STUDY GUIDE
for
Nervous System Emergencies

1. The central nervous system consists of the

   A. sympathetic and parasympathetic branches
   B. cranial nerves and peripheral nerves
   C. axial and appendicular skeleton
   D. brain and spinal cord

2. Which of the following is **NOT** a component of a neuron?

   A. cell body
   B. synapse
   C. axon
   D. dendrite

3. During the resting state, the inside of the neuron is _____ charged.

   A. negatively
   B. positively
   C. neutral
   D. none of the above

4. During the action potential, the inside of the nerve cell becomes

   A. negative
   B. positive
   C. neutral
   D. none of the above

5. Neurons connect with other neurons at junctions called
   A. neurojunctions
   B. synapses
   C. axons
   D. dendrites

6. The primary neurotransmitters for the autonomic nervous system are
   A. epinephrine
   B. norepinephrine
   C. acetylcholine
   D. B and C

7. The outermost meningeal layer is the

A. pia mater
B. arachnoid
C. subdura
D. dura mater

Match the five main divisions of the brain with their respective definitions:

8.	Diencephalon	A. The mesencephalon
9.	Midbrain	B. Coordinates motor control and balance
10.	Pons	C. Contains the thalmus, hypothalmus, limbic system
11.	Medulla	D. Contains the respiratory and vasomotor centers
12.	Cerebellum	E. Lies between the midbrain and medulla

13. The right and left hemispheres of the brain are connected by the

A. medulla oblongata
B. midbrain
C. Circle of Willis
D. corpus callosum

14. The cerebrum contains the centers for thinking and reasoning.

A. True
B. False

Match the five areas of specialization of the brain with their respective lobe:

15.	Temporal	A. Personality, motor skills
16.	Occipital	B. Sensory
17.	Frontal	C. Speech center
18.	Cerebellum	D. Coordination and balance
19.	Parietal	E. Vision

20. The Circle of Willis joins the

A. carotid and vertebrobasilar circulatory systems
B. midbrain and brainstem
C. right and left brain
D. venous sinuses and jugular veins

21. Nerve fibers that transmit impulses from the brain to the body are called

A. afferent fibers
B. efferent fibers
C. dermatomes
D. neurotransmitters

22. Each nerve root has a corresponding area of the body to which it supplies sensation. These are called
A. afferent areas
B. efferent areas
C. dermatomes
D. neurotransmitters

23. The pupils are controlled by which cranial nerve?
A. First
B. Third
C. Fifth
D. Tenth

24. Which of the following is an early sign of increased intracranial pressure?
A. Dilated, unreactive pupils
B. Dilated, reactive pupils
C. Unilaterally dilated pupil
D. None of the above

Match the following respiratory patterns with their respective descriptions:

25.	Cheyne-Stokes	A. Prolonged inspiration
26.	Central neurogenic hyperventilation	B. No intercostal movement
27.	Ataxic	C. Increase/decrease/apnea
28.	Apneustic	D. Rapid, deep breathing
29.	Diaphragmatic	E. Ineffective, muscular coordination

30. Which of the following is true?
A. Carbon dioxide is a potent vasodilator
B. Hyperventilation can decrease intracranial pressure
C. At a $PaCO_2$ of approximately 25 mm/Hg, the cerebral blood vessels constrict
D. All of the above.

31. All of the following are signs of increased intracranial pressure **EXCEPT**

A. increased blood pressure
B. increased pulse rate
C. decreased respirations
D. increased temperature

32. A patient who responds to questions, but is disoriented and sluggish is categorized

A. A
B. V
C. P
D. U

33. Decorticate posturing is characterized by

A. arms extended, legs extended
B. arms flexed, legs extended
C. arms extended, legs flexed
D. arms flexed, legs flexed

34. A common mnemonic for remembering the causes for coma is

A. PQRST
B. AEIOU-TIPS
C. SLUDGE
D. ABCDE

35. Inadequate thiamine intake may result in all of the following **EXCEPT**

A. Wernicke's syndrome
B. Kernig's sign
C. Korsakoff's psychosis
D. encephalopathy

SCENARIO

Your patient is a 56-year-old homeless man who, per bystanders, suffered a seizure. He presents to you on the street, comatose, smelling of alcohol and urine, with vomit and blood around his mouth. Further examination finds him responsive to deep pain with purposeful movement, breathing at 20/minute, heart rate 90 and regular, BP 140/70, pupils equal but sluggish to react. As you prepare to examine him further he seizes once again, full grand mal.

