Overview of Nursing in the Inpatient Environment

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Role of the Rehabilitation Nurse

Objectives

• Discuss the history of rehabilitation

• Describe rehabilitation nurse’s scope and standards of practice
Your Roles

• What inspired you to become a nurse?
• What does Rehab Nursing mean to you?
• What strengths do you bring to the team?

Rehabilitation…A Rich History

• Emerged to help individuals integrate changes associated with disability and chronic health problems into their lives
• Many changes grew out of entering or recovering from wars of the 20th century
• 2nd half of 20th century led to national support for right to lead normal, high quality lives for those with disabilities
Historical Perspective

-- From ancient to modern times, humans have adapted & coped with disability

-- 400-300 BC, Hippocrates: “exercise strengthens and inactivity wastes”

-- 1750: Focus on importance of relationship between person’s will, range of motion and muscle reeducation

19th Century

-- 1854, Florence Nightingale organized professional nursing in England

-- 1889-1893, Growth of interest in caring for crippled children (1st US schools for crippled children established)

-- Advances in science increase potential for survival & physical restoration

20th Century

-- 1900-1919, ID need for licensure and definition of specialty of rehabilitation

-- WW I, Impact on growth of physical medicine; creation of Veterans Administration

-- 1935: Social Security Act defined rehab as a process to help those with disabilities engage in remunerative occupations

-- WW II, Further development of rehab programs
Audience Participation

Who developed the first rehabilitation services in a civilian hospital?

A. Dr. Henry Kessler
B. Florence Nightingale
C. Dr. Howard Rusk
D. Alice Morrissey

20th Century

-- Dr Howard Rusk demonstrated positive impact of rehab on men who had been hospitalized since WWI.
-- 1947, Dr Rusk established 1st rehab services in US civilian hospital
-- 1948, Dr. Henry Kessler founds Kessler Institute in West Orange, NJ
-- Increased survival with improved treatments and care

20th Century

-- 1951, Alice Morrissey wrote 1st textbook for rehab nurses: “Rehabilitation Nursing”
-- Basic bedside nursing care
-- Clinical teaching and rehab services
-- Emphasis on nutrition and ADLs
-- “Each sick person is regarded not as a patient with a disease but as a person with a future”
1960-1989
-- Broadened scope of rehabilitation (chronic diseases, aging, re-entering workforce after traumatic injury or disease)
-- Multiple legislative acts and amendments (Worker’s Comp, Vocational Rehab, etc.)
-- 1966: Commission on Accreditation of Rehabilitation Facilities (CARF) established

1960-1989
-- 1974: Association of Rehabilitation Nurses (ARN) established
-- 1975: ARN Journal developed
-- 1976: ARN recognized as specialty organization; standards & scope published
-- 1984: First certification exam held (CRRN)

1990’s
-- Decade of healthcare reform (ADA, early interventions & treatment, new/expanded roles such as case management, research & consultation, QI, ethics impact)
-- 1994: ARN updated standards and scope of practice
-- 1997: Introduction of CRRN-A (advanced)
21st Century Challenges

-- Effects of changing demographics (aging, shift of acute to chronic illnesses, complexity of care)

-- Nursing Shortage & Recruitment/Retention

-- Healthcare Crisis: Access, Equity and Reimbursement Issues (Changes in qualifying conditions/medical necessity)

-- Ethical Issues/Dilemmas (Patient rights/choices/quality of life/end of life)

21st Century Challenges

-- Integration of information technology

-- Emphasis on research/evidence-based practice

-- Changes in practice care settings

-- Disaster preparedness & education

Regulations for Acute Rehabilitation

-- Acute rehab units/hospitals are licensed
  -- 75%-60% Rule
  -- 3 Hour Rule
  -- 24/7 Specialized Nursing
-- Patient must meet “medical necessity” criteria
-- Payment based on Prospective Payment System (PPS)
Post Acute Care Funding from Medicare--PPS

-- Began in 2002 in response to Balanced Budget Act of 1997; payment system uses IRF-PAI

-- IRF-PAI
  -- Inpatient Rehabilitation Facility Patient Assessment Instrument
  -- Functional Independence Measure (FIM) is part of this instrument

-- Centers for Medicare and Medicaid Services (CMS)
  -- Require the IRF-PAI

Why Are FIM Scores Important?

