

OBAT SAKIT KEPALA & VERTIGO

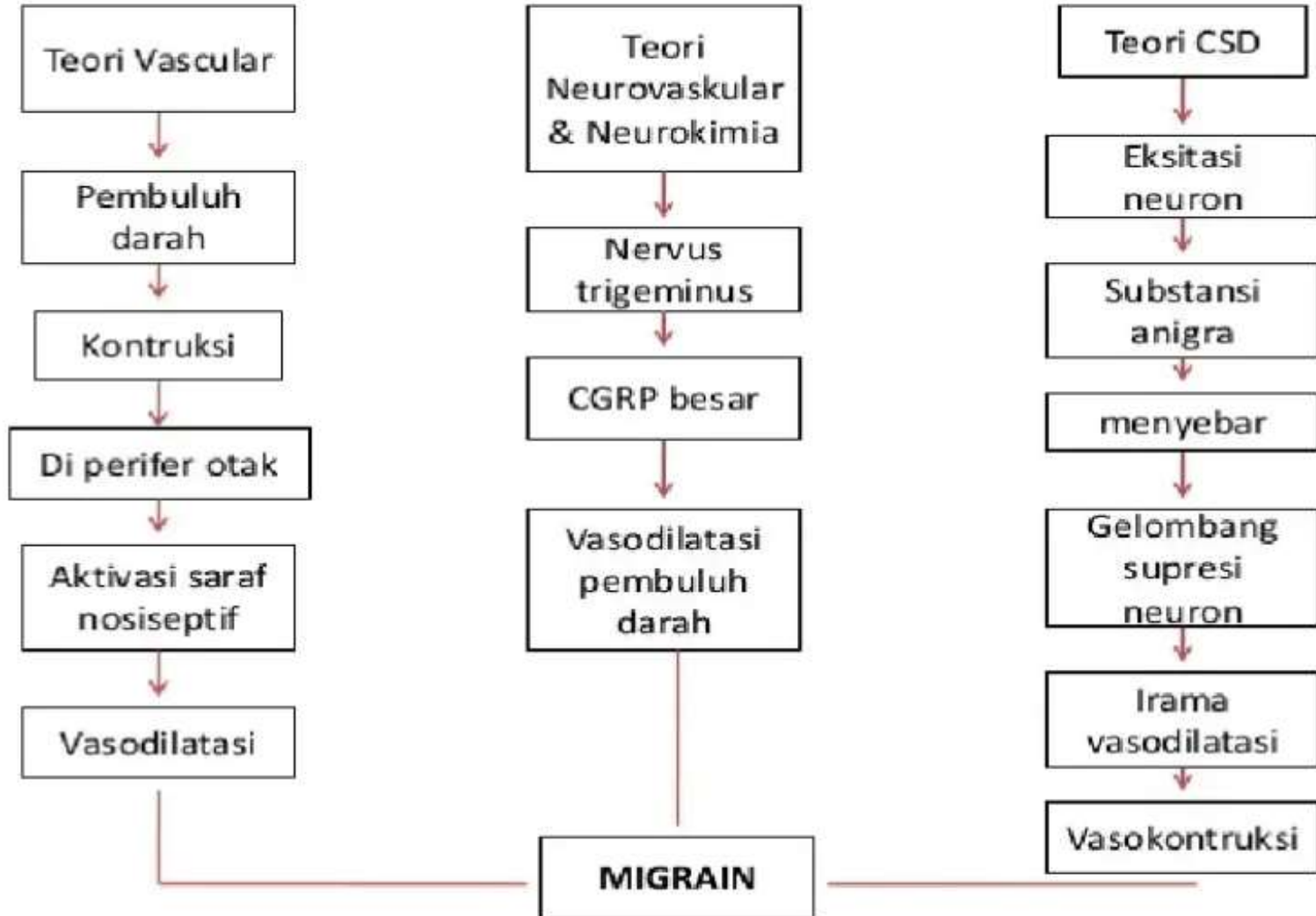
Fathiyah Safithri

Primary Headache disorder

Headache disorder	Headache duration	Headache location	Pain intensity	Pain characteristics	Accompanying symptoms	Routine physical activity
Migraine	4–72 h	Usually unilateral	Usually moderate or severe	Usually pulsating	Photophobia, phonophobia, nausea, vomiting	Often aggravated by routine physical activity
Tension-type headache	Hours to days or unremitting	Usually bilateral or circumferential	Usually mild or moderate	Usually pressing or tightening	Often none; sometimes photophobia or phonophobia (but not both); sometimes mild nausea in chronic tension-type headache	Not aggravated by routine physical activity
Cluster headache	15–180 min	Strictly unilateral and orbital, supraorbital, and/or temporal	Severe or very severe	Overwhelming	Ipsilateral to the headache: cranial autonomic symptoms, such as conjunctival injection, lacrimation, and nasal congestion	Restlessness or agitation

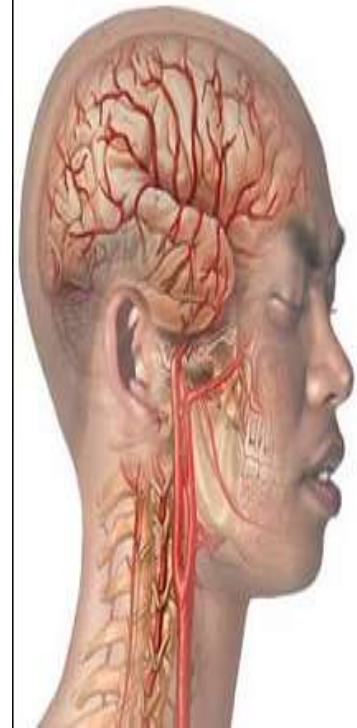
PATOFISIOLOGI MIGRAIN

Patofisiologi Migrain

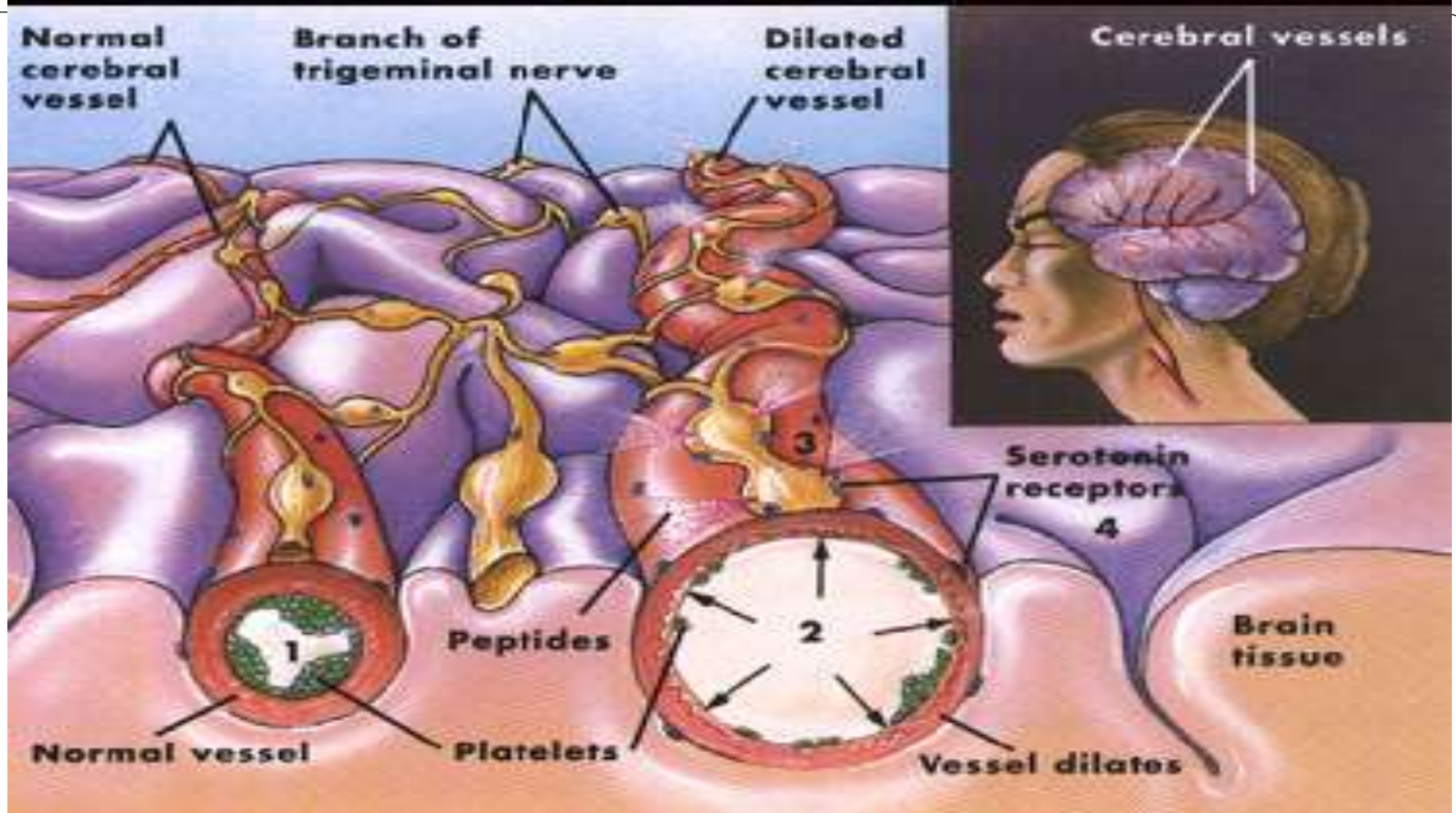


MIGRAIN

- Menurut teori/hipotesis vaskuler : aura disebabkan oleh **vasokonstriksi** intraserebral diikuti dengan **vasodilatasi ekstrakranial**
- Aura mungkin merupakan manifestasi penyebaran depresi, suatu peristiwa neuronal yang dikarakterisir oleh gelombang penghambatan yang menyebabkan turunnya aliran darah otak sampai 25-35 %
- Nyeri disebabkan karena aktivitas sistem trigeminal yang menyebabkan pelepasan neuropetida vasoaktif → vasodilatasi, plasma protein extravasation, dan nyeri
- Aktivitas di dalam sistem trigeminal diregulasi oleh saraf noradrenergik dan serotonergik
- Reseptor 5-HT, terutama 5-HT1 dan 5-HT2 → terlibat dalam patofisiologi migrain



Blood vessel abnormalities are a component of vascular headaches such as migraines and cluster headaches



Peningkatan kadar 5-HT menyebabkan vasokonstriksi → menurunkan aliran darah kranial → terjadi iskemia → aura
Iskemi selanjutnya akan berkurang dan diikuti oleh periode vasodilatasi serebral, neurogenic inflammation, dan nyeri.

