

CRANIOCEREBRAL TRAUMA (ACUTE REHABILITATIVE PHASE)

Cranioerebral trauma, also called head or brain injury (open or closed), includes skull fractures, brain concussion, cerebral contusion/laceration, and hemorrhage (subarachnoid, subdural, epidural, intracerebral, brainstem). Primary injury occurs from a direct or indirect blow to the head, causing acceleration/deceleration of the brain. Secondary brain injury results from diffuse intracerebral axonal injury, intracranial hypertension, hypoxemia, hypercapnia, or systemic hypotension. Cerebral concussion is the most common form of head injury.

Consequences of brain injury range from no apparent neurological disturbance to a persistent vegetative state or death. Therefore, every head injury must be considered potentially dangerous.

CARE SETTING

This plan of care focuses on acute care and acute inpatient rehabilitation. Brain injury care for those experiencing moderate to severe trauma progresses along a continuum of care, beginning with acute inpatient hospital care and inpatient rehabilitation to subacute and outpatient rehabilitation, as well as home- and community-based services.

RELATED CONCERNS

Cerebrovascular accident (CVA)/stroke
Psychosocial aspects of care
Seizure disorders/epilepsy
Surgical intervention
Thrombophlebitis: deep vein thrombosis
Total nutritional support: parenteral/enteral feeding
Upper gastrointestinal/esophageal bleeding

Patient Assessment Database

Data depend on type, location, and severity of injury and may be complicated by additional injury to other vital organs.

ACTIVITY/REST

May report: Weakness, fatigue, clumsiness, loss of balance
May exhibit: Altered consciousness, lethargy
Hemiparesis, quadriparesis
Unsteady gait (ataxia); balance problems
Orthopedic injuries (trauma)
Loss of muscle tone, muscle spasticity

CIRCULATION

May exhibit: Normal or altered BP (hypotension or hypertension)
Changes in heart rate (bradycardia, tachycardia alternating with bradycardia, other dysrhythmias)

EGO INTEGRITY

May report: Behavior or personality changes (subtle to dramatic)
May exhibit: Anxiety, irritability, delirium, agitation, confusion, depression, impulsivity

ELIMINATION

May exhibit: Bowel/bladder incontinence or dysfunction

FOOD/FLUID

May report: Nausea/vomiting, changes in appetite
May exhibit: Vomiting (may be projectile)
Swallowing problems (coughing, drooling, dysphagia)

NEUROSENSORY

- May report:** Loss of consciousness, variable levels of awareness, amnesia surrounding trauma events
Vertigo, syncope, tinnitus, hearing loss
Tingling, numbness in extremity
Visual changes, e.g., decreased acuity, diplopia, photophobia, loss of part of visual field
Loss of/changes in senses of taste or smell
- May exhibit:** Alteration in consciousness from lethargy to coma
Mental status changes (orientation, alertness/responsiveness, attention, concentration, problem solving, emotional affect/behavior, memory)
Pupillary changes (response to light, symmetry), deviation of eyes, inability to follow
Loss of senses, e.g., taste, smell, hearing
Facial asymmetry
Unequal, weak handgrip
Absent/weak deep tendon reflexes
Apraxia, hemiparesis, quadriparesis
Posturing (decorticate, decerebrate); seizure activity
Heightened sensitivity to touch and movement
Altered sensation to parts of body
Difficulty in understanding self/limbs in relation to environment (proprioception)

PAIN/DISCOMFORT

- May report:** Headache of variable intensity and location (usually persistent/long-lasting)
- May exhibit:** Facial grimacing, withdrawal response to painful stimuli, restlessness, moaning

RESPIRATION

- May exhibit:** Changes in breathing patterns (e.g., periods of apnea alternating with hyperventilation)
Noisy respirations, stridor, choking
Rhonchi, wheezes (possible aspiration)

SAFETY

- May report:** Recent trauma/accidental injuries
- May exhibit:** Fractures/dislocations
Impaired vision, visual field disturbances, abnormal eye movements
Skin: Head/facial lacerations, abrasions, discoloration, e.g., raccoon eyes. Battle's sign around ears (trauma signs)
Drainage from ears/nose (CSF)
Impaired cognition
Range of motion (ROM) impairment, loss of muscle tone, general strength; paralysis
Fever, instability in internal regulation of body temperature

SOCIAL INTERACTION

- May exhibit:** Expressive or receptive aphasia, unintelligible speech, repetitive speech, dysarthria, anomia
Difficulty dealing with noisy environment, interacting with more than one or two individuals at a time
Changes in role/family structure related to illness/condition

TEACHING/LEARNING

- May report:** Use of alcohol/other drugs
- Discharge plan** **DRG projected mean length of inpatient stay: 17.1 days (inclusive/multiple care setting)**
- considerations:** May require assistance with self-care, ambulation, transportation, food preparation, shopping, treatments, medications, homemaker/maintenance tasks; change in physical layout of home or placement in living facility other than home
Refer to section at end of plan for postdischarge considerations.

DIAGNOSTIC STUDIES

CT scan (with/without contrast): Screening image of choice in acute brain injury. Identifies space-occupying lesions, hemorrhage, skull fractures, brain tissue shift.

MRI: Uses similar to those of CT scan but more sensitive than CT for detecting cerebral trauma, determining neurologic deficits not explained by CT, evaluating prolonged interval of disturbed consciousness, defining evidence of previous trauma superimposed on acute trauma.

Cerebral angiography: Demonstrates cerebral circulatory anomalies, e.g., brain tissue shifts secondary to edema, hemorrhage, trauma.

Serial EEG: May reveal presence or development of pathological waves. EEG is not generally indicated in the immediate period of emergency response, evaluation, and treatment. If the patient fails to improve, EEG may help in diagnostic evaluation for seizures, focal or diffuse encephalopathy.

X-rays: Detect changes in bony structure (fractures), shifts of midline structures (bleeding/edema), bone fragments.

Brainstem auditory evoked responses (BAER): Determines levels of cortical and brainstem function.

PET/SPECT tomography: Detects changes in metabolic activity in the brain and may be used for differentiation of head injuries. (These procedures are not in widespread clinical use, but are more often used for research.)

