

## Module 28

### Neurological Disorders

#### OBJECTIVES

Upon completion of this unit, you should be able to

- Describe underlying causes, signs and symptoms, diagnostic studies, treatments and nursing interventions related to the patient experiencing seizures.
- Describe some of the causes (if known), signs and symptoms, diagnostic studies, treatments, and nursing interventions for the following neurological conditions: Parkinson's disease, Alzheimer's disease, and cerebral vascular accident (CVA).
- Describe indications for performing a craniotomy and nursing management of the postoperative craniotomy patient.
- Describe indications for spinal surgery and the types of procedures that may be performed.
- Describe nursing interventions for the patient who has had a laminectomy.
- Describe causes of spinal cord injury, signs and symptoms, diagnostic studies, treatment, and nursing interventions appropriate for the patient with a spinal cord injury.

#### COMMENTS

**Seizures.** Seizures may represent a symptom of numerous underlying disease processes such as renal failure; hypoglycemia; acidosis; alcohol withdrawal; infection; heart, lung and liver failure; and brain tumor. Furthermore, seizures may result from brain injury or there may be no recognizable cause. Seizures that occur repeatedly and spontaneously are often referred to as epilepsy. For approximately 75 percent of individuals suffering from epilepsy, there is no traceable cause.

**Signs & symptoms:** The signs and symptoms vary depending on the type of seizure. **Grand mal** is a generalized seizure. All types of seizures may involve an aura or preliminary stage where the patient experiences an auditory, visual, or olfactory hallucination. Some patients deny experiencing any aura. If the seizure is generalized (grand mal) this phase is followed by a stage of generalized uncontrolled movement involving clonic and tonic muscle twitching and loss of consciousness. It is followed by a stage when the patient is drowsy or in deep sleep. There may be a loss of bladder and bowel sphincter control during the phase of clonic and tonic muscle twitching. Another type of seizure is **focal or partial** seizure during which a body part, often an extremity, begins clonic and tonic muscle activity that may spread across to the side of the body usually opposite from the area of cerebral irritability. These patients do not generally lose consciousness unless the seizure spreads to both sides of the body and becomes generalized. The focal seizures are sometimes referred to as **Jacksonian** seizures. Another type of limited seizure activity is sometimes referred to as **psychomotor or temporal** lobe seizures. These often involve repetitive motions such as lip smacking. Sometimes the patient may have been engaged in an activity prior to the seizure such as

taking a can off a grocery shelf. During the seizure the patient may continue to load cans into the supermarket cart to overflowing until the seizure ends. After the seizure, the patient has no recollection of the behavior. Another type of seizure is the absence seizure, sometimes referred to as **petit mal**, where the individual experiences a loss of consciousness that lasts a few seconds or less. The person may break off in the middle of a sentence, stare off into space, and then resume speaking. Sometimes if walking, the person may stumble and then resume walking normally. The seizure is so brief it may go undetected by friends and family or may be misinterpreted. For example, in children, the behaviors may be interpreted as daydreaming or clumsiness.

A. Grand mal, tonic

B. Grand mal, clonic

**Diagnosis:** Most important is an accurate history and description of seizure events. Electroencephalography (EEG) is often used, however, in many cases, abnormalities may not be detected. CAT scan, PET scan, magnetic resonance imaging, skull x-ray, and cerebral angiogram may be useful in diagnosing the etiology.

**Treatment:** The goal of treatment is to eliminate the underlying causes, if possible. For example, the physician may excise a brain tumor or treat the hypoglycemia causing the seizure. Another objective may be to stop or control seizure activity with anticonvulsant medication. Generalized seizure activity may respond to Dilantin and Phenobarbitol. Absence seizures may respond to Depakane, Clonopin, or Zarontin. Partial or focal seizures often respond better to Tegretol or Mysoline. Intravenous Valium may be used in emergency situations to control life threatening status epilepticus when seizures occur in such rapid succession that there is not opportunity for the patient to either regain consciousness or function. Physicians may often experiment with a number of medications or medication combinations to prevent seizures and the toxic side effects of anticonvulsant medications.