Faktor pemicu migrain

■ Faktor psikologis

- Stress, depresi

■ Faktor lingkungan

- Rokok
- Bau menyengat
- Perubahan cuaca
- Cahaya atau suara

■ Faktor makanan

- Yg mengandung tiramin
- Food additive (MSG, aspartam)
- Coklat, kopi
- Jeruk

■ Obat-obatan

- Simetidin
- Kokain
- Fluoksetin
- Indometasin
- Nikotin
- Nifedipin, dll.

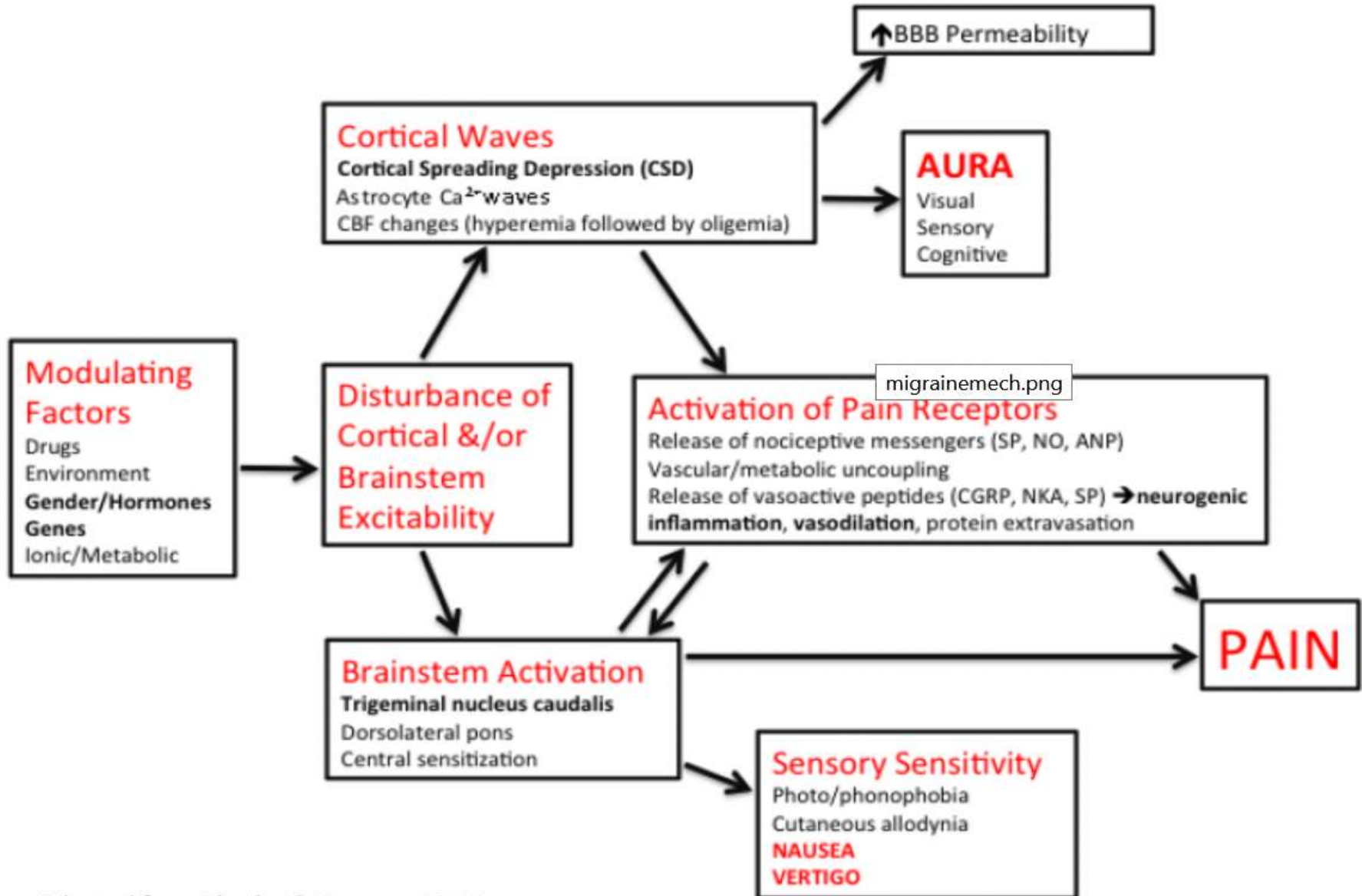
■ Faktor hormonal

- Mens
- Hamil, menopause

■ Gaya hidup

- Kurang atau kebanyakan tidur
- Terlambat makan, dll.

Hypothesized Sequence of Events in Migraine



PRINSIP TX MIGREN

- Menghindari atau menghilangkan pemicu
- **Terapi abortif** → dimulai pada saat terjadinya serangan
- **Terapi profilaksis** → diperlukan jika serangan terjadi lebih dari 2-3 kali sebulan, serangan berat dan menyebabkan gangguan fungsi, terapi simptomatik gagal atau menyebabkan efek samping yang serius

Tx Profilaksis & Abortif Migrain

Terapi Profilaksis

- ▼ menghindari **pemicu**
- ▼ menggunakan **obat profilaksis** secara teratur

Profilaksis: bukan analgesik, memperbaiki pengaturan proses fisiologis yang mengontrol aliran darah dan aktivitas sistem syaraf

Terapi abortif

menggunakan obat-obat penghilang nyeri dan/atau vasokonstriktor

4 Acute treatment

First-line medication

- NSAIDs (acetylsalicylic acid, ibuprofen or diclofenac potassium)

Second-line medication

- Triptans
- When triptans provide insufficient pain relief, combine with fast-acting NSAIDs

Third-line medication

- Ditans
- Gepants

Adjunct medications for nausea and/or vomiting

- Prokinetic antiemetics (domperidone or metoclopramide)

5 Preventative treatment

- Recommended for patients adversely affected on ≥ 2 days per month despite optimized acute therapy

First-line medication

- Beta blockers (propranolol, metoprolol, atenolol, bisoprolol)
- Topiramate
- Candesartan

Second-line medication

- Flunarizine
- Amitriptyline
- Sodium valproate^a

Third-line medication

- CGRP monoclonal antibodies^b

6 Managing migraine in special populations

Older people

- Secondary headache, comorbidities and adverse events are all more likely
- Poor evidence base for all drugs in this age group

Children and adolescents

- Be aware that presentation can differ from migraine in adults
- Parents and schools have important roles in the management of young children
- Bed rest alone can be sufficient
- Use ibuprofen for acute treatment and propranolol, amitriptyline or topiramate for prevention

Women who are pregnant or breastfeeding

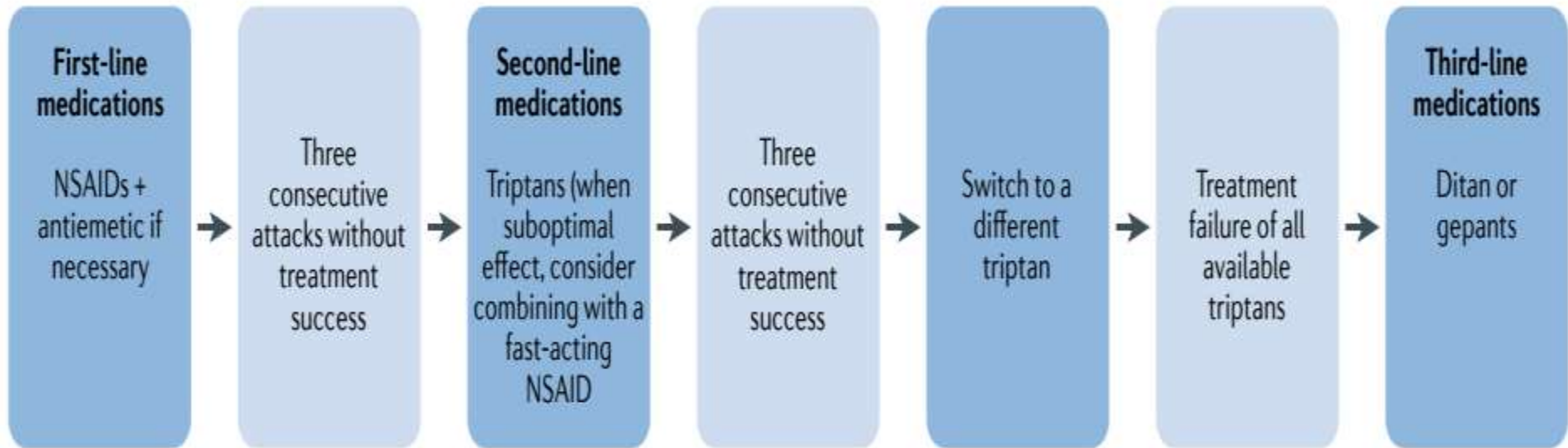
- Use paracetamol for acute treatment
- Avoid preventive treatment if possible