Evaluation over 72-hour period from time of admission
  -- Captures current Burden of Care

-- Process to determine Case Mix Group (CMG)
  -- FIM (13 Motor & 5 Cognitive Scores)
  -- Impairment Group Code (ICD-9) (i.e., Stroke, Brain Injury, Amputation, Cardiac, Orthopedic, etc.)
  -- Admitting Diagnosis Code (ICD-9 code) (i.e., 4321 SDH; 431 SAH; 434.91 CVA)
  -- Co-morbid Conditions (i.e., dysphagia, HTN, G-Tube, PNA, etc.)

-- When CMS obtained, Length of Stay (LOS) is assigned (important for patient rehab and reimbursement)

-- One of most important parts of accurate CMS is FIM process.

Your documentation must match your FIM score!

Rehabilitation Nursing

- “The diagnosis and treatment of human responses of individuals and groups to actual or potential health problems relative to altered functional ability and lifestyle.” (ARN, 2000)
Role Responsibilities of Rehab Nurses

1. Provider of Care
   -- Caregiver
   -- Client Advocate
   -- Client Educator
   -- Counselor
   -- Nurse Practitioner
   -- Expert Witness
   -- Researcher

2. Designer, Manager and Coordinator of Care Skills
   -- Communication
   -- Collaboration (example: Goal setting)
   -- Negotiation
   -- Delegation
   -- Coordination
   -- Evaluation of Interdisciplinary Work
   -- Team Leaders and Members

3. Member of a Profession
   -- Lifelong Learning
   -- Identify with Profession’s Values
   -- Incorporate Professionalism into Practice
   -- Client Advocacy
   -- Shape Public Policy
   -- Educate Public in Disease & Trauma Prevention
• As a nurse, we have the opportunity to heal the heart, mind, soul and body of our patients, their families and ourselves. They may forget your name, but they will never forget how you made them feel.

Maya Angelou

Bowel Issues in Rehabilitation

Objectives

• Evaluate bowel structure and function

• Compare various dysfunctions of bowel elimination
Scope of the problem:
Bowel Incontinence

- Bowel incontinence is associated with urinary incontinence
- In one study looking at urinary and bowel incontinence among LTC residents (Chiang, 2000)
  - 114 out of 413 were continent
  - 53 had urinary incontinence
  - 237 had both urinary incontinence and bowel incontinence
- Socially and psychologically devastating
- Other risk factors include age, female gender, multiparity

Overall GI Function

- Interconnected
- Coordinated effort to maximize nutritional uptake, moderate fluid and electrolyte balance, eliminate waste
  - Can be too fast
  - Can be too slow
Too slow…

GI Tract—top to bottom
Points in GI tract where reflexes are activated stimulating peristalsis

Anatomy of the Lower GI Tract
- Large intestine
  - tubular muscle lined with mucous membrane 5 ft long ileum to anal canal
  - 7 sections—designed to absorb water and electrolytes and store feces
  - Internal Sphincter(involuntary)—inside anus, thickened, autonomic innervation
  - External Sphincter—visible portion of anus under voluntary control
  - Defecation initiated when fecal material enters the rectum
Rectal Anatomy

Physiology

- GI tract composed of layers of smooth muscle—longitudinal and circular
- Signals passed from one fiber to the next
- Haustral contractions (segmentation) propels content from one pouch to the next
- Peristalsis is longitudinal waves moving bolus along at rate appropriate for digestion and absorption of nutrients

Innervation of the GI tract

- Intrinsic neural control
  - Within walls of gut from esophagus to rectum
  - Independent of spinal cord control
  - Myenteric plexus in outer layer and responsible for peristalsis
  - Sub-mucosal plexus in sub-mucosa responsible for secretion and absorption
Innervation of the GI tract

- Extrinsic neural control
  - Autonomic innervation
    - Parasympathetic via vagus innervates esophagus, stomach, pancreas, 1st ½ of large bowel—via sacral supply innervates 2nd ½ of bowel with direct impact on sigmoid, rectum, and anus
    - Increases peristalsis and motility, stimulates secretions, maintains tone, relaxes sphincter
Defecation Process

- Uses reflexes and voluntary control
- Defecation reflex—peristalsis of the colon moves feces to rectum, distention, afferent signals to myenteric plexus—results in cord response to close glottis, lower diaphragm, contract abdominal muscle called Valsalva maneuver in voluntary defecation
- Peristaltic waves begin in colon and force feces to rectum with reflex contraction
- Rectal reflex relax internal sphincter, contract external sphincter
- Pelvic muscles relax simultaneously with sphincters to expel feces
- After emptying, pelvic floor rises, anal sphincter recovers

Begins with your morning coffee...