36. The most common cause of seizures is

A. hypoglycemia
B. hypoxia
C. drug overdose
D. epilepsy

Match the following types of seizures with their respective descriptions:

37.	Grand mal	A. Brief loss of consciousness
38.	Petit mal	B. Dysfunction to one area of the body
39.	Focal motor	C. Tonic/clonic extremity movement
40.	Psychomotor	D. Involves temporal lobe with aura
41.	Hysterical	E. Can be interrupted, no post-ictal period

42. Status epilepticus is defined as

A. a seizure due to epilepsy
B. a seizure that does not stop following diazepam therapy
C. two or more seizures without a lucid interval
D. all of the above

43. Which of the above is **NOT RECOMMENDED** in the management of this patient?
A. Anectine
B. Blood glucose determination
C. Diazepam IV push
D. 100% oxygen administration

SCENARIO

Your patient is a 75-year-old female who presents at home slumped to one side of the couch. She appears awake, but disoriented. Per her family, she has a long history of hypertension and one stroke. Her respiratory rate is 18, pulse is 90 and regular, BP 170/90, pupils equal and reactive. Her left side is obviously weakened, she slurs her speech, and has facial drooping. According to her family, these signs are all new.

44. Strokes are caused by
A. hemorrhage of cerebral blood vessels
B. thrombus formation
C. embolism
D. all of the above

45. Transient ischemic attacks are defined as

A. minor strokes
B. temporary strokes
C. strokes caused by hypoxia
D. none of the above

46. Patients with strokes commonly present with

A. bilateral paralysis or paresthesia
B. polyuria, polydipsia, polyphagia
C. hemiparesis or hemiplegia
D. all of the above

47. Hemiplegia means

A. weakness to the legs
B. inability to speak
C. unilateral paralysis
D. numbness

48. Management of this patient should include

A. Blood glucose determination
B. 100% oxygen administration
C. Cardiac monitoring
D. all of the above

49. Each nerve cell has branches that receive impulses and carry them to the cell body. Each of these branches is called

A. a nucleus.
B. a dendrite.
C. an axon.
D. a ganglia.
E. a neuron.

50. Each nerve cell also has at least one branch that carries impulses away from the cell body. This branch is called

A. a nucleus.
B. a dendrite.
C. an axon.
D. a ganglia.
E. a neuron.

51. Impulses are communicated from nerve cell to nerve cell by means of

A. interconnected myelinated junctions that intertwine and provide direct transfer of impulses from cell branch to cell branch.
B. interconnected synapses that provide direct transfer of impulses from the "sending" cell body to the "receiving" cell branch.
C. endoplasmic reticulum, providing direct contact of nerves at connecting synapses.
D. A chemical neurotransmitter release that bridges the gap between a "sending" branch and transfers the impulse across the synapse to the "receiving" branches.
E. None of the above.

52. The spinal cord communicates with the brain at the brain stem. The brain stem consists of three segments, called the
A. cerebrum, pons, and medulla oblongata.
B. cerebellum, diencephalon, and medulla oblongata.
C. midbrain, pons, and medulla oblongata.
D. mesencephalon, diencephalon, and medulla oblongata.
E. cerebrum, cerebellum, and the diencephalon.

53. The seat of consciousness and center of higher mental faculties (memory, learning, judgement) is located in the largest part of the brain. This part of the brain is called the
A. cerebellum.
B. medulla oblongata.
C. cerebrum.
D. pons.
E. diencephalon.

54. The primary control of balance and coordination is located in the brain portion that is called the
A. cerebellum.
B. medulla oblongata.
C. cerebrum.
D. pons.
E. diencephalon.

55. Life-sustaining, involuntary functions of the respiratory and cardiovascular systems are primarily controlled by centers within the
A. cerebellum.
B. medulla oblongata.
C. cerebrum.
D. pons.
E. diencephalon.

56. Within the brain, the speech center is located in the
    A. temporal lobes of the cerebrum.
    B. cerebellum.
    C. frontal lobe of the cerebrum.
    D. parietal lobes of the cerebrum.
    E. None of the above.