**Nursing management:** The first priority during a seizure is to prevent injury. Do not restrain the patient or force objects between the teeth. Insert a soft cloth into the mouth if possible. Have suction equipment and an airway available. Observe and document the seizure activity. Be aware of medications that interact adversely with anticonvulsant drugs; there are many. Also know the toxic side effects associated with these medications. Be aware that many patients and families still attach a social stigma to epilepsy. They will need reassurance and opportunities to discuss their feelings. Teach patients and their families about medications, stressing the need for compliance and the need to avoid hazardous activities and stressful situations. It is often appropriate to make referrals to community resources. Support groups, such as the Epilepsy Foundation of America, can be extremely helpful. The patient may need job counseling; he or she needs to know the law in regard to protection from job dismissal, and should also be informed about driving restrictions.

### **Parkinson's disease**

Parkinson's disease is a neurological disorder that may affect both men and women over 50 years of age. It is rarely found in the black population. There are many disorders, and some medications, that produce Parkinson-like behaviors and characteristics, but the exact etiology of Parkinson's disease itself is unknown. What is known is that Dopamine-producing neurons deteriorate in the mid-brain, specifically in the area known as the substantia nigra. Since Dopamine balances the effects of acetylcholine, the stimulation of acetylcholine on basal ganglia goes unchecked, producing symptoms characteristic of the disease.

**Signs and symptoms:** The onset is gradual. Usually the first symptom is tremor, which worsens as the disease progresses. Tremors tend to increase with fatigue, may diminish when the patient is engaged in activity, and disappear when the patient is asleep. The

voice often quivers, and a pill-rolling motion of the thumb and forefinger is common. The patient assumes a posture in which the neck, arms and trunk are slightly flexed, as if leaning forward. There is marked rigidity in the limbs and movement is often slow and jerky (cogwheel rigidity). There is a lack of spontaneous movement; for example, the face is mask-like or expressionless with little blinking of the eyes. Swallowing saliva is an effort and drooling is common. The gait is shuffling and arms do not swing when walking.

**Diagnosis:** The diagnosis of Parkinson's disease is made when the history and physical behaviors are those described above. A positive response to a course of treatment with antiparkinsonian medication (Sinemet, Symmetrol, or Parlodel) is also diagnostic for Parkinsonism.

**Treatment:** Treatment is geared only to relief of symptoms. Medications are at the center of the treatment plan. These either increase dopamine or block the effects of acetylcholine in the neurons. Physical therapy is helpful to promote continued activity for as long as possible. In younger patients with only unilateral tremors, surgery of the thalamus may be successful in relieving symptoms.

**Nursing management:** Nursing care of the individual with Parkinson's disease is concerned with maintaining patient weight and monitoring nutritional status. As swallowing becomes progressively more difficult, the patient is prone to aspiration and malnutrition. Feeding tubes are often placed when oral intake is insufficient to maintain adequate nutrition or when the danger of aspiration is imminent. All of the complications of immobility will present problems of potential contractures, constipation, impaired skin integrity, and stasis of respiratory secretions. Performance of range of motion exercises and scrupulous attention to skin care will help to avoid some potential complications. Assistance with activities of daily living will be necessary, but independence should be maintained for as long as possible. Be aware that depression and a damaged self-concept are common problems. Patients often suffer anxiety and frustration over their inability to perform simple tasks and to communicate verbally. The nurse should be patient and innovative in helping the patient and family deal with these problems. For example, there are many assistive devices available to help the patient prolong independence.

**Self-Test 1**

1. The patient who suffers from generalized seizures usually experiences a \_\_\_\_\_ phase after clonic and tonic muscle twitching ends, during which the patient is \_\_\_\_\_.
2. Which medications are used in treatment of absence or petit mal seizures?
3. What is the nurse's first priority when a patient is experiencing a seizure?
4. Anticonvulsant medications have many toxic effects and drug interactions are common.
  - a. True
  - b. False
5. What is the first symptom of Parkinson's disease?
6. Name three anti-Parkinsonian medications.
7. Parkinsonian tremors usually disappear when the individual sleeps.
  - a. True
  - b. False

## **Alzheimer's disease**

A major health problem among older Americans, Alzheimer's disease, is a chronic condition that progressively destroys cerebral tissue. The disease produces gradual deterioration of memory and cognitive function, resulting in dementia. Causes of the disease are unknown, though current research centers around discovery of a genetic anomaly.