Audiometry, otology, and vestibular function tests: Diagnostic procedures that identify hearing loss, reasons for balance problems, and/or eighth cranial nerve dysfunction.

Lumbar puncture and CSF analysis: May be performed in patient with suspected or known increased intracranial pressure when CT or MRI is not diagnostic. Generally contraindicated in acute trauma.

ABGs: Determines presence of ventilation or oxygenation problems that may exacerbate/increase intracranial pressure.

Serum chemistry/electrolytes: May reveal imbalances that contribute to increased intracranial pressure (ICP)/changes in mentation.

Toxicology screen: Detects drugs that may be responsible for/potentiate loss of consciousness.

Serum anticonvulsant levels: May be done to ensure that therapeutic level is adequate to prevent seizure activity.

NURSING PRIORITIES

1. Maximize cerebral perfusion/function.
2. Prevent/minimize complications.
3. Promote optimal functioning/return to preinjury level.
4. Support coping process and family recovery.
5. Provide information about condition/prognosis, potential complications, treatment plan, and resources.

DISCHARGE GOALS

1. Cerebral function improved; neurological deficits resolving/stabilized.
2. Complications prevented or minimized.
3. Activities of daily living (ADLs) needs met by self or with assistance of other(s).
4. Family acknowledging reality of situation and involved in recovery program.
5. Condition/prognosis, complications, and treatment regimen understood and available resources identified.
6. Plan in place to meet needs after discharge.

NURSING DIAGNOSIS: Tissue Perfusion, ineffective cerebral

May be related to

Interruption of blood flow by space-occupying lesions (hemorrhage, hematoma); cerebral edema (localized or generalized response to injury, metabolic alterations, drug/alcohol overdose); decreased systemic BP/hypoxia (hypovolemia, cardiac dysrhythmias)

Possibly evidenced by

Altered level of consciousness; memory loss
Changes in motor/sensory responses, restlessness
Changes in vital signs

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Neurological Status (NOC)

Maintain usual/improved level of consciousness, cognition, and motor/sensory function.

Demonstrate stable vital signs and absence of signs of increased ICP.

ACTIONS/INTERVENTIONS

Neurological Monitoring (NIC)

Independent

Determine factors related to individual situation, cause for coma/decreased cerebral perfusion, and potential for increased ICP.

Monitor/document neurological status frequently and compare with baseline, e.g., Glasgow Coma Scale during first 48 hr:

Evaluate eye opening, e.g., spontaneous (awake), opens only to painful stimuli, keeps eyes closed (coma);

Assess verbal response; note whether patient is alert; oriented to person, place, and time; or is confused; uses inappropriate words/phrases that make little sense;

Assess motor response to simple commands, noting purposeful (obeys command, attempts to push stimulus away) and nonpurposeful (posturing) movement. Note limb movement and document right and left sides separately;

RATIONALE

Influences choice of interventions. Deterioration in neurological signs/symptoms or failure to improve after initial insult may reflect decreased intracranial adaptive capacity, requiring the patient be transferred to critical care for monitoring of ICP and/or surgical intervention.

Assesses trends in level of consciousness (LOC) and potential for increased ICP and is useful in determining location, extent, and progression/resolution of central nervous system (CNS) damage. *Note:* Secondary brain injury can occur as a result of various factors, including hypoxemia, hypercapnia, hypocapnia, the rate of cerebral metabolism, and presence of cerebral edema/hypotension impairing cerebral perfusion.

Determines arousal ability/level of consciousness.

Measures appropriateness of speech and content of consciousness. If minimal damage has occurred in the cerebral cortex, patient may be aroused by verbal stimuli but may appear drowsy or uncooperative. More extensive damage to the cerebral cortex may be displayed by slow response to commands, lapsing into sleep when not stimulated, disorientation, and stupor. Damage to midbrain, pons, and medulla is manifested by lack of appropriate responses to stimuli.

