Rehabilitation of the Stroke Survivor

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Stroke

Definitions

1. A sudden impairment of body functions caused by a disruption in the supply of blood to the brain.

2. A constellation of neurological findings—sudden in onset, persisting more than 24 hours, and vascular in origin.

3. “Brain Attack”

Epidemiology

- Approximately 795,000 new or recurrent strokes in US each year
  - 610,000 first
  - 185,000 recurrent
- 6,400,000 survivors
  - 2,500,000 male
  - 3,900,000 female
- Third leading cause of death in Western countries (#1 Heart disease; #2 All cancers)
- Approximately 23% die within first year
- Stroke occurs every 45 seconds
Epidemiology

- Twice as many women die from stroke as breast cancer yearly.
- Majority of caregivers are women (as high as 75%)
- Leading cause of adult disability
- 80% of strokes are preventable
  - Lifestyle changes
  - Medications
  - Surgery
  - Combination of above

Costs

Total Costs=$68 Billion annually

- Includes direct medical costs and lost productivity

Modifiable Risk Factors

- Hypertension
- Obesity
- Hyperlipidemia
- Smoking
- Cardiac Disease/Disorders
- Diabetes
- Sedentary Life Style
- Substance Abuse
- Heavy Alcohol Consumption
- Sleep Apnea
Fixed (Non-Modifiable) Risk Factors

- Age
- Gender
- Race
- Family History
- Additional Medical Conditions (Sickle Cell Disease, Polycythemia)

Anatomical Review

- Cerebrum
  - Hemispheres
  - Lobes
- Cerebellum
- Medulla/Brainstem
- Vascular Supply

Cerebrum

- Largest and most developmentally advanced portion of brain
- Controls higher functions
  - Speech
  - Integration of sensory stimuli
  - Fine control of movement
  - Emotion
- Divided into left and right hemisphere
- Composed of frontal, parietal, temporal and occipital lobes
Cerebrum
- Frontal lobe
  -- Planning, organizing, problem solving, selective attention
- Prefrontal controls personality and higher cognitive functions (behavior/emotions)
- Back of frontal lobe consists of pre-motor and motor areas (produce and modify movement)

Parietal Lobes (Left and Right)
- Sensation and perception
  -- Touch and Pressure
  -- Fine Sensation (Judgment of texture, size, weight and shape)
- Integration of sensory input (allows for understanding a single concept)

Temporal Lobes (Left and Right)
- Auditory perception
- Receptive components of language
- Visual and verbal memory
- Emotion
Occipital Lobe
- Primary visual cortex
  -- Visual reception
  -- Visual recognition of shapes and colors

Cerebellum
- Second largest area of brain
  -- Controls:
    --- Certain aspects of movement and coordination
    --- Reflexes
    --- Balance

Brainstem
- Automatic functions critical to life
  -- Breathing
  -- Heart beat
  -- Digestion
  -- Alertness
  -- Arousal
Blood Flow to Brain

- Two major sets of arterial vessels
  1. Internal Carotid Arteries
     -- Branch to form anterior and middle cerebral arteries
     -- Form anterior circulation supplying cortex and basal surface of brain
     --- Deep structures such as thalamus & basal ganglia

Blood Flow to Brain

2. Vertebral Arteries
   -- Arise from subclavian arteries
   -- Join to form single basilar artery
     --- Divides to form 2 posterior cerebral arteries
     --- Joins blood supply from internal carotids in arterial ring at base of brain (Circle of Willis)
   -- Form posterior circulation of brain
     --- Cerebrum, part of cerebellum & brain stem

Blood Flow to Brain

- Circle of Willis
  -- Loops around brainstem
  -- With blockage, smaller arteries can receive blood from other arteries (Collateral Circulation)
  -- Formed by: posterior cerebral arteries, posterior communicating arteries, internal carotid arteries, anterior cerebral arteries and anterior communicating artery
Anterior Cerebral Artery (ACA)

