Top 100 Neuroscience Concepts

BASED ON KMU PRE-PROFFS 2024 **MEDICINE • SURGERY • PAEDS • PSYCHIATRY**

1. STROKE & VASCULAR (THE BIGGEST SECTION)

Concept	Exam Pearl / Clinical Scenario
Ischemic Stroke Mgmt	**Thrombolysis (tPA):** Within 4.5 hours. **Aspirin:** If >4.5 hours or tPA contraindicated.
MCA Stroke	Contralateral Face/Arm weakness > Leg. Aphasia (Left/Dominant) or Neglect (Right).
ACA Stroke	Contralateral Leg weakness > Arm. Urinary incontinence. Personality changes.
Lacunar Infarct	Pure Motor or Pure Sensory. No cortical signs (No aphasia/neglect). Hypertension key risk.
Subarachnoid Hemorrhage	"Thunderclap" headache. CT: Star sign. LP: Xanthochromia (>12h). Comp: Vasospasm (Rx: Nimodipine).
Extradural Hematoma	Trauma (Temporal bone). **Lucid Interval**. Lens-shaped (Biconvex) on CT. Middle Meningeal Artery.
Subdural Hematoma	Elderly/Alcoholics. Bridging Veins rupture. Crescent-shaped (Concave) on CT.
Wallenberg Syndrome	Lateral Medullary (PICA). Dysphagia, Hoarseness, Vertigo, Horner's. **NO limb weakness.**
Weber's Syndrome	Midbrain. Ipsilateral CN III palsy (Down/Out pupil) + Contralateral Hemiplegia.
BP in Stroke	Permissive Hypertension. Do NOT lower unless >220/120 or giving tPA (keep <185/110).
ABCD2 Score	Predicts stroke risk after TIA. Age, BP, Clinical features, Duration, Diabetes.
Amaurosis Fugax	Painless transient monocular vision loss ("Curtain falling"). Carotid embolism.

2. EPILEPSY & SEIZURES

Concept	Exam Pearl / Clinical Scenario
Status Epilepticus	Seizure > 5 mins. 1st Line: **Benzodiazepine** (IV Lorazepam/Diazepam). 2nd: Phenytoin/Levetiracetam.
Absence Seizures	Child, "daydreaming", 3Hz spike-wave on EEG. Rx: **Ethosuximide**.
Juvenile Myoclonic (JME)	Morning jerks (spilling coffee) + GTCS. Trigger: Sleep deprivation. Rx: **Valproate**.
Febrile Convulsions	6mo-6yr. Simple (<15min, generalized) vs Complex (>15min, focal, recurrent). Rx: Reassurance/Antipyretics.
Infantile Spasms	West Syndrome. "Salaam" attacks. EEG: Hypsarrhythmia. Rx: ACTH (Steroids).
Drug Side Effects	Valproate (NTD, Weight gain), Phenytoin (Gum hypertrophy), Carbamazepine (Hyponatremia), Lamotrigine (Rash/SJS).
Temporal Lobe Epilepsy	Aura (Epigastric rising sensation, smells), Automatisms (Lip smacking), Déjà vu.
Rolandic Epilepsy	Benign. Centrotemporal spikes. Facial twitching/drooling at night. Self-limiting by puberty.

3. HEADACHE & INFECTION

Concept	Exam Pearl / Clinical Scenario
Bacterial Meningitis	Fever, Neck stiffness, Photophobia. CSF: High Neutrophils, Low Glucose, High Protein. Rx: Ceftriaxone + Vanco.
Viral Meningitis	Lymphocytic CSF, Normal Glucose. Self-limiting.
TB Meningitis	Basal exudates. CSF: Lymphocytes, **Very Low Glucose**, High Protein ("Cobweb clot").
HSV Encephalitis	Temporal Lobe necrosis. Personality changes/Seizures. Rx: Acyclovir.
Brain Abscess	Ring-enhancing lesion. Sources: CSOM (Temporal/Cerebellar), Sinusitis (Frontal). Triad: Headache + Fever + Focal deficit.
Migraine	Unilateral, Throbbing, Photophobia. Acute: Triptans. Prophylaxis: Propranolol/Topiramate.
Cluster Headache	Male, periorbital pain, lacrimation/rhinorrhea. "Suicide headache". Rx: 100% Oxygen.
Trigeminal Neuralgia	Electric shock face pain (V2/V3). Triggered by touch/chewing. Rx: **Carbamazepine**.
Temporal Arteritis	Elderly, jaw claudication, scalp tenderness. Risk: Blindness. Rx: High dose steroids immediately.
IIH (Pseudotumor)	Obese female, headache, papilledema. CT Normal. Rx: Acetazolamide / LP.

