NEUROLOGY STUDY GUIDE OUTLINE

I. DISORDERS OF MOTOR FUNCTION

A. Differentiate between disorders causing weakness, incoordination and involuntary movements by using muscle strength, muscle bulk, reflex changes, sensory changes, loss of coordination and involuntary movements

B. For disorders of weakness differentiate between Upper Motor Neuron (UMN) and Lower Motor Neuron (LMN) dysfunction by using distribution of weakness, muscle bulk, muscle tone, and reflex changes

1. Contrast the common UMN clinical syndromes of monoparesis, hemiparesis, paraparesis and quadriparesis by distribution and discuss the pathophysiology

a. Describe which reflexes are deep, superficial and pathologic and how they differ in very early vs. more mature lesions
b. Define spasticity and rigidity

2. Differentiate between UMN facial weakness and LMN facial weakness (e.g. Bell's Palsy)

C. For disorders of incoordination discuss the clinical findings and pathophysiology for midline vs. hemispheric cerebellar disorders

1. Define ataxia
2. Define dysmetria
3. Define titubation
4. Describe a wide-based-gait and discuss its anatomical localization

D. For involuntary movement disorders define and differentiate the following:

1. Resting vs. action (intention) tremor
2. Rigidity vs. spasticity
3. Athetosis and Chorea
4. Asterixis
5. Dystonia (including Writers Cramp and Torticollis)
6. Myoclonus
7. Tics

8. Discuss the clinical findings, lab findings, and treatment of the following:

    a. Parkinson's Disease
    b. Essential Tremor
    c. Tardive Dyskinesia
    d. Huntington's Chorea
    e. Wilson's Disease

II. DISORDERS OF SENSATION

A. Differentiate central sensory disorders from peripheral sensory disorders by distribution, modalities affected, associated findings and the presence or absence of pain.

B. For central sensory disorders describe the following and discuss the localization of each:

1. Hemihypesthesia
2. Sensory level
3. Brown-Sequard syndrome
4. Dissociated sensory loss (as in syringomyelia)
5. Sacral sparing

III. DISORDERS OF VISION

A. Assess Visual Loss

1. Localize the lesion causing the following:

    a. Monocular visual loss
    b. Enlarged blind spot
    c. Central scotoma
    d. Bitemporal field defect
    e. Homonymous hemianopsia

2. Learn the funduscopic appearance of papilledema

B. Assess Diplopia

1. Describe the innervation and action of each of the extraocular muscles
2. Describe the oculocephalic response on passive lateral rotation of the head (Doll's Head Maneuver) and indicate its clinical use
3. Name the anatomical location and most common causes for each of the following syndromes:

    a. Internuclear Ophthalmoplegia
    b. CN III palsy (pupil sparing vs. non-pupil sparing)

c. CN VI palsy
d. Fluctuating or fatigable muscle paresis sparing the pupil

C. Recognize nystagmus and list its common causes

D. Assess Pupillary Abnormalities

1. Recognize Horner's syndrome and its implications
2. Describe the swinging flashlight test and the findings in an afferent pupillary defect; list the location of lesions that can cause an afferent pupillary defect

IV. EPISODIC DISORDERS

A. Discuss the common clinical features that help distinguish seizure from syncope

B. Seizure Disorders

1. Outline the International System used for classification of common forms of seizures. Distinguish among the following:

a. Primary Generalized Epilepsy (convulsive and non-convulsive)
b. Partial Epilepsy
c. Complex partial seizure
d. Simple partial seizure
e. Partial seizure with secondary generalization

2. Distinguish between seizure and epilepsy
3. List the common causes of seizures as related to different age groups
4. Describe some common ictal characteristics of non-epileptic (pseudo) seizures
5. Describe Todd's postictal phenomenon
6. Describe the routine evaluation of a patient for new onset seizures and discuss which patients should receive anticonvulsant treatment
7. List the commonly used anticonvulsants, their indications and side effects
8. Define status epilepticus

a. Outline the initial evaluation and management of a patient in status epilepticus
b. List the medications and the dosages that are used to stop status immediately and for long-term maintenance

C. Define syncope and identify its common causes
D. Distinguish between narcolepsy and obstructive sleep apnea

V. CEREBROVASCULAR DISEASES

A. List the major risk factors for cerebrovascular disease
B. Define the following:

1. Carotid bruit
2. Transient Ischemic Attack (TIA), including Amaurosis Fugax (Transient Monocular Blindness)
3. Ischemic infarct
4. Small deep infarcts (alias “lacunes”)
5. Hemorrhagic infarct
6. Intracerebral hemorrhage or Intracranial hemorrhage
7. Subarachnoid hemorrhage

C. Give the major clinical features of infarction in the distribution of the following:

1. Anterior cerebral artery
2. Middle cerebral artery
3. Lenticulostriate arteries
4. Basilar artery

D. Discuss the treatment options designed to prevent infarction in the following:

1. Atrial fibrillation
2. Symptomatic carotid stenosis

E. List the causes of intracranial hemorrhage

1. List the most common sites and clinical features for Intracerebral hemorrhage
2. Describe the typical clinical picture of a subarachnoid hemorrhage (SAH)

    a. List the two major causes of spontaneous SAH
    b. Outline the diagnostic workup for a patient with a suspected SAH