Medial surfaces & upper areas of frontal & parietal lobes

-- Personality Changes & Confusion
-- Urinary Incontinence
-- Lower extremity weakness > Upper
-- Loss of coordination

Middle Cerebral Artery (MCA)

Part of frontal & lateral surface of temporal & parietal lobes

-- Most commonly occluded vessel
-- Upper extremity weakness > Lower
-- Visual field deficits
-- Alterations in communication & cognition

Posterior Cerebral Artery (PCA)

Medial & inferior temporal lobes, medial occipital, thalamus & visual receptive area

-- Receptive aphasia
-- Dyslexia
-- Visual field cuts
Vertebral & Basilar Arteries
Brainstem and Cerebellum
-- Visual & auditory deficits
-- Nausea, vertigo, ataxia, tinnitus
-- Dysarthria (motor speech disorder)
-- Dysphagia

Major Causes of Stroke
1. Ischemic
   --Thrombosis
   --Embolism
2. Hemorrhagic
   --Intracerebral
   --Subarachnoid
3. Hypotension and Blood Clotting Abnormalities

Ischemic Stroke (80-85%)
Process
--Focal area of brain receives little or no blood flow due to occlusion
Classifications
a. Transient Ischemic Attack (TIA)
   -- Brief interruption of blood flow
   -- Short, reversible ischemic event
   -- Symptoms disappear in less than 24 hours (1 hour)
   -- Major Risk Factor—Precede 20%–40% of ischemic strokes
Ischemic Stroke

b. Systemic Hypoperfusion
   -- Low blood flow

c. Cerebral Thrombus (Most common cause)
   -- Plaque
   -- Forms when calcium and lipids collect and attach to vessel wall
   -- Produces narrowing; impedes or obstructs blood flow
   -- Atherosclerosis
   -- Can produce degeneration of blood vessel walls
   -- Involves tearing of weakened wall or plaque
   -- Triggers normal clotting process; further reduces circulation
   -- Progresses slowly

d. Cerebral Embolism
   -- Traveling clot obstructs cerebral blood flow
   -- Usually associated with cardiac disease, esp. Atrial Fibrillation
   -- Neurological dysfunction is more sudden

e. Lacunar Infarct (Small Vessel Disease)
   -- Thrombotic occlusion in small, penetrating cerebral arteries
   -- Lesions are small, oval-shaped, pitting, and deep in brain
   -- Often result in pure motor or sensory deficits
   -- Associated with hypertension and diabetes

Hemorrhagic Strokes (15-20%)

Process
   -- Spontaneous rupture of cerebral vessel occurs; blood enters brain tissue or subarachnoid space

a. Intracerebral Hemorrhage
   -- Frequently caused by hypertension
   -- Small, deep-penetrating vessels rupture; release blood into tissue
   -- Released blood puts pressure on tissue/surrounding vessels
   -- Hematoma acts as space-occupying lesion (brain shifting or herniation)

b. Subarachnoid Hemorrhage
   -- Blood from ruptured vessel enters subarachnoid space
   -- Usually related to aneurysm rupture
   -- Less commonly related to AVM, anticoagulants
Signs and Symptoms

1. Headache
2. Dizziness
3. Change in Level of Consciousness
4. Unilateral Weakness or Paralysis
5. Difficulty Speaking or Understanding
6. Difficulty Swallowing
7. Visual Changes
8. Cognitive Changes
9. Sense of Anxiety

Left vs. Right Hemispheric Stroke

1. Functions of Left Hemisphere
   -- Controls language and verbal communication for most
   -- Logic
   -- Detail oriented
2. Functions of Right Hemisphere
   -- Controls spatial orientation and non-verbal communication
   -- “Big Picture”
Deficits Following Left Hemisphere Stroke

1. Paralysis/Paresis right side
2. Cautious, hesitant behavior
3. Language impairment
4. Cognitive deficits
5. Impaired ability to think analytically
6. Inability to do math computations or interpret symbols
7. Easily frustrated
Deficits Following Right Hemisphere Stroke