Measures overall awareness and ability to respond to external stimuli, and best indicates state of consciousness in the patient whose eyes are closed because of trauma or who is aphasic. Consciousness and involuntary movement are integrated if patient can both grasp and release the tester's hand or hold up two fingers on command. Purposeful movement can include grimacing or withdrawing from painful stimuli or movements that the patient desires, e.g., sitting up. Other movements (posturing and abnormal flexion of extremities) usually indicate diffuse cortical damage. Absence of spontaneous movement on one side of the body indicates damage to the motor tracts in the opposite cerebral hemisphere.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Neurological Monitoring (NIC)</p> <p>Independent</p> <p>Monitor vital signs, e.g.:</p> <p>BP, noting onset of/continuing systolic hypertension and widening pulse pressure; observe for hypotension in multiple trauma patient;</p> <p>Heart rate/rhythm, noting bradycardia, alternating bradycardia/tachycardia, other dysrhythmias;</p> <p>Respirations, noting patterns and rhythm, e.g., periods of apnea after hyperventilation, Cheyne-Stokes respiration.</p> <p>Evaluate pupils, noting size, shape, equality, light reactivity.</p> <p>Assess for changes in vision, e.g., double vision (diplopia), blurred vision, alterations in visual field, depth perception.</p> <p>Assess position/movement of eyes, noting whether in midposition or deviated to side or downward. Note loss of doll's eyes (oculocephalic reflex).</p> <p>Note presence/absence of reflexes (e.g., blink, cough, gag, Babinski).</p>	<p>Normally, autoregulation maintains constant cerebral blood flow despite fluctuations in systemic BP. Loss of autoregulation may follow local or diffuse cerebrovascular damage. Elevating systolic BP accompanied by decreasing diastolic BP (widening pulse pressure) is an ominous sign of increased ICP when accompanied by decreased level of consciousness. Hypovolemia/hypotension (associated with multiple trauma) may also result in cerebral ischemia/damage.</p> <p>Changes in rate (most often bradycardia) and dysrhythmias may develop, reflecting brainstem pressure/injury in the absence of underlying cardiac disease.</p> <p>Irregularities can suggest location of cerebral insult/increasing ICP and need for further intervention, including possible respiratory support. (Refer to ND: Breathing Pattern, risk for ineffective, following.)</p> <p>Pupil reactions are regulated by the oculomotor (III) cranial nerve and are useful in determining whether the brainstem is intact. Pupil size/equality is determined by balance between parasympathetic and sympathetic innervation. Response to light reflects combined function of optic (II) and oculomotor (III) cranial nerves.</p> <p>Visual alterations, which can result from microscopic damage to areas of the brain, have consequent safety concerns and influence choice of interventions.</p> <p>Position and movement of eyes help localize area of brain involvement. An early sign of increased ICP is impaired abduction of eyes, indicating pressure/injury to the fifth cranial nerve. Loss of doll's eyes indicates deterioration in brainstem function and poor prognosis.</p> <p>Altered reflexes reflect injury at level of midbrain or brainstem and have direct implications for patient safety. Loss of blink reflex suggests damage to the pons and medulla. Absence of cough and gag reflexes reflects damage to medulla. Presence of Babinski reflex indicates injury along pyramidal pathways in the brain.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Cerebral Perfusion Promotion (NIC)</p> <p>Independent</p> <p>Monitor temperature and regulate environmental temperature as indicated. Limit use of blankets; administer tepid sponge bath in presence of fever. Wrap extremities in blankets when hypothermia blanket is used.</p> <p>Monitor I&O. Weigh as indicated. Note skin turgor, status of mucous membranes.</p> <p>Maintain head/neck in midline or neutral position, support with small towel rolls and pillows. Avoid placing head on large pillows. Periodically check position/fit of cervical collar or tracheostomy ties when used.</p> <p>Provide rest periods between care activities and limit duration of procedures.</p> <p>Decrease extraneous stimuli and provide comfort measures, e.g., back massage, quiet environment, soft voice, gentle touch.</p> <p>Help patient avoid/limit coughing, vomiting, straining at stool/bearing down when possible. Reposition patient slowly; prevent patient from bending knees and pushing heels against mattress to move up in bed.</p> <p>Avoid/limit use of restraints.</p> <p>Hyperventilate/hyperoxygenate patient for 2 min before suctioning bronchial tree. Limit number and duration of suctioning passes (e.g., two passes less than 10 sec each).</p> <p>Encourage SO to talk to patient.</p> <p>Investigate increasing restlessness, moaning, guarding behaviors.</p>	<p>Fever may reflect damage to hypothalamus. Increased metabolic needs and oxygen consumption occur (especially with fever and shivering), which can further increase ICP.</p> <p>Useful indicators of total body water, which is an integral part of tissue perfusion. Cerebral trauma/ischemia can result in diabetes insipidus (DI) or syndrome of inappropriate antidiuretic hormone (SIADH). Alterations may lead to hypovolemia or vascular engorgement, either of which can negatively affect cerebral pressure.</p> <p>Turning head to one side compresses the jugular veins and inhibits cerebral venous drainage, thereby increasing ICP. Tight fitting collar/ties can also limit jugular venous drainage.</p> <p>Continual activity can increase ICP by producing a cumulative stimulant effect.</p> <p>Provides calming effect, reduces adverse physiological response, and promotes rest to maintain/lower ICP.</p> <p>These activities increase intrathoracic and intra-abdominal pressures, which can increase ICP.</p> <p>Mechanical restraints may enhance fight response, increasing ICP. <i>Note:</i> Cautious use may be indicated to prevent injury to patient when other measures including medications are ineffective.</p> <p>Prevents hypoxia and associated vasoconstriction that can impair cerebral perfusion. <i>Note:</i> Recent research indicates that prophylactic hyperventilation makes little improvement in intracranial pressure. The goal is to prevent transient hypoxemia and hypercarbia associated with suctioning.</p> <p>Familiar voices of family/SO appear to have a relaxing effect on many comatose patients, which can reduce ICP.</p> <p>These nonverbal cues may indicate increasing ICP or reflect presence of pain when patient is unable to verbalize complaints. Unrelieved pain can in turn aggravate/potentiate increased ICP.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Cerebral Perfusion Promotion (NIC)</p> <p>Independent</p> <p>Palpate for bladder distension, maintain patency of urinary drainage if used. Monitor for constipation. Observe for seizure activity and protect patient from injury.</p> <p>Assess for nuchal rigidity, twitching, increased restlessness, irritability, onset of seizure activity.</p> <p>Collaborative</p> <p>Elevate head of bed gradually to 15–30 degrees as tolerated/indicated. Avoid hip flexion greater than 90 degrees.</p> <p>Restrict fluid intake as indicated. Administer IV fluids with control device.</p> <p>Administer supplemental oxygen as indicated.</p> <p>Monitor ABGs/pulse oximetry.</p> <p>Administer medications as indicated:</p> <ul style="list-style-type: none"> Diuretics, e.g., mannitol (Osmitrol), furosemide (Lasix); Steroids, e.g., dexamethasone (Decadron), methylprednisolone (Medrol); Anticonvulsant, e.g., phenytoin (Dilantin); Chlorpromazine (Thorazine); 	<p>May trigger autonomic responses, potentiating elevation of ICP.</p> <p>Seizures can occur as a result of cerebral irritation, hypoxia, or increased ICP; additionally, seizures can further elevate ICP, compounding cerebral damage. Indicative of meningeal irritation, which may occur because of interruption of dura, and/or development of infection during acute or recovery period of brain injury.</p> <p>Promotes venous drainage from head, thereby reducing cerebral congestion and edema/risk of increased ICP. <i>Note:</i> Presence of hypotension can compromise cerebral perfusion pressure, negating beneficial effect of elevating head of bed.</p> <p>Fluid restriction may be needed to reduce cerebral edema; minimize fluctuations in vascular load, BP, and ICP.</p> <p>Reduces hypoxemia, which may increase cerebral vasodilation and blood volume, elevating ICP.</p> <p>Determines respiratory sufficiency (presence of hypoxia/acidosis) and indicates therapy needs.</p> <p>Diuretics may be used in acute phase to draw water from brain cells, reducing cerebral edema and ICP. <i>Note:</i> Loop diuretics (e.g., Lasix) also reduce production of CSF, which can contribute to increased ICP when cerebral edema impairs CSF circulation.</p> <p>May be effective for treating vasogenic edema—decreasing inflammation, reducing tissue edema. <i>Note:</i> Use and efficacy of steroids continues to be debated in this diagnosis.</p> <p>Dilantin is the drug of choice for treatment and prevention of seizure activity in immediate posttraumatic period to reduce risk of secondary injury from associated increased ICP. Prophylactic anticonvulsive therapy may be continued for an indeterminate period of time.</p> <p>Useful in treating posturing and shivering, which can increase ICP. <i>Note:</i> This drug can lower the seizure threshold or precipitate Dilantin toxicity.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Cerebral Perfusion Promotion (NIC)</p> <p>Collaborative</p> <p>Mild analgesics, e.g., codeine);</p> <p>Sedatives, e.g., diphenhydramine (Benadryl);</p> <p>Antipyretics, e.g., acetaminophen (Tylenol);</p> <p>Antidiuretic hormone replacement, e.g., desmopressin (DDAVP), aqueous vasopressin (Pitressin); nonhormonal agents, e.g., chlorpropamide (Diabinese).</p> <p>Prepare for surgical intervention, if indicated.</p>	<p>May be indicated to relieve pain and its negative effect on ICP but should be used with caution to prevent respiratory embarrassment.</p> <p>May be used to control restlessness, agitation.</p> <p>Reduces/controls fever and its deleterious effect on cerebral metabolism/oxygen needs and insensible fluid losses.</p> <p>Indicated for the treatment of diabetes insipidus to prevent hypovolemia. Diabinese may be used alone or in combination with Diuril to treat partial neurogenic DI.</p> <p>Craniotomy or trephination (“burr” holes) may be done to remove bone fragments, elevate depressed fractures, evacuate hematoma, control hemorrhage, and debride necrotic tissue.</p>

