**Unconscious:** is abnormal state, the patient is unarousable and unresponsive.

Unconsciousness is symptom rather than disease. Degree of unconsciousness that vary in length and severity;

Brief: fainting

Prolong: deep coma.

Coma: is deepest state of unconsciousness, arousal and awareness are lacking.

**Pathophysiology**: Consciousness involves arousal, or wakefulness, and awareness. Neither of these functions is present in the patient in coma. Ascending fibers of the reticular activating system (ARAS) in the pons, hypothalamus, and thalamus maintain arousal as an autonomic function. Neurons in the cerebral cortex are responsible for awareness. Diffuse dysfunction of both cerebral hemispheres and diffuse or focal dysfunction of the reticular activating system can produce coma. Structural causes usually produce compression or dysfunction in the area of the ARAS, whereas most medical causes lead to general dysfunction of both cerebral hemispheres.8 Trauma, hemorrhage, and tumor can damage the ARAS, leading to coma. Destruction of large regions of bilateral cerebral hemispheres can be the result of seizures or viral agents. Toxic drugs, toxins, or metabolic abnormalities can suppress cerebral function.

**Continuum of Descending States of Consciousness:**

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**Causes of Consciousness:**

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**Assessment of unconscious patient:** Assessment of the critically ill patient with neurologic dysfunction includes a review of the patient’s health history, a thorough physical examination, and an analysis of the patient’s laboratory data. Numerous invasive and noninvasive diagnostic procedures may also be performed to assist in the identification of the patient’s disorder.

1. **History:** Common to all neurologic assessments is the need to obtain a comprehensive history of events preceding hospitalization. An adequate neurologic history includes information about clinical manifestations, associated complaints, precipitating factors, progression, and familial occurrences.
2. **Physical Examination:** Five major components make up the neurologic evaluation of the critically ill patient:

A. Level of consciousness.

B. Motor function.

C. Pupillary function.

D. Respiratory function.

E. Vital signs. A complete neurologic examination requires assessment of all five components.



1. **Level of Consciousness**: There are two components to level of consciousness: **arousal and awareness**. Arousal refers to the state of wakefulness; awareness reflects the content and quality of interactions with the environment. Arousal reflects function of the reticularactivating system and brain stem, and awareness indicates functioning of the cerebral cortex. Categories are often used to describe the patient’s level of consciousness.



* **Glasgow Coma Scale** : The highest possible score on the GCS is 15, and the lowest score is 3. A score of 7 or less on the GCS usually indicates coma.



1. **Motor Function:** Assessment of motor function focuses on muscle size and tone and on an estimation of muscle strength. Each side should be assessed individually and then compared with the other.

* Evaluation of Muscle Size and Tone: Muscle tone is assessed by evaluating opposition to passive movement. The patient is instructed to relax the extremity while the nurse performs passive rangeof-motion movements and evaluates the degree of resistance. Muscle tone is appraised for signs of flaccidity (no resistance), hypotonia (little resistance), hypertonia (increased resistance), spasticity, or rigidity.
* Estimation of Muscle Strength: Having the patient perform a number of movements against resistance assesses muscle strength. The strength of the movement is then graded on a six-point scale (Box 23-4) .The patient is asked to extend both arms with the palms turned upward and to hold that position with the eyes closed. If the patient has a weaker side, that arm will drift downward and pronate. The lower extremities are tested by asking the patient to push and pull the feet against resistance or to elevate the legs.

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* Abnormal Motor Responses:

-Abnormal flexion also is known as **decorticate posturing** (Fig. 23-1A). In response to painful stimuli, the upper extremities exhibit flexion of the arm, wrist, and fingers, with adduction of the limb. The lower extremity exhibits extension, internal rotation, and plantar flexion. Abnormal flexion occurs with lesions above the midbrain, located in the region of the thalamus or cerebral hemispheres.

- Abnormal extension also is known as decerebrate rigidity or posturing (see Fig. 23-1B); when the patient is stimulated, teeth clench, and the arms are stiffly extended, adducted, and hyperpronated. The legs are stiffly extended, with plantar flexion of the feet.

* Evaluation of Reflexes :Deep tendon reflexes (DTRs) are usually evaluated by a physician when a complete neurologic evaluation is performed. The four reflexes tested are: 1) the Achilles (ankle jerk), 2) the quadriceps (knee jerk), 3) the biceps, and 4) the triceps.



1. Pupillary function: Assessment of pupillary function focuses on three areas: 1) estimation of pupil size and shape, 2) evaluation of pupillary reaction to light, and 3) assessment of eye movements.
2. Respiratory Function Assessment of respiratory function focuses on two areas: 1) observation of respiratory pattern and 2) evaluation of airway status.



1. Vital Signs Assessment of vital signs focuses on two areas: 1) evaluation of blood pressure and 2) observation of heart rate and rhythm. As a result of the brain and brainstem influences on cardiac, respiratory, and body temperature functions, changes in vital signs could be signs of deterioration in neurologic status.

