Chronic Neurologic Problems

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N243

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Objectives

- Headache: Tension-type, migraine, & cluster
  - Compare & contrast etiology, c/m, & therapeutic and nursing interventions
- Seizures
  - Pathophysiology, population at risk, etiology, c/m, & diagnostic procedures, & nursing management
- MS, MG, ALS, Parkinson's disease, & Alzheimer's disease
  - Pathophysiology, population at risk, etiology, c/m, & diagnostic procedures
- Chronic neurologic problems
  - Nursing care plans, physical complications, age related risk factors, major health problems in the elderly, major goals of treatment, potential impact on physical, psychological, psychosocial well-being, essential elements of patient and family teaching
- Cognitive disorders
  - Nursing diagnosis, intra, inter and extrapersonal stressors

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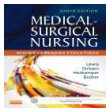
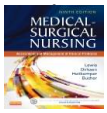
Required Reading



Med Surg Textbook

p# 1413-1441 Chapter 59
p# 1443-1461 Chapter 60



Study Guide

p# 265-273

Pharmacology Textbook

p# 268-280, 304-313, 314-325, 326-334, 365-368,

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Headache

- The most common type of pain experienced by humans
- Primary classifications
  - Tension-type
  - Migraine
  - Cluster

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Tension-Type Headache

- Bilateral, band like headache associated with neck pain & increased tone in the cervical and neck muscles
- Constant, squeezing tightness

Etiology

- Neurovascular factors-abnormal neuronal sensitivity

C/M

- No prodrome
- No nausea or vomiting
- Photophobia or phonophobia
- May occur intermittently

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Migraine Headache

- Recurring
- Unilateral or bilateral throbbing pain

Etiology

- Neuronal hyperexcitability in the cerebral cortex, especially in the occipital cortex
- Triggers

C/M

- Can be preceded by prodrome and aura
- Steady, throbbing pain that is synchronous with the pulse.

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Cluster Headache

- Repeated headaches that occur for weeks or months at a time, followed by periods of remission

Etiology

- Dysfunction of intracranial blood vessels
- Trigeminal nerve is implicated

C/M

- Sharp and stabbing
- Intense pain lasting from a few minutes to 3 hours
- Pain is usually located around the eye, radiating to the temple, forehead, cheek, nose, or gums.

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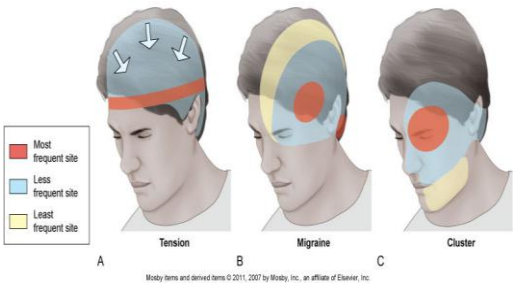
Pain Locations



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Collaborative Care

Drug therapy

- Tension-type headache
  - Non-opioid analgesics, sedatives, muscle relaxants, tranquilizers.
  - Prophylactic: Depakote, Topamax, Elavil
- Migraine headache
  - Aspirin, NSAIDs, Caffeine-containing analgesics, sumatriptan (Imitrex)
  - Prophylactic: Topamax, Elavil, Botox

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Collaborative Care…

- Cluster headache
  - 100% O2 6 to 8 L /m for 10 minutes.
  - Triptans
  - Prophylactic: Ergotamine
  - Refractory: Nerve blocks, deep brain stimulation

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Nursing Management

Nursing implementation

- Exercise, relaxation periods, and socializing
- Alternative pain management
- Massage and moist heat packs to the neck
- Dietary counseling for food triggers
- Avoid smoking and smoke exposure
- Avoid high altitudes or take ergotamine (Ergomar)

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Seizure

Paroxysmal, uncontrolled electrical discharge of neurons in brain, interrupts normal function.

Epilepsy: A condition in which a person has spontaneous recurring seizures caused by a chronic underlying condition.