**Diagnosis:** The diagnosis of Alzheimer's disease is reached only after eliminating all other possibilities for the dementia. Definitive diagnosis can only be established by autopsy when the characteristic atrophy, neurofibrillary tangles and plaque deposits can be microscopically identified.

**Signs and symptoms:** Early symptoms of Alzheimer's disease typically manifest as subtle behavior changes. At first the individual may have trouble recalling recent events and mastering new learning. Irritability and mood swings are common. Later, logic and judgment begin to fail. Personal hygiene and eating habits may deteriorate. The person starts to have problems with communication and orientation. Finally, long-term memories are lost. Even family members may not be recognized. The patient may not be able to communicate at all and may become totally dependent on others for activities of daily living. The deteriorating eventually ends in death, usually from complications of prolonged immobility.

**Treatment:** Medications like Aricept and Exelon are cholinesterase inhibitors which improve or stabilize cognitive decline. As a result, they can enhance the patient's functional abilities. Treatment also focuses on alleviation of symptoms and is geared to preserving function for as long as possible. Medications such as Haldol and Valium may be given to control agitation and anxiety. For depression, medications such as Elavil or Sinequen are often used. To increase cognitive function through promotion of improved blood flow to the brain, Hydergine or Pavabid may be ordered.

**Nursing management:** Nursing care is geared toward preserving function and independence for as long as possible. Families may need to be taught skills for providing care and for providing a safe environment in the home. Patients and families need support and reassurance, as family stress levels are often high. The nurse should be aware of community resources such as support groups and respite options. Eventually the nurse may need to help families deal with the prospect of skilled care placement and the guilt and sadness that this step may generate.

## **Cerebrovascular accident**

Cerebrovascular accident (CVA), or stroke, can be caused by an embolism, thrombosis, or hemorrhage in the subarachnoid or intracerebral spaces.

Some of the common risk factors for CVA include: a history positive for cardiovascular disease, hypertension, diabetes mellitus, obesity, smoking, hypercholesterolemia,

arteriosclerotic disease of intra and extracranial vessels; advancing age; and familial history. At least half of all CVAs are caused by thrombosis with gradual progressive occlusion of cerebral vessel. Before experiencing a CVA, many patients may have experienced several transient ischemic attacks (TIAs), with temporary symptoms and ischemia that reverses when blood flow is restored. These are warning signs of impending CVA and the patient who experiences these should seek medical attention immediately.

A CVA may take several days to evolve and is not considered complete until no further neurologic deterioration has occurred for two or three days.

**Signs and symptoms:** Symptoms vary tremendously depending on the size of the involved vessel and the region of the brain that has been affected. On occasion, the vessel is tiny and collateral circulation is present to compensate. If this occurs, there may be few signs and symptoms and a diagnosis of a CVA could be difficult to make.

However, neuromuscular deficits often occur. Because of the crossing of pyramidal nerve pathways at the medulla, a CVA that occurs in the right hemisphere of the brain will cause left-sided paralysis, while damage to the left side of the brain affects the right side of the body. Again, loss of function depends on the size and location of the vessel involved. Problems with swallowing, respiration, as well as receptive and expressive communication can occur. Loss of bowel and bladder control is usually transient, and the patient should be involved in a bladder and bowel retraining regime as soon as possible. Memory, judgment and spatial perception may be impaired. Unilateral neglect may occur; for example, a patient may not recognize the paralyzed body part as his own and ignore all sensory input from the affected side or may have problems judging distance.

**Diagnosis:** Diagnosis of a CVA is most often based on the results of a CT scan. Computerized tomography will identify the size and location of the CVA. In some facilities nuclear magnetic resonance imaging (MRI) may be done. This type of imaging also visualizes the CVA, but without the use of radiation. Although other studies may be done to confirm the diagnosis, one of these is often enough to establish that a CVA occurred.