**Diagnostic Procedures**

* Computed Tomography
* Magnetic Resonance Imaging
* Cerebral Angiography
* Myelography
* Digital subtraction angiography
* Lumbar puncture
* Positive Emission Tomography
* Single-Photon Emission Computed Tomography
* Electroencephalography
* Intracranial Pressure Monitoring
* Cerebrospinal Fluid Analysis
* Transcranial Doppler Studies
* Laboratory tests include analysis of blood glucose, electrolytes, serum ammonia, and liver function tests; blood urea nitrogen (BUN) levels; serum osmolality; calcium level; and partial thromboplastin and prothrombin times.

**Medical Management**

The goals of Medical Management are to preserve brain function and prevent further damage. Identification and treatment of the underlying cause of the condition. Initial medical management includes emergency measures to support vital functions and prevent further neurologic deterioration

* Maintain adequate oxygenation and ventilation
* The circulatory status (blood pressure, heart rate) is monitored to ensure adequate perfusion to the body and brain.
* Fluid and electrolyte management.
* Medical interventions are aimed at Pharmacologic management and prevention of complications.
* Management of increase of ICP: Mannitol, corticosteroid.
* Anticonvulsant therapy may be necessary to prevent further ischemic damage to the brain.
* Management of elimination laxatives
* Management of nutrition: TPN
* DVT prophylaxis

**Nursing Management of unconscious patient**

Based on the assessment data, the major nursing diagnoses may include the following:

•Ineffective airway clearance and impaired gas exchange related to

Brain injury

•Ineffective cerebral tissue perfusion related to increased ICP,

Decreased CPP, and possible seizures

•Deficient fluid volume related to decreased LOC and hormonal

dysfunction

•Imbalanced nutrition, less than body requirements, related to

Increased metabolic demands, fluid restriction, and inadequate intake

•Risk for injury (self-directedanddirectedatothers)related to seizures, disorientation, restlessness, or brain damage

•Risk for imbalanced body temperature related to damaged temperature-regulating mechanisms in the brain

•Risk for impaired skin integrity related to bed rest, hemiparesis,

hemiplegia,immobility,orrestlessness

•Disturbed thought processes (deficitsinintellectualfunction,

Communication, memory, information processing) related to brain injury

•Disturbed sleep pattern related to brain injury and frequent neurologic checks

•Interrupted family process related to unresponsiveness of patient, unpredictability of outcome , prolonged.

**Maintaining the Airway**

* ABC management. an adequate airway and ensure ventilation.
* Assess swallow and lacks pharyngeal reflexes, these secretions must be removed to eliminate the danger of aspiration.
* Elevating the head of the bed to 30 degrees helps prevent aspiration.
* Positioning the patient in a lateral or semiprone position also helps, because it allows the jaw and tongue to fall forward, thus promoting drainage of secretions.
* Suctioning and oral hygiene may be required. Suctioning is performed to remove secretions from the posterior pharynx and upper trachea.
* Before and after suctioning, the patient is adequately ventilated to prevent hypoxia.
* Chest physiotherapy and postural drainage may be initiated to promote pulmonary hygiene, unless contraindicated by the patient’s underlying condition.
* The chest should be auscultated at least every 8 hours to detect adventitious breath sounds or absence of breath sounds.
* Nursing actions for the mechanically ventilated patient include maintaining the patency of the endotracheal tube or tracheostomy, providing frequent oral care, monitoring arterial blood gas measurements, and maintaining ventilator setting.

**Protecting the Patient**

* protection of the patient, side rails are kept in the raised position during the day.
* Care should be taken to prevent injury from invasive lines and equipment, and other potential sources of injury should be identified, such as restraints, tight dressings, environmental irritants, damp bedding or dressings, and tubes and drains.
* providing privacy and speaking to the patient during nursing care activities preserve the patient’s dignity.
* Not speaking negatively about the patient’s condition or prognosis is also important, because patients in a light coma may be able to hear.

**Maintaining Fluid Balance and Managing Nutritional Needs**

* Hydration status is assessed by examining tissue turgor and mucous membranes.
* assessing intake and output trends, and analyzing laboratory data.
* administering the required IV fluids.
* However, IV solutions (and blood component therapy) for patients with intracranial conditions must be administered slowly. If they are administered too rapidly, they can increase ICP.
* The quantity of fluids administered may be restricted to minimize the possibility of cerebral edema.
* If the patient does not recover quickly and sufficiently enough to take adequate fluids and calories by mouth, a feeding or gastrostomy tube will be inserted for the administration of fluids and enteral feedings.

**Providing Mouth Care**

* The mouth is cleansed and rinsed carefully to remove secretions and crusts and to keep the mucous membranes moist.
* A thin coating of petrolatum on the lips prevents drying, cracking, and encrustations.
* If the patient has an endotracheal tube, the tube should be moved to the opposite side of the mouth daily to prevent ulceration of the mouth and lips.
* toothbrushing every 8 hours significantly decreases ventilator-associated pneumonia.