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Etiology & Pathophysiology

- First 6 months of life
  - Birth injury , Congenital defects, Infections
  - Inborn errors of metabolism
- From ages 2 to 20
  - Birth injury, Infection, Trauma, Genetic factors
- Between 20 and 30
  - Trauma, Brain tumors, or Vascular disorders
- After 50
  - Stroke, Metastatic brain tumors

* Activation of astrocytes by hyperactive neurons

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Types & Phases

- Major classes
  - Generalized
  - Focal
- Phases
  - Prodromal
  - Aural
  - Ictal
  - Post-ictal

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Generalized Seizures

C/M

- Bilateral synchronous epileptic discharges in the brain from seizure onset
- Loss of consciousness from few seconds to several minutes

Types

- Tonic-clonic seizures (grand mal)
- Typical absence seizures (petit mal)

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Focal/Partial Seizures

- Simple: Remain conscious but experience unusual feelings or sensations
- Complex: Alteration/loss of consciousness, producing a dream-like experience
  - Last just a few seconds

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Complications

- Status epilepticus
  - Subclinical seizures
- Severe injury
- Psychosocial problems

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Diagnostic Studies

- Accurate, comprehensive description of seizures with patient's health history
- EEG
- Magnetoencephalography
- CBC, serum chemistries, liver and kidney function, UA to rule out metabolic disorders
- CT or MRI
- Cerebral angiography

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Collaborative Care

- Generalized tonic-clonic and focal seizures
  - phenytoin (Dilantin), gabapentin (Neurontin), levetiracetam (Keppra)
- Absence & myoclonic
  - clonazepam (Klonopin), divalporex (Depakote)
- Status epilepticus
  - IV lorazepam (Ativan), diazepam (Valium)
- Gerontologic considerations
- Surgery: Anterior temporal lobe resection
- Other: Vagal nerve stimulation

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Nursing Interventions

- **Health Promotion**
  - General safety measures, improved prenatal, labor, and delivery care
  - Assist to identify events or situations precipitating seizure, avoid if possible.
- **Acute intervention**
  - Observation and treatment of seizure
- **Ambulatory and home care**
  - Adherence to medication

http://www.epilepsy.com/mmc/animation

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Multiple Sclerosis (MS)

- A chronic, progressive, degenerative disorder of the central nervous system (CNS)
- Demyelination of nerve fibers of the brain and spinal cord occurs

Population

- Young to middle-aged adults <>20 & 50
- Women are affected more than men

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Etiology & Pathophysiology

- Infectious, immunologic, and genetic factors
- Chronic inflammation, demyelination, and gliosis in the CNS
- Virus → autoreactivate T cells → T cells migrate to CNS → blood-brain (BBB) disruption → antigen-antibody reaction → inflammation → demyelination of axons.

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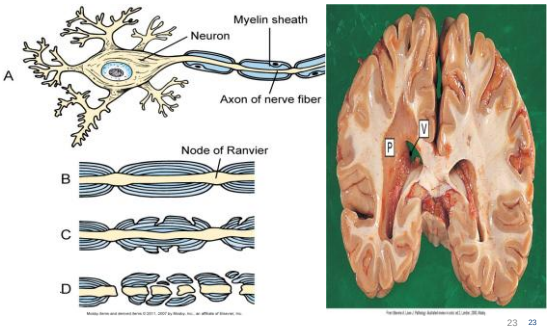
Pathogenesis of MS



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Clinical Manifestations

- Common signs and symptoms include:
  - Motor symptoms
  - Sensory abnormalities
    - Lhermitte's sign
  - Cerebellar signs
  - Emotional problems
  - Bowel & bladder problems
  - Cognitive problems
  - Sexual dysfunction

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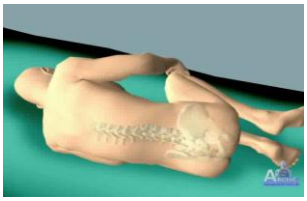
Diagnostic Studies

- H & P
- Cerebral spinal fluid (CSF) analysis
- MRI



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Collaborative Care

- Drug therapy
  - Corticosteroids: prednesolone (Prednesone)
  - Immunomodulators: interferon β1b (Betaseron)
  - Immunosuppressants: azathioprine (Imuran)
  - Muscle relaxants: baclofen (Lioresal)
  - CNS stimulants: methylphenidate (Ritalin)
  - Anticholinergics: oxybutynin (Ditropan)
  - Nerve conduction enhancer: dalfampridine (Ampyra)
- Physical therapy, water exercise

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Nursing Diagnoses

- Impaired physical mobility r/t muscle weakness
- Risk for impaired skin integrity
- Impaired urinary elimination pattern r/t sensorimotor deficits
- Ineffective self-health management r/t knowledge deficit regarding management of MS