Women with menstrual migraine

- Perimenstrual preventive therapy with long-acting NSAID or triptan

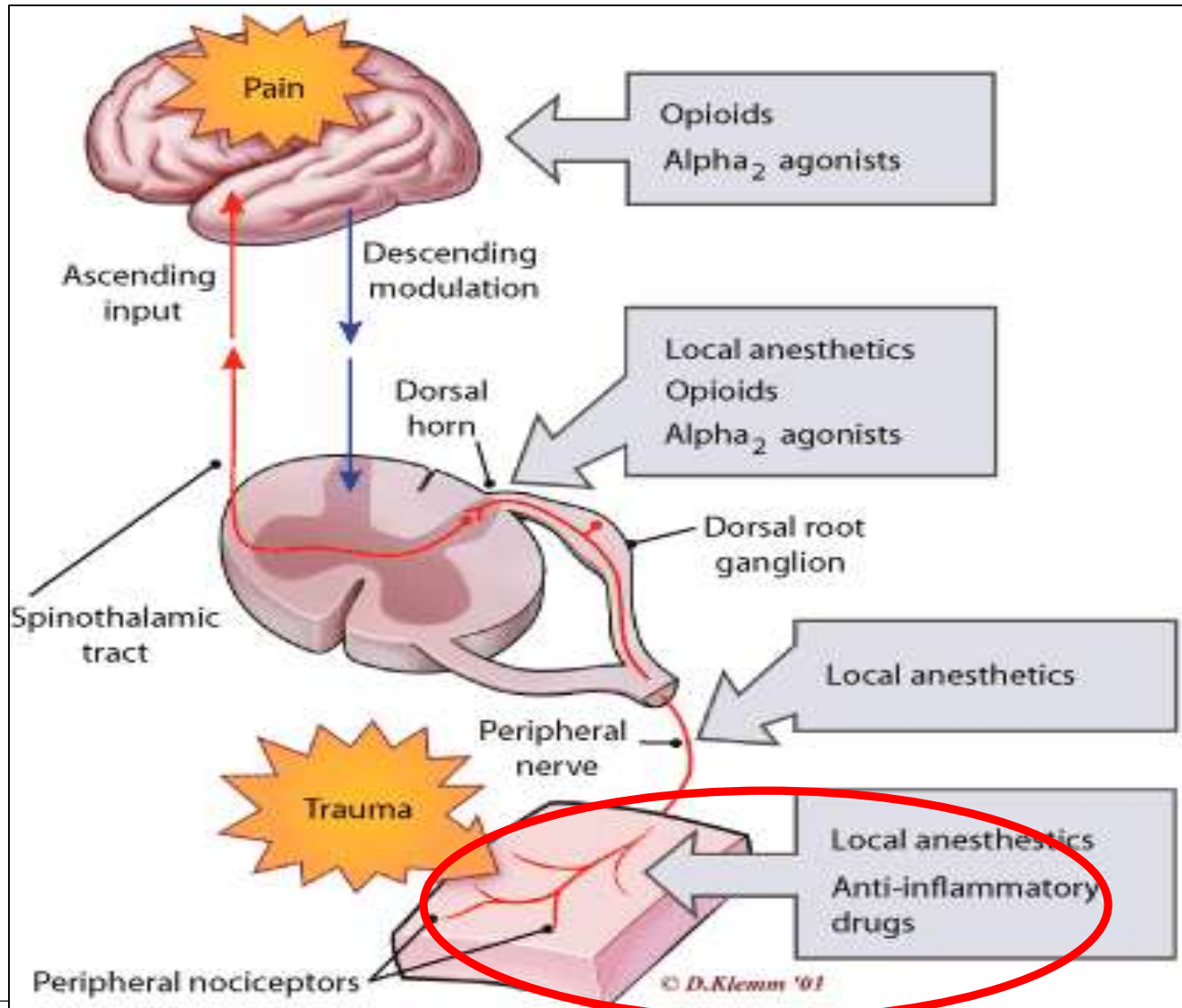
TERAPI ABORTIF/ACUTE MIGREN

Drug class	Drug	Dosage and route	Contraindications
First-line medication			
NSAIDs	Acetylsalicylic acid	900–1,000 mg oral	Gastrointestinal bleeding, heart failure
	Ibuprofen	400–600 mg oral	
	Diclofenac potassium	50 mg oral (soluble)	
Other simple analgesics (if NSAIDs are contraindicated)	Paracetamol	1,000 mg oral	Hepatic disease, renal failure
Antiemetics (when necessary)	Domperidone	10 mg oral or suppository	Gastrointestinal bleeding, epilepsy, renal failure, cardiac arrhythmia
	Metoclopramide	10 mg oral	Parkinson disease, epilepsy, mechanical ileus
Second-line medication			
Triptans	Sumatriptan	50 or 100 mg oral or 6 mg subcutaneous or 10 or 20 mg intranasal	Cardiovascular or cerebrovascular disease, uncontrolled hypertension, hemiplegic migraine, migraine with brainstem aura
	Zolmitriptan	2.5 or 5 mg oral or 5 mg intranasal	
	Almotriptan	12.5 mg oral	
	Eletriptan	20, 40 or 80 mg oral	
	Frovatriptan	2.5 mg oral	
	Naratriptan	2.5 mg oral	
	Rizatriptan	10 mg oral tablet (5 mg if treated with propranolol) or 10 mg mouth-dispersible wafers	
Third-line medication			
Gepants	Ubrogepant	50, 100 mg oral	Co-administration with strong CYP3A4 inhibitors
	Rimegepant	75 mg oral	Hypersensitivity, hepatic impairment
Ditans	Lasmiditan	50, 100 or 200 mg oral	Pregnancy, concomitant use with drugs that are P-glycoprotein substrates

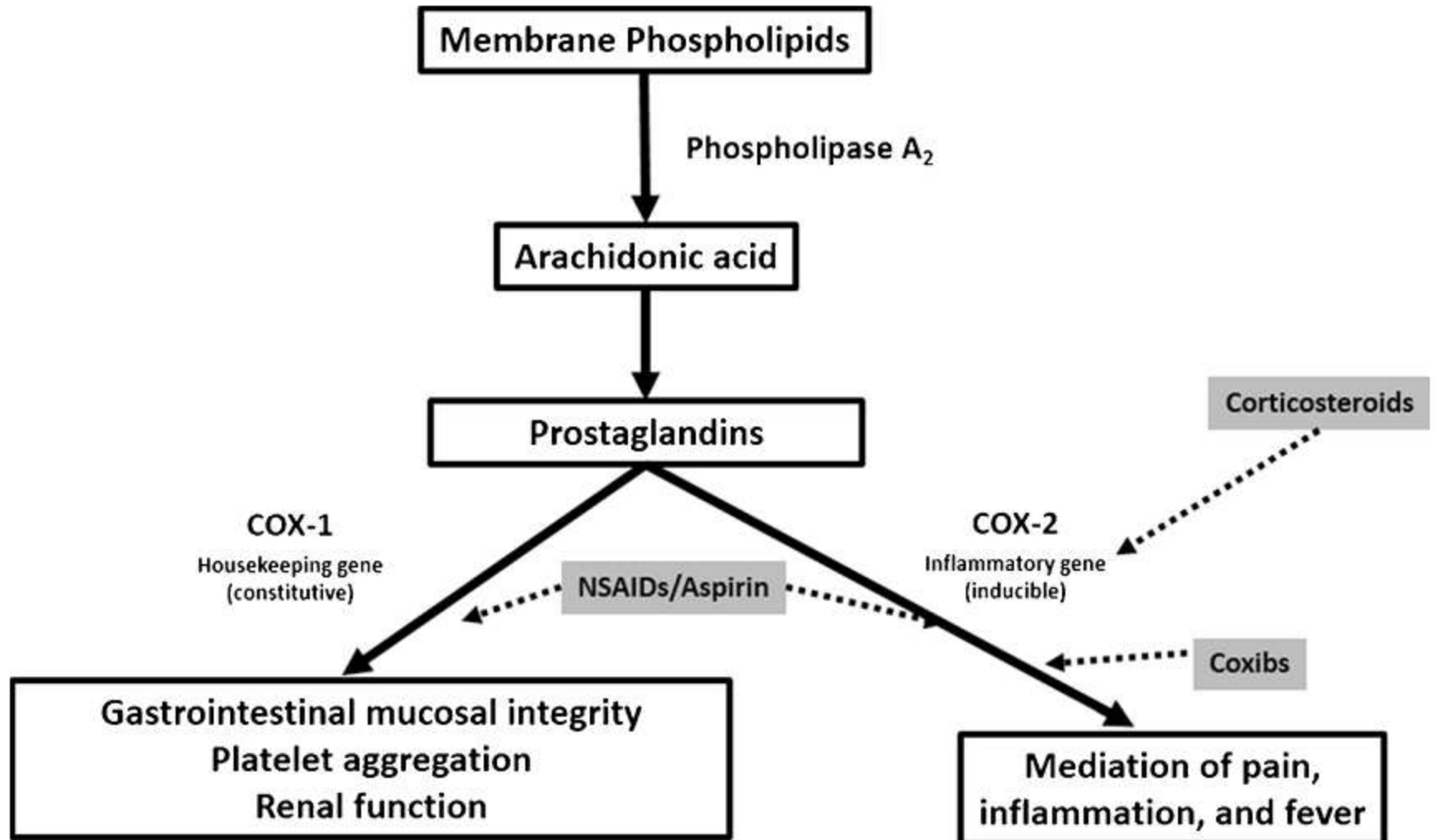


- ▼ **Analgesik ringan** : aspirin (drug of choice), parasetamol
- ▼ **NSAIDs** :
 - ▼ Menghambat sintesis prostaglandin, agregasi platelet, dan pelepasan 5-HT
 - ▼ Naproksen terbukti lebih baik dari ergotamin
 - ▼ Pilihan lain : ibuprofen, ketorolak
- ▼ **Golongan triptan**
 - ▼ Agonis reseptor 5-HT_{1D} → menyebabkan vasokonstriksi
 - ▼ Menghambat pelepasan takikinin, memblokir inflamasi neurogenik
 - ▼ Efikasinya setara dengan dihidroergotamin, tetapi onsetnya lebih cepat
 - ▼ Sumatriptan oral lebih efektif dibandingkan ergotamin per oral
- ▼ **Ergotamin**
 - ▼ Memblokade inflamasi neurogenik dengan menstimulasi reseptor 5-HT₁ presinaptik
 - ▼ Pemberian IV dpt dilakukan untuk serangan yang berat
- **Metoklopramid**
 - Digunakan untuk mencegah mual muntah
 - Diberikan 15-30 min sebelum terapi antimigrain, dapat diulang setelah 4-6 jam
- **Kortikosteroid**
 - Dapat mengurangi inflamasi
- **Analgesik opiat**
 - Contoh : butorphanol

NSAID & target kerjanya



NSAID



OBAT AINS

ASAM KARBOKSILAT

ASAM ENOLAT

Asam Asetat

Derivat Asam Salisilat

Derivat Asam Propionat

Derivat Asam Fenamat

Derivat Pirazolon

Derivat Oksikam

- * Aspirin
- * Benorilat
- * Diflunisal
- * Salsalat

- * As. tiaprofenat
- * Fenbufen
- * Fenoprofen
- * Flurbiprofen
- * Ibuprofen
- * Ketoprofen
- * Naproksen

- * As. mefenamat
- * Meklofenamat

- * Azapropazon
- * Fenilbutazon
- * Oksifenbutazon

- * Piroksikam
- * Tenoksikam

Derivat Asam Fenilasetat

Derivat Asam Asetat-inden / indol :

- * Diklofenak
- * Fenklofenak

- * Indometasin
- * Sulindak
- * Tolmetin

NSAID for migraine

Carboxylic acids

Arylpropionic acids

Flurbiprofen, ketoprofen, oxaprofen,
ibuprofen, naproxen, fenoprofen

Salicylic acids

Aspirin, difunisal, trisalicylate salsalate,
sodium salicylate, olsalazine, sulfasalazine

Anthranilic acids

Mefenamic acid, meclofenamic acid

Acetic acids

- Indole and indene acids
- Etodolac, indomethacin, sulindac,
tolmetin, ketorolac
- Phenylacetic
- Diclofenac