**Treatment:** The treatment of CVA varies according to the cause of the condition. For patients who have suffered TIAs with no residual deficits and who demonstrate with angiography that the TIAs are caused by carotid stenosis rather than cerebral arteriosclerosis, carotid endarterectomy (removal of plaque from the artery) might be indicated. Sometimes Heparin or Coumadin are given because of the anticoagulation effect if blood clots are a suspected cause. Aspirin or Persantine may be given to reduce platelet aggregation and the potential for vessel blockage. Underlying disease that may be contributing to the problem, such as cardiac problems, is treated.

The treatment for an actual CVA is symptomatic. The first priority is maintaining an airway. IV access is obtained and a Foley catheter is inserted. Fluids and electrolytes are

monitored closely. If there are signs of cerebral edema, IV Decadron and/or Mannitol, Glycerol or urea solution may be given.

If the CVA has occurred because of cerebral hemorrhage from an aneurysm (bulging of a weak arterial wall), surgery may be attempted when the patient is stable.

If the patient is unable to take food orally, he or she may receive tube feedings or total parenteral nutrition (TPN). To preserve function, it is extremely important that the patient be actively involved in rehabilitation therapy as soon as the acute phase has passed.

**Nursing management:** Nursing management centers on combating the immobility which makes this patient a candidate for all the attendant problems. Careful monitoring of respiratory status and maintaining a patent airway are essential. Frequent neurological checks are indicated including level of consciousness (LOC), mental status, papillary response, and ability to move extremities, perceive sensation, and demonstrate equal strength bilaterally. Measures to prevent breakdown and contracture of the affected joints are instituted early. The nurse needs to be aware that flexion contractures of hand, wrist, and elbow are common, as is planter flexion of the foot. The shoulder tends to adduct and the hip tends to rotate externally. Be sure to test for a gag reflex before feeding oral foods and fluids and have a suction set-up available. Food should be placed on the unaffected side of the mouth and when eating is completed, the affected side of the mouth should be checked for retained food particles which the patient may be unable to feel.

Post-CVA care includes many components. Incontinence often requires bladder retraining. The patient should be offered a bedpan or urinal every two hours to promote efforts at continence. Speech therapy should be instituted if the patient has communication problems. Physical therapy and occupational therapy are key aspects of post-CVA care. The nurse may need to act as coordinator for other team members to see that the patient does in fact have sessions with each service. Also, the nurse should be aware of the progress the patient is making and make every attempt to reinforce the learning taking place. Supporting rehabilitation efforts tends to increase the patient's level of independence and self-esteem.

The recovery period as well as the acute stage will be a highly stressful time for the patient and family. Fear, frustration, and grieving are common reactions. The nurse needs to take a prominent role in being supportive to the patient and family.

**Right brain damage:**

- Paralyzed left side
- Behavioral style: quick, impulsive
- Spatial perceptual deficits
- Deficits in memory performance
- Indifference to the disability

**Left brain damage:**

- Paralyzed right side
- Behavior slow, cautions
- Speech-language deficits  
(if left brain is dominant)
- Memory deficits: language
- Distress and depression in  
relation to the disability

**Self-Test 2**

Match the items in Column A with the appropriate responses in Column B.

Column A

1. Alzheimer's disease
2. CVA
3. Haldol
4. Sinequan
5. Hydergine

Column B

- a. Improves blood flow to brain
  - b. neurofibrillary tangles
  - c. antidepressant
  - d. unilateral neglect
  - e. diagnose with CT scan
  - f. tranquilizer
- 
6. What three medications may be used in treatment of cerebral edema?
  7. What should the nurse do before feeding a patient who has suffered a CVA?

## Craniotomy

Craniotomy is the surgical procedure involving an incision in the scalp, cutting through the skull and laying back a flap of bone to reveal a portion of the brain. The size and location of the area exposed depends upon the reason for surgery. Some indications for this type of surgery include evacuation of an intracranial abscess, removal of a tumor, placement of a ventriculovenous shunt to treat hydrocephalus, to evacuate blood from an intracranial bleed, to excise an aneurysm or arteriovenous malformation, to debride fragments following a traumatic injury, and/or possibly to elevate depressed skull fragments.