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Nursing Interventions

- Help patient identify triggers and develop ways to avoid them or minimize their effects.
- Prevent major complications of immobility.
- Patient teaching
  - Good balance of exercise and rest
  - Well balanced diet, adequate intake of fiber
  - Avoiding the hazards of immobility
  - Self-catheterization if necessary
  - Avoiding fatigue, extremes of heat and cold, exposure to infection

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Parkinson's Disease (PD)

Chronic, progressive neurodegenerative disorder characterized by:

- Slowing down in the initiation and execution of movement (bradykinesia)
- ↑muscle tone (rigidity)
- Tremor at rest
- Gait disturbance

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Etiology & Pathophysiology

- Diagnosis↑with age, 15% of people diagnosed are <50, more common in men, ratio of 3:2
- Degeneration of dopamine-producing neurons in substantia nigra of the midbrain.
- Disrupts dopamine (DA) & acetylcholine (ACh) balance in basal ganglia
- Other causes of parkinsonism
  - Use of illicit drugs, drug induced, intoxication of chemicals
  - Hydrocephalus, MS, encephalitis, hypoxia, infections, stroke, tumor, Huntington's disease, & trauma

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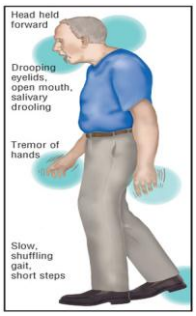
Clinical Manifestations

- Onset is gradual & insidious
- Classic triad of PD
  - Tremor
    - Occurs at rest, “pill rolling”
  - Rigidity
    - Jerky quality , “Cogwheel”
  - Bradykinesia
    - Loss of autonomic movements



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Complications

- Nonmotor & motor symptoms
- Dementia and neuropsychiatric problems
- Dysphagia —malnutrition and aspiration
- General debilitation may lead to pneumonia, UTIs, and skin breakdown.
- Orthostatic hypotension, falls/injury

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Diagnostic Tests

- No specific tests
- Diagnosis based solely on history and clinical features
  - A firm diagnosis can be made when at least two of the three characteristics of the classic triad (tremor, rigidity, and bradykinesia) are present.
  - Ultimate confirmation is a positive response to antiparkinsonian drugs

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Drug Therapy

- Dopaminergics
  - Levodopa with carbidopa (Sinemet)
  - DA receptor agonist: bromocriptine (Parlodel)
- Anticholinergics: trihexyphenidyl (Artane), benztropine (Cogentin).
- Antihistamines with anticholinergic properties: diphenhydramine (Benadryl)
- Antiviral agents: amantadine (Symmetrel)
- MAO-B inhibitors: selegiline (Eldepryl)

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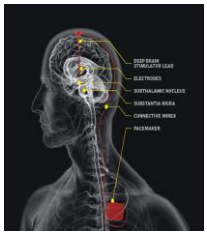
Surgical & Nutritional Therapy

Surgery

- Deep brain stimulation (DBS)

Nutrition

- Easy to chew and swallow
- Adequate roughage
- Bite sized pieces
- Small meals
- Limit protein & vitamin B6



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Nursing Diagnoses

- Impaired physical mobility r/t rigidity
- Imbalanced nutrition: less than body requirement r/t dysphagia
- Impaired verbal communication r/t tremor
- Impaired swallowing r/t decreased gag reflex

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Nursing Interventions

- Promote physical exercise and a well-balanced diet
- Teach maintenance of good health, independence, and avoidance of complications
- Promote psychological wellbeing

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Myasthenia Gravis (MG)

- An autoimmune disease of the neuromuscular junction characterized by fluctuating weakness of certain skeletal muscle groups.

Etiology & Pathophysiology

- Antibodies attack acetylcholine (ACh) receptors number of Ach receptor sites (AChR) at the neuromuscular junction

→ prevents ACh molecules from attaching and stimulating muscle contraction.