Enolic acids

Nonacidic compounds

COX-2 selective inhibitors (Coxibs)

- Pyrazolones
 - Phenylbutazone
 - Oxicams
 - Piroxicam
 - Meloxicam
- Nabumetone

- Celecoxib
Rofecoxib
Meloxicam
Nimesulide
Paracoxib
Etodolac
Lumiracoxib
Valdecoxib
Deracoxib
Etoricoxib

log (IC₈₀ ratio COX-2/COX-1)

3
2
1
0
-1
-2
-3

Ketorolac
Flurbiprofen
Suprofen
Ketoprofen
Indometacin
Aspirin
Naproxen
Tolmetin
Ibuprofen
Ampyrone
Fenoprofen

COX-1 selective

Zomepirac
Niflumic acid
Sodium salicylate
Diflunisal
Piroxicam
Tomoxiprol
Meclofenamate
Sulindac
Diclofenac

<5-fold COX-2 selective

5-50-fold COX-2 selective

>50-fold COX-2 selective

Nimesulide
Celecoxib
Meloxicam
Etodolac

Rofecoxib

Tx spesifik migraine lini kedua dan tiga

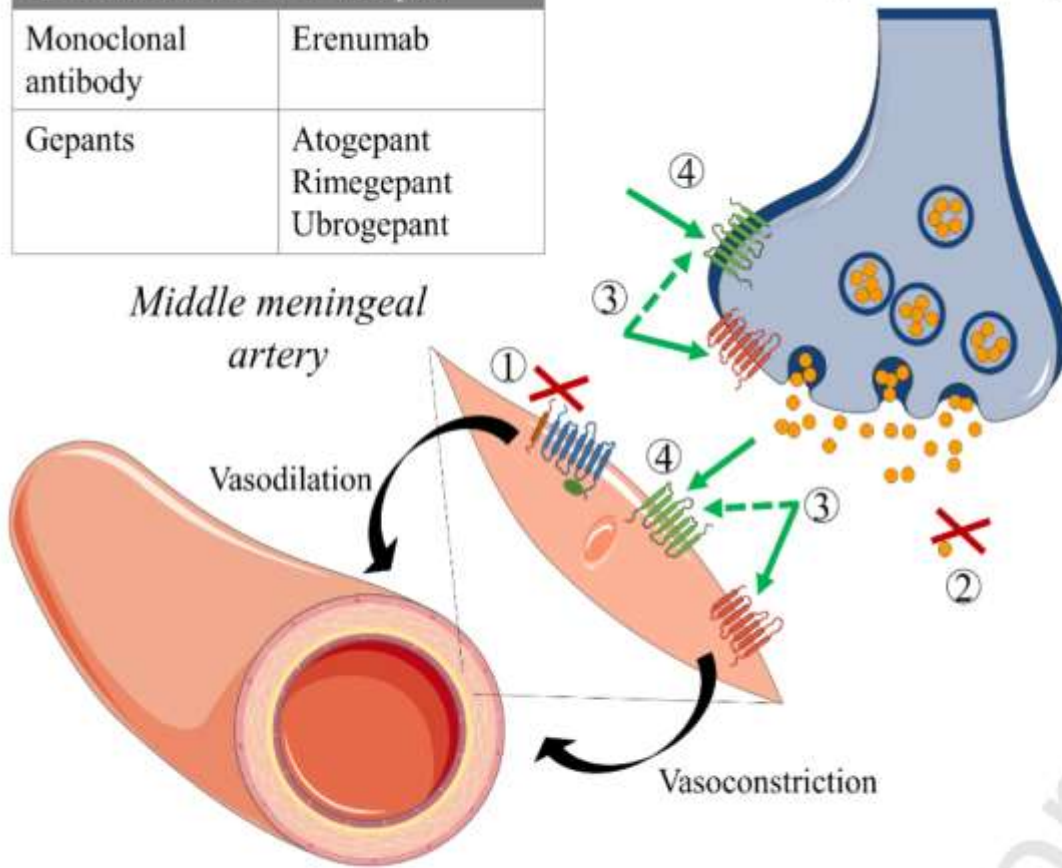
① Blockade of CGRP receptor	
Monoclonal antibody	Erenumab
Gepants	Atogepant Rimegepant Ubrogepant

② Blockade of CGRP	
Monoclonal antibody	Eptinezumab Fremanezumab Galcanezumab

③ Stimulation of 5-HT _{1B/1D/1F} receptor	
Triptans	Almotriptan Eletriptan Frovatriptan Naratriptan Rizatriptan Sumatriptan Zolmitriptan

④ Stimulation of 5-HT _{1F} receptor	
Ditans	Lasmiditan

Trigeminal nerve fiber



 CGRP receptor

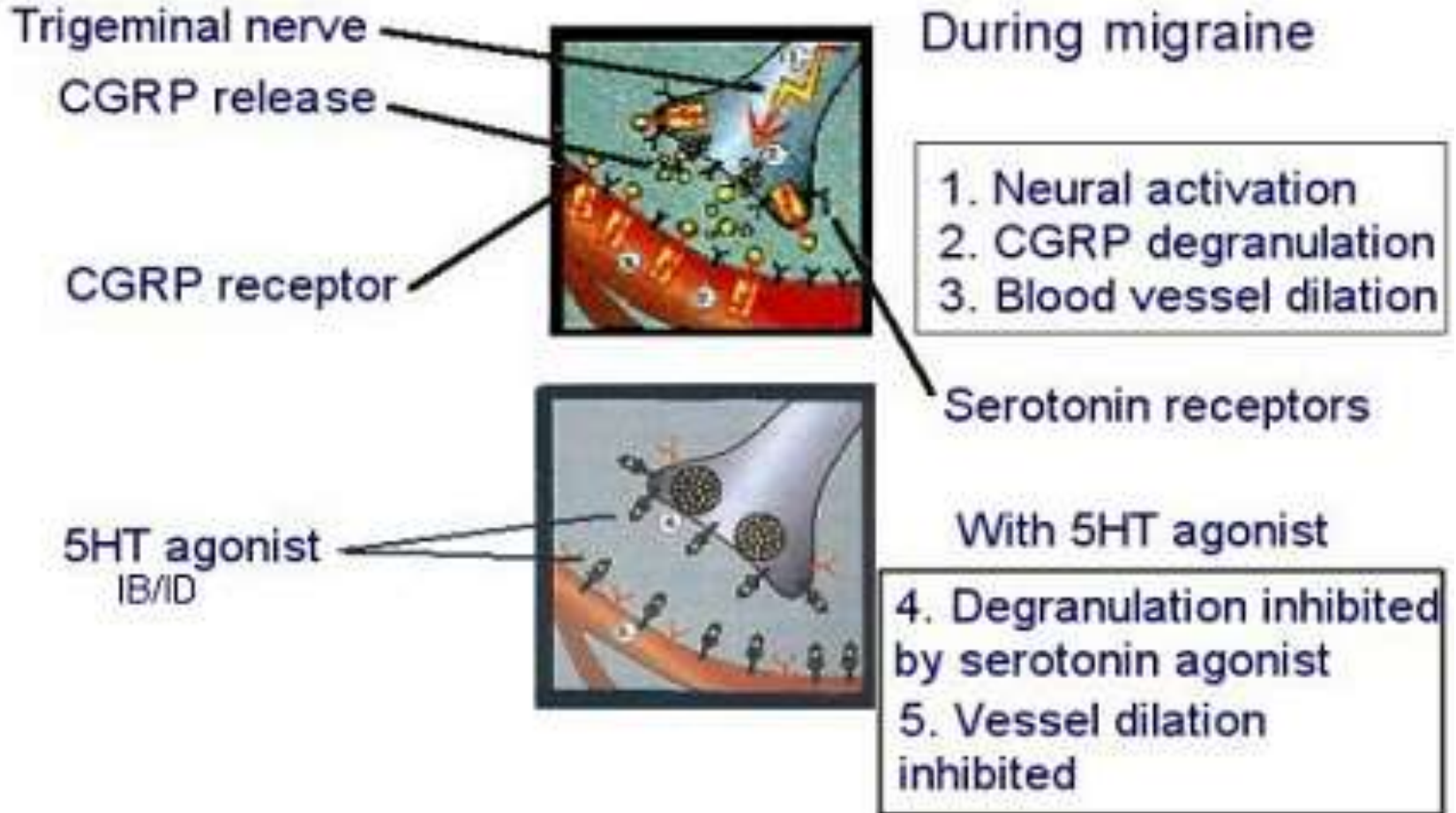
 5-HT_{1B/1D} receptor

 5-HT_{1F} receptor

 CGRP

SUMATRIPTAN

Agonis Serotonin



Tx Preventif

Drug class	Drug	Dosage and route	Contraindications
<i>First-line medication</i>			
Beta blockers	Atenolol	25–100 mg oral twice daily	Asthma, cardiac failure, Raynaud disease, atrioventricular block, depression
	Bisoprolol	5–10 mg oral once daily	
	Metoprolol	50–100 mg oral twice daily or 200 mg modified-release oral once daily	
	Propranolol	80–160 mg oral once or twice daily in long-acting formulations	
Angiotensin II-receptor blocker	Candesartan	16–32 mg oral per day	Co-administration of aliskiren
Anticonvulsant	Topiramate	50–100 mg oral daily	Nephrolithiasis, pregnancy, lactation, glaucoma
<i>Second-line medication</i>			
Tricyclic antidepressant	Amitriptyline	10–100 mg oral at night	Age <6 years, heart failure, co-administration with monoamine oxidase inhibitors and SSRIs, glaucoma
Calcium antagonist	Flunarizine	5–10 mg oral once daily	Parkinsonism, depression
Anticonvulsant	Sodium valproate ^a	600–1,500 mg oral once daily	Liver disease, thrombocytopenia, female and of childbearing potential

Third-line medication

Botulinum toxin	OnabotulinumtoxinA	155–195 units to 31–39 sites every 12 weeks	Infection at injection site
Calcitonin gene-related peptide monoclonal antibodies	Erenumab	70 or 140 mg subcutaneous once monthly	Hypersensitivity Not recommended in patients with a history of stroke, subarachnoid haemorrhage, coronary heart disease, inflammatory bowel disease, chronic obstructive pulmonary disease or impaired wound healing
	Fremanezumab	225 mg subcutaneous once monthly or 675 mg subcutaneous once quarterly	
	Galcanezumab	240 mg subcutaneous, then 120 mg subcutaneous once monthly	
	Eptinezumab	100 or 300 mg intravenous quarterly	

SSRI, selective serotonin reuptake inhibitor. ^aSodium valproate is absolutely contraindicated in women of childbearing potential.

