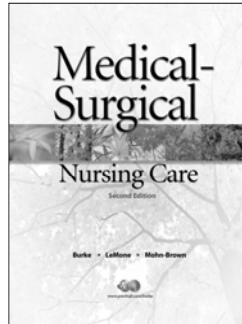


Medical-Surgical Nursing Care *Second Edition*

Karen Burke
Priscilla LeMone
Elaine Mohn-Brown

Chapter 38

*Caring for Clients with
Intracranial Disorders*



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Intracranial Disorders

- Increased intracranial pressure
- Head injuries
- Brain tumors
- Cerebrovascular accidents
- Seizures
- Intracranial infections

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Increased Intracranial Pressure

- Components of cranium
 - Brain
 - Blood in cerebral vessels
 - Cerebrospinal fluid

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Increased ICP

- Common causes
 - Traumatic brain injury
 - Cerebral edema
 - Brain tumor
 - Cerebral hematoma
 - Cerebrovascular accident
 - Brain infections

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Increased ICP

- Manifestations
 - Change in LOC
 - Earliest sign
 - Can progress to coma
 - Pupils
 - Sluggish to fixed and dilated
 - Vision
 - Blurry
 - Diplopia

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Increased ICP

- Manifestations
 - Motor functioning
 - Hemiparesis
 - Hemiplegia
 - Posturing
 - Decorticate
 - Decerebrate
 - Difficulty speaking

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Increased ICP

- Manifestations
 - Altered vital signs
 - Cushing's triad (Cushing's response)
 - Widening pulse pressure
 - Slow bounding bradycardic pulse
 - Alteration in respiratory pattern
 - Change in body temperature
 - Headache
 - Projectile vomiting

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Increased ICP

- Fatal Complications
 - Brain herniation
 - Shifting of brain
 - Compression of brain/brainstem
 - Brain death
 - Cessation of cerebral blood flow/vital functions

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Increased ICP

- Assessing for IICP
 - Cerebral monitoring
- Determining the cause
 - CT scan or MRI
 - Cerebral angiography
 - Lumbar puncture
 - Diagnostics: Altered LOC

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Increased ICP – Lab Tests

- Blood glucose
- Arterial blood gases
- Toxicology screening
- Serum creatinine/BUN
- Liver function
- Complete blood count

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Increased ICP - Medications

- Osmotic diuretics/loop diuretics
 - Monitor client for fluid and electrolyte imbalances
 - Monitor client for dehydration
- Corticosteroids
 - Assess for GI irritation/ulcers
 - Administer H2 blockers and/or antacids concurrently

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Increased ICP - Medications

- Anticonvulsants
 - Monitor for signs of seizure activity
 - Document cessation of signs of seizure activity
- Barbiturate therapy for severe TBI, IICP
 - Artificial coma requiring ICU monitoring

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Increased ICP – Nursing Care

- Assessment
 - LOC/vital signs
 - Altered cognitive functioning
 - Headache
 - Vomiting

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Increased ICP – Nursing Care

- Assessment
 - Sensory alterations: vision/hearing
 - Numbness or tingling in extremities
 - History; medication/alcohol use
 - Reflexes; posturing

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Increased ICP – Nursing Care

- Nursing Diagnoses
 - Ineffective Tissue Perfusion
 - Ineffective Breathing Pattern
 - Risk for Imbalanced Nutrition
 - Risk for Impaired Skin Integrity
 - Impaired Physical Mobility
 - Risk for Infection

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Increased ICP – Nursing Care

- Evaluation
 - LOC
 - Grips, gait
 - Absence of deficits

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Increased ICP

- Interdisciplinary Care
 - Pharmacotherapy
 - Respiratory support
 - Nutritional support
 - Surgery
 - Discharge planning

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Skull Fractures

- Linear
 - Simple clean break in skull
- Comminuted
 - Skull in fragmented pieces
- Depressed
 - Skull bone fragments pushed into brain
- Basilar
 - At base of skull, may extend to temporal bone

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Skull Fractures

- Leakage of blood or CSF from nose/ears
- Battle's sign
- "Raccoon" eyes

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Open Head Injury

- Opening through skull and dura
 - Severe blunt trauma
 - Penetrating injuries
- Brain exposed to external environment
- Risk of meningitis; brain damage