Ends with a trip to the bathroom...
Bowel Initial Assessment

- **Nursing History**
  - Principal Diagnosis and Comorbidities
  - Prior patterns—time of day, triggers, use of laxatives
  - Medical history—constipation, diverticulosis
  - Normal intake of food and fluid
  - Normal activity pattern
  - Medication use—narcotics and others

- **Examination**
  - Bowel sounds
  - Abdominal distention
  - Appearance of stool
  - Fecal impaction, hemorrhoids, rectal prolapse

Establishing a “clean” bowel

- Patients post acute care are often constipated and/or impacted when they arrive in rehabilitation
- These conditions cause pain, discomfort, lethargy, possible obstruction
- They can interfere with ability to participate in rehabilitation process
- Normal bowel function contributes to the patient’s sense of dignity and self-esteem
- Not addressing this issue can be disastrous

Achieving a clean bowel

- Create a balance between fully evacuating the bowel and increasing bowel motility that might lead to diarrhea
- Combination of diet modifications, increased fluid intake, laxatives, cleansing enemas, and disimpaction may be required
- This may take several days to complete
- Any bowel program cannot begin until a clean bowel has been established
Neurogenic Bowel

- **Upper Motor Neuron Bowel-Reflexive**
  - Encourage the pt. to eat a meal, or drink 6-8 ounces of warm liquid thirty minutes before the bowel program to take advantage of the gastrocolic reflex
  - Manually remove any stool in the rectal vault, and perform digital stimulation for about one minute, with a gloved, lubricated finger. Topical anesthetic ointment should be applied five minutes beforehand if the pt. has previously experienced autonomic dysreflexia during the program
  - Repeat the digital stimulation three to four times with a ten minute gap between stimulations
  - If no response to digital stimulation, stimulate the intestinal mucosa by inserting a suppository which will cause stool to move down into the rectum by way of its irritant action.
  - Modify diet, fluid intake, use of medications to create a soft stool with once a day evacuation and no incontinence between

Neurogenic Bowel

- **Lower Motor Neuron**- spinal cord trauma at or below T12-L1
  - Flaccid or areflexic bowel
  - Flaccid rectal sphincter with risk of incontinence
  - Establish a daily regime following a meal or hot liquid-wait about 30 minutes
  - Have patient perform a gentle Valsalva to initiate bowel activity
  - Perform a disimpaction either side lying on the commode or toilet
  - Finish sitting on a commode or toilet to facilitate complete evacuation
  - Modify the diet, fluid, and medications to create a firm stool and decrease the risk of incontinence
  - Perform a bowel program before community outings
Neurogenic Bowel

- Uninhibited neurogenic bowel: Stroke, Brain Injury, MS
  - No conscious control
  - Reflexive bowel programs can be utilized
  - Bowel continence is achievable with a regular bowel program consciously applied

Expected Outcomes

- Effectiveness - The goal is to prevent episodes of bowel incontinence.
- Acceptability – Must be compatible and workable.
- Cost effective – Use of least costly medications.
- Health maintenance – Complications vs. results.

Results of a Good Bowel Program
Designing an Individualized Bowel Program

- Always take the pt’s prior evacuation pattern into account.
- The program should be daily, or every other day at the same time of day.
- Any pt. that has experienced autonomic dysreflexia during digital stimulation or when passing stool should have a topical anesthetic (Xylocaine) inserted into the rectum five minutes before performing the bowel program.
- Oral medications should be given at a time that will provide the best effect with the timing of the bowel program.

Medications

- Stool softener – Colace
- Stimulants – Senokot, Pericolace,(softener and stimulant).
- Bulk formers – Fibercon, Metamucil

Keys to Success

- Compliance
- Maintenance of technique
- Adequate fluid intake, diet, physical activity, and personal hygiene
- Management of constipation
- Adherence to medication schedule
- **Compliance**
Case Study

- Michael J., a 33 year old Caucasian male, is admitted to the rehab hospital with an incomplete spinal cord injury at the C-6 level following a motor vehicle accident. Michael lives at home with his wife and two small children. He works full time as janitor in a large office building. His wife babysits for two children as well as her own in their home. Michael has been having difficulty having bowel movements, but when he does, they are unexpected. Michael is often angry when these episodes occur and lashes out at the staff as well as his wife. In spite of this, Michael will not discuss a bowel routine with his physician.

Audience Participation

- Would Michael’s bowel program need to be designed for a reflexive or flaccid bowel?
  
  A. Reflexive
  B. Flaccid

Audience Participation

- Michael’s Bowel Program will be most effective if he is given time to accept his condition before initiating a bowel routine.