Tx Profilaksis Migrain

■ Beta bloker

- Merupakan drug of choice untuk prevensi migrain
- Contoh: atenolol, metoprolol, propranolol, nadolol

■ Antidepresan trisiklik

- Pilihan: amitriptilin, bisa juga: imipramin, doksepin, nortriptilin
- Punya efek antikolinergik, tidak boleh digunakan untuk pasien glaukoma atau hiperplasia prostat

■ Metisergid

- Mrpk senyawa ergot semisintetik, antagonis 5-HT₂

■ Asam/Na Valproat

- Dapat menurunkan keparahan, frekuensi dan durasi pada 80% penderita migrain

■ NSAIDs

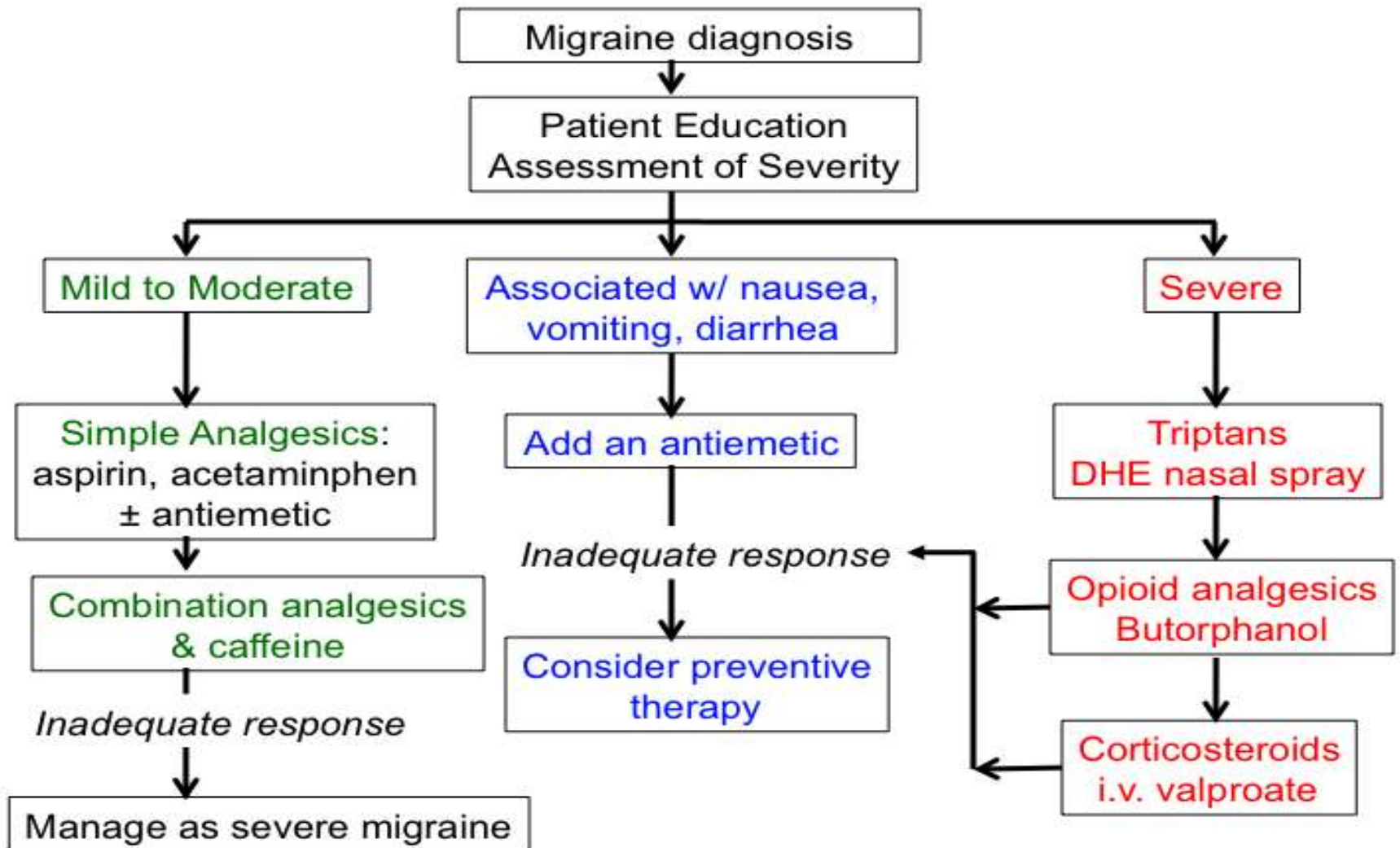
- Aspirin dan naproksen terbukti cukup efektif
- Tidak disarankan penggunaan jangka panjang karena dpt menyebabkan gangguan GI

■ Verapamil

- Merupakan terapi lini kedua atau ketiga

■ Topiramat

- Sudah diuji klinis, terbukti mengurangi kejadian migrain

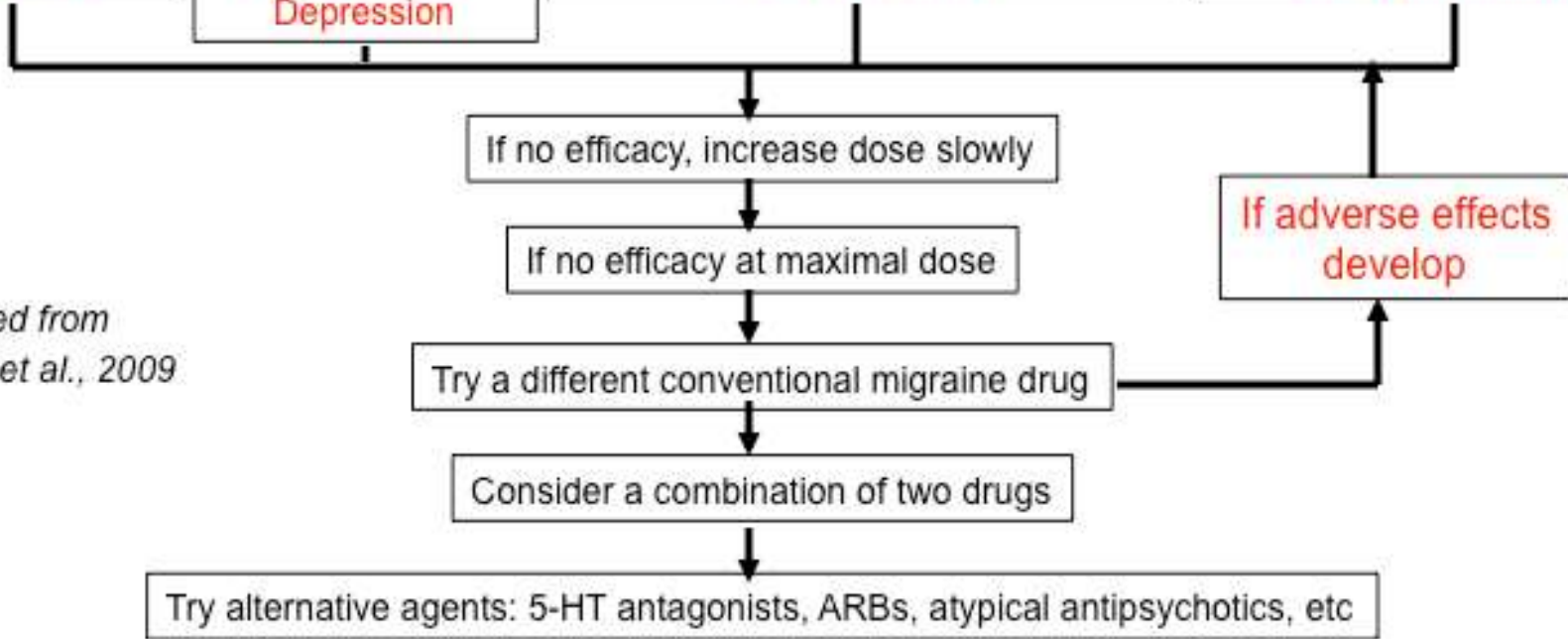
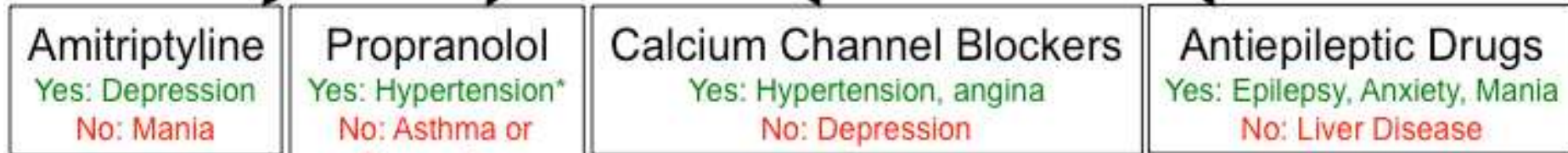


Adapted from Silberstein SD et al., 2000

Need for Migraine Prophylaxis:

- An unsatisfactory response to acute therapy
- Two or more attacks per month that interfere with patient's daily routine
- Contraindications to acute treatments or adverse effects related to them
- The use of abortive medications > 2 times per week

Choose a conventional migraine preventative medicine
(consider co-morbidity & relative contraindications)