1. Paralysis/Paresis left side
2. Spatial-Perceptual deficits
3. Impulsive behavior
4. Cognitive deficits
5. Poor judgment, especially related to safety
6. Emotional lability
7. Time disorientation

Deficits Following Brainstem Stroke

Ischemic or hemorrhagic process in medulla, pons, or midbrain
Deficits vary greatly—many vital centers and nuclei of cranial nerves

1. Dysarthria
2. Dysphagia
3. Ataxia, staggered gait
4. Quadriparesis or quadriplegia
5. Poor balance or coordination
6. Double or blurred vision; pinpoint pupils
7. Vertigo with nausea
8. Abnormal respiratory patterns
9. Hyperthermia
10. Coma or persistent vegetative state

Question

The most common ischemic stroke syndrome involves the:

a. Anterior Cerebral Artery
b. Middle Cerebral Artery
c. Posterior Cerebral Artery
d. Anterior Cerebellar Artery
Middle cerebral artery syndrome is by far the most common of all cerebral occlusions. Fewer strokes involve the other arteries.

Mrs F. has been diagnosed with a right hemisphere stroke. Which of the following interventions is MOST appropriate for Mrs F.?

A. Break tasks into simple steps.
B) Encourage all forms of communication.
C) Monitor for swallowing difficulties.
D) Allow time for her to respond after asking a question.

Most of the teaching that occurs in rehabilitation focuses on accommodating the cognitive, sensory-perceptual, and motor deficits associated with a specific disability. When working with patients with right hemisphere stroke, impulsivity leads to lack of insight and judgment. The most effective intervention is to break tasks into simple steps to make focus more achievable. Encouraging all form of communication, monitoring for swallowing difficulties, and allowing time for the patient to respond after asking a question are more appropriate for those with a left hemisphere stroke.
Common Problem Areas Following Stroke

1. Directional Concepts
   - Inability to distinguish & interpret directional concepts
   - Examples: right/left, up/down, in/out, top/bottom, front/back, vertical/horizontal

2. Body Scheme
   - Altered perception of position of one’s body & relationship of the parts of the body

3. Figure-Ground & Spatial Relationships
   - Difficulty in differentiating foreground from background, depth & distance & like forms & objects

Common Problems

4. Hemianopsia
   - Blindness of ½ field of vision
     - Nasal field of one eye and temporal field of other eye

5. Unilateral Neglect
   - Inability to integrate sensory or perceptual stimuli from one side of body

6. Apraxia
   - Inability to carry out a motor act on command in unparalyzed extremity or part

Common Problems

7. Time Perception
   - Altered perception of concept of time

8. Agnosia
   - Inability to recognize familiar objects/symbols by means of senses

9. Anosognosia
   - Denial of extent of paralysis and physical disability
   - Reduced insight into ramifications of impairments

10. Somatognosia
    - Inability to localize and/or recognize one’s own body parts and how they are related to each other
Communication Deficits
- Aphasia
  -- Acquired language disorder
  -- Results in difficulty
    -- Expressing oneself when speaking
    -- Understanding the speech of others
  -- Reading
  -- Writing

Broca's Aphasia
(Expressive/Non-Fluent)
- Damage to left frontal region of brain
- Responsible for motor aspects of speech

Broca's Aphasia
(Expressive/Non-Fluent)
Characteristics
-- Telegraphic (articles, pronouns, prepositions, and inflections omitted)
-- Short sentence length; flat melody
-- Slow, labored speech; impaired word-finding
-- May have intact automatic speech
-- Low frustration levels; awareness of errors
Wernicke’s Aphasia (Receptive/Fluent)
Damage to posterior 1st temporal gyrus of left hemisphere

--Comprehension and expression equally impaired but with normal melody and rate
--Fluently formed, but definitely not normal
--Long, grammatically well-formed utterances;
--Verbalization may contain almost no meaning
--Reduced self-monitoring and self-correction