4. MOVEMENT & DEGENERATIVE DISORDERS

Concept	Exam Pearl / Clinical Scenario
Parkinson's Disease	TRAP: Tremor (Resting), Rigidity (Cogwheel), Akinesia, Postural Instability. Rx: Levodopa.
Huntington's	Chorea + Dementia + Psych. Autosomal Dominant (CAG repeats). Caudate atrophy.
Wilson's Disease	Young pt with tremor/psych + Liver disease. Keyser-Fleischer rings. Low Ceruloplasmin.
Alzheimer's	Short term memory loss first. Hippocampal atrophy. Amyloid plaques/Tau tangles.
Lewy Body Dementia	Visual hallucinations + Parkinsonism + Fluctuating cognition.
Frontotemporal	Personality/Behavior change first (disinhibition), then memory. Pick bodies.
Essential Tremor	Postural/Action tremor. Improves with Alcohol. Rx: Propranolol.

5. NEUROMUSCULAR & SPINAL CORD

Concept	Exam Pearl / Clinical Scenario
Guillain-Barré (GBS)	Ascending paralysis, Areflexia. Post-GI infection. CSF: High Protein, Normal Cells. Rx: IVIG.
Multiple Sclerosis	Disseminated in Time & Space. Optic Neuritis, INO. MRI: Periventricular plaques. Rx: Steroids (Acute).
Myasthenia Gravis	Fatigable weakness (worse at night), Ptosis, Diplopia. Anti-AChR antibodies. Thymoma association.
Lambert-Eaton	Improves with exercise. Associated with Small Cell Lung Ca. Pre-synaptic Ca channels.
Cauda Equina	Saddle anesthesia, Urinary retention/incontinence, Lax anal tone. Surgical Emergency.
Brown-Sequard	Hemisection. Ipsilateral Motor/Vibration. Contralateral Pain/Temp.
Syringomyelia	Cape-like loss of pain/temp (Central cord). Associated with Chiari Malformation.
B12 Deficiency	Subacute Combined Degeneration. Dorsal Columns (Vibration) + CST (UMN signs).
Motor Neuron Disease	ALS. Mix of UMN (spasticity/brisk reflexes) and LMN (wasting/fasciculations) signs. No sensory loss.

6. PSYCHIATRY (HIGH YIELD)

Concept	Exam Pearl / Clinical Scenario
Schizophrenia	Delusions, Hallucinations (Auditory), Disorganized speech > 6 months. Rx: Antipsychotics.
Depression	SIGECAPS. 2 weeks duration. Screen for suicide. Rx: SSRI (Sertraline/Fluoxetine).
Bipolar I vs II	Type I: Mania (>1 week, severe). Type II: Hypomania (>4 days, no hospitalization). Rx: Lithium/Valproate.
Lithium Toxicity	Tremors, Ataxia, Confusion, Polyuria. Precipitated by dehydration/NSAIDs/Thiazides.
Neuroleptic Malignant Syndrome	"Lead pipe" rigidity, Fever, Autonomic instability. Caused by Antipsychotics. Rx: Dantrolene.
Serotonin Syndrome	Hyperreflexia, Clonus, Fever, Agitation. Drug interaction (SSRI + MAOI/Tramadol).
OCD	Obsession (Thought) + Compulsion (Act). Rx: High dose SSRI + CBT (Exposure Response Prevention).
PTSD	Flashbacks, Avoidance, Hyperarousal > 1 month. (Acute Stress Disorder if < 1 month).
Anorexia Nervosa	Low BMI, fear of weight gain, amenorrhea. Lanugo hair.
Wernicke's Encephalopathy	Thiamine (B1) deficiency. Triad: Confusion + Ataxia + Ophthalmoplegia. Rx: Thiamine BEFORE Glucose.

7. PAEDIATRIC & MISCELLANEOUS

Concept	Exam Pearl / Clinical Scenario
Hydrocephalus	"Sun-setting" eyes, Bulging fontanelle, Increasing head circumference. Rx: VP Shunt.
Neural Tube Defects	Folic Acid deficiency. Spina Bifida (Tuft of hair) vs Meningomyelocele (Sac with nerves).
Cerebral Palsy	Non-progressive motor deficit. Spastic Diplegia (Scissors gait) is common in preterms.
Neurofibromatosis 1	Café-au-lait spots (>6), Axillary freckling, Lisch nodules, Neurofibromas.
Tuberous Sclerosis	Ash-leaf spots (Hypopigmented), Shagreen patch, Angiofibromas, Epilepsy, Retardation.