Adapted from
Galletti et al., 2009

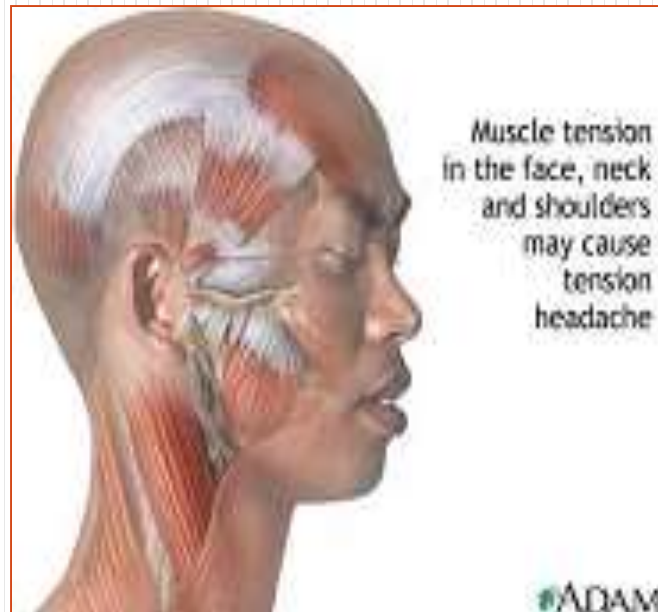
<i>Drug</i>	<i>Route</i>	<i>Dose</i>	<i>Contraindications</i>	<i>Adverse Effects</i>	<i>Comments</i>
Sumatriptan (Imitrex)	PO IN SC	6 mg SC stat; may repeat in 1 hr	Ischemic heart disease, within 24 hr of ergot alkaloids	Heavy sensation in head or chest, tingling, pain at injection site	First-line therapy for moderate-to-severe headaches; SC for intractable migraine
Ibuprofen (Motrin) or other NSAIDs	PO	400–800 mg	Aspirin or NSAID-related bronchospasm	N, V, bleeding, renal dysfunction	First-line therapy for mild-to-moderate headaches
Dihydroergotamine (Migranal)	IN IM IV	2 mg IN stat; repeat in 15 min	See Ergotamine	Rhinitis, dizziness, N, V	For moderate-to-severe headaches; parenteral use for intractable migraine
Ergotamine tartrate (Cafergot, Ergostat)	PO SL PR	1–4 mg stat, then 1–2 mg Q 30 min to max of 6 mg/attack or 10 mg/wk	CV disease, sepsis, liver or kidney disease, arterial insufficiency, pregnancy, breast feeding, concomitant macrolide use	N, V, anorexia, limb paresthesias or pain	Use at HA onset for max effect; ↓ N and V by using smallest effective dose
Isometheptene/ dichloralphenazone/ acetaminophen (Midrin)	PO	2 cap stat, then 1 cap Q hr to max 5 cap/12 hr	See Ergotamine tartrate; avoid in patients taking MAOIs	N, V, dizziness, drowsiness	As effective as ergotamine tartrate

Prochlorperazine (Compazine)	IM IV	10 mg stat	CV disease	Extrapyramidal reactions, sedation, dizziness	IV/IM for adjunctive antiemetic therapy; IV for antimigraine effect in intractable migraine
Chlorpromazine (Thorazine)	IM	1 mg/kg	CV disease, history of seizures	Extrapyramidal reactions, sedation, hypotension	For intractable migraine; also has antiemetic properties
Morphine (or meperidine)	IM	5–10 mg	↑ ICP or head trauma with funduscopic changes	Sedation, hypoventilation	For intractable migraine
Metoclopramide (Reglan)	PO IM	10 mg stat	GI hemorrhage or obstruction; pheochromocytoma	Extrapyramidal reactions, sedation, restlessness	For adjunctive antiemetic therapy; prochlorperazine also effective

^aSee text for references and additional details. See Table 52-4 for additional information on sumatriptan and other triptan agents.

CV, cardiovascular; GI, gastrointestinal; HA, headache; ICP, intracranial pressure; IM, intramuscular; IN, intranasal; MAOIs, monoamine oxidase inhibitors; N, nausea; NSAID, nonsteroidal anti-inflammatory drug; PO, oral; PR, rectal; SC, subcutaneous; SL, sublingual; V, vomiting.

TENSION TYPE HEADACHE



Terapi Non-farmakologi

- melakukan latihan peregangan leher atau otot bahu sedikitnya 20 sampai 30 menit
- perubahan posisi tidur
- pemafasan dengan diafragma atau metode relaksasi otot yang lain
- Penyesuaian lingkungan kerja maupun rumah :
 - Pencahayaan yang tepat untuk membaca, bekerja, menggunakan komputer, atau saat menonton televisi
 - Hindari eksposur terus-menerus pada suara keras dan bising
 - Hindari suhu rendah pada saat tidur pada malam hari

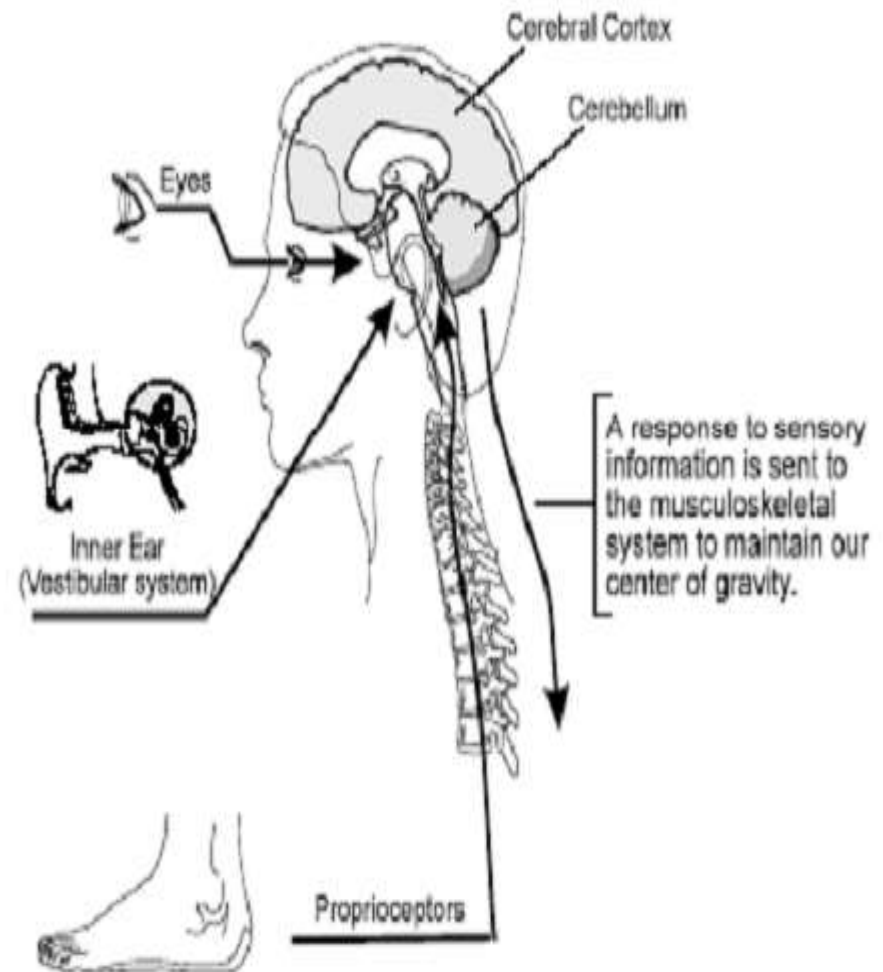
Terapi farmakologi

- Menggunakan analgesik atau analgesik plus adjuvan sesuai tingkat nyeri
- Contoh : Obat-obat OTC seperti **aspirin, acetaminophen, ibuprofen** atau **naproxen sodium**. Produk kombinasi dengan **kafein** dapat meningkatkan efek analgesik
- Untuk sakit kepala kronis, perlu assesment yang lebih teliti mengenai penyebabnya, misalnya karena **anxietas** atau **depresi**
- pilihan obatnya adalah **antidepresan**, seperti **amitriptilin** atau antidepresan lainnya. Hindari penggunaan analgesik secara kronis → memicu **rebound headache**
- Adjuvan : muscle relaxan : diazepam

ANTIVERTIGO

Regulasi keseimbangan tubuh

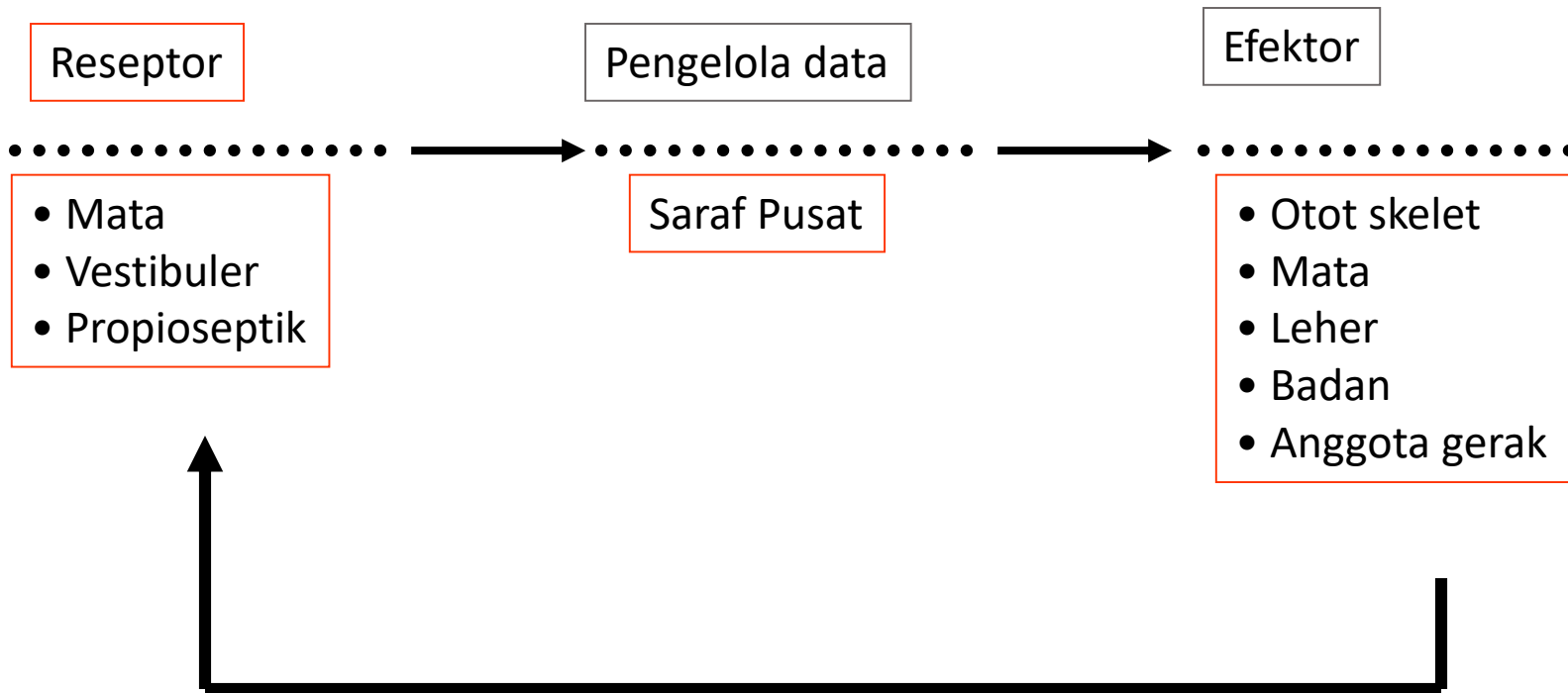
- Sistem vestibular
 - Aparatus vestibularis (labirin)
: labirin membran (endolimfe), labirin tulang (perilimfe)
 - N. Vestibularis
 - Vestibular sentral
- Sistem propioseptik
- Sistem optik