Transcortical Aphasias
May be fluent (sensory) or nonfluent (motor)
-- Ability to repeat & recite
-- Inability to read or write
-- Impaired comprehension
Global Aphasia
Anterior & posterior lesions extensively impaired
Characteristics
-- Severe impairment in all modalities
-- Uniformly poor speech, auditory processing, reading and writing
-- May have persistent recurrent utterance
-- May be sensitive to nonverbal communication (gestures, facial expressions)

Dysarthria
Damage to central or peripheral motor nerve, brainstem and/or cranial nerves
Speech disturbance from motor impairment involving muscles used to produce speech

Dysarthria Characteristics
-- Abnormal muscle control of oral mechanisms
-- Articulation difficulties
-- Slow, commonly slurred, hard to understand speech with abnormal tone; “breathy”
-- Writing and reading ability intact
**Terminology**

Anomia - Inability to name objects or place

Agraphia - Inability to express thoughts in written language

Alexia - Inability to understand written language

**Terminology**

Apraxia of Speech

-- Disorder of motor planning and voluntary movement to produce speech in absence of paralysis

-- Effortful, struggling behavior

-- Perseveration & inconsistency

-- Aware of errors

**Terminology**

Anarthria

-- Total loss of articulation capability

-- Absent muscle control

Automatic Speech

-- Speech consisting of habitual responses, words, phrases or songs

-- Validate yes/no reliability
Communication Tips
- Review Speech Therapist's recommendations
- Accept emotionality
- Treat patient as adult
- Avoid long explanations
- Don't shout
- Use meaningful gestures and encourage gestures
- Be patient
- Don't speak for the patient
- Offer a choice of words
- Provide recommended communication

Dysphagia & Swallowing
Cranial Nerves involved in swallowing
-- Trigeminal #5
-- Facial #7
-- Glossopharyngeal #9
-- Vagas #10
-- Spinal Accessory #11
-- Hypoglossal #12

Phases of Swallowing
1. Oral Preparatory Phase (Voluntary)
   a. Food is chewed, collected, and formed into bolus
   b. Lips are sealed to contain food inside mouth
   c. Facial tone prevents “pocketing”
   d. Tongue holds bolus against hard palate
2. Oral Phase (Voluntary)
   a. Tongue elevated and presses bolus against hard palate
   b. Tongue squeezes bolus; moves it back against soft palate
   c. Soft palate elevates to close off nasal passage
   d. Swallow is triggered
### Phases of Swallowing

3. **Pharyngeal Phase** (Most complex; initiate voluntarily but reflexive)
   a. Pharyngeal peristalsis moves bolus into pharynx
   b. Larynx raises, vocal folds adduct, epiglottis closes off trachea
   c. Respiration halts
   d. Cricopharyngeal sphincter relaxes
   e. Bolus passes through sphincter into esophagus
   f. Lasts approximately 1 second

4. **Esophageal Phase** (Reflexive)
   a. Bolus enters esophagus and travels to stomach
   b. Cricopharyngeal sphincter closes and airway opens
   c. Larynx resumes normal position
   d. Lasts approximately 8-20 seconds

### Signs and Symptoms

- Coughing (during and after meals)
- Wet or gurgly vocal quality
- Throat clearing (during and after meals)
- Running nose, tearing eyes, red face, drooling
- Difficulty chewing
- Pocketing
- Food or liquid leaking from mouth

### Swallowing Problems Related to Phases

1. **Oral Phase**
   a. Poor sensation/perception re. quantity/location of food in mouth
   b. Inadequate chewing; food pocketed to side of mouth
   c. Difficulty initiating swallow

2. **Pharyngeal Phase**
   a. Poorly coordinated swallowing reflex
   b. Coughing/choking
   c. Aspiration

3. **Esophageal Phase**
   a. Neuromuscular deficiency to complete swallow process
   b. Sensation of food sticking in throat
Diagnostic Approaches