<p>NURSING DIAGNOSIS: Breathing Pattern, risk for ineffective</p> <p>Risk factors may include</p> <p>Neuromuscular impairment (injury to respiratory center of brain)</p> <p>Perception or cognitive impairment</p> <p>Tracheobronchial obstruction</p> <p>Possibly evidenced by</p> <p>[Not applicable; presence of signs and symptoms establishes an <i>actual</i> diagnosis.]</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Respiratory Status: Ventilation (NOC)</p> <p>Maintain a normal/effective respiratory pattern, free of cyanosis, with ABGs/pulse oximetry within patient’s acceptable range.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p>Airway Management (NIC)</p> <p>Independent</p> <p>Monitor rate, rhythm, depth of respiration. Note breathing irregularities, e.g., apneustic, ataxic, or cluster breathing.</p>	<p>Changes may indicate onset of pulmonary complications (common following brain injury) or indicate location/extent of brain involvement. Slow respiration, periods of apnea (apneustic, ataxic, or cluster breathing patterns) are signs of brainstem injury and warn of impending respiratory arrest.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Airway Management (NIC)</p> <p>Independent</p> <p>Note competence of gag/swallow reflexes and patient's ability to protect own airway. Insert airway adjunct as indicated.</p> <p>Elevate head of bed as permitted, position on sides as indicated.</p> <p>Encourage deep breathing if patient is conscious.</p> <p>Suction with extreme caution, no longer than 10–15 sec. Note character, color, odor of secretions.</p> <p>Auscultate breath sounds, noting areas of hypoventilation and presence of adventitious sounds (crackles, rhonchi, wheezes).</p> <p>Monitor use of respiratory depressant drugs, e.g., sedatives.</p>	<p>Ability to mobilize or clear secretions is important to airway maintenance. Loss of swallow or cough reflex may indicate need for artificial airway/intubation. <i>Note:</i> Soft nasopharyngeal airways may be preferred to prevent stimulation of the gag reflex caused by hard oropharyngeal airway, which can lead to excessive coughing and increased ICP.</p> <p>Facilitates lung expansion/ventilation and reduces risk of airway obstruction by tongue.</p> <p>Prevents/reduces atelectasis.</p> <p>Suctioning is usually required if patient is comatose or immobile and unable to clear own airway. Deep tracheal suctioning should be done with caution, because it can cause or aggravate hypoxia, which produces vasoconstriction, adversely affecting cerebral perfusion. <i>Note:</i> Administration of intratracheal or IV lidocaine 1–2 min before suctioning suppresses cough reflex and minimizes Valsalva maneuver, limiting impact on ICP.</p> <p>Identifies pulmonary problems such as atelectasis, congestion, and airway obstruction, which may jeopardize cerebral oxygenation and/or indicate onset of pulmonary infection (common complication of head injury).</p> <p>Can increase respiratory embarrassment/complications.</p>
<p>Collaborative</p> <p>Monitor/graph serial ABGs, pulse oximetry.</p> <p>Review chest x-rays.</p> <p>Administer supplemental oxygen.</p> <p>Assist with chest physiotherapy when indicated.</p>	<p>Determines respiratory sufficiency, acid-base balance, and therapy needs.</p> <p>Reveals ventilatory state and signs of developing complications (e.g., atelectasis, pneumonia).</p> <p>Maximizes arterial oxygenation and aids in prevention of cerebral hypoxia. If respiratory center is depressed, mechanical ventilation may be required.</p> <p>Although contraindicated in patient with acutely elevated ICP, these measures are often necessary in acute rehabilitation phase to mobilize and clear lung fields and reduce atelectasis/pulmonary complications.</p>

NURSING DIAGNOSIS: Sensory Perception, disturbed (specify)

May be related to

Altered sensory reception, transmission and/or integration (neurological trauma or deficit)

Possibly evidenced by

Disorientation to time, place, person

Change in usual response to stimuli

Motor incoordination, alterations in posture, inability to tell position of body parts (proprioception)

Altered communication patterns

Visual and auditory distortions

Poor concentration, altered thought processes/bizarre thinking

Exaggerated emotional responses, change in behavior pattern

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Cognitive Ability (NOC)

Regain/maintain usual level of consciousness and perceptual functioning.

Acknowledge changes in ability and presence of residual involvement.