57. The portion of the brain that specializes in aspects of the individual's personality is the
    A. temporal lobes of the cerebrum.
    B. cerebellum.
    C. frontal lobe of the cerebrum.
    D. parietal lobes of the cerebrum.
    E. None of the above.

58. The spinal chord is 17 to 18 inches long and ends approximately at the level of the
    A. first lumbar vertebra.
    B. third lumbar vertebra.
    C. fifth lumbar vertebra.
    D. seventh lumbar vertebra.
    E. ninth lumbar vertebra.

59. The dorsal roots of the 31 pairs of spinal nerves contain afferent fibers. Afferent impulses travel from the
    A. body to the spinal cord only.
    B. body to the brain.
    C. brain to the body.
    D. spinal cord to the body only.
    E. None of the above.

60. The ventral roots of the 31 pairs of spinal nerves contain efferent fibers. Efferent impulses travel from the
    A. body to the spinal cord only.
    B. body to the brain.
    C. brain to the body.
    D. spinal cord to the body only.
    E. None of the above.

61. There are pairs of cranial nerves that originate in the brain and innervate structures outside the brain.
    A. 9
    B. 12
    C. 5
    D. 7
    E. 14

62. Peripheral nerves are divided into categories consisting of

A. somatic motor nerves.
B. somatic sensory nerves.
C. visceral motor and sensory nerves.
D. Answers A and B only.
E. Answers A, B and C.

63. Afferent impulses communicating pain, temperature, and position or muscle sense are transmitted by

A. somatic motor nerves.
B. somatic sensory nerves.
C. visceral motor and sensory nerves.
D. Answers A and B only.
E. Answers A, B and C.

64. There is a collection of nerves located at the posterior base of the neck and extending bilaterally to the axilla. Injury to this nerve collection will result in permanent disability. This nerve collection is called the

A. cervical plexus.
B. solar plexus.
C. brachial plexus.
D. phrenic plexus.
E. vertebral plexus.

65. Alcohol intoxication (overdose) represents one of the _____ causes of coma or altered level of consciousness.

A. neurologic
B. metabolic
C. drug use
D. cardiovascular
E. respiratory

66. Hypoglycemia and diabetic ketoacidosis are examples of the causes of coma or altered level of consciousness.

A. structural
B. metabolic
C. drug use
D. cardiovascular
E. respiratory

67. Toxic inhalation (for example, CO poisoning) represents one of the causes of coma or altered level of consciousness.

A. neurologic
B. metabolic
C. drug use
D. cardiovascular
E. respiratory

68. Intracranial bleeding or brain tumors are examples of the _____ causes of coma or altered level of consciousness.

A. structural
B. metabolic
C. drug use
D. cardiovascular
E. respiratory

69. Kidney and liver failure are examples of the _____ causes of coma or altered level of consciousness.

A. structural
B. metabolic
C. drug use
D. cardiovascular
E. respiratory

70. Hypovolemic shock is an example of the _____ causes of coma or altered level of consciousness.

A. neurologic
B. metabolic
C. drug use
D. cardiovascular
E. respiratory

71. Which of the following statements regarding administration of 50% dextrose in water is false?

A. All adult patients without evidence of CVA and who are unresponsive should receive 50 cc of $D_{50}W$, IV.
B. All pediatric patients who are unresponsive should receive $D_{25}W$, IV.
C. Extravasation of $D_{50}W$ will cause tissue necrosis.
D. All adult patients who are unresponsive should receive 25 grams of $D_{50}W$, IV.
E. $D_{50}W$ should be withheld if a reagent strip indicates hypoglycemia in an unconscious patient.

72. Which of the following statements regarding administration of naloxone is false?
    A. All patients who are unresponsive for unknown reasons should receive IV naloxone.
    B. Only unresponsive patients with known narcotic exposure should receive IV naloxone.
    C. Alcohol-induced coma may be an indication for naloxone administration.
    D. Naloxone administration may precipitate violent withdrawal signs and symptoms.
    E. Naloxone may be administered via IV, IM, SQ, or ET routes.

73. Which of the following statements regarding administration of thiamine is false?
    A. Thiamine is a B vitamin utilized in carbohydrate metabolism.
    B. Alcoholics frequently have a thiamine deficiency that causes Wernicke's and Korsakoff's syndromes.
    C. Wernicke's syndrome is an acute and reversible encephalopathy characterized by ataxia, eye muscle weakness (diplopia and nystagmus), and mental derangements.
    D. Korsakoff's psychosis is an acute and easily reversible memory disorder.
    E. Administration of $D_{50}W$ may precipitate signs and symptoms of Wernicke's or Korsakoff's syndromes in the alcoholic patient.