**Nursing management:** The patient, if conscious, and certainly the family, will be anxious prior to the surgery, given the gravity attached to this type of procedure and the fear of residual physical or emotional effects following surgery. Patients and families should know that the individual will likely be placed in an intensive care unit immediately after surgery before returning to a regular hospital unit. They should also know that the operative area will be shaved. A baseline assessment that includes the patient's mental status, motor and sensory function, and papillary response are important.

Post-operative care in the intensive care unit will not be discussed except to say that intracranial pressure and central venous pressure monitoring will be done. When stable, the patient will be transferred to a medical/surgical unit, where careful monitoring will continue. The nurse will continue to perform assessment of LOC, papillary response, motor and sensory function. In many facilities the Glasgow Coma Scale is used as a meaningful objective measure of LOC. To determine cognitive and behavioral patterns, the Rancho Los Amigos Scale of Cognitive Levels and Expected Behavior may be used. With any sign of increased intracranial pressure, steroids will be ordered. To prevent increased intracranial pressure, the HOB may be elevated to 30 degrees. Neck flexion is discouraged, and the patient is given stool softeners to prevent straining which can increase intracranial pressure. The patient may deliberately be kept in a slightly dehydrated state to also reduce intracranial fluid pressure. Mouth care is especially important, and, if able, the patient may be encouraged to suck on hard candy to reduce the sensation of dryness. Urine output should be at least 30ml/hr.

### Glasgow Coma Scale

#### Eye opening:

Spontaneous.....	4
To sound.....	3
To pain.....	2
Never.....	1

#### Motor response:

Obeys commands.....	6
Localizes pain.....	5
Normal flexion (withdrawal).....	4
Abnormal flexion.....	3
Extension.....	2
Lack of response.....	1

#### Verbal response:

Oriented.....	5
Confused conversation.....	4
Inappropriate words.....	3
Incomprehensible sounds.....	2
None.....	1

Temperatures must be carefully monitored as the thermoregulatory center in the brain may have been affected; temperature elevations may also indicate infection. Orders should be specific about turning and repositioning. If bone has been removed it may not be desirable to turn the patient onto the operative side. Patients may complain of headache, and a mild analgesia may be ordered. Sedatives and strong pain medication are avoided because of the danger that symptoms of decreasing level of consciousness may be masked by the effects of medication. In addition, nurses should employ other nursing measures that may be helpful, including dimming lights, providing quiet, and perhaps offering cool cloths to be placed over the eyes. Dressings must be carefully observed for the character and amount of drainage and be reinforced as needed. If dressing changes are ordered, sterile technique must be employed and the nurse should observe and document the condition of the wound. Because seizures are not an uncommon complication following a craniotomy, the nurse needs to observe closely for signs and symptoms of seizures and protect the patient from potential injury should a seizure occur. Suctioning equipment and a plastic airway should be kept at the bedside. In addition, the patient may be vulnerable to all the complications of immobility such as respiratory problems, altered elimination patterns, and potential for development of contractures or pressure areas. Nutritional status should be closely monitored since anorexia may occur or the patient may simply have difficulty feeding him or herself. Finally, emotional needs will continue to be a high priority, depending upon the outcome of the surgery and the prognosis. For many patients and families, recovery may seem agonizingly slow. Grieving may need to occur if the prognosis is poor and if the residual

effects are such that permanent alteration in function, such as a personality change, cognitive deficit, or other impairment has occurred.

### **Spinal surgery**

Most spinal surgery is performed to relieve nerve compression. Lumbar laminectomy, removal of a herniated lumbar disc, is the most common procedure. Nerve compression can be caused by numerous other problems, including spinal tumors, fractures, arthritic changes, spinal defects, dislocations, and hematomas. One type of surgical procedure is a microlumbar discectomy, which is a microsurgical technique involving a tiny incision, with little blood loss, to remove the protruding disc. No laminectomy takes place, and ambulation is often within hours.

More extensive surgery includes regular discectomy with or without laminectomy. A laminectomy involves removal of the posterior arch of the vertebrae as well as the protruding disc. Anterior approaches present special problems since an abdominal and/or thoracic approach involves entry into these cavities with manipulation of numerous organs. Post-operatively, the patient will require chest tubes, gastric decompression, and may have a ureteral stent in place. An anterior cervical approach involves working near the trachea, esophagus, jugular and carotid vessels. Fusions are often done in spinal surgery to provide stability. Sometimes bone grafts are taken from the tibia or iliac crest and seeded around the unstable vertebrae where the entire bone mass will eventually fuse together.

