

CNS1 – Midterm 2012/2013

1. Deficiency of vitamin B₆ (pyridoxal phosphate) will result in the impairment of all the following pathways EXCEPT:

- (a) DOPA to dopamine
 - (b) Norepinephrine to epinephrine**
 - (c) Aspartate to glutamate
 - (d) Tryptophan to serotonin
 - (e) Histidine to histamine
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2. The 'retrograde' mechanism of NO (nitric oxide) means:

- (a) It is produced in the post-synaptic neurone.
 - (b) It regulates the pre-synaptic neurone.**
 - (c) It activates guanylyl cyclase.
 - (d) It diffuses to nearby cells.
 - (e) It binds to post-synaptic receptors.
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3. All of the following regarding Huntington's disease are correct EXCEPT:

- (a) Normally there are 6-34 CAG repeats found.
 - (b) People who have more than 34 CAG repeats are at risk of developing Huntington's disease.
 - (c) Age of onset of the disease depends mainly on the length of CAG repeats.
 - (d) It is an autosomal recessive disease (at least in regard to age of onset).**
 - (e) The CAG repeat encodes a poly-glutamine tract.
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4. Which of the following regarding the familial type of Parkinson's disease is CORRECT:

- (a) It affects over 1% of people below 45 years of age.
 - (b) Familial type is more common than sporadic type.
 - (c) Mitochondrial toxins are a major cause of familial type of Parkinson's disease.
 - (d) DJ-1 and PINK-1 genes are involved in the familial type of Parkinson's disease.**
 - (e) None of the above.
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5. Which of the following is the causative agent of Waterhouse–Friderichsen syndrome ?

- (a) Haemophilus influenzae
 - (b) Streptococci group A
 - (c) Neisseria meningitidis**
 - (d) Streptococcus pneumoniae
 - (e) Escherichia coli
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6. All of the following regarding Histoplasmosis are correct EXCEPT:

- (a) A causative agent of chronic meningitis.
 - (b) Can infect the lungs as well as the skin.
 - (c) Can be isolated on Sabouraud dextrose agar.
 - (d) Can be prevented by administering a vaccine.**
 - (e) More commonly seen in the USA.
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7. All of the following are true regarding Haemophilus influenzae EXCEPT:

- (a) Possesses a thin capsule.
 - (b) Susceptible to dryness.
 - (c) Presence of pilli.
 - (d) Is resistant to 3rd-generation cephalosporins.**
 - (e) A rare cause of meningitis now in Jordan.
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8. All of the following regarding Toxoplasma gondi are correct EXCEPT:

- (a) Intracellular infection.
 - (b) Endodyogeny.
 - (c) Non-specific intermediate host.
 - (d) Bradyzoites are found inside the oocyst.**
 - (e) Diagnosis depends on serology.
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9. All of the following regarding African Trypanosoma are correct EXCEPT:

- (a) Trypomastigote is found in the primary host.
 - (b) Schizogony.**
 - (c) T. rhodesiense causes a more severe disease but of shorter duration than T.gambiense.
 - (d) Winterbottom's sign.
 - (e) Zoonosis.
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10. All of the following are involved in the neurotoxicity of stroke EXCEPT:

- (a) Glutamate
 - (b) Ca²⁺
 - (c) K⁺**
 - (d) NO
 - (e) Na⁺
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11. All of the following are functions controlled at the lower brain level (subcortical level) EXCEPT:

- (a) Arterial Pressure
 - (b) Respiration
 - (c) Emotions
 - (d) Personality**
 - (e) Equilibrium and balance
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12. Which of the following regarding neurotransmitters and their pathways is CORRECT:

- (a) Decrease in acetylcholine input to the cortex will result in Alzheimer's disease.**
 - (b) Increase in norepinephrine input to the frontal cortex will result in depression.
 - (c) Decrease in dopamine input via the mesolimbic pathway will result in schizophrenia.
 - (d) Increase in dopamine input to the cortex will result in negative symptoms of schizophrenia.
 - (e) Increase in serotonin level in the body will result in depression.
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13. Which of the following cases is associated with cluster headache:

- (a) A 30 year old female suffers from throbbing-like pain on one side of the face. She presents symptoms such as nausea and vomiting.
 - (b) A 32 year old female suffers from pain in the front of the head, which usually fades away when she sleeps at night.
 - (c) A 29 year old male suffers from excruciating pain presenting in the back of the head.
 - (d) A 40 year old female suffering from a band-like pain beginning at mid-day and worsening towards the end of the day.
 - (e) A 25 year old male, suffering for 3 months of fronto-orbital pain associated with episodes of electric-like shocks. He suffered from the same type of episodes for a period of 10 weeks 3 years ago.**
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14. All of the following are associated with problems in the brain stem EXCEPT:

- (a) Dysphagia
 - (b) Visual deficits
 - (c) Respiratory problems
 - (d) Dysphasia**
 - (e) Altered equilibrium
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15. Which of the following types of headache require immediate imaging and further investigation:

- (a) Migraine
 - (b) Cluster headache
 - (c) Tension headache
 - (d) Headache with other neurological deficits
 - (e) Headache secondary to sinusitis
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16. All of the following are true regarding the symptomatology and diagnosis of neurological disorders EXCEPT:

- (a) Grasp response usually remains intact following a neurological lesion.
 - (b) Positive symptom might be due to compensation for a missing function.
 - (c) Non-anatomical factors help determine the localization of the lesion.**
 - (d) Acquired language is affected more than a native language.
 - (e) Rigidity is an example of a positive symptom.
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17. All of the following regarding SNAP (sensory nerve action potential) and CMAP (compound motor action potential) are correct EXCEPT:

- (a) Orthodromic sensory study produces a larger SNAP.**
 - (b) In CMAP, the reference electrode is placed over the tendon.
 - (c) Usually during stimulation, 10% more than the maximum stimulus (supramaximal) is needed.
 - (d) The active electrode in CMAP is placed over the belly of the muscle.
 - (e) Orthodromic sensory study follows the normal physiology of a sensory pathway.
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18. Which of the following matches in INCORRECT:

- (a) Significant demyelination → More than 50% decrease in velocity of conduction
 - (b) Myasthenia gravis → Decremental repetitive nerve stimulation
 - (c) Carpal Tunnel Syndrome → Decrease in amplitude of CMAP
 - (d) Myasthenic syndrome → Normal repetitive nerve stimulation**
 - (e) Axonal loss → Less than 30% decrease in velocity of conduction
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19. All of the following regarding sensory receptors are correct EXCEPT:

- (a) Sensory receptors are histologically non-specific.
- (b) Every receptor has one adequate stimulus.
- (c) In 'phantom limb' phenomenon, whenever a nerve fiber is stimulated, sensation is felt equally throughout all the receptors found in its area.**
- (d) Signals from sensory receptors will ultimately reach the somatic sensory cortex in the brain.
- (e) The modality of sensation of a nerve fiber depends on which area in the cortex it stimulates.

20. All of the following regarding adaptation of sensory receptors is correct EXCEPT:

- (a) Baroreceptors can adapt after a period of time of 48 hours.
 - (b) The accommodation of the unmyelinated nerve fiber is one of the mechanisms of adaptation.
 - (c) Thermal receptors are phasic receptors.
 - (d) The Pacinian corpuscle adapts at a receptor potential of only 10 mV.**
 - (e) The structure of the Pacinian corpuscle's lamellae is also one of the mechanisms of receptor adaptation.
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21. A 29 year old patient was investigated at the neurology clinic, and it was noted that she lacks the 'two point discrimination' ability in her left hand. What is the most likely cause of such a presentation:

- (a) Fasciculus cuneatus lesion on the right side of the spinal cord at the level of C2.
 - (b) Dorsal column lesion on the right side of the spinal cord at the level of C5.
 - (c) Medial lemniscus lesion in the right side of the pons.**
 - (d) Fasciculus gracilis lesion in the right side of the medulla.
 - (e) Spinothalamic lesion on the right side of the spinal cord.
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22. All of the following are true regarding Tabes Dorsalis EXCEPT:

- (a) Associated with meningoradiculitis and papillary involvement.
 - (b) Loss of dorsal column modalities of sensation bilaterally.
 - (c) Ataxic gait only when eyes are closed.
 - (d) Severe stabbing pain in the lower limbs and abdomen due to involvement of the spinothalamic tract.**
 - (e) Positive Romberg's test due to sensory ataxia.
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23. Which of the following matches is INCORRECT:

- (a) Appendicitis irritating the peritoneum → Right iliac fossa pain
 - (b) Dissociated sensory loss → central lesion.
 - (c) Anterior spinal artery syndrome → loss of all sensory modalities below the level of the lesion except discriminative touch.
 - (d) Tumor pressing on the lateral aspect of the spinal cord from the outside → loss of pain and temperature sensation with sacral sparing.**
 - (e) Subacute combined degeneration of the spinal cord → both lateral and posterior columns are affected
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24. A patient suffers from anesthesia on the left side of the face and the right side of the body. Which of the following tests is most suitable and should be carried out immediately:

- (a) Electrophysiological test
 - (b) Electromyography
 - (c) Spinal cord MRI and angiography
 - (d) MRI of the brain**
 - (e) fMRI
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25. All of the following are associated with Brown-Sequard syndrome EXCEPT:

- (a) Ipsilateral loss of proprioception and sense of vibration below the level of the lesion.
 - (b) Ipsilateral spastic paralysis below the level of the lesion.
 - (c) Contralateral anesthesia.
 - (d) Ipsilateral loss of all touch sensations below the level of the lesion.**
 - (e) Loss of all modalities of sensation and flaccid paralysis at the level of the lesion.
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26. A 32 year old woman presents to the neurology clinic. Investigation shows atrophy of the thenar muscles of both hands, and she also complains of burning her hands while cooking. The most likely cause of such a presentation:

- (a) Tabes Dorsalis
 - (b) Medullary carcinoma
 - (c) Beck's syndrome
 - (d) Syringomyelia**
 - (e) Osteosarcoma
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27. All of the following techniques can be used to treat severe chronic type of pain EXCEPT:

- (a) Stimulation of the periaqueductal gray matter.
 - (b) Stimulation of the periventricular nucleus in the hypothalamus.
 - (c) Stimulation of the dorsal column.
 - (d) Stimulation of the dorsolateral tract.
 - (e) Stimulation of the spinothalamic tract.**
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28. All of the following are associated with migraine EXCEPT:

- (a) May be due to a reduction in serotonin level in the brain.
 - (b) There is a genetic predisposition.
 - (c) Associated with an early aura phase spasm.
 - (d) More commonly seen in young males.**
 - (e) Associated with a late vasodilatation stage with the onset of throbbing pain.
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29. All of the following are true regarding plantar reflex EXCEPT:

- (a) Plantar flexion is the response that occurs in normal individuals.
 - (b) 'Up-going-toe' may indicate a lesion to the pyramidal tract.
 - (c) In a spinal cord lesion, the receptive field of stimulation is restricted to the lateral aspect of the sole.**
 - (d) Chaddock's, Gordon and Oppenheim signs are present only when Babinski's reflex is.
 - (e) Dorsiflexion might occur in a case of deep anesthesia.
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30. Which of the following reflexes will be lost first following multiple sclerosis:

- (a) Abdominal reflex**
 - (b) Plantar reflex
 - (c) Withdrawal reflex
 - (d) Stretch reflex
 - (e) Cremasteric reflex
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31. All of the following are true regarding the development of the nervous system EXCEPT:

- (a) Failure of anterior neuropore to close results in anencephaly.
 - (b) An increase in alpha-fetoprotein in the amniotic fluid may be due to anencephaly.
 - (c) Spinal and autonomic ganglia are derived from the neural crest.
 - (d) Myelocoele is usually associated with spina bifida and neurological symptoms.**
 - (e) The corticospinal tract starts to be myelinated 6 months after birth.
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32. All of the following statements are correct EXCEPT:

- (a) Stretch reflex: Monosynaptic reflex
 - (b) Thalamus: Stereognosis**
 - (c) Muscle contraction: Increases Ia afferent discharge
 - (d) Somatic sensory cortex: Tactile discrimination
 - (e) Supplementary motor area: Bimanual tasks
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33. All of the following regarding SMA (supplementary motor area) and PMA (premotor area) are correct EXCEPT:

- (a) Involved in programming of movement.
 - (b) Neither is involved in the medial motor system.**
 - (c) Neither receive a direct input from the cerebellum or basal ganglia.
 - (d) Lesion in the premotor area results in grasp response.
 - (e) They control mainly the proximal and axial muscles.
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34. All of the following matches are correct EXCEPT:

- (a) Limbic circuit: Nucleus accumbens
 - (b) Association circuit: Cognition
 - (c) Limbic circuit: Posture and gesture
 - (d) Motor circuit: Caudate nucleus**
 - (e) Striatum: Integration of sensory, motor, emotional and motivational inputs.
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35. Lesion in the right internal capsule and left frontal eye field will result in:

- (a) Left-sided hemiplegia, deviation of the eyes to the left, and deviation of the mouth to the right.**
 - (b) Monoplegia in the upper limbs associated with deviation of the eyes to the right.
 - (c) Paraplegia as well as loss of pain sensation.
 - (d) Monoplegia in the upper limbs associated with deviation of the eyes to the left.
 - (e) Loss of all sensory modalities from the upper limbs.
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36. Cut in the dorsal afferent root, and stimulating the gamma motor neurones will result in:

- (a) Decrease in intrafusal muscle fiber length with increased stretch reflex for the same muscle.
 - (b) Decrease in intrafusal muscle fiber length with increased stretch reflex for the antagonist muscle.
 - (c) Decrease in length of intrafusal muscle fiber.**
 - (d) Decrease in length of intrafusal and extrafusal muscle fibers.
 - (e) Tension in golgi tendon organ.
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37. All of the following regarding spasticity and rigidity are true EXCEPT:

- (a) Spasticity occurs in the antigravity muscles.
 - (b) Both are due to release of certain nuclei from inhibition mechanisms.
 - (c) Both can excite and stimulate the golgi tendon organ.**
 - (d) Rigidity is seen in both flexors and extensors of the same limb.
 - (e) They are caused by lesions at different sites of the nervous system.
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38. All of the following regarding UMNL signs are correct EXCEPT:

- (a) Three characteristic features that occur in an UMNL are due to the same mechanism.
 - (b) Positive Babinski's sign is physiological in a one year old child.
 - (c) Absence of certain flexion reflexes.
 - (d) Hyperreflexia with or without positive Babinski's sign is an indicator of UMNL.**
 - (e) Clonus is associated with increased gamma discharge.
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39. All of the following neurones or pathways are inhibitory EXCEPT:

(a) Strio-pallidal pathways that start from the caudate and putamen and end in the globus pallidus internal segment.

(b) Nigro-striatal pathways that begin from the pars compacta and end in the caudate and putamen.

(c) Dentato-thalamic pathways that start from the dentate nucleus and end in the VA and VL nuclei of the thalamus.

(d) Purkinje cells to cerebellar nuclei.

(e) Golgi type 2 cells to granule cells.

40. All of the following regarding the basal ganglia are correct EXCEPT:

(a) The striatum sends inhibitory signals to the globus pallidus internal segment, pars compacta and pars reticulata.

(b) Parkinson's disease is associated with overactive globus pallidus internal segment.

(c) Pars compacta has an inhibitory effect on the striatum of the indirect pathway.

(d) Decreased activity is seen in the subthalamic nucleus in Parkinson's disease.

(e) The pars reticulata is functionally connected to the globus pallidus internal segment.

41. Which of the following regarding chorea is CORRECT:

(a) Hypokinesia and hypertonia.

(b) Loss of striatal GABAergic neurones of the direct pathway.

(c) Rapid dance-like movements that involve the muscles of the proximal extremities.

(d) Increased activity in the subthalamic nucleus.

(e) Underactive globus pallidus internal segment.

42. All of the following regarding the cerebellum are correct EXCEPT:

(a) The cerebrocerebellum receives its major input from the motor and premotor areas of the cortex.

(b) Cerebellar ataxia is due to incoordination of the cerebellum to the different muscles of movement.

(c) The vermis with the fastigial nucleus controls the movement of the head, neck and proximal muscles.

(d) The cerebrocerebellum is required for the initiation and timing of certain ballistic type of movements.

(e) Nystagmus can occur sometimes due to multiple sclerosis.

43. All of the following regarding the brain stem are correct EXCEPT:

- (a) **The upper two-thirds is found in the infra-tentorial compartment.**
 - (b) An increase in intracranial pressure will result in the herniation of the medulla.
 - (c) Descending motor and ascending sensory pathways pass through it.
 - (d) Pyramidal lesion will produce the same effect as a lesion in area 4.
 - (e) Lesion in area 6 following a lesion in area 4 will cause spastic paralysis.
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44. All of the following occur during cortical motor activity EXCEPT:

- (a) Increased muscle contraction through the α -motor neurones.
 - (b) Decreased length of the muscle.
 - (c) **Decreased Ia afferent discharge.**
 - (d) Contraction of extrafusal muscle fibers.
 - (e) Increased contractile force of the muscle.
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45. All of the following regarding lesions in the CNS are correct EXCEPT:

- (a) Motor neurone disease involves both upper and lower motor neurones.
 - (b) The first objective sign in LMNL is fasciculations of the muscles involved.
 - (c) In an UMNL, the fine skilled movements will be lost forever.
 - (d) **Babinski's sign is a late symptom of UMNL.**
 - (e) A comatose patient changing from decerebrate to decorticate rigidity indicates good prognosis.
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46. The following statements regarding the cerebellum are correct EXCEPT:

- (a) Dysmetria and dysdiadochokinesia are due to the absence of proper timing.
 - (b) **Hypotonia and pendular jerk are due to damping function of the cerebellum.**
 - (c) Dysarthria is due to incoordination of the muscles used in speaking.
 - (d) Patient with cerebellar ataxia can't compensate by visual guidance.
 - (e) Intention tremor is due to damping function of the cerebellum.
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47. Regarding the pathophysiology of headache, all of the following structures are sensitive to pain EXCEPT:

- (a) Periosteum
 - (b) **Brain tissue**
 - (c) Blood vessels
 - (d) Dura matter
 - (e) Aponeurosis galea
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48. **Wrong statement:** Following a stroke by 2 weeks, a patient is able to walk due to the extrapyramidal tracts.