  A. True
  B. False
Audience Participation

Michael's Bowel Program should include which of the following:

A. Suppositories and digital stimulation  
B. Valsalva Maneuver  
C. High Fiber and Stool Softeners  
D. A and C Only  
E. All of the Above

Open Discussion:

• What strategies can we use to educate and assist Michael in coping with his condition?  
• What psychosocial factors need to be included in designing Michael's bowel program?
Bladder Management in Rehabilitation

Objectives

• Describe the neurological control of bladder function
• Distinguish various types of incontinence
• State two goals of bladder management

Scope of the Problem: Incontinence

• Prevalence: >17 million Americans in community or institutional settings experience urinary incontinence
  Newman, 2002
  – Under 30 yrs 14-40% women 5-15% men Newman, 2002
  – 30-60 yrs 10-29% women 2-12% men Hampel, 1997
  – 65+community 12-49% women 7-22% men Yarnell, 1981

• Age 75 and older associated with poor recovery from incontinence Patel, 2001

• Associated with lower FIM on admission Ween, 1996, & with lower FIM gains than continent patients Gross, 1998
Scope of the Problem: Incontinence

- Associated with worse functional outcome, and predictive of institutionalization (4X greater risk) across cultures Minassian, 2003

- Predictive of
  - Falls Lamb, 2003
  - Lower functional ADLs Sveen, 2004
  - Re-hospitalization Thom, 1997

- Associated with
  - Disorientation to time, memory impairment Owen, 1995
  - Cognitive impairments Patel, 2002
  - Impaired social cognition Gross, 1998
  - Cough increases risk Finkelstein, 2002

Normal Bladder Function: the Urinary Tract (Upper & Lower)

**Upper** - urine production & drainage

- Kidneys - filter waste, reabsorb electrolytes, and produce urine.
- Ureters - bilateral muscular tubes that drain urine from kidneys to bladder.

**Lower** - micturition (voiding process)

- Bladder - reservoir for urine and hollow muscular organ with two parts
- Urethra - tube that carries urine from the bladder out of the body.
Structures That Aid Continence

- **Deep Perineal Muscles** – make up external (voluntary) sphincter mechanism
- **Pelvic Floor Muscles** - voluntary contraction of these muscles results in compressing, lengthening, and elevating the urethra
- **Prostate Gland (males)** - the urethra passes through the prostate gland - which contains smooth & striated muscle

Bladder Anatomy

Normal Micturition

- **Filling and Storage Phase** - Bladder fills with urine which is stored until stretch receptors are activated
- **Contraction Phase** - 200-300 ml (up to 600) stimulation of stretch receptors, signal to cord, initiation of voiding reflex
- **Emptying Phase** - relaxation of sphincters resulting in voiding
Assessment of Voiding Dysfunction

• Medical History
  – Childbirth
  – Surgery
  – Acute and/or chronic illness
  – Diabetes
  – Neurological diseases (CVA, dementia, Parkinson’s disease)
  – Renal disease
  – Bowel disorders
  – Cancer
  – Medications

• History
  – Onset & duration
  – Frequency
  – Timing (day, night, or both)
  – Precipitating circumstances (cough, sneeze, laugh, exercise, positional changes, hand washing, etc.)
  – Urgency
  – Leakage
  – Voiding characteristics (spurt or stream, continuous dribbling)
  – Use of pads/protective briefs

• Other factors to consider...
  – Awareness of bladder fullness
  – Ability to delay voiding
  – Sensation of incomplete bladder emptying
  – Dribbling after urination
  – Obstructive symptoms (hesitancy, slow or interrupted stream, straining)
  – Symptoms of urinary tract infection (dysuria, hematuria)
Diagnostic Testing - Basic

• Measurement of Post-Void Residual (PVR) bladder ultrasound

• Urinalysis/culture and sensitivity

• Blood tests: BUN, Creatinine, glucose, calcium

• 24 hour urine for creatinine clearance

Diagnostic Testing – Advanced

• Urodynamics – anatomical & functional status of bladder

• Cystometry – bladder sensation, capacity, compliance

• Cystoscopy – lesions, fistulas, strictures

• Electromyography – integrity & function of urethral sphincter

• Renal scan

• Renal ultrasound/CT scan/IVP

Neurogenic Bladder Dysfunction

• Most common form of bladder impairment seen in rehabilitation settings.

• Mostly due to combined sensory and motor impairment.

• Sensory and motor messages are interrupted between the bladder and supra-spinal center.