**Nursing management:** As mentioned earlier, in microdiscectomy, the patient may be ambulatory within a few hours. In anterior cervical discectomy, the patient may also be ambulatory with a cervical collar for support by the day following surgery. Of course this depends on the extent of the surgery,

In more extensive laminectomies, in addition to routine post-operative care, positioning to maintain spinal alignment is important. Some physicians prefer patients to be kept flat in bed and log-rolled from side to side. A rolled blanket at the back and pillows between the knees when lying in the side position can greatly increase comfort. Pain medications and sometimes muscle relaxants may be ordered. The nurse should perform frequent neurological assessment to be sure the patient has sensation and movement in arms and legs. Monitoring of bowel and bladder function is also important. Patients who have had a bone graft will also need to have the donor site assessed as well as the site of spinal surgery. These patients are usually kept immobile for a prolonged time and are often fitted with a rigid “turtle shell” type of brace before being allowed out of bed.

Patients who have had cervical fusions must also initially be watched closely for any sign of respiratory distress because of the danger of soft tissue swelling. Some patients initially may also have difficulty swallowing. Emergency equipment should be available in case respiratory distress occurs.

The few patients who have an anterior approach performed through the chest and/or abdominal cavity will likely have the longest recovery period since for them there is involvement of multiple organ system manipulation during surgery. They will likely remain in an ICU setting for several days post-operatively. They will require all the post-operative care of patients having thoracic and abdominal surgery as well as the care required for spinal surgery.

### **Spinal cord injury**

The incidence of spinal cord injury is highest among young males aged 15-30 who are injured in motor vehicle accidents, sporting activities, stabbings, and gunshot wounds. Although injuries occur at all levels of the spinal cord (including cervical, thoracic, and lumbar), cervical injuries are the most common. Most cervical injuries are caused by sudden and severe flexion and extension movements. When the cervical spinal cord is damaged, quadriplegia results. Thoracic and lumbar cord damage usually result in paraplegia, depending on the level of injury. But the amount of loss of function depends on whether the cord is completely transected or destroyed, in which case there is flaccid paralysis with complete and permanent loss of all motor and sensory functions below the level of the injury. The amount of function that remains depends upon the specific nerve tracts that have been destroyed. The condition known as **spinal shock** occurs almost immediately when the injury occurs and can last a week or more.

**Signs and symptoms:** Injury to the cervical spine causes loss of sensory and motor function below the injury, vasodilation with pooling of venous blood, and reduced cardiac output. The patient becomes hypotensive, the pulse slows, and the extremities feel warm and dry to the touch. When spinal shock ends, reflexes that were absent return and flaccidity changes to involuntary spasticity. At this point, autonomic dysreflexia may occur. This is a life threatening complication that may occur from uninhibited sympathetic nerve discharges. A distended bladder or constipation can precipitate this syndrome. Symptoms include severe hypertension and headache, flushed skin, nasal congestion and bradycardia.

**Diagnosis:** A beginning diagnostic work-up for a typical cervical spine injury might include a series of cervical spine x-rays with lateral, anterior/posterior, and oblique views; a CT scan; arterial blood gases; routine laboratory work of CBC and electrolytes; and urinalysis.

**Treatment:** In the acute stage, preventing further cord damage is a top priority. The spine must be totally immobilized and the individual handled with extreme caution to prevent any further stress on the cord or displacement of vertebrae. Decompression of the cord may be done with laminectomy or removal of bone fragments followed by stabilization. Sometimes a combination of medical/surgical treatments is used.

To treat signs and symptoms of spinal shock, Dopamine may be given IV for hypotension, and Atopine may be given for bradycardia. Decadron may be used to reduce cord edema. IV fluids are started and a Foley catheter will be placed. If there is

indication of the respiratory distress, the patient may be intubated. Skeletal traction will be instituted with the insertion of tongs in the skull. Patients are often placed on Roto-rest beds or Striker frames to reduce problems of immobility. After several weeks of traction or following surgical decompression, the patient may be placed in a Halo brace. This is a vest like jacket attached to an external fixator in the shape of a halo; the halo is attached to the skull with screws. The patient in a halo brace can then be allowed to get out of bed.