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Closed Head Injury

- Coup–contrecoup phenomenon
- Bruising of brain at two points
- Brain damage
 - Focal symptoms related to area of brain injured
 - Possible increased ICP

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Closed Head Injury

- Concussion r/t shaking of brain
 - Immediate loss of consciousness < 5 min
 - Drowsiness, confusion
 - Headache, blurred/double vision

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Closed Head Injury

- Contusion: bruising/swelling of brain tissue
- Initial loss of consciousness
- Motionless, pale, clammy
- Hypotensive, weak pulse, shallow respirations
- Altered motor response

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Epidural Hematoma

- Arterial bleed between skull and dura
- Can be caused by skull fracture/contusion
- Brief loss of consciousness short period of alertness
rapid progression to coma
- Posturing, pupil changes, seizures; IICP

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Subdural Hematoma

- Venous bleed between dura and subarachnoid layer
- Acute
 - Rapid progression to coma, pupil dilation, contralateral hemiparesis
- Subacute
 - Symptoms 48 hrs to 2 wks; alert period then slow progression to coma

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Subdural Hematoma

- Chronic
 - Symptoms weeks to months later
 - Impaired thinking
 - Confusion
 - Drowsiness
 - Pupil changes
 - Motor deficits

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Intracerebral Hematoma

- Bleeding into brain tissue
- Decreasing LOC
- Pupil changes
- Motor deficits

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Head Injuries – Diagnostic Tests

- Skull series: x-ray
- CT scan

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IICP in Head Injuries

- IICP results from:
 - Direct trauma to the brain tissue
 - Cerebral edema
 - Hematomas

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Head Injuries – Nursing Care

- Discharge teaching topics
 - Symptoms of IICP
 - Frequent monitoring at home
 - Postconcussion syndrome
 - Necessity for rehabilitation
 - Necessity for long-term care

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Brain Tumors

- Abnormal growths within the cranium
 - Benign or malignant
 - Primary
 - Arising from brain cells/structures
 - Secondary
 - Metastasis from other primary site of cancer

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Brain Tumor

- Glioma
 - Astrocytoma
 - Glioblastoma
- Meningioma
- Acoustic neuroma
- Metastatic brain tumors

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BOX 38-5 Manifestations of Brain Tumors.

BOX 38-5
MANIFESTATIONS OF BRAIN TUMORS
Frontal Lobe Tumors
■ Personality changes, inappropriate behavior, impaired judgment, inability to concentrate
■ Recent memory loss
■ Motor deficits
■ Expressive aphasia
■ Seizures
Parietal Lobe Tumors
■ Sensory-perceptual deficits
■ Seizures
Temporal Lobe Tumors
■ Psychomotor seizures
■ Receptive aphasia
Occipital Lobe Tumors
■ Visual deficits
■ Headache

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Brain Tumors – Diagnostic Tests

- CT scan or MRI
- EEG
- Cerebral angiogram
- Stereotactic needle biopsy

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Brain Tumors - Medications

- Chemotherapy
 - Ommaya reservoir
 - Wafers in tumor cavity
- Assess for bone marrow suppression

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Brain Tumor – Nursing Care

- Assessment
 - Cognitive changes
 - Pain
 - Sensory changes: vision, hearing
 - Paresthesias
 - Vital signs, LOC
 - Strength, movement
 - Gait, coordination

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Brain Tumor – Nursing Care

- Diagnoses
 - Anxiety
 - Disturbed Body Image

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Brain Tumor – Nursing Care

- Evaluation
 - Effectiveness of interventions: postop craniotomy
 - Absence of neurologic deficits
 - No signs of infection
 - Knowledge re: follow-up care at home

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Cerebrovascular Accident

- Terms preferred by National Stroke Association:
 - Stroke or brain attack
- Affects 700,000 people in the U.S. per year
- Third leading cause of death in the U.S.
- Most frequent cause of chronic neurologic disability

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Stroke/Brain Attack

- Risk Factors
 - Race: African American
 - Hypertension
 - Obesity
 - Diabetes mellitus
 - Atrial fibrillation
 - Atherosclerosis

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Stroke/Brain Attack

- Other Risk Factors: Lifestyle Choices
 - Smoking
 - High cholesterol
 - Excessive use of alcohol, cocaine, and heroin
 - Oral contraceptive use by women