Demonstrate behaviors/lifestyle changes to compensate for/overcome deficit.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Reality Orientation (NIC)</p> <p>Independent</p> <p>Evaluate/continually monitor changes in orientation, ability to speak, mood/affect, sensorium, thought process.</p> <p>Assess sensory awareness, e.g., response to touch, hot/cold, dull/sharp, and awareness of motion and location of body parts. Note problems with vision, other senses.</p> <p>Observe behavioral responses, e.g., hostility, crying, inappropriate affect, agitation, hallucinations. (Refer to ND: Thought Processes, disturbed, following)</p> <p>Document specific changes in abilities, e.g., focusing/tracking with both eyes, following simple verbal instructions, answering “yes” or “no” to questions, feeding self with dominant hand.</p>	<p>Upper cerebral functions are often the first to be affected by altered circulation/oxygenation. Damage may occur at time of initial injury or develop later because of swelling or bleeding. Motor, perceptual, cognitive, and personality changes may develop and persist, with gradual normalization of responses, or changes may remain permanently to some degree.</p> <p>Information is essential to patient safety. All sensory systems may be affected, with changes involving increased or decreased sensitivity or loss of sensation and/or the ability to perceive and respond appropriately to stimuli.</p> <p>Individual responses may be variable, but commonalities, such as emotional lability, increased irritability/frustration, apathy, and impulsiveness, exist during recovery from brain injury. Documentation of behavior provides information needed for development of structured rehabilitation.</p> <p>Helps localize areas of cerebral dysfunction, and identifies signs of progress toward improved neurological function.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Reality Orientation (NIC)</p> <p>Independent</p> <p>Eliminate extraneous noise/stimuli as necessary.</p> <p>Speak in calm, quiet voice. Use short, simple sentences. Maintain eye contact.</p> <p>Ascertain/validate patient's perceptions, provide feedback. Reorient patient frequently to environment, staff, and procedures, especially if vision is impaired.</p> <p>Provide meaningful stimulation: verbal (talk to patient), olfactory (e.g., oil of clove, coffee), tactile (touch, hand holding), and auditory (tapes, television, radio, visitors). Avoid physical or emotional isolation of patient.</p> <p>Provide structured therapies, activities, and environment. Provide written schedule for patient to refer to on a regular basis.</p> <p>Schedule adequate rest/uninterrupted sleep periods.</p> <p>Use day/night lighting.</p> <p>Allow adequate time for communication and performance of activities.</p> <p>Provide patient safety, e.g., padded side rails, assistance with ambulation, protection from hot/sharp objects. Document perceptual deficit and compensatory activities on chart and at bedside.</p> <p>Identify alternative ways of dealing with perceptual deficits, e.g., arrange bed, personal articles, food to take advantage of functional vision; describe where affected body parts are located.</p>	<p>Reduces anxiety, exaggerated emotional responses/confusion associated with sensory overload.</p> <p>Patient may have limited attention span/understanding during acute and recovery stages, and these measures can help patient attend to communication.</p> <p>Assists patient to differentiate reality in the presence of altered perceptions. Cognitive dysfunction and/or visual deficits potentiate disorientation and anxiety.</p> <p>Carefully selected sensory input may be useful for coma stimulation as well as for documenting progress during cognitive retraining.</p> <p>Promotes consistency and reassurance, reducing anxiety associated with the unknown. Promotes sense of control/cognitive retraining.</p> <p>Reduces fatigue, prevents exhaustion, and improves sleep. <i>Note:</i> Absence of rapid eye movement (REM) sleep is known to aggravate sensory perception deficits.</p> <p>Provides for normal sense of passage of time and sleep/wake pattern.</p> <p>Reduces frustration associated with altered abilities/delayed response pattern.</p> <p>Agitation, impaired judgment, poor balance, and sensory deficits increase risk of patient injury.</p> <p>Enables patient to progress toward independence, enhancing sense of control, while compensating for neurological deficits.</p>
<p>Collaborative</p> <p>Refer to physical, occupational, speech, and cognitive therapists.</p>	<p>Interdisciplinary approach can create an integrated treatment plan based on the individual's unique combination of abilities/disabilities with focus on evaluation and functional improvement in physical, cognitive, and perceptual skills.</p>

NURSING DIAGNOSIS: Thought Processes, disturbed

May be related to

Physiological changes; psychological conflicts

Possibly evidenced by

Memory deficit/changes in remote, recent, immediate memory

Distractibility, altered attention span/concentration

Disorientation to time, place, person, circumstances, and events

Impaired ability to make decisions, problem-solve, reason, abstract, or conceptualize

Personality changes; inappropriate social behavior

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Distorted Thought Control (NOC)

Maintain/regain usual mentation and reality orientation.

Recognize changes in thinking/behavior.

