1. Afferent nerves transmit impulses from parts of the body to the spinal cord; efferent nerves transmit impulses away from the central nervous system (CNS) and produce responses in muscles and glands.

2. Occlusion of an artery caused by an atheroma, sudden obstruction by an embolus including a cerebral thrombosis (clot), embolism (moving clot) or other moving emboli, and a cerebral bleed.

3. Little or mini-stroke

4. Symptoms include sudden weakness and numbness down one side of the body, dizziness, dysphagia, confusion, difficulty seeing with one eye, loss of balance, and/or headache. There usually is not a loss of consciousness.

5. Cerebral contusion

6. Epilepsy

7. Direct impact on the skull with a blunt object

8. Restoration of the normal alignment and stability of the spine; decompression of the spinal cord, nerves and vertebrae; and early rehabilitation of the patient.

9. Burning and constant pain that radiates down the nerve path; some loss of motor function may be present.

10. It is a shock-absorbing cushion between the vertebrae and gives the back its flexibility for moving.

11. Trauma, degeneration, or rupture of the nucleus pulposus within any of the intervertebral disks L4 through S3.

12. Medical history, EEG, MRI, CT scan, cerebral angiogram, radiographs of the skull, and certain blood studies help to confirm the diagnosis of epilepsy.

13. Anticonvulsants

14. Mosquito

15. Intravenous antibiotics, mannitol or steroids, surgical drainage
16. The increased intracranial pressure may cause the brain stem to herniate and cause death.
17. Numbness and tingling of the feet and hands, followed by increasing muscle pain, tenderness, and subsequent progressive muscle weakness and paralysis.
18. Salk and Sabin vaccines
19. 33%
20. Bones of the floor of the cranial vault
21. Raccoon eyes or Battle’s signs
22. Nose and throat
23. Histologically according to the type of cell
24. Caucasian
25. Testing the patient’s sense of smell, visual acuity and eye movements, muscles of mastication, taste perception, facial muscles, hearing, tongue movements, and swallowing
26. 8 pairs; 5 pairs
27. Vomiting and headache with increasing intensity
28. Concussions, contusions, and injuries in which the cranial vault is not violated are types of closed head injuries. Fractures to the cranial vault are open head injuries and include linear, depressed, comminuted, compound, and basilar skull fractures.
29. Partial seizures, including simple (motor, sensory, autonomic, psychic), and generalized seizures, including possible loss of consciousness (tonic-clonic [grand mal], absence [petit mal], myoclonic, infantile spasms, atonic [akinetic] Lennox's-Gastaut's syndrome [febrile seizures]) and unclassified.
30. Status epilepticus occurs when one seizure follows another with no recovery of consciousness between attacks.
Fill in the Blanks

1. neurons
2. central, peripheral
3. brain, spinal cord
4. medulla oblongata
5. spinal cord
6. bruising, violent
7. blow, head, impact
8. depressed
9. lower extremities
10. cartilage, spine
11. frontal, temporal, occipital
12. migraine
13. entire, localized
14. epilepsy
15. chewing, swallowing, breathing
Anatomic Structures

The Brain

1. Sulcus (fissure)
2. Skull
3. Dura mater
4. Arachnoid membrane
5. Pia mater
6. Thalamus
7. Cerebellum
8. Spinal cord
9. Pons
10. Medulla oblongata
11. Brain stem
12. Pituitary gland
13. Hypothalamus
14. Ventricles of brain
15. Cerebrum
16. Gyrus (convolution)
Anatomic Structures
The Spinal Cord

1. Cervical nerves
2. Thoracic nerves
3. Lumbar nerves
4. Sacral nerves
5. Coccygeal nerve
Anatomic Structures
The Neuron