1. Clinical Observations
2. Non-Instrumental Clinical Evaluation of Swallowing (NICE)
3. Videofluoroscopic Swallowing Study (VFSS)
4. Fiberoptic Endoscopic Evaluation of Swallowing (FEES)

Treatment Goals

a. Prevent malnutrition
b. Prevent dehydration
c. Prevent aspiration

Nursing Interventions

1. Interdisciplinary Team Involvement
2. Nutrition and Hydration Concerns
3. Positioning Guidelines
4. Feeding Programs
5. Environmental Factors
6. Correct Diet
National Dysphagia Diet
- NDD Level 1
  -- Dysphagia-Pureed (homogenous, pudding-like, very cohesive, requiring very little chewing
- NDD Level 2
  -- Dysphagia-Mechanical Altered (cohesive, moist, semisolid foods, requiring some chewing
- NDD Level 3
  -- Dysphagia-Advanced (soft foods requiring more chewing ability
- Regular
  -- All foods allowed

Liquids
- Thin
- Nectar
- Honey
- Spoon-thick
- Free Water Protocol

Question
Complications of the oral phase of swallowing include:
a. Inability to adequately chew food
b. Failure to collect the food into a bolus in the middle of the mouth
c. Inability to move the bolus from the front of the mouth to the rear
d. All of the above
The oral phase of swallowing can be compromised when the patient cannot adequately chew food because of poor dentition or weakness of the muscles used to chew and manipulate the food bolus.

If a swallowing problem is suspected, a nurse should always refer the patient to a healthcare provider certified in assessing and treating swallowing disorders. However, there are some strategies that the nurse can employ to discourage aspiration. Which of the following is an example of such an intervention?

a. Having the patient hyperelevate his or her chin when swallowing
b. Sitting the patient upright for meals and medications
c. Placing food and medication on the weaker side of the mouth for individuals with a stroke
d. Avoiding thickened liquids

Placing the patient in an upright position for meals and medications encourages him or her to swallow properly and uses gravity to enhance the swallowing process. Hyperelevating the chin actually increases the difficulty of swallowing and likelihood of aspiration. Thickened liquids are easier to manage than thin liquids.
Mrs Y has dysarthric speech as a result of a stroke. Dysarthria occurs due to neurological damage to:

a. the left frontal lobe
b. the left temporal lobe
c. both the left frontal and left temporal lobes
d. the brainstem and/or cranial nerves

Neurological damage to the brainstem and/or cranial nerves results in dysarthria, a speech problem characterized by problems with articulation and abnormal muscle control of structures such as the tongue, palate and larynx. Damage to the left frontal lobe is associated with Broca’s aphasia. Damage to the left temporal lobe results in Wernicke’s aphasia. Global aphasia occurs when both the left frontal and left temporal lobes are affected.

Mrs A has had a left hemisphere stroke. She has problems with verbal expression but comprehends what you are communicating to her. Which of the following interventions would be INAPPROPRIATE to use with Mrs A?

a. Encourage automatic speech
b. Describe aloud an activity as she is performing it.
c. Tell her you understand the communication even if you do not.
d. Don’t interrupt while she is trying to communicate
Answer

C

Pretending to understand a patient’s communication efforts is not a therapeutic intervention. Ask simple questions or use gesturing or pantomime until the communication is understood. Choices A, B and D are all appropriate interventions.

Elimination Problems

Urinary incontinence common after stroke (neurogenic bladder)

-- Increased risk with age, stroke severity, DM & other disabling diseases
-- 53-80% immediately following stroke
-- 44-69% one week post stroke
-- 31% six months post stroke

-- Associated with worse functional outcome and predictive of institutionalization

Elimination

- Goals:
  -- Manage fluids
  -- Prevent urinary retention
  -- Reduce risk of skin breakdown
  -- Gain control
Elimination Problems - Bladder

Assessment
- Continence history prior to stroke
- Recent history (i.e. UTI, urgency, frequency)
- Awareness of need to void
- Ability to perform toileting and get to bathroom
- Hygiene needs—assistance and privacy issues
- Catheter (i.e. intermittent or indwelling)
- Fluid Intake
- Medication Use