Participate in therapeutic regimen/cognitive retraining.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Delirium Management (NIC)</p> <p>Independent</p> <p>Assess attention span, distractibility. Note level of anxiety.</p> <p>Confer with SO to compare past behaviors/preinjury personality with current responses.</p> <p>Maintain consistency in staff assigned to patient, to the extent possible.</p> <p>Present reality concisely and brief; avoid challenging illogical thinking.</p> <p>Provide information about injury process in relationship to symptoms. Explain procedures and reinforce explanations given by others.</p>	<p>Attention span/ability to attend/concentrate may be severely shortened, which both causes and potentiates anxiety, affecting thought processes.</p> <p>Recovery from head injury includes a phase of agitation, angry responses, and disordered thought sequences/conversation. Hallucinations or altered interpretation of stimuli may have been present before the head injury or be part of developing sequelae of brain injury. <i>Note:</i> SOs often have difficulty accepting and dealing with patient's aberrant behavior and may require assistance in coping with situation.</p> <p>Provides patient with feelings of stability and control of situation.</p> <p>Patient may be totally unaware of injury (amnesic) or of extent of injury and therefore deny reality of injury. Structured reality orientation can reduce defensive reactions.</p> <p>Loss of internal structure (changes in memory, reasoning, and ability to conceptualize) and fear of the unknown affect processing and retention of information and can compound anxiety, confusion, and disorientation.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Delirium Management (NIC)</p> <p>Independent</p> <p>Review necessity of recurrent neurological evaluations.</p> <p>Reduce provocative stimuli, negative criticism, arguments, and confrontations.</p> <p>Listen with regard to patient’s verbalizations in spite of speech pattern/content.</p> <p>Promote socialization within individual limitations.</p> <p>Encourage SO to provide current news/family happenings.</p> <p>Instruct in relaxation techniques. Provide diversional activities.</p> <p>Maintain realistic expectations of patient’s ability to control own behavior, comprehend, remember information.</p> <p>Avoid leaving patient alone when agitated, frightened.</p> <p>Implement measures to control emotional outbursts/aggressive behavior if needed; e.g., tell patient to “stop,” speak in a calm voice, remove patient from the situation, provide distraction, restrain for brief periods of time.</p> <p>Inform patient/SO that intellectual function, behavior, and emotional functioning will gradually improve but that some effects may persist for months or even be permanent.</p>	<p>Understanding that assessments are done frequently to prevent/limit complications, and do not necessarily reflect seriousness of patient’s condition, may help reduce anxiety.</p> <p>Reduces risk of triggering fight/flight response. Severely brain-injured patient may become violent or physically/verbally abusive.</p> <p>Conveys interest and worth to individual, enhancing self-esteem and encouraging continued efforts.</p> <p>Reinforcement of positive behaviors (e.g., appropriate interaction with others) may be helpful in relearning internal structure.</p> <p>Promotes maintenance of contact with usual events, enhancing reality orientation and normalization of thinking.</p> <p>Can help refocus attention and reduce anxiety to manageable levels.</p> <p>It is important to maintain an expectation of the ability to improve and progress to a higher level of functioning, to maintain hope, and promote continued work of rehabilitation.</p> <p>Anxiety can lead to loss of control and escalate to panic. Support may provide calming effect, reducing anxiety and risk of injury.</p> <p>Patient may need help/external control to protect self or others from harm until internal control is regained. Restraints (physical holding, mechanical, pharmacological) should be used judiciously to avoid escalating violent, irrational behavior.</p> <p>Most brain-injured patients have persistent problems with concentration, memory, and problem solving. If brain injury was moderate to severe, recovery may be complete or residual effects may remain.</p>
<p>Collaborative</p> <p>Refer for neuropsychological evaluation as indicated.</p>	<p>Useful for determining therapeutic interventions for cognitive and neurobehavioral disturbances.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Exercise Therapy: Muscle Control (NIC)</p> <p>Independent</p> <p>Assess degree of immobility, using a scale to rate dependence (0–4).</p> <p>Provide/assist with ROM exercises.</p> <p>Instruct/assist patient with exercise program and use of mobility aids. Increase activity and participation in self-care as tolerated.</p> <p>Bed Rest Care (NIC)</p> <p>Position patient to avoid skin/tissue pressure damage. Turn at regular intervals, and make small position changes between turns.</p> <p>Provide meticulous skin care, massaging with emollients. Remove wet linen/clothing, keep bedding free of wrinkles.</p> <p>Maintain functional body alignment, e.g., hips, feet, hands. Monitor for proper placement of devices and/or signs of pressure from devices.</p> <p>Support head and trunk, arms and shoulders, feet and legs when patient is in wheelchair/recliner. Pad chair seat with foam or water-filled cushion, and assist patient to shift weight at frequent intervals.</p> <p>Provide eye care, artificial tears; patch eyes as indicated.</p> <p>Monitor urinary output. Note color and odor of urine. Assist with bladder retraining when appropriate.</p>	<p>The patient may be completely independent (0), may require minimal assistance/equipment (1), moderate assistance/supervision/teaching (2), extensive assistance/equipment and devices (3), or be completely dependent on caregivers (4). Persons in all categories are at risk for injury, but those in categories 2–4 are at greatest risk.</p> <p>Maintains mobility and function of joints/functional alignment of extremities and reduces venous stasis.</p> <p>Lengthy convalescence often follows brain injury, and physical reconditioning is an essential part of the program.</p> <p>Regular turning more normally distributes body weight and promotes circulation to all areas. If paralysis or limited cognition is present, patient should be repositioned frequently.</p> <p>Promotes circulation and skin elasticity and reduces risk of skin excoriation.</p> <p>Use of high-top tennis shoes, “space boots,” and T-bar sheepskin devices can help prevent footdrop. Handsplints are variable and designed to prevent hand deformities and promote optimal function. Use of pillows, bedrolls, and sandbags can help prevent abnormal hip rotation.</p> <p>Maintains comfortable, safe, and functional posture, and prevents/reduces risk of skin breakdown.</p> <p>Protects delicate eye tissues from drying. Patient may require patches during sleep to protect eyes from trauma if unable to keep eyes closed.</p> <p>Indwelling catheter used during the acute phase of injury may be needed for an extended period of time before bladder retraining is possible. Once the catheter is removed, several methods of continence control may be tried, e.g., intermittent catheterization (for residual and complete emptying), external catheter, planned intervals on commode, incontinence pads.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Bed Rest Care (NIC)</p> <p>Independent</p> <p>Provide fluids, including 8 oz cranberry juice, within individual tolerance (i.e., regarding neurological and cardiac concerns), as indicated.</p> <p>Monitor bowel elimination and provide for/assist with a regular bowel routine. Check for impacted stool; use digital stimulation as indicated. Sit patient upright on commode or stool at regular intervals. Add fiber/bulk/fruit juice to diet as appropriate.</p> <p>Inspect for localized tenderness, redness, skin warmth, muscle tension, and/or rosy veins in calves of legs. Observe for sudden dyspnea, tachypnea, fever, respiratory distress, chest pain.</p> <p>Collaborative</p> <p>Provide air/water mattress, kinetic therapy as appropriate.</p> <p>Apply/monitor use of sequential compression device.</p> <p>Exercise Therapy: Muscle Control (NIC)</p> <p>Refer to physical/occupational therapists as indicated.</p>	<p>Once past the acute phase of head injury and if patient has no other contraindicating factors, forcing fluids decreases risk of urinary tract infections/stone formation and provides other positive effects such as normal stool consistency and optimal skin turgor.</p> <p>A regular bowel routine requires simple but diligent measures to prevent complications. Stimulation of the internal rectal sphincter stimulates the bowel to empty automatically if stool is soft enough to do so. Upright position aids evacuation.</p> <p>Patient is at risk for development of deep vein thrombosis (DVT) and pulmonary embolus (PE), requiring prompt medical evaluation/intervention to prevent serious complications.</p> <p>Equalizes tissue pressure, enhances circulation, and helps reduce venous stasis to decrease risk of tissue injury.</p> <p>May be used to reduce risk of deep vein thrombosis associated with bedrest/limited mobility.</p> <p>Useful in determining individual needs, therapeutic activities, and assistive devices.</p>