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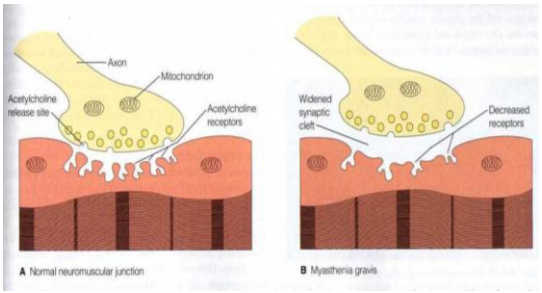
Pathophysiology



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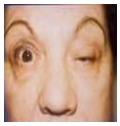
C/M & Diagnosis



Clinical Manifestations

- Fluctuating weakness of skeletal muscles
  - Eyes, eyelids, chewing, swallowing, speaking, breathing
  - "Peek sign"
- Impaired speech, facial mobility and expression
- **Diagnostic Studies**
- H&P, neuro exam
- EMG [single-fiber EMG is very sensitive]
- Tensilon (edrophonium) test is used to diagnose MG or to differentiate the crisis type

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Complications

Myasthenia Crisis: An acute exacerbation of muscle weakness. Complications are..

- Aspiration
- Respiratory insufficiency
- Respiratory tract infection

Cholinergic Crisis: Overdose of anticholinestrase drug

C/M:

- Muscle fasciculation
- Sweating
- Excessive salivation
- Constricted pupils Ref. p# 1439, Table 59-21

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Collaborative Care

Drug therapy

- Anticholinesterase agents
  - pyridostigmine (Mestinon)
- Corticosteroids
  - Prednisone
- Immunosuppressive agents
  - azathioprine (Imuran), cyclosporine (Sandimmune)

Surgical therapy

- Thymectomy

Plasmapheresis

IV Immunoglobulin G

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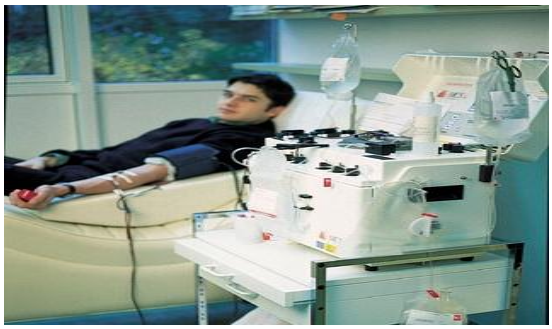
Plasmapheresis



Nursing Management

Assessment

- Respiratory function, muscle strength, cough & gag, speech

Diagnosis

- Ineffective breathing pattern r/t intercostal muscle weakness

Implemenation

- Adequate ventilation
- Semisolid foods easier to swallow
- Schedule drugs & ADL to avoid fatigue

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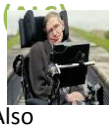
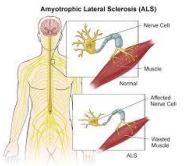
Amyotrophic Lateral Sclerosis (ALS)



A rare progressive neurologic disorder characterized by loss of motor neurons. Also known as Lou Gehrig's Disease



Demographics

- Onset between 40 & 70
- Men: women - 2:1

Etiology & Pathophysiology

- Motor neurons in the brainstem and spinal cord gradually degenerate

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C/M & Diagnosis

C/M

- Weakness of the limbs
- Dysarthria and dysphagia
- Muscle wasting and fasciculations
- Pain, sleep disorders, spasticity, drooling, emotional lability, depression, constipation, esophagial reflux

Diagnosis

- H&P, PE
- EMG

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ALS Treatment

Drugs

- CNS agent/Glutamate antagonist: Riluzole (Rilutek)

Nursing interventions

- Facilitate communication
- Reduce the risk of aspiration
- Early identification of respiratory insufficiency
- Decrease pain from muscle weakness
- Reduce risks of injury
- Provide diversional activities
- Support the patient's cognitive and emotional functions

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Dementia

- Syndrome characterized by dysfunction or loss of:
  - Memory, orientation, attention, language, judgment, & reasoning
- Personality changes & behavioral problems
- Neurodegenerative & vascular causes
- Diagnosis: 2 or more brain functions are significantly impaired

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Delirium

- A state of temporary but acute mental confusion, a common, life threatening, and possibly preventable syndrome.
- Causes: Cholinergic deficiency, excess release of dopamine, increased & decreased serotonergic activity
- C/M: Early- inability to concentrate, loss of appetite, restlessness
  Later-agitation, hallucinations

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Alzheimer's Disease (AD)

Chronic, progressive, degenerative disease of the brain.
Most common form of dementia