1. Dendrites
2. Cell body
3. Nucleus
4. Axon
5. Myelin sheath
Anatomic Structures
Functional areas of the Brain

1. Premotor cortex
2. Motor cortex
3. Central sulcus
4. Sensory cortex
5. Foot
6. Leg
7. Trunk
8. Arm
9. Hand
10. Face
11. Parietal lobe
12. Occipital lobe
13. Visual association
14. Visual area
15. Cerebellum
16. Balance, equilibrium, coordination
17. Vital centers
18. Medulla
19. Ras
20. Pons
21. Memory
22. Auditory area
23. Wernicke’s area
24. Broca’s speech area
25. Temporal lobe
26. Lateral sulcus (fissure of Sylvius)
27. Frontal lobe
28. Intellect, personality

<table>
<thead>
<tr>
<th>Structure</th>
<th>Diagram</th>
</tr>
</thead>
</table>
| 1. Musculocutaneous        | ![Diagram](image1)
| 2. Axillary                | ![Diagram](image2)
| 3. Radial                  | ![Diagram](image3)
| 4. Median                  | ![Diagram](image4)
| 5. Ulnar                   | ![Diagram](image5)
| 6. Lumbar plexus (T12 and L1-L5) | ![Diagram](image6)
| 7. Sacral plexus (S1-S4)   | ![Diagram](image7)
| 8. Common peroneal         | ![Diagram](image8)
| 9. Tibial                  | ![Diagram](image9)
| 10. Saphenous              | ![Diagram](image10)
| 11. Deep peroneal          | ![Diagram](image11)
| 12. Superficial peroneal   | ![Diagram](image12)
| 13. Sciatic                | ![Diagram](image13)
| 14. Femoral                | ![Diagram](image14)
| 15. Ulnar                  | ![Diagram](image15)
| 16. Median                 | ![Diagram](image16)
| 17. Radial                 | ![Diagram](image17)
| 18. Axillary               | ![Diagram](image18)
| 19. Brachial plexus (C5-C8 and T1) | ![Diagram](image19)
| 20. Phrenic                | ![Diagram](image20)
Anatomic Structures
Major Arteries of the Head & Neck
Cerebral Circulation

1. Maxillary
2. Facial
3. External carotid
4. Common carotid
5. Internal carotid
6. Vertebral
7. Circle of Willis
Anatomic Structures
Types of Paralysis

1. Quadriplegia
2. Hemiplegia
3. Paraplegia
## Multiple Choice Questions

<table>
<thead>
<tr>
<th>Pharmacology Questions</th>
<th>Certification Examination Review Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A</td>
<td>1. A</td>
</tr>
<tr>
<td>2. C</td>
<td>2. B</td>
</tr>
<tr>
<td>3. D</td>
<td>3. C</td>
</tr>
<tr>
<td>5. B</td>
<td>5. B</td>
</tr>
<tr>
<td></td>
<td>6. B</td>
</tr>
<tr>
<td></td>
<td>7. A</td>
</tr>
<tr>
<td></td>
<td>8. C</td>
</tr>
<tr>
<td></td>
<td>9. D</td>
</tr>
<tr>
<td></td>
<td>10. A</td>
</tr>
<tr>
<td></td>
<td>11. D</td>
</tr>
<tr>
<td></td>
<td>12. C</td>
</tr>
<tr>
<td></td>
<td>13. D</td>
</tr>
<tr>
<td></td>
<td>14. B</td>
</tr>
</tbody>
</table>
A subdural hematoma is a collection or pool of blood between the dura and the arachnoid membrane, the second meningeal layer. The symptoms are headache, dilated pupils, nausea, and often vomiting. The patient may experience drowsiness and hemiparesis. Unconsciousness, coma, and death may occur. The symptoms are the same as with an epidural hematoma, but they are delayed and may appear to be symptoms of a stroke, TIA, or dementia. The patient may complain of diplopia.

The epidural hematoma causes rapid deterioration and must be treated quickly. Blood pools or collects between the skull and the dura mater, the outermost meningeal layer. Symptoms occur within a few hours of head trauma.