C. Discuss immediate and early medical/surgical management of a patient with a subarachnoid hemorrhage

VI. MULTIPLE SCLEROSIS (MS)

A. Discuss the criteria for the clinical diagnosis of MS

B. Describe the findings suggestive of MS on clinical examination, MRI and CSF

VII. HEAD TRAUMA

A. Define each of the following sequela of closed head trauma in terms of temporal profile, symptoms, and treatment:

1. Concussion
2. Anterograde and retrograde amnesia
3. Post concussion syndrome
4. Subdural hematoma
5. Epidural hematoma
6. Contusion or hemorrhage
7. CSF rhinorrhea

B. Describe the evaluation and management of a patient with a closed head injury admitted for altered consciousness or focal findings.

VIII. DIZZINESS AND DISORDERS OF HEARING

A. Assess Dizziness

1. Define vertigo and contrast it to other types of dizziness
2. Describe the following vestibular exam findings

    a. Nystagmus
    b. Describe the bedside technique for the Hanging Head Test (Hallpike maneuver)

4. Identify the clinical features used to distinguish among the following:

    a. Benign paroxysmal positional vertigo
    b. Occlusion of the Internal Auditory Artery
    c. Meniere's Disease
    d. Brainstem TIA with vertigo
    e. Acoustic neuroma

B. Assess Auditory Symptoms

1. Define tinnitus
2. Discuss the findings on Rinne and Weber testing for conductive vs. sensorineural hearing loss

IX. DISORDERS OF HIGHER COGNITIVE FUNCTION AND COMMUNICATION

A. Assess Disorders of Higher Cognitive Function

1. Define the following:

    a. Dementia
    b. Delirium
    c. Amnesia
    d. Confabulation
    e. Hallucination
    f. Delusion
    g. Illusion

2. Differentiate acute confusional state (delirium) from dementia and give three common examples of each

3. Assess Dementia

    a. List the common causes of dementia
    b. Define normal pressure hydrocephalus

B. Assess Communication Disorders

1. Define the following:

    a. Aphasia
    b. Dysarthria

2. Differentiate the following aphasia types on the basis of anatomy, ability to produce speech, comprehension, naming ability and repetition:

    a. Broca's (nonfluent, motor) Aphasia
    b. Wernicke's (fluent, receptive) Aphasia
    c. Global aphasia

X. DISORDERS OF ALTERED CONSCIOUSNESS

A. Define the following terms:

1. Consciousness
2. Coma
3. Brain Death
4. Persistent vegetative state
5. Locked in syndrome

B. Discuss the anatomy of consciousness

1. List the anatomic structures of the brain necessary to maintain consciousness

2. List the clinical characteristics that distinguish metabolic from structural causes of coma

C. Assess the comatose patient

1. List the first three things you must do when confronted with a comatose patient (the ABCs)
2. Outline steps in the initital evaluation and empiric treatment of the comatose patient
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3. Discuss the techniques for eliciting and the localization of the following findings on the neurologic exam of a comatose patient:

    a. Motor
        1.) Decorticate vs. decerebrate rigidity
        2.) Eyes conjugately deviated towards hemiparesis; Eyes conjugately deviated away from hemiparesis

    b. Respiratory
        1.) Cheyne-Stokes respiration

    c. Pupillary response
        1.) Midposition-fixed pupils
        2.) Pinpoint pupils
        3.) Unilateral fixed dilated pupil

    d. Eye movements
        1.) Conjugate roving extraocular movements
        2.) Intact vs. absent oculocephalic response (Doll's Eyes)
        3.) Intact vs. absent or disconjugate ice water calorics

D. Diagnosis and management of increased intracranial pressure (ICP)

1. List the symptoms and signs of increased ICP
2. List the effects of uncal hemiation on:

    a. Level of consciousness
    b. Motor activity
    c. Extraocular movements
    d. Pupillary reactivity

3. List the indications for a CT or MRI scan prior to performing an LP
4. List the methods used to treat increased ICP
5. Distinguish between communicating and non-communicating hydrocephalus

XI. HEADACHES AND FACIAL PAIN

A. Contrast the clinical features that distinguish between benign vs. potentially serious underlying causes of headaches

B. Describe the clinical features of the following chronic recurrent headaches in terms of mode of onset and evolution, location, character, duration, precipitants, associated symptoms and family history

1. Migraine headaches with aura vs. without aura
2. Cluster headaches
3. Tension-type headaches
4. Trigeminal neuralgia
5. Chronic daily headache

C. Describe the clinical features of the following causes of headaches

1. Subarachnoid hemorrhage (SAH)
2. Meningitis
3. Increased intracranial pressure/mass
4. Temporal arteritis
5. Intracranial hemorrhage
6. Hypertensive encephalopathy
7. Sinusitis
8. Temporomandibular joint dysfunction
9. Post-trauma/concussive syndrome