Etiology & Pathophysiology

•Age is the most important risk factor

•Familial & sporadic

•Genetic & environmental factors

Changes in the brain's structure and function

- Amyloid plaques
- Neurofibrillary tangles
- Loss of connections between neurons
- Neuron death

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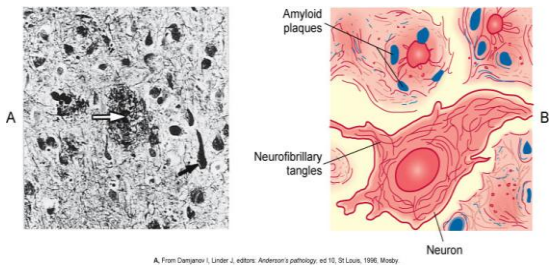
Etiology & Pathophysiology



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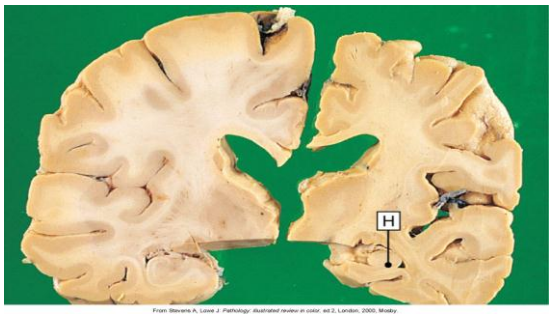
Effect of AD on the Brain



From Stevens A, Lowe J. Pathology: illustrated review in color, ed 2, London, 2000, Mosby.

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Clinical Manifestations

Early warning signs (Refer p#1448, Table 60-3)

1. Memory loss that affects job skills
2. Difficulty performing familiar tasks
3. Problems with language
4. Disorientation to time and place
5. Poor or ↓ judgment
6. Problems with abstract thinking
7. Misplacing things
8. Changes in mood or behavior
9. Changes in personality
10. Loss of initiative

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Stages of AD

- Mild
- Moderate **(Refer p#1449 Table 60-4)**
- Severe

Retrogenesis: Degenerative changes occur in the reverse order in which they were acquired

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Clinical Manifestations…

Cognitive impairments with progression of AD

- Dysphasia
- Apraxia
- Visual agnosia
- Dysgraphia
- Long-term memory loss
- Aggression, wandering

Late stages

- Unable to communicate or perform ADLs
- Unresponsive and incontinent

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Diagnostic Studies

- Diagnosis of exclusion
- H&P
- Brain imaging tests: CT, MRI,PET, MRS
- Neuropsychologic testing
- Biomarkers:
  - Levels of beta amyloid accumulation in the brain
  - CSF- levels of tau protein
- Definitive diagnosis-autopsy

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Drug Therapy

Cholinesterase inhibitors

• donepezil (Aricept), rivastigmine (Exelon)

NMDA receptor antagonist

• memantine (Namenda)

Antidepressants

• SSRIs: sertraline (Zoloft), and citalopram (Celexa)

Antipsychotics

• haloperidol (Haldol)

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Nursing Diagnoses

- Impaired memory r/t effects of dementia
- Self-neglect r/t memory deficit
- Wandering r/t cognitive impairment
- Caregiver role strain r/t lack of experience

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Nursing Interventions

- Behavioral problems
- Safety
- Pain management
- Eating and swallowing difficulties
- Oral care
- Infection prevention
- Skin care
- Elimination problems
- Care giver support
- Family & caregiver teaching **(Refer p#1456,**

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Health patterns	Stressors
Cognitive-perceptual	Forgetfulness, disorientation, confusion
Elimination	Incontinence, constipation
Role-relationship	Spouse, parent, breadwinner
Coping-stress tolerance	Anxiety, anger, depression
Activity-exercise	Muscle weakness, lack of coordination

Chronic Neuro Problems: Major Goals of Treatment

- Maximize neuromuscular function.
- Maintain independence in ADLs for as long as possible.
- Optimize psychosocial well-being.
- Adjust to the illness.
- Decrease factors that precipitate exacerbations.
- Maintain functional ability as long as possible.
- Maintain personal, emotional, and physical health.
- Cope with long-term effects associated with caregiving.

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- Lewis, S.L., Heitkemper, M.M., Dirksen, S.R., Camera, I.M., & Bucher. L. (2014). *Medical Surgical Nursing: Assessment and Management of Clinical Problems.* (9th ed.).St. Louis:Elsevier.

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