Nursing Interventions
- Scheduled voiding bladder program
- Adequate hydration
- Monitor intake and output
- Measure post-void residuals
- Catheterize as ordered; external collection device for males
- Provide time, privacy, and adaptive equipment for hygiene
- Provide medication to facilitate bladder tone and emptying
- Provide safe environment
- Meticulous hygiene; skin inspections
- Support
- Maintain dignity

Elimination Problems - Bowel

Initially, fecal incontinence occurs in substantial proportion of stroke patients
- Majority of patients improve within two weeks
- Continued fecal incontinence signals poor prognosis for regaining control

Constipation and fecal impaction more common problems
- Immobility/inactivity
- Inadequate fluid and food intake
- Depression/anxiety
- Neurogenic bowel or inability to perceive bowel signals
- Lack of transfer ability
- Cognitive deficits
Elimination Problems - Bowel

Assessment
-- Continence history prior to stroke
-- Awareness of need to defecate
-- Bowel sounds; abdominal tenderness or distension
-- Ability to get to bathroom
-- Ability to remove clothing
-- Hygiene needs
-- Privacy and Positioning

Nursing Interventions
-- Establish bowel program; verify premorbid bowel evacuation routine; follow consistent schedule
-- Increase fluid intake
-- Increase fiber/bulk intake; avoid gas-forming foods
-- Monitor intake and output
-- Monitor bowel sounds and abdominal distension
-- Position patient upright—avoid use of bedpan
-- Allow time for complete evacuation
-- Provide appropriate medications (stool softeners, laxatives, etc)
-- Encourage wear of loose clothing
-- Meticulous hygiene and skin inspections
-- Provide safe, private environment; support

Mobility Problems
- Hemiplegia/Hemiparesis
- Spasticity
- Stiffness
- Muscle spasms
- Balance problems
- Pain
- Numbness/odd sensation
- Sleep disturbances
Nursing Interventions for Altered Mobility

1. Positioning - Must support affected extremities; use devices
   - Prevent shoulder subluxation - common problem
     --- Sling applications, prevent trauma (staff/family education)
     --- Avoid use of overhead pulleys
   - Improved hand function becomes moot without integrity of shoulder
2. Transfers - Safety is paramount
3. Fall Prevention - Safety; large percentage of rehab falls
4. Pain Management
5. Prevent skin breakdown
6. Gentle ROM

Treatment Approaches

1. Compensatory
   -- Traditional — Train unaffected side to compensate for loss of function on affected side
   -- Approach from unaffected side, room set-up for all items on unaffected side, transfers occur from unaffected side
2. Neuro Developmental Approach (NDT)
   -- Bobath System and Motor Relearning Program — Due to plasticity of brain, relearning can occur after damage
   -- Reprogramming involves stimulating and using affected side
   -- Integrate affected side into functional activities
3. Constraint Induced Therapy — Forced Use
   -- Restrain use of non-affected limb for targeted # hours daily
   -- Formation of redundant neural pathways
   -- Problems with adherence
4. Partial Body Weight Support for Treadmill Training
   -- Unload lower extremities by supporting % of body weight
   -- Facilitates walking
Effects of Stroke on Cognition

Behaviors
-- Disorientation/confusion
-- Memory deficits
-- Apathy
-- Lack of motivation
-- Attention span deficits
-- Impaired problem-solving skills
-- Impulsivity
-- Perseveration
-- Agitation
-- Lack of insight
-- Depression-common (Response to loss of function suffered and damage to certain parts of brain)