74. Seizures most commonly are attributed to

    A. hypoxia, hypoglycemia, infections, and other metabolic disorders.
    B. brain tumors, strokes, and other vascular disorders.
    C. head trauma.
    D. toxin exposure (including alcohol or other drug ingestion or withdrawal).
    E. idiopathic epilepsy.

75. Seizures that include a loss of consciousness and incontinence of urine or feces would be called

    A. Jacksonian seizures.
    B. focal motor seizures.
    C. grand mal seizures.
    D. petit mal seizures.
    E. hysterical seizures.

76. Seizures productive of sharp and bizarre movements that can be interrupted by firm command would be called

A. Jacksonian seizures.
B. psychomotor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

77. Seizures that frequently go unnoticed because of their brief duration and lack of overt motor movement are
A. Jacksonian seizures.
B. focal motor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

78. Unexplained attacks of rage or bizarre behavior are indicative of
A. Jacksonian seizures.
B. psychomotor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

79. A child who abruptly stares off into space for a few seconds, then returns immediately to consciousness without demonstrating any motor symptoms may be experiencing

A. Jacksonian seizures.
B. psychomotor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

80. Generalized, full-body tonic-clonic activity, occasionally resulting in tongue biting, is indicative of

A. Jacksonian seizures.
B. focal motor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

81. Twitching of one body part that frequently progresses to generalized body seizures characterizes

A. Jacksonian seizures.
B. focal motor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

82. Seizure activity involving one side of the body only is indicative of

A. Jacksonian seizures.
B. psychomotor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

83. Temporal lobe seizures produce altered personality states and are also called

A. Jacksonian seizures.
B. psychomotor seizures.
C. grand mal seizures.
D. petit mal seizures.
E. hysterical seizures.

84. The peculiar metallic taste that frequently precedes temporal lobe seizures can be called

A. an auditory aura.
B. a visual aura.
C. an olfactory aura.
D. a gustatory aura.
E. a tactile aura.

85. A "odd" feeling in part of the body preceding a seizure can be called

A. an auditory aura.
B. a visual aura.
C. an olfactory aura.
D. a gustatory aura.
E. a tactile aura.

86. Smelling a specific odor prior to a seizure can be called

A. an auditory aura.
B. a visual aura.
C. an olfactory aura.
D. a gustatory aura.
E. a tactile aura.

87. Muscle rigidity alternating with relaxation characterizes the

A. hyperclonic phase of a grand mal seizure.
B. clonic phase of a grand mal seizure.
C. tonic phase of a grand mal seizure.
D. hypertonic phase of a grand mal seizure.
E. None of the above.

88. Extreme muscular rigidity and hyperextension of the back characterizes the

A. hyperclonic phase of a grand mal seizure.
B. clonic phase of a grand mal seizure.
C. tonic phase of a grand mal seizure.
D. hypertonic phase of a grand mal seizure.
E. None of the above.

89. Massive autonomic discharge with hyperventilation, frothy salivation, and tachycardia accompanies the

A. hyperclonic phase of a grand mal seizure.
B. clonic phase of a grand mal seizure.
C. tonic phase of a grand mal seizure.
D. hypertonic phase of a grand mal seizure.
E. None of the above.

90. Continuous motor tension (contraction) of the muscles characterizes the

A. hyperclonic phase of a grand mal seizure.
B. clonic phase of a grand mal seizure.
C. tonic phase of a grand mal seizure.
D. hypertonic phase of a grand mal seizure.
E. None of the above.

91. Although the time of duration for any particular phase of a grand mal seizure varies from patient to patient, the order of phase progression remains basically the same. Using the following phase descriptions, indicate the correct phase progression for a typical grand mal seizure (not all phase descriptions must be used).