<p>NURSING DIAGNOSIS: Infection, risk for</p> <p>Risk factors may include</p> <ul style="list-style-type: none"> Traumatized tissues, broken skin, invasive procedures Decreased ciliary action, stasis of body fluids Nutritional deficits Suppressed inflammatory response (steroid use) Altered integrity of closed system (CSF leak) <p>Possibly evidenced by</p> <p>[Not applicable; presence of signs and symptoms establishes an <i>actual</i> diagnosis.]</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Immune Status (NOC)</p> <ul style="list-style-type: none"> Maintain normothermia, free of signs of infection. Achieve timely wound healing when present.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Infection Protection (NIC)</p> <p>Independent</p> <p>Provide meticulous/asceptic care, maintain good handwashing techniques.</p> <p>Observe areas of impaired skin integrity (e.g., wounds, suture lines, invasive line insertion sites), noting drainage characteristics and presence of inflammation.</p> <p>Monitor temperature routinely. Note presence of chills, diaphoresis, changes in mentation.</p> <p>Encourage deep breathing, aggressive pulmonary toilet. Observe sputum characteristics.</p> <p>Provide perineal care. Maintain integrity of closed urinary drainage system if used. Encourage adequate fluid intake.</p> <p>Observe color/clarity of urine. Note presence of foul odor.</p> <p>Screen/restrict access of visitors or caregivers with upper respiratory infections (URIs).</p>	<p>First-line defense against nosocomial infections.</p> <p>Early identification of developing infection permits prompt intervention and prevention of further complications.</p> <p>May indicate developing sepsis requiring further evaluation/intervention.</p> <p>Enhances mobilization and clearing of pulmonary secretions to reduce risk of pneumonia, atelectasis. <i>Note:</i> Postural drainage should be used with caution if risk of increased ICP exists.</p> <p>Reduces potential for bacterial growth/ascending infection.</p> <p>Indicators of developing urinary tract infection (UTI) requiring prompt intervention.</p> <p>Reduces exposure of “compromised host.”</p>
<p>Infection Control (NIC)</p> <p>Collaborative</p> <p>Obtain specimens as indicated.</p>	<p>Culture/sensitivity, Gram’s stain may be done to verify presence of infection and identify causative organism and appropriate treatment choices.</p>

<p>NURSING DIAGNOSIS: Nutrition: imbalanced, risk for less than body requirements</p> <p>Risk factors may include</p> <ul style="list-style-type: none"> Altered ability to ingest nutrients (decreased level of consciousness) Weakness of muscles required for chewing, swallowing Hypermetabolic state <p>Possibly evidenced by</p> <p>[Not applicable; presence of signs and symptoms establishes an <i>actual</i> diagnosis.]</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Nutritional Status (NOC)</p> <ul style="list-style-type: none"> Demonstrate maintenance of desired weight/progressive weight gain toward goal. Experience no signs of malnutrition, with laboratory values within normal range.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Nutrition Therapy (NIC)</p>	
<p>Independent</p>	
<p>Assess ability to chew, swallow, cough, handle secretions.</p>	<p>These factors determine choice of feeding because patient must be protected from aspiration.</p>
<p>Auscultate bowel sounds, noting decreased/absent or hyperactive sounds.</p>	<p>GI functioning is usually preserved in brain-injured patients, so bowel sounds help in determining response to feeding or development of complications, e.g., ileus.</p>
<p>Weigh as indicated.</p>	<p>Evaluates effectiveness or need for changes in nutritional therapy.</p>
<p>Provide for feeding safety, e.g., elevate head of bed while eating or during tube feeding.</p>	<p>Reduces risk of regurgitation and/or aspiration.</p>
<p>Divide feedings into small amounts and give frequently.</p>	<p>Enhances digestion and patient's tolerance of nutrients and can improve patient cooperation in eating.</p>
<p>Promote pleasant, relaxing environment, including socialization during meals. Encourage SO to bring in food that patient enjoys.</p>	<p>Although the recovering patient may require assistance with feeding and/or use of assistive devices, mealtime socialization with SO or friends can improve intake and normalize the life function of eating.</p>
<p>Check stools, gastric aspirant, vomitus for blood.</p>	<p>Acute/subacute bleeding may occur (Cushing's ulcer), requiring intervention and alternative method of providing nutrition.</p>
<p>Collaborative</p>	
<p>Consult with dietitian/nutritional support team.</p>	<p>Effective resource for identifying caloric/nutrient needs, depending on age, body size, desired weight, concurrent conditions (trauma, cardiac/metabolic problems).</p>
<p>Monitor laboratory studies, e.g., prealbumin/albumin, transferrin, amino acid profile, iron, BUN, nitrogen balance studies, glucose, AST/ALT, electrolytes.</p>	<p>Identifies nutritional deficiencies, organ function, and response to nutritional therapy.</p>
<p>Administer feedings by appropriate means, e.g., IV/tube feeding, oral feedings with soft foods and thick liquids (Refer to CP: Total Nutritional Support: Parenteral/Enteral Feeding.)</p>	<p>Choice of route depends on patient needs/capabilities. Tube feedings (nasogastric, gastric) may be required initially, or parenteral route may be indicated in presence of gastric/intestinal pathology. If patient is able to swallow, soft foods or semiliquid foods may be more easily managed without aspiration.</p>
<p>Involve speech/occupational/physical therapists when mechanical problem exists, e.g., impaired swallow reflexes, wired jaws, contractures of hands, paralysis.</p>	<p>Individual strategies/devices may be needed to improve ability to eat.</p>

NURSING DIAGNOSIS: Family Processes, interrupted

May be related to

Situational transition and crisis
Uncertainty about outcomes/expectations

Possibly evidenced by

Difficulty adapting to change or dealing with traumatic experience constructively
Family not meeting needs of its members
Difficulty accepting or receiving help appropriately
Inability to express or to accept feelings of members

DESIRED OUTCOMES/EVALUATION CRITERIA—FAMILY WILL:

Family Coping (NOC)

Begin to express feelings freely and appropriately.
Identify internal and external resources to deal with the situation.
Direct energies in a purposeful manner to plan for resolution of crisis.
Encourage and allow injured member to progress toward independence.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Family Integrity Promotion (NIC)</p> <p>Independent</p> <p>Note components of family unit, availability/involvement of support systems.</p> <p>Encourage expression of concerns about seriousness of condition, possibility of death, or incapacitation.</p> <p>Listen for expressions of helplessness/hopelessness.</p> <p>Encourage expression of/acknowledge feelings. Do not deny or reassure patient/SO that everything will be all right.</p> <p>Reinforce previous explanations about extent of injury, treatment plan, and prognosis. Provide accurate information at current level of understanding/ability to accept.</p>	<p>Defines family resources and identifies areas of need.</p> <p>Verbalization of fears gets concerns out in the open and can decrease anxiety and enhance coping with reality.</p> <p>Joy of survival of victim is replaced by grief/anger at “loss” and necessity of dealing with “new person that family does not know and may not even like.” Prolongation of these feelings may result in depression.</p> <p>Because it is not possible to predict the outcome, it is more helpful to assist the person to deal with feelings about what is happening instead of giving false reassurance.</p> <p>Patient/SO are unable to absorb/recall all information, and blocking can occur because of emotional trauma. As time goes by, reinforcement of information can help reduce misconceptions, fear about the unknown/future expectations.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Family Integrity Promotion (NIC)</p> <p>Independent</p> <p>Stress importance of continuous open dialogue between family members.</p> <p>Evaluate/discuss family goals and expectations.</p> <p>Identify individual roles and anticipated/perceived changes.</p> <p>Assess energy direction, e.g., whether efforts at resolution/problem solving are purposeful or scattered.</p> <p>Identify and encourage use of previously successful coping behaviors.</p> <p>Demonstrate and encourage use of stress management skills, e.g., relaxation techniques, breathing exercises, visualization.</p> <p>Help family recognize needs of all members.</p> <p>Support family grieving for “loss” of member. Acknowledge normality of wide range of feelings and ongoing nature of process.</p>	<p>Provides opportunity to get feelings out in the open. Recognition and awareness promotes resolution of guilt, anger.</p> <p>Family may believe that if patient is going to live, rehabilitation will bring about a cure. Despite accurate information, expectations may be unrealistic. Also, patient’s early recovery may be rapid, then plateau, resulting in disappointment/frustration.</p> <p>Responsibilities/roles may have to be partially or completely assumed by others, which can further complicate family coping.</p> <p>May need assistance to focus energies in an effective way/enhance coping.</p> <p>Focuses on strengths and reaffirms individual’s ability to deal with current crisis.</p> <p>Helps redirect attention toward revitalizing self to enhance coping ability.</p> <p>Attention may be so focused on injured member that other members feel isolated/abandoned, which can compromise family growth and unity.</p> <p>Although grief may never be fully resolved and family may vacillate among various stages, understanding that this is typical may help members accept/cope with the situation.</p>
<p>Collaborative</p> <p>Include family in rehabilitation team meetings and care planning/placement decisions.</p> <p>Identify community resources, e.g., visiting nurse, homemaker service, day care facility, legal/financial counselor.</p> <p>Refer to family therapy, support groups.</p>	<p>Facilitates communication, enables family to be an integral part of the rehabilitation, and provides sense of control.</p> <p>Provides assistance with problems that may arise because of altered role function. Also as family structure changes over time and patient’s needs increase with age, additional resources/support are often required.</p> <p>Cognitive/personality changes are usually very difficult for family to deal with. Decreased impulse control, emotional lability, inappropriate sexual or aggressive/violent behavior can disrupt family and result in abandonment/divorce. Trained therapists and peer role models may assist family to deal with feelings/reality of situation and provide support for decisions that are made.</p>

NURSING DIAGNOSIS: Knowledge, deficient [Learning Need] regarding condition, prognosis, potential complications, treatment, self-care, and discharge needs

May be related to

Lack of exposure, unfamiliarity with information/resources
Lack of recall/cognitive limitation

Possibly evidenced by

Request for information, statement of misconception
Inaccurate follow-through of instructions

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT/SO WILL:

Knowledge: Disease Process (NOC)

Participate in learning process.
Verbalize understanding of condition, prognosis, potential complications.

Knowledge: Treatment Regimen (NOC)

Verbalize understanding of therapeutic regimen and rationale for actions.
Initiate necessary lifestyle changes and/or involvement in rehabilitation program.
Correctly perform necessary procedures.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Teaching: Disease Process (NIC)</p> <p>Independent</p> <p>Evaluate capabilities and readiness to learn of both patient and SO.</p> <p>Review information regarding injury process and aftereffects.</p> <p>Review/reinforce current therapeutic regimen. Identify ways of continuing program after discharge.</p> <p>Discuss plans for meeting self-care needs.</p> <p>Provide written instructions and schedules for activity, medication, important facts.</p> <p>Identify signs/symptoms of individual risks, e.g., delayed CSF leak, posttraumatic seizures, headache/chronic pain.</p> <p>Discuss with patient/SO development of symptoms, such as reexperiencing traumatic event (flashbacks, intrusive thoughts, repetitive dreams/nightmares); psychic/emotional numbness; changes in lifestyle, including adoption of self-destructive behaviors.</p>	<p>Permits presentation of material based on individual needs. <i>Note:</i> Patient may not be emotionally/mentally capable of assimilating information.</p> <p>Aids in establishing realistic expectations and promotes understanding of current situation and needs.</p> <p>Recommended activities, limitations, medication/therapy needs have been established on the basis of a coordinated interdisciplinary approach, and follow-through is essential to progression of recovery/prevention of complications.</p> <p>Varying levels of assistance may be required/need to be planned based on individual situation.</p> <p>Provides visual reinforcement and reference source after discharge.</p> <p>Recognizing developing problems provides opportunity for prompt evaluation and intervention to prevent serious complications.</p> <p>May indicate occurrence/exacerbation of posttrauma response, which can occur months to years after injury, requiring further evaluation and supportive interventions.</p>