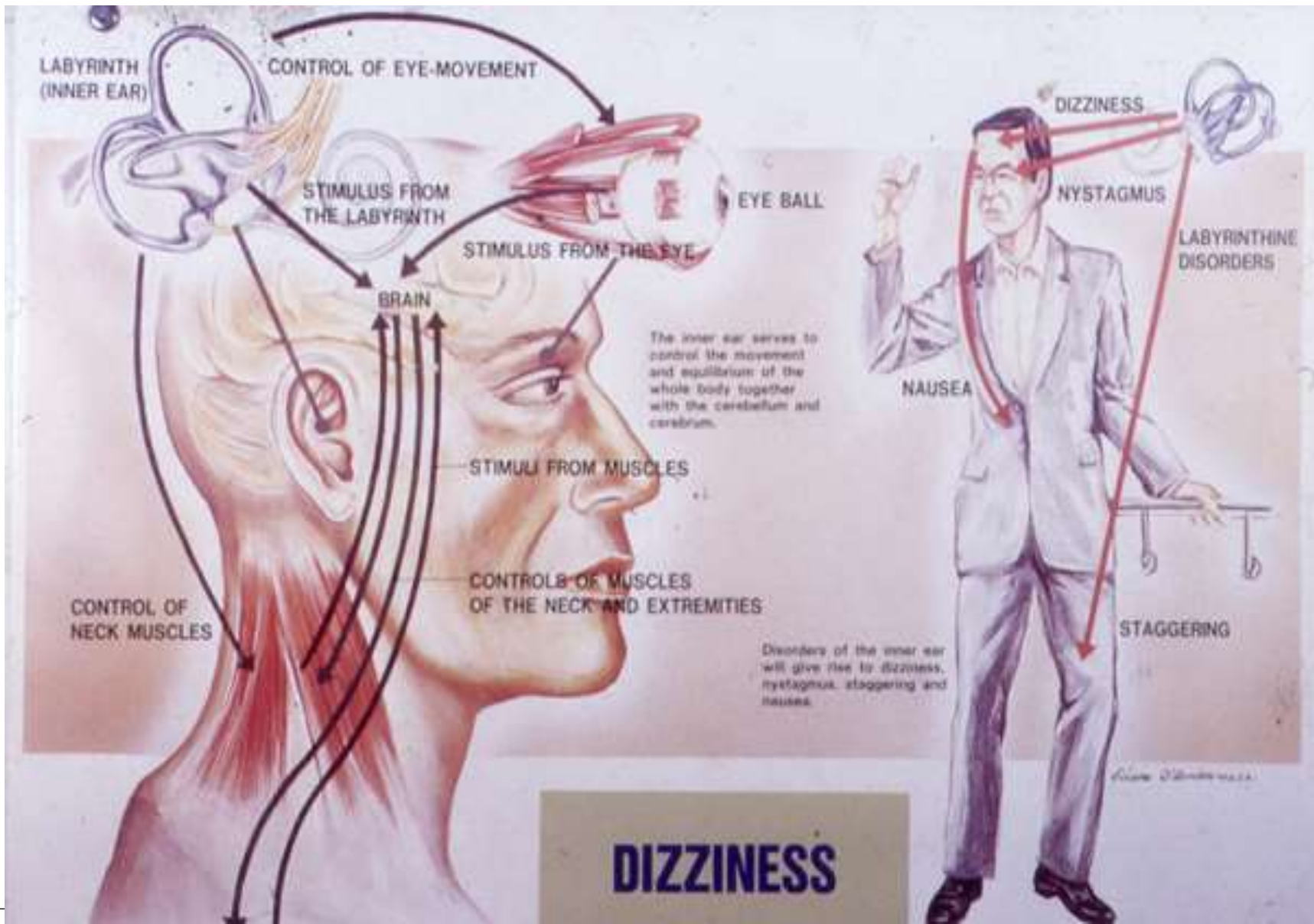


Neurofisiologi Keseimbangan tubuh

- Tahap Transduksi
 - Rangs gerakan (mekanik, cahaya, propioseptif) → ditangkap reseptor tubuh → diubah menj impuls saraf (bioelektrokimia) → transmisi
- Tahap transmisi
 - Impuls saraf → transmisi lwt saraf aferen (N.vestibularis, N. Optikus, N. Spinovestibuloserebelaris) → pusat keseimb di otak
- Tahap modulasi
 - Modulasi, komparasi, integras, persepsi oleh inti vestibularis, serebellum, okulomotorius, hipotalamuus (tms pusat muntah), formatio retiularis (tms inti locus coeruleus), korteks serebri (tms limbik, prefrontal)
 - Ggn keseimbangan : respon vertigo (korteks serebri), mual-muntah-keringat dingin (otonom), nistagmus 9otot penggerak mata)

NEUROFISIOLOGI KESEIMBANGAN TUBUH





Dizziness - Vertigo

- *Dizziness* adalah suatu sensasi yang tidak menyenangkan dari keseimbangan atau gangguan orientasi dalam ruangan

	Vertigo	Presyncope	Disequilibrium	Light headedness
Description	Illusion of movement, usually rotatory of self or surrounding	Sensation of impending loss of consciousness	Postural unsteadiness, imbalance	Also called 'dizziness', 'giddiness' or 'wooziness'. No clear definition
Clinical significance	A wide range of possible causes requiring further assessment	Reduction of total cerebral blood flow, usually of cardiovascular origin Presence of syncope exclude peripheral causes of dizziness	Neurological disorder, musculoskeletal weakness or visual impairment	This term is now used interchangeably with presyncope

Penyebab Vertigo-Dizziness

Vestibular System (25%)*

Benign paroxysmal positional vertigo

Meniere's disease

Vestibular neuritis

Chronic labyrinthine imbalance

Proprioceptive System (15%)

Distal sensory peripheral neuropathy (diabetes, alcohol, and toxic compounds)

Pernicious anemia (Vitamin B₁₂ deficiency)

Spinocerebellar ataxia

Human immunodeficiency virus myelopathy

Visual System (<1%)

Recent unrecognized diplopia or cataracts

Brainstem or Cerebellum (25%)

Structural (1%)

Infarction (lateral medulla or mid-line cerebellum)

Tumor (glioma, ependymoma, etc)

Degenerative (multisystem atrophy)

Congenital (Arnold–Chiari malformation)

Metabolic (24%)

Cardiovascular (orthostatic hypotension, vasovagal syncope, cardiac arrhythmia, heart failure, and severe anemia)

Endocrine (hypo- or hyperglycemia, hypothyroidism)

Psychophysiologic (5%)

Anxiety with hyperventilation

Adverse Drug Effects (30%)

Over 150 drugs have >3% incidence of dizziness and vertigo, but those listed below are the major drug types.

Vestibulotoxic drugs that cause permanent vestibular hair cell damage

Aminoglycoside antibiotics (**gentamycin** and kanamycin)

Cancer chemotherapeutics (cisplatin and chlorambucil)

Central nervous system drugs

Sedatives (benzodiazepines and sleeping pills)

Psychoactive (phenothiazines, lithium, and tricyclics)

Anticonvulsants (phenytoin and carbamazepine)

Circulatory drugs

Antihypertensives (prazosin, ganglionic blockers, and β -blockers)

Vasodilators (isosorbide and nitroglycerin)

Antiarrhythmics (mexiletine, flecainide, and amiodarone)

Loop diuretics (furosemide and ethacrinic acid)

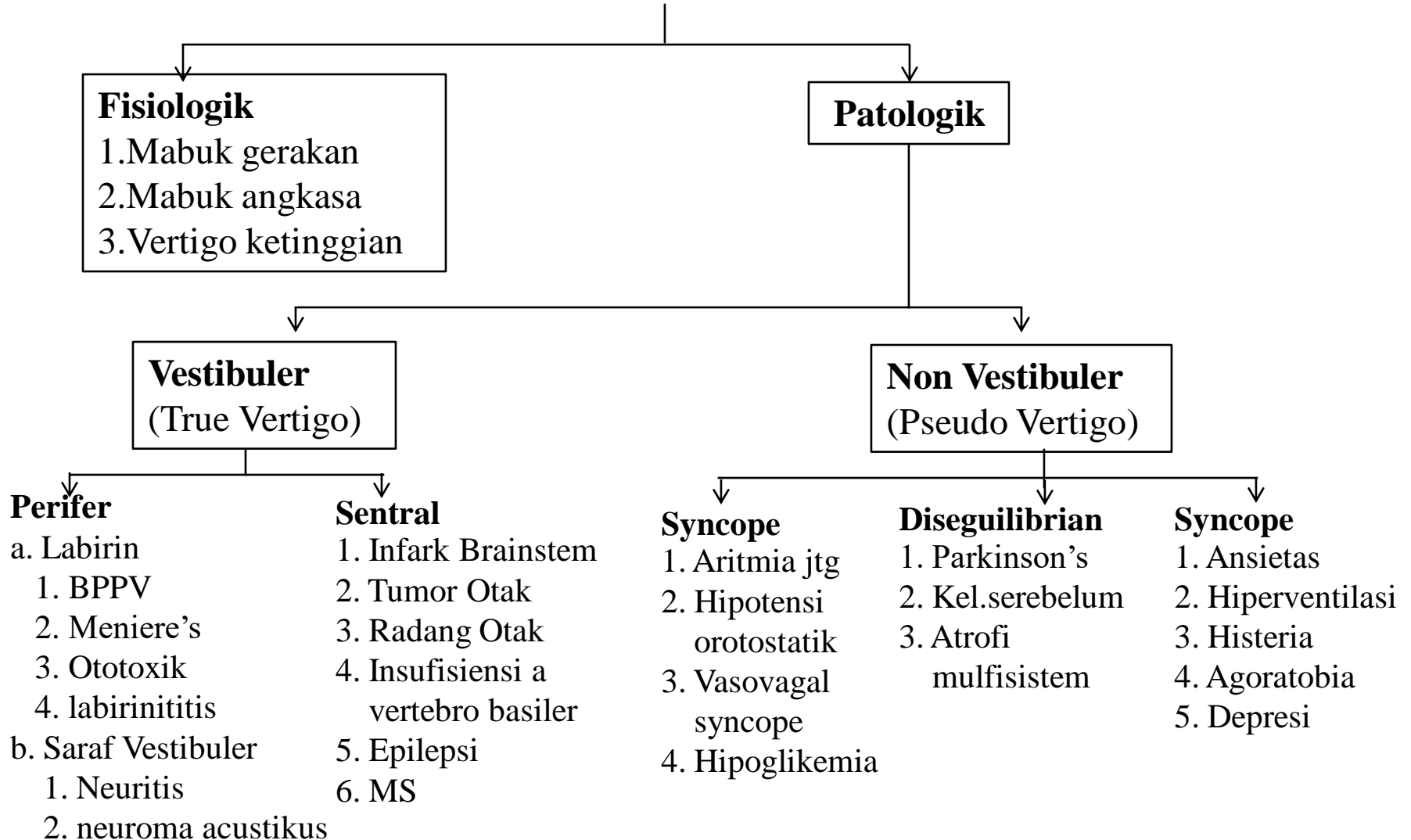
Herbal medicines

Dizziness is a side effect of many herbs

* (%) refers to the approximate distribution of causes. **Bold** type refers to the most common cause in each category.

