropinirol, rotigotin)
- Amantadin (NMDA antagonist)
- Anticholinergic drugs (biperidin, procyclidin)
- L-DOPA
 - +DOPA-decarboxilase (carbidopa, benserazid)
 - +Cathecolamine-O-Methyl-Transferase inhibitor (COMT inhibitors: tolcapone, entacapone)







Antiparkinsonian drugs

Side effects

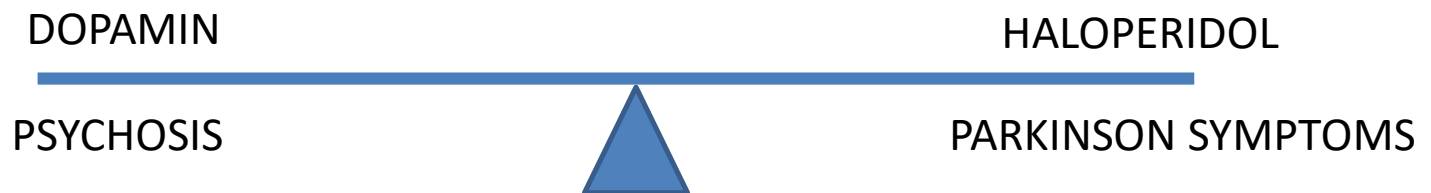
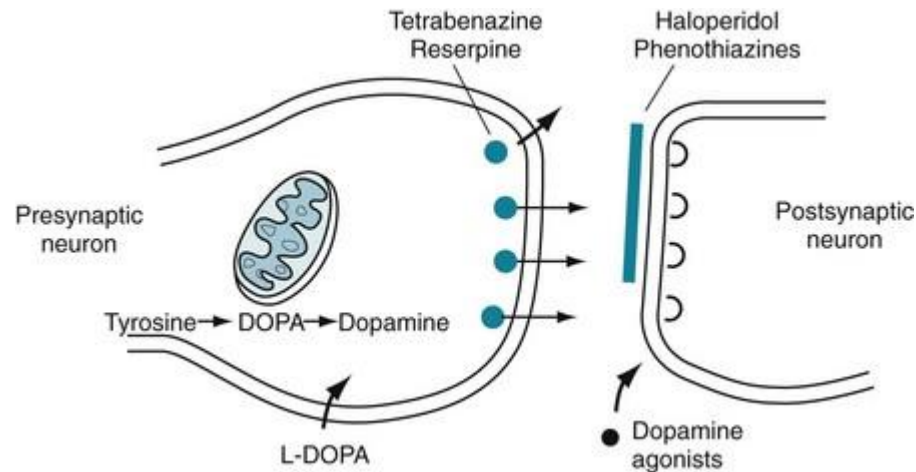
- MAO-B inhibitor (not together with SSRI, SNRI)
 - confusion, hypomania, hallucination, agitation, myoclonus, tremor, convulsion, diarrhoea, fever
- Dopamin agonists
 - excessive daytime sleepiness, sleep attacks
 - compulsive gambling and hypersexuality
 - Nausea, constipation, hallucination
- Amantadin
 - Excreted through kidney!!!
- Anticholinergics
 - Dry mouth, tachycardia, urinary retention...

Antiparkinsonian drugs

Side effects

- L-DOPA
 - Confusion, agitation, hallucination, anxiety, hypotension (orthostatic), nausea
- Entacapone
 - Orange or dark yellow urine - normal, harmless!!!

How to treat the hallucination, agitation in Parkinson disease?



Atypical antipsychotics

- Clozapine
 - Agranulocytosis
- Quetiapine
 - Somnolence, unfavourable metabolic profile (weight gain, diabetes!!!)

Antiepileptics

- Carbamazepine
 - Elevated liver enzymes, hyponatraemia, low WBC count
- Oxcarbazepine
 - Hyponatraemia
- Valproic acid
 - Teratogenic, major anomalies (spina bifida and rarely anencephaly, cardiac, craniofacial, skeletal and limb defects)
- Lamotrigine
 - Toxic epidermal necrolysis
- Levetiracetam
 - Anxiety, depression
- Topiramate
 - Metabolic acidosis, nephrolithiasis, depression, glaucoma, visual field defects

Lyell syndrome, Stevens-Johnson syndrome – Toxic epidermal necrolysis

Fever and flu-like symptoms → a few days later the skin begins to blister and peel forming painful raw areas

Mucous membranes such as the mouth, are also typically involved
Complications: dehydration, sepsis, pneumonia, multiorgan failure

Medicines in migraine prevention

- Propranolol
 - Bradycardia, hypotension, bronchial asthma
- Flunarizine
 - Weight gain, depression
- TCA
 - Glaucoma, somnolence, urinary retention
- Valproic acid
 - Teratogenic, POS, Weight gain
- Topiramate
 - Metabolic acidosis, nephrolithiasis, depression, glaucoma, visual field defects
 - BUT WEIGHT LOSS!!!

Trigeminal neuralgia – signs and symptoms

- Severe, shooting, sharp pain (electricizing pain) – danger of suicide
- Sudden onset and end
- Short duration (usually ca. 5 sec., but might be repeated several hundreds times/day); always < 2 min.
- Respects the territory of a trigeminal branch
- The pain paroxysm is followed by 2-3 min. refractory period
- Trigger points: not nociceptive stimuli, but touch may provoke
- Previous Dental or ENT treatment?

Trigeminal neuralgia - therapy

- Carbamazepine (Na-channel), NNT:1,4-1,7
- Baclofen (GABA-B rec agonist), NNT:1,4
- Lamotrigin (Na channel...), NNT:2,1
- Gabapentin, (Ca channel...), NNT: 3,2-3,8
- Phenytoin, Valproic acid, Clonazepam, Lidocain,

- Start with low dose, increase after 2-3 days till the effective dose, or intolerable side effects, or maximal dose -- tolerance

- Spontaneous remission is not rare

Bell's palsy - Treatment

- **Prednisolon**
 - Adults: 40-80 mg/die
 - Children: 1 mg/kg/die
 - After 5 days decrease the dose gradually.
- **Acyclovir**
 - Adults 5 x 400 mg for 7 days
 - Children 80 mg/kg/die for 5 days
 - Most effective in Ramsay-Hunt syndrome!
- **Protection of the eye!**
 - Eye drops (antibiotics), if necessary blepharorrhaphia.
- **Prevention of atrophy of facial muscles**
 - Electrotherapy
 - Active gymnastics of facial muscles