D. Discuss both the emergent and non-emergent indications for the following diagnostic tests used to evaluate a headache patient:

1. MRI or CT
2. Lumbar puncture (LP) - also list contraindications
3. Erythrocyte Sedimentation Rate

E. Differentiate the CSF profiles of Subarachnoid Hemorrhage and meningitis

F. Discuss the treatment for common headache syndromes including symptomatic and prophylactic therapy

XII. ASSESS NECK AND BACK PAIN

A. Differentiate clinically between myofacial pain, radiculopathy and spinal cord compression and list two common causes of each

B. Discuss the significance of back pain in cancer patients

XIII. BRAIN TUMORS

A. Discuss the clinical presentation of a primary brain tumor in the following locations:

1. Cerebellopontine angle
2. Pituitary region
3. Cerebral hemisphere
4. Cerebellum

B. Discuss metastatic tumors to the brain

1. Differentiate metastatic from primary brain tumor by
   a. Clinical features
   b. Imaging: CT or MRI

2. List the most common metastatic tumors to the brain in adults

XIV. INFECTIONS

A. List the common organisms for the following and contrast the clinical presentations, CSF findings and treatment for each:

1. Acute bacterial meningitis (list most common organisms for infants, children and adults)
2. Acute viral meningitis
3. Encephalitis - including herpes simplex
4. Chronic meningitis
5. Brain abscess

B. Discuss the common clinical manifestations, lab findings and treatment of neurosyphilis

C. Discuss the common clinical manifestations, lab findings and treatment of neurologic Lyme disease

D. HIV and the nervous system

1. Discuss the manifestations of primary HIV infection of the nervous system including:

   a. Encephalitis
   b. Myelopathy
   c. Neuropathy
   d. Myopathy

2. List the treatable opportunistic infections of the nervous system in HIV patients

3. Identify the most common primary CNS neoplasm associated with HIV disease

XV. SPINAL CORD DISORDERS

A. Localize the lesion that gives the following findings on neurologic exam:

1. Ipsilateral UMN findings and decreased position sense with contralateral decrease in pain and temperature sensation
2. Dissociated sensory loss, weakness and areflexia of the upper extremities
3. Sensory level with paraparesis and bladder incontinence

B. Describe the usual clinical presentation of vitamin B12 deficiency

XVI. PERIPHERAL NERVOUS SYSTEM DISORDERS

A. List the components of the motor unit and contrast the common LMN clinical syndromes of neuropathy, neuromuscular junction disorders, and myopathy by symptoms, sensory changes, reflex changes, muscle bulk and tone

B. For peripheral sensory-motor disorders describe the following and discuss the localization of each:

1. Radiculopathy
2. Mononeuropathy
3. Mononeuritis multiplex (multiple mononeuropathy)
4. Polyneuropathy
5. Paresthesia
6. Fasciculation
7. Describe the typical clinical findings in root lesions at C5, L5
8. Herniated nucleus pulposus (HNP)
9. Straight leg raising signs

C. Discuss the symptoms, exam and lab findings of carpal tunnel syndrome (median neuropathy)

D. Describe an approach to the workup of a chronic polyneuropathy

E. Describe the time course, symptoms, lab findings and treatment of Acute Inflammatory Demyelinating Polyneuropathy (AIDP; Guillain-Barre Syndrome)

1. Discuss criteria used to determine need for ventilatory support in patients with AIDP

F. Describe the usual clinical features and differential diagnosis of motor neuron disease

G. Describe the pathogenesis, usual clinical presentation, workup and therapy of myasthenia gravis

H. Describe the common clinical manifestations and enzyme findings of the following myopathies:

1. Duchenne's Muscular Dystrophy
2. Myotonic Dystrophy
3. Polymyositis

XVII. ALCOHOL RELATED DISORDERS

A. Define the clinical characteristics of the following:

1. Wernicke-Korsakoff syndrome
2. Alcohol withdrawal seizure
3. Delirium tremens
4. Cerebellar degeneration
5. Peripheral polyneuropathy

XVIII. CHILD NEUROLOGY

A. The neurologic disorders of particular importance in children are not detailed in this objective list. Three entities of special importance are:

1. Differentiation of static encephalopathy (Cerebral Palsy) from progressive cognitive decline
2. Evaluation of enlarging head size
3. State the major genetic principles that determine hereditary neurological disorders. Name a neurologic disorder which is:

    a. Autosomal dominant
    b. Autosomal recessive
    c. X-linked recessive
    d. Associated with a specifically localized gene abnormality

This study guide was prepared with the help of the American Academy of Neurology's Undergraduate Education Subcommittee. The subcommittee prepared an outline titled "What Should a Graduating Medical Student Know about Neurology?" by B.Scherokman, K.Cannard, and J.Q.Miller. Selected parts of the monograph appear in the study guide.