1.	hypertonic phase	5.	tonic phase
2.	hyperclonic phase	6.	loss of consciousness
3.	aura	7.	tongue swallowing
4.	clonic phase	8.	confusion, fatigue, and/or headache

A. 6,3,4,2,5,8
B. 3,6,4,2,7,5,8
C. 3,5,1,4,6,7,8
D. 6,3,5,4,2,7,8
E. 3,6,5,1,4,8

92. Vasovagal syncope differs from seizures, in that

A. it may occur in any position (that is, standing, sitting, or lying).
B. it may occur without warning.
C. the patient regains consciousness almost immediately upon becoming supine
D. Answers A and B only
E. Answers A, B, and C.

93. Which of the following is included in the correct management of a focal motor seizure?

A. Airway protection: using the cross-finger technique, part the teeth to insert a padded tongue blade or bite block to prevent tongue trauma or broken teeth during the seizure.
B. High-flow oxygen (15 LPM) via a nonrebreather mask.
C. Soft restraints as needed, to prevent self-injury from flailing extremities.
D. All of the above.
E. None of the above.

94. *Status epilepticus* is defined as

A. any seizure lasting 30 seconds or longer.
B. two or more seizures within one hour.
C. two or more seizures without an intervening period of consciousness.
D. Any of the above.
E. None of the above.

95. Status epilepticus is a life-threatening emergency because it may result in

A. respiratory inadequacy, hypoxia, or respiratory arrest.
B. hypoxic brain damage, necrosis of heart muscle, or severe dehydration.
C. aspiration of secretions or vomitus.
D. All of the above.
E. None of the above.

96. The most common cause of status epilepticus in adults is

A. head trauma.
B. failure to take prescribed anticonvulsant medications.
C. infection.
D. hypoglycemia.
E. cardiovascular disease.

97. Management of status epilepticus includes airway management, supplemental oxygen, assisted ventilation as needed, and

A. 25 grams of 50% dextrose in water, IV.
B. diazepam administration.
C. morphine sulfate administration (with naloxone prepared and ready for administration should respiratory arrest ensue).
D. Answers A and B only.
E. Answers A, B, and C.

98. The adult dosage for diazepam when one is treating status epilepticus is

A. 5 tp 10 mg IV.
B. 5 to 15 mg IV.
C. 2 to 5 mg IV.
D. 0.5 to 1 mg IV.
E. 0.5 to 1 mg/kg IV.

99. Diazepam administration can cause

A. respiratory depression or arrest.
B. hypotension.
C. acute hypersensitivity reactions.
D. Answers A and B only.
E. Answers A, B, and C.

100. A stroke, or cerebrovascular accident (CVA), may be caused by all of the following, except

A. thrombus occlusion of cerebral vasculature.
B. air or fat embolus occlusion of cerebral vasculature.
C. atherosclerotic plaque or tumor tissue occlusion of cerebral vasculature.
D. subarachnoid hemorrhage.
E. aortic aneurysm.

101. Strokes are the

A. second most common cause of death in adults.
B. third most common cause of death in adults.
C. least common cause of death in adults.
D. least common cause of death, but most common cause of disability in adults
E. None of the above.

102. Predisposing factors that increase the incidence of stroke include all of the following, except

A. hypertension and some cardiac dysrhythmias.
B. diabetes and sickle cell disease.
C. use of oral contraceptives.
D. abnormal blood lipid levels.
E. All of the above are predisposing factors.

103. Transient ischemic attacks (TIAs) are defined as episodes of cerebral dysfunction with signs and symptoms similar to that of CVAs, lasting

A. only a few minutes, never more than one hour.
B. a week to ten days, with complete recovery achieved at the end of that time period.
C. anywhere from two or three minutes to several hours, but always less than 24 hours.
D. no longer than three to four days.
E. two to three hours only.

104. Signs and symptoms of a patient experiencing a TIA or CVA include all of the following, except

A. paraparesis or paraplegia.
B. speech disturbances (dysarthria, aphasia).
C. altered level of consciousness, confusion, or agitation.
D. vision disturbances.
E. unresponsiveness.

105. The preferred position of transport for the patient suffering from CVA or TIA is

A. left laterally recumbent.
B. right laterally recumbent.
C. supine, with feet elevated.
D. the Trendelenburg position.
E. supine, with head elevated.

106. Treatment of the CVA/TIA victim includes airway management, oxygen administration, ventilatory assistance, and

A. NTG administration if acute hypertension is present.
B. administration of 50% dextrose in water if hypoglycemia is suspected.
C. diazepam administration if the patient is acutely combative.
D. Answers A and B only.
E. Answers A, B, and C.