**Maintaining Skin and Joint Integrity**

* turn the patient every 2hours to enhance blood circulation and prevent skin breakdown resulting pressure ulcer formation.
* a regular schedule of turning to avoid pressure, which can cause breakdown and necrosis of the skin.
* Turning also provides kinesthetic (sensation of movement), proprioceptive (awareness of position), and vestibular (equilibrium) stimulation.
* After turning, the patient is carefully repositioned to prevent ischemic necrosis over pressure areas.
* Maintaining correct body position is important; equally important is passive exercise of the extremities to prevent contractures.
* The use of splints or foam boots aids in the prevention of foot drop and eliminates the pressure of bedding on the toes.
* The use of trochanter rolls to support the hip joints keeps the legs in proper alignment.

**Preserving Corneal Integrity**

* The eyes may be cleansed with cotton balls moistened with sterile normal saline to remove debris and discharge.
* If artificial tears are prescribed, they may be instilled every 2 hours aid to prevent corneal ulceration.
* Periorbital edema (swelling around the eyes) often occurs after cranial surgery. If cold compresses are prescribed, care must be exerted to avoid contact with the cornea.

**Maintaining Body Temperature**

* The environment can be adjusted, depending on the patient’s condition, to promote a normal body temperature. If body temperature is elevated, a minimum amount of bedding is used. The room may be cooled to 18.3C (65F). However, if the patient is elderly and does not have an elevated temperature, a warmer environment is needed.
* Because of damage to the temperature-regulating center in the brain or severe intracranial infection, unconscious patients often develop very high temperatures. Such temperature elevations must be controlled, because the increased metabolic demands of the brain can exceed cerebral circulation and oxygen delivery, potentially resulting in cerebral deterioration.
* Strategies for reducing fever include:
* Removing all bedding over the patient (with the possible exception of a light sheet, towel, or small drape(..
* Administering acetaminophen as prescribed.
* Giving cool sponge baths and allowing an electric fan to blow over the patient to increase surface cooling.
* Using a hypothermia blanket.
* Frequent temperature monitoring to assess the patient’s response to the therapy and to prevent an excessive decrease in temperature and shivering

**Preventing Urinary Retention**

* The bladder is palpated or scanned at intervals to determine whether urinary retention is present, because a full bladder may be an overlooked cause of overflow incontinence.
* If the patient is not voiding, an indwelling urinary catheter is inserted and connected to a closed drainage system.
* Because catheters are a major cause of urinary tract infection, the patient is observed for fever and cloudy urine.
* An intermittent catheterization program may be initiated to ensure complete emptying of the bladder at intervals, if indicated
* An external catheter (condom catheter) for the male patient and absorbent pads for the female patient can be used for unconscious patients who can urinate spontaneously, although involuntarily.

**Promoting Bowel Function**

* The abdomen is assessed for distention by listening for bowel sounds and measuring the girth of the abdomen with a tape measure.
* Commercial fecal collection bags are available for patients with fecal incontinence.
* The nurse monitors the number and consistency of bowel movements and performs a rectal examination for signs of fecal impaction.
* Stool softeners may be prescribed and can be administered with tube feedings. To facilitate bowel emptying, a glycerin suppository may be indicated.
* The patient may require an enema every other day to empty the lower colon.

**Providing Sensory Stimulation**

* The nurse touches and talks to the patient and encourages family members and friends to do so.
* Communication is extremely important and includes touching the patient and spending enough time with the patient to become sensitive to his or her needs. It is also important to avoid making any negative comments about the patient’s status or prognosis in the patient’s presence.
* The nurse orients the patient to time and place at least once every 8 hours.

**Meeting the Family’s Needs**

* help family members mobilize resources and coping skills, the nurse reinforces and clarifies information about the patient’s condition.
* permits the family to be involved in care, and listens to and encourages ventilation of feelings and concerns while supporting decision making about management and placement after hospitalization.
* Families may benefit from participation in support groups offered through the hospital, rehabilitation facility, or community organizations

**Monitoring and Managing Potential Complications**

* Vital signs and respiratory function are monitored closely to detect any signs of respiratory failure or distress.
* Total blood count and arterial blood gas measurements are assessed to determine whether there are adequate red blood cells to carry oxygen and whether ventilation is effective.
* Chest physiotherapy and suctioning are initiated to prevent respiratory complications such as pneumonia.
* Oral care interventions are performed for patients receiving mechanical ventilation to decrease the incidence of pneumonia.
* If pneumonia develops, cultures are obtained to identify the organism so that appropriate antibiotics can be administered.
* The patient with altered LOC is monitored closely for evidence of impaired skin integrity, and strategies to prevent skin breakdown and pressure ulcers are continued through all phases of care, including hospitalization, rehabilitation, and home care.
* The patient should also be monitored for signs and symptoms of deep vein thrombosis (DVT). Patients who develop DVT are at risk for pulmonary embolism. Prophylaxis such as subcutaneous heparin or low-molecular-weight heparin
* Anti-embolism stockings or pneumatic compression devices should also be prescribed to reduce the risk of clot formation

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