IV. ETIOLOGI: Jenis dan Penyebab

DIZZINESS



JENIS	MEKANISME	KAUSA
Vertigo	Sinyal dari vestibular yang tak seimbang	BPPV, vestibular neuronitis, Meniere disease, labyrinthitis, vertebrobasilar insufficiency, brainstem / cerebellar infarction
Presinkop	Iskemi difus serebral	Hiperventilasi disertai panik atau ansietas, hipotensi postural, gagal jantung kongestif, penyakit serebrovaskular difus
Disekuilibrium	Hilangnya kesimetrian vestibular & proprioseptif, kerusakan serebelum	Obat ototoksik, neuropati perifer, atrofi / infark serebelum, tumor fossa posterior, meningitis
Distorsi visual	'Mismatch' input visual dan vestibular	Kacamata refraksi baru, operasi katarak dgn lensa kontak, disfungsi otot ekstraokuler, penyakit kornea
Multisensoris	Disfungsi integrasi visual, proprioseptif dan atau sistem vestibular	Disines psikofisiologis, diabetes mellitus, vaskulitis sistemik, reaksi obat, usia

(Dikutip dari : Jackler. Neurotology, chapter 32)

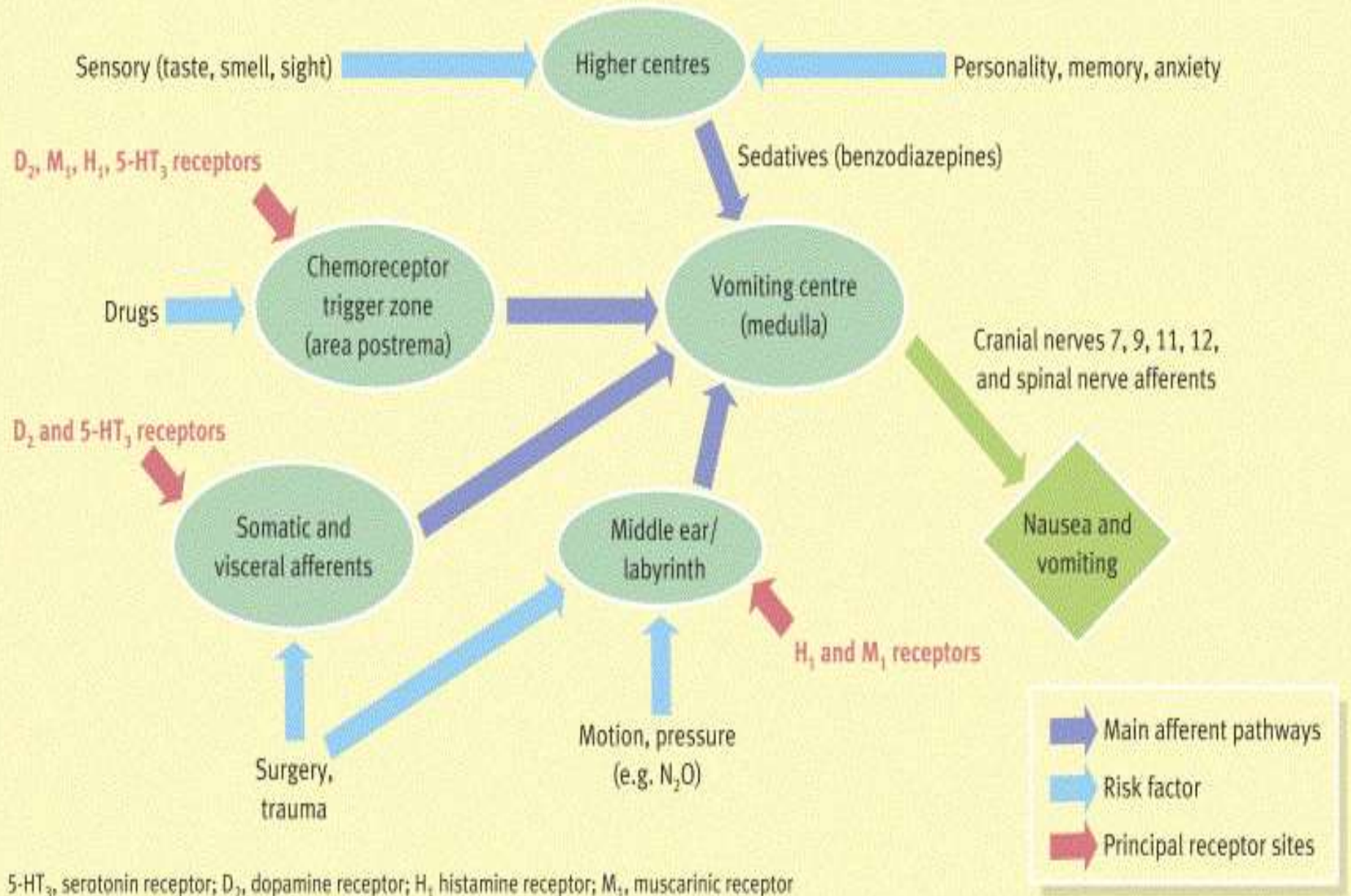
Medical Treatment

- Symptomatic :
 - Relieve acute symptoms , autonomic complaints
- Specific therapy :
 - Targeting the underlying cause of vertigo

Symptomatic Pharmacotherapy

- Predominant targeted vestibular neurotransmitters:
 - Cholinergic
 - Histaminergic
 - GABA neurotransmitters - negative inhibition
- Vomiting center transmitters:
 - Dopaminergic (D2)
 - Histaminergic (H1)
 - Serotonergic (5-HT3)
- Multiple classes of drugs effective

Nausea and vomiting



Symptomatic Pharmacotherapy

- Main classes :
 - Antihistaminergic - dimenhydrinate
 - Anticholinergics - scopolamine, meclizine
 - Anti-dopaminergic - droperidol
 - (gamma)-aminobutyric acid enhancing (GABA-ergic) agents - lorazepam, valium
- Reduce the severity of vestibular symptoms

Symptomatic Pharmacotherapy

Table 2. Drugs Commonly Used for Symptomatic Treatment of Acute Vertigo.*

Drug	Usual Starting Dose	Range of Doses and Frequency of Administration†	Antiemetic Action	Common Precautions	Common Side Effects	Common Drug Interactions
Dimenhydrinate (Dramamine)	50 mg IM, IV, or orally	25–100 mg every 4–8 hr	Moderate	Asthma, glaucoma, prostatic enlargement	Dryness, drowsiness	Alcohol, hypnotics, antidepressants, sedatives, tranquilizers
Promethazine (Phenergan)	25 mg IM, IV, orally, or by suppository	12.5–50 mg every 4–8 hr	Moderate	Same as for dimenhydrinate	Same as for dimenhydrinate	Same as for dimenhydrinate
Meclizine (Antivert, Bonine)	25 mg orally	12.5–50 mg every 4–8 hr	Mild	Same as for dimenhydrinate	Same as for dimenhydrinate	Same as for dimenhydrinate
Scopolamine (Transderm-Scop)	0.2 mg IM or orally Transdermal patch	0.1–0.4 mg every 4–6 hr 1.5 mg over a 3-day period	Moderate	Same as for dimenhydrinate	Dryness, visual blurring, memory loss, confusion in elderly patients	Alcohol, antidepressants, antihistamines, belladonna alkaloids
Droperidol (Inapsine)	2.5 mg IM or IV	2.5–10 mg every 3–4 hr	Prominent	Liver or kidney disease	Drowsiness, extrapyramidal reactions	Antidepressants, barbiturates, spinal and peridural anesthetics
Prochlorperazine (Compazine)	10 mg IM, IV, orally, or by suppository	5–20 mg every 4–12 hr	Prominent	Same as for droperidol	Same as for droperidol	Alcohol, anesthetics, propranolol, phenytoin anticoagulants, levodopa, thiazide diuretics
Diazepam (Valium)	5 mg IM, IV, or orally‡	2–20 mg every 4–8 hr	Mild	Glaucoma, additive with other CNS depressants	Drowsiness	Alcohol, phenothiazines, barbiturates, antidepressants, scopolamine
Lorazepam (Ativan)	1 mg IM, IV, or orally‡	0.5–2 mg every 4–8 hr	Mild	Same as for diazepam	Same as for diazepam	Same as for diazepam

* IM denotes intramuscularly, IV intravenously, and CNS central nervous system.

† It is recommended that the following doses not be exceeded in adults during a 24-hour period: 200 mg of dimenhydrinate, 75 mg of promethazine, 150 mg of meclizine, 1.2 mg of scopolamine (orally), 30 mg of droperidol, 60 mg of prochlorperazine, 60 mg of diazepam, and 6 mg of lorazepam. Smaller doses are used in children and elderly persons.

‡ With intravenous use, equipment to maintain patent airway should be available.

Fase Akut

1. Anti kolinergik

- Sulfas Atropin : 0,4 mg/im
- Scopolamin : 0,6 mg IV bisa diulang tiap 3 jam
- Scopolamine transdermal patch 0.5mg (behind ear) QID

2. Menghambat aktivitas nukleus vestibuler

a. Golongan antihistamin :

- Diphenhydramine (25-50mg IM, IV, or PO q4hr
- Dimenhydrinate 50-100mg IM, IV, or PO q4hr
- Meclizine 25mg PO QID

b. Sedatif

- Phenobarbital: 15-30 mg/ 6 jam
- Diazepam: 5-10 mg
- Chlorpromazin (CPZ): 25 mg

c. Antidopaminergik

– Metoclopramide 10-20 IV or PO TID

Terapi Kausalis : sesuai kausa, mis

a. Oklusi:

- ✓ Anti platelet agregasi, Vasodilator, Flunarizin

b. Epilepsi:

- ✓ Phenitoin, Carbamazepin

c. Migren:

- ✓ Ergotamin, Flunarizin

Terima kasih