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Transient Ischemic Attack (TIA)

- Temporary reduction in cerebral blood flow
- Reversible neurologic deficits
 - Several minutes to 24 hours
- Warning sign of an impending or future stroke
- Carotid endarterectomy

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TIA

- Manifestations
 - Dizziness
 - Loss of vision in one eye
 - Numbness, weakness
 - One arm, hand, leg
 - Aphasia

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Stroke – Diagnostic Tests

- CT scan/MRI
- Cerebral arteriogram
- Doppler ultrasound
- PET scan
- Lumbar puncture

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Stroke/Brain Attack

- Sudden loss of neurologic function due to decreased blood supply to a local area of the brain
- Ischemic
 - Thrombus
 - Emboli
- Hemorrhagic

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Right Hemisphere Problems

- Manifestations
 - Left hemiplegia; visual field deficits
 - Spatial-perceptual deficits
 - Poor judgment; easily distracted
 - Impulsive

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Left Hemisphere Problems

- Manifestations
 - Right hemiplegia; visual field deficits
 - Aphasia
 - Impaired intellect
 - Slow/cautious; high frustration

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Stroke/Brain Attack

- Motor Deficits
 - Contralateral
 - Hemiparesis
 - Hemiplegia
 - Flaccidity moving to spasticity
 - Problems associated with immobility

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Stroke/Brain Attack

- Speech Deficits
 - Expressive aphasia
 - Receptive aphasia
 - Global aphasia
 - Dysarthria

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Stroke/Brain Attack

- Visual Deficits
 - Due to parietal and/or temporal lobe damage
 - Diplopia
 - Homonymous hemianopia

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Stroke/Brain Attack

- Sensory-Perceptual Deficits
 - Agnosia
 - Apraxia
 - Unilateral neglect
 - Alterations in perception
 - Temperature; vibration; pain; pressure; proprioception
 - Increased risk for injury

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Stroke/Brain Attack

- Cognitive/Behavioral Changes
 - Memory loss; decreased attention span
 - Poor judgment; inability to solve problems
 - Emotionally labile/loss of self-control
 - Depression; stress manifesting as anger

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Stroke/Brain Attack

- Urinary/Gastrointestinal Problems
 - Urinary frequency, urgency, incontinence
 - Constipation
 - Dysphagia
 - Choking, drooling, aspiration

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Stroke/Brain Attack - Medications

- Preventive post TIA
 - Antiplatelets
- Thrombolytics
 - Only in ischemic stroke
 - Time frame critical
- Major nursing responsibility
 - Assess for bleeding

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Stroke/Brain Attack - Medications

- Anticoagulants (thrombotic stroke)
 - Assess for bleeding
- Antihypertensives
 - Assess BP
- Osmotic diuretics for IICP
 - Monitor I&O
- Anticonvulsants
 - Watch for seizure activity

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Stroke/Brain Attack – Nursing Care

- Assessment
 - Cognitive changes
 - Sensory changes
 - Change in motor function
 - Headache

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Stroke/Brain Attack – Nursing Care

- Assessment
 - History of:
 - HTN, TIA, diabetes, cardiac dysrhythmias
 - Alcohol abuse, smoking
 - Use of anticoagulants
 - Vital signs
 - Focused neurologic exam

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Stroke/Brain Attack – Nursing Care

- Diagnoses
 - Ineffective Tissue Perfusion: Cerebral
 - Risk for Ineffective Airway Clearance
 - Impaired Physical Mobility
 - Impaired Verbal Communication

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Stroke/Brain Attack – Nursing Care

- Diagnoses
 - Disturbed Sensory Perception
 - Impaired Urinary Elimination/Constipation
 - Impaired Swallowing
 - Self-Care Deficit

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Stroke/Brain Attack – Nursing Care

- Evaluation
 - Airway
 - Self-care
 - Communication
 - Coping
 - Knowledge of medications

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Seizure Disorders

- Abnormal electrical activity in brain cells
- Involving all or part of brain
- Can be isolated event
- Chronic pattern epilepsy

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Seizures

- Causes
 - Most unknown
 - In adults:
 - Brain infection
 - Stroke
 - Brain tumor
 - Hypoglycemia, high fever, hypoxia