Cognitive Assessment

1. Neuropsychological Testing
2. Behavioral Observations
3. Interdisciplinary Collaboration

Nursing Interventions

1. Structure and consistency
2. Facilitate reality orientation; organize and prioritize information
3. Speak in concrete terms; avoid abstract
4. Encourage participation in decision making; safe, simple choices
5. Encourage patient to make choices in care
6. Stimulate memory by repeating last response
7. Use memory aids—cues, making lists, memory games
8. Converse in one to one conversations
9. Model calm and friendly behavior to reduce fear and anxiety
10. Assess for depression (sleep disturbances, decreased appetite, tearfulness, sad appearance, withdrawal)
   Report findings to team. May need antidepressants/therapy
Impact of Stroke on Sexuality

1. Sensory/Motor Deficits - Some loss of sensation/function
2. Sexual Dysfunction - Not always, but studies show considerable decrease in sexual activity, but not necessarily in desire. May not be organic in nature
3. Cognitive Deficits - Variable effects
4. Communication Deficits
5. Behavioral Deficits
6. Elimination Problems
7. Medication/Disease Effects

Nursing Interventions-Sexuality

1. Encourage use of times of day when patient most rested
2. Provide education and support with significant other
3. Teach positioning (supine or on affected side, pillows)
4. Openly discuss fear of another stroke, esp during orgasm
5. Instruct partner on emotional lability of patient
6. Encourage tactile stimulation to enhance communication, especially in aphasic patient
7. Encourage patient to evacuate bowel and bladder prior to sex

Nursing Interventions Related to Psychosocial Needs

1. Provide time for verbalization and counseling for pt and family
2. Facilitate team and family conferences, as needed
3. Provide socialization opportunities (meals, support groups)
4. Discuss role changes with patient and family
5. Allow patient/family to grieve losses (function, role, relationships)
6. Reduce stress when possible; allow patient/family to have as much control over care as possible
7. Don’t forget to address spiritual needs
Transition to Community/Discharge Planning

Rehabilitation Goals
-- Continued progress
-- Prevention of complications
-- Quality of life
-- Appropriate health care
-- Control of risk factors

Coping Strategies for Patients and Families
-- Open communication
-- Knowledge of resources
-- Opportunities for socialization
-- Plan for success
-- Plan for emergencies

Resources

Support groups
Reference materials
Community involvement
Respite services

Treatment Advances

Advances in risk factor identification
-- Chronic inflammation may be risk factor for atherosclerosis, thus ischemic stroke (may use blood markers for chronic inflammation)
-- Genetic markers—predisposition to develop aneurysms
-- Markers may predict development of A Fib, CHF, HTN

Neuroprotective agents; Stem Cell Transplants; Hypothermia
Telemedicine for acute stroke care
Advances in medications, diagnostic technology and interventional techniques
Question

A 65 year old man is in rehab after a right hemisphere embolic stroke. He has been incontinent of a small amount of formed stool the past three mornings in therapy. He takes a stool softener BID, a bulk forming agent daily and has received a suppository every other evening, after which has passed moderate, soft BM’s. What additional information would be the MOST helpful to assess in order to prevent stool incontinence for this patient?

a. How often he used laxatives at home
b. How much fluid he drank at home
c. What time of day he defecated at home
d. How much exercise he got at home

Answer

C

All of the questions are pertinent to ask the patient. Since he is incontinent the same time of day (each AM) the nurse should suspect that this may be his normal pattern for defecation. Previous bowel patterns should be used to schedule bowel care to promote effective results during rehab, not institution convenience.
Question
Injury to which lobe of the brain may result in loss of smell, hearing deficits, memory deficits and Wernicke’s aphasia?
  a. Temporal lobe
  b. Parietal lobe
  c. Frontal lobe
  d. Occipital lobe

Answer
A
The temporal lobe controls hearing, taste, smell and memory functions. Wernicke’s area in the left temporal lobe enables speech reception and interpretation of sounds and words.

Question
Injury to which part of the brain that receives and interprets sensory input, will result in difficulty in right/left discrimination?
  a. Frontal lobe
  b. Parietal lobe
  c. Occipital lobe
  d. Temporal lobe
Injury to the parietal lobe, which receives and interprets sensory input, is usually indicated by difficulty in discriminating between right and left.