**Nursing management:** Nursing management is extremely complex. Because of extensive and prolonged immobility, the quadriplegic is prone to an enormous number of problems. Be careful to involve the family in learning about care. Often a family member will be the long-term care provider who will assist this patient in the home setting. Encourage family members to allow patients as much independence as possible. Maintaining skin integrity is a major concern. Patients may have no sensation to alert them to skin breakdown, and they cannot easily see, for example, the sacral region. Patients with injuries of the cervical spine may have problems with respiratory function. Patients with high cervical injuries may have difficulty with deep breathing and airway clearance, and may require endotracheal intubation or tracheotomies with ventilator assistance. The nurse observes for symptoms of spinal shock and autonomic dysreflexia and takes vital signs at a minimum of every four hours.

Initially, paralytic ileus may occur in many patients and nasogastric decompression will be instituted until bowel sounds return. Bowel and bladder dysfunction are also to be expected. A bowel regimen should be introduced with use of stool softeners, suppositories, and digital stimulation to produce bowel movements on a regular schedule. Although a Foley catheter will be in place initially, it should be removed in a short while and the patient and/or family taught in and out catheterization procedures. Encourage patients to do whatever activities they can perform independently. Monitor nutritional status. When patients are taking food and fluids by mouth, fluids should be forced to 3-4 liters each day and diet should be high in protein, carbohydrates, calories, and bulk. Monitor closely for signs and symptoms of respiratory, urinary, and pin site (if applicable) infections. Be aware that autonomic nerve dysfunction may cause problems with temperature regulation. Monitor temperatures every four hours and protect the patient from chilling drafts as well as overheating from excess clothing and coverings. The patient should be turned every two hours and should perform deep breathing and coughing. Coughing can be facilitated by placing the hands on the abdomen below the diaphragm and gently pushing upwards toward the chest as the patient inhales. This increases lung expansion. Careful monitoring of signs and symptoms of deep vein thrombosis is also essential.

The patient and family will have to work through the grieving process, and the nurse needs to be aware of signs and symptoms of increasing depression and perhaps suicidal intent that will require psychiatric referral. Counseling will also be helpful for the patient who has fears and concerns about future sexual function. An extensive teaching program for the patient and the individual who will be the primary caregiver should be started as

soon as possible and should include all aspects of care as well as signs and symptoms of bowel, bladder, skin, respiratory and cardiovascular problems.

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**Self-Test 3**

1. What is the purpose of giving stool softeners to the post-craniotomy patient?
2. What is the Glasgow Coma Scale?
3. What major complication should the nurse observe for when a patient has an anterior cervical laminectomy/fusion?
4. What is one method to increase comfort for the patient S/P lumbar laminectomy who is lying on his side?
5. Match the items in Column A with the appropriate responses in Column B.

## Column A

1. cervical cord injury
2. lumbar cord injury
3. Dopamine
4. Halo Brace

## Column B

- a. treat hypotension
- b. quadraplegia
- c. treat bradycardia
- d. most common spinal cord injury
- e. paraplegia
- f. external fixation
- g. soft cervical collar
- h. turtle shell brace

**Module 28**  
**Answers to Self-Tests**

- Self-Test 1
1. postictal, drowsy or in deep sleep
  2. Depakene, Clonopin, Zartoin
  3. prevent injury
  4. True
  5. tremor
  6. Simemet, Symmetrol, Parlodel
  7. True

- Self-Test 2
1. b
  2. d, e
  3. f
  4. c
  5. a
  6. Mannitol, Decadron, Glycerol
  7. test gag reflex, have suction available

- Self-Test 3
1. to prevent straining which increases intracranial pressure
  2. a method of objectively measuring level of consciousness
  3. respiratory distress
  4. place a rolled blanket at his back and a pillow between his knees
  5.
    1. b, d
    2. e
    3. a
    4. f