Both hematomas are life threatening, but the epidural hematoma is a neurologic emergency, because the blood pools much faster than it does with a subdural hematoma.
A neurological assessment is appropriate after head trauma occurs, cranial surgery is performed, or when a neurologic disorder, such as a brain tumor or stroke, is suspected. Observations and findings are graded on a scale and documented. The assessment is done within the constraints of circumstances (e.g., the location [the scene of an accident or a physician’s office] and the patient’s state of consciousness).
Possible Transient Ischemic Attack (TIA)

As with individuals complaining of symptoms of a type of cerebral vascular accident (CVA), these individuals require immediate assessment and intervention to reduce residual effects. Instruct the patient or the family to contact EMS or to transport the patient immediately to an emergency facility.
Possible Cerebral Concussion

Individuals who have suffered a head injury and have experienced a loss of consciousness demand immediate assessment and intervention. In most cases, treatment at an emergency care facility is the optimal choice. The unconscious individual should be entered into the EMS for immediate assessment and transport to an emergency facility.
Patient Screening #3

Possible Degenerative Disk Disease

Patients complaining of severe back pain require prompt assessment. Schedule for an appointment as soon as possible. A report of loss of motor function in the legs requires prompt assessment. Refer to an emergency treatment facility.
Possible Migraine Headache

Patients known to experience migraine headaches, as well as those reporting typical migraine headache symptoms, require prompt treatment. If an office appointment is not immediately available, refer to an emergency treatment facility.
Possible Transient Global Amnesia

The patient should be seen as soon as possible if the office schedule will allow, which will permit observation of the symptoms and will help to reduce anxiety of both patient and family. Neurologic signs need to be observed, evaluated, and recorded. If unable to arrange for a time to be worked into the schedule, refer to an emergency facility for prompt observation and to rule out TIA and CVA.
Possible Brain Abscess

Individuals who complain of an unusual headache should be scheduled for an appointment as soon as possible. When reports of nausea, vomiting, visual disturbances, stiff neck, unequal pupil size, and possible seizures are relayed, the situation has progressed to a state that requires prompt assessment and intervention. Refer the patient to an emergency facility or advise the individual or family to call 911 and enter the individual into the EMS.
Possible Bell Palsy

The individual reporting sudden onset of one-sided facial paralysis requires prompt assessment to rule out a cerebral vascular accident. Referral is usually to an emergency facility for diagnosis. Anxiety will be high in the individuals and their families, so any requests for appointments to discuss the condition after diagnosis should be scheduled for the next available opening.
CVA and TIA

Provide patients and the family with the printed information. Review warning signs of a stroke with the patient and family and emphasize the need to seek medical intervention quickly for any signs of impending stroke. For the individual who has experienced a stroke, assist the family to find appropriate medical equipment for home care and safety. Talk with the family about achievable goals. Assist the family with referrals to support groups, and encourage them to seek available help in the community. As with stroke patients, instructions should be given concerning possible symptoms of an impending stroke. Family members should be encouraged to seek medical intervention for the patient at the first sign of a stroke. Instruction should be given for monitoring blood pressure, and emphasis on the importance of drug therapy compliance should be made.
Ruptured Disk

Review the printed instructions with the patient. Provide these patients with information about good and proper body mechanics. For those patients for whom rest and physical therapy is prescribed, encourage them to be compliant.
Migraine Headache

Review the information with the patient and give the printed information to the patient. Additionally, provide patients with information on stress reduction. Stress the importance of taking preventive medications on a regular basis.
Parkinson’s Disease

Review the printed information with the patient and family. Stress the importance of compliance with the prescribed medication regimen. Assist the patient and family to locate and contact available community resources. Encourage family members to be supportive of therapy prescribed to help the patient to remain independent as long as possible.
Seizure Activity

Because this disease often is feared and misunderstood, education is necessary to dispel myths. First aid instructions are available that can teach family members how to care for the patient in the event of grand mal seizures. Emphasize local restrictions about driving a motor vehicle. Additionally, stress the importance of drug therapy compliance. Assist the patient and family in locating and contacting support groups in the community. Explain to family that after any type of seizure activity there may be a period where alertness may be compromised. The patient may experience confusion and not be aware of what has happened. Many times he or she will have no memory of what has happened.