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Seizures – Diagnostic Tests

- Radiologic
 - Skull x-rays; CT; MRI
- EEG
- CBC, electrolytes, BUN, glucose
- Testing for syphilis

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Seizures

- Simple
 - Jacksonian march
 - Flashing lights; tingling sensation; hallucinations
 - 20–30 secs; no loss of consciousness
- Complex
 - Automatisms
 - Altered LOC
 - Aura

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Seizures

- Absence
 - Brief change in consciousness
 - Motor activity halts
- Tonic-clonic
 - Aura
 - Tonic contractions—rigidity
 - Clonic contractions—muscle jerking; eyes roll; frothing at mouth; incontinence
 - Postictal period

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Status Epilepticus

- Life-threatening emergency
- Continuous tonic-clonic activity and loss of consciousness
- Can deprive brain of oxygen/glucose
- Causes physical exhaustion/respiratory distress
- Can cause permanent brain damage

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Seizures - Medications

- Halting status epilepticus
 - Valium
 - Ativan
 - Phenobarbital
- Long-term seizure control
 - Anticonvulsants
- Assess for effectiveness: monitor drug levels

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Seizures – Nursing Care

- Assessment
 - Seizure experience
 - Onset, duration, aura, postictal period
 - History of intracranial disorders
 - Observation
 - Physical symptoms before, during, and after seizure

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Seizures – Nursing Care

- Diagnoses
 - Risk for Ineffective Airway Clearance
 - Risk for Injury
 - Anxiety
- Evaluation
 - Seizure control
 - Safety
 - Knowledge of medications

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Meningitis

- Inflammation of the meninges: brain and spinal cord
 - Bacterial
 - Viral
 - Less severe
 - Shorter course

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Meningitis

- Positive Brudzinski's sign
- Positive Kernig's sign
- Headache, photophobia
- High fever, nausea, vomiting
- Restlessness, confusion, seizures
- Altered LOC
- Signs of IICP
- Altered vital signs

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Encephalitis

- Acute inflammation of white and gray matter: brain and spinal cord
- Damage of nerve cells
 - Cerebral edema, necrosis, localized hemorrhage
- Manifestations similar to meningitis

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Brain Abscess

- Collection of purulent material within the brain
- Caused by/often follow:
 - Middle ear/sinus infection
 - Head injury/intracranial surgery
 - Bacterial infections in hear, bone, lung
- Manifestations similar to meningitis

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Brain Infections – Diagnostic Tests

- Lumbar puncture
- Culture, sensitivity and Gram stain of CSF
- Blood, urine, throat, and nasal cultures
- CT, MRI, skull x-rays

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Brain Infections - Medications

- Antibiotics: teaching related to completion
- Antivirals: teaching related to completion
- Anticonvulsants: monitor for seizures
- Antipyretics/analgesics: monitor temp
- Osmotic diuretics/corticosteroids: assess for signs of IICP
- Antiemetics: assess for nausea

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Brain Infections – Nursing Care

- Assessment
 - Nausea, vomiting
 - Photophobia; stiff neck
 - Confusion; headache
 - History of:
 - Head injury; brain surgery; infections

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Brain Infections – Nursing Care

- Assessment
 - Vital signs/LOC
 - Changes in vision/hearing
 - Brudzinski's and Kernig's signs
 - Seizures
 - Petechial rash

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Brain Infections – Nursing Care

- Diagnoses
 - Risk for Ineffective Tissue Perfusion: Cerebral
 - Hyperthermia
 - Acute Pain
- Evaluation
 - Afebrile
 - Absence of headache/signs of IICP
 - Knowledge of anti-infective therapy

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Craniotomy

- Surgical opening into the cranial cavity
- Purposes:
 - Elevate a depressed skull fracture
 - Remove foreign body
 - Evacuate hematoma
 - Debulk/remove tumor

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Craniotomy

- Preoperative Care
 - Routine preoperative care/teaching
 - Assess understanding of procedure
 - Assess anxiety level
 - Postoperative appearance

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Craniotomy

- Postoperative Care
 - Monitoring
 - Vital signs, respiratory status oxygenation status
 - IICP; CSF leak; manifestations of meningitis; seizures
 - Pain control; antibiotic therapy
 - Positioning
 - Care of the wound/incision

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