• A dysfunction that results in the interference with the normal nerve pathways associated with urination
Neurogenic Bladder Dysfunction
(failure to empty, failure to store or
both)

Five types:
• Uninhibited-failure to store
• Reflex or spastic-both
• Areflexive or flaccid-failure to store or failure
to empty atonic
• Sensory paralytic-failure to empty
• Motor paralytic-failure to empty

Uninhibited Neurogenic Bladder

• Frequent involuntary bladder contractions —
  failure to store
• Injury: cortex, brainstem, pons, or subcortical
  areas
• Etiology: stroke, brain injury, multiple
  sclerosis, encephalopathy, dementia,
  Alzheimer’s disease
• Symptoms: lack of awareness, frequency,
  urgency, decreased bladder capacity, low
  residual volumes.

Uninhibited Neurogenic Bladder

• Associated with variable volumes and timing
  of bladder emptying
• Most challenging to manage with reliance on
  urinary containment
• Typical type of incontinence post stroke, often
  transient
• Once diagnosed, patient should be reassessed
  weekly for changes in patterns of cognition
  and control
Reflex Neurogenic Bladder

Upper motor neuron dysfunction
Sensory & motor tracts disrupted between bladder and brain – failure to store/reflex voiding
• Injury: SCI above T12-L1, or level of the sacral reflex arc
• Etiology: SCI, multiple sclerosis, spinal cord tumor
• Symptoms: some or no awareness of voiding, unpredictable voiding, voiding occurs in response to reflex (stroking, tapping, etc.)

Areflexive (Flacid) Neurogenic Bladder

Includes paraplegia (complete LMN injury and atonic bladder (ie. Diabetes)
Lower motor neuron dysfunction (paraplegia) Failure to store
– Injury: Sacral reflex arc
– Etiology: SCI to sacral arc, spinal shock, polio, vascular occlusion to spinal cord, herniated lumbar disc, pelvic surgery
– Symptoms: absent voiding reflexes, flaccid bladder and flaccid sphincter
Atonic Bladder with poor bladder tone
Failure to empty

Areflexive Atonic Neurogenic Bladder

- Co-morbid conditions increase risk, such as diabetes
- Long-term may be difficult to reverse damage to bladder and kidneys
- Must be ruled out by post-voiding bladder ultrasound and/or PVR
- Regaining bladder tone and normal reflex voiding is central to treatment plan
- PVR of 150 or > associated with UTI

Dromerick, 2003

Paralytic Bladder

- Motor Paralytic
  - Injury: anterior cell horns or S2-4 ventral roots; motor side of micturition reflex damaged
  - Etiology: Poliomyelitis, herniated disc, pelvic trauma
  - Symptoms: NO voluntary control, difficulty passing urine, incomplete emptying with high residual volumes

- Sensory Paralytic
  - Injury: posterior horn cells or S2-4 ventral roots; sensory side of micturition reflex damaged
  - Etiology: diabetes, pelvic surgery or trauma, PVD
  - Symptoms: lacks awareness to void, infrequent voiding, large volume voids with low residual volumes

Audience Participation

- Patients who have suffered a stroke and are incontinent of bladder, rarely regain bladder control.
  A. True
  B. False
Incontinence

- Involuntary loss of urine resulting from pathological, anatomical or physiological factors.

-- Can be transient or chronic.

Consequences

- Skin breakdown
- Urinary tract infections, sepsis
- Falls and injuries
- Dehydration
- Embarrassment, social isolation, anxiety, depression, dependence, impact on sexual activity
- Impaired Quality of Life

Management Strategies

- Goals
  - Must develop a REALISTIC program for patient and caregiver according to dysfunction, capabilities & lifestyle

- Compliance with regular emptying
  - to prevent lower tract complications
  - to prevent upper tract complications
Management Strategies

- All types of incontinence
  - Use gravity and normalize activity—standing to void for men, sitting for women
  - Ongoing assessment and intervention for high PVR
  - Eliminate delays, barriers, streamline transfers and clothing management
  - Good hydration and nutrition—malnutrition associated with incontinence
  - Predict voiding patterns and act
  - Assure privacy and dignity

Behavioral Training

Low risk: cost effective, non-invasive, patient independence, strain for caregiver

**Timed Voiding** — stress, urge, mixed, uninhibited neurogenic bladder
  - Set up fixed schedule, void by clock
  - Titrate up 15 minute increments every 3 dry days
  - Good for decreased cognition - CVA, TBI

**Habit Training** - stress, urge, mixed, uninhibited neurogenic bladder, predictable incontinence episodes
  - Scheduled toileting
  - Based on current voiding patterns (Voiding Diary)
  * Both are enhanced with Kegel Exercises

Behavioral Training

- **Double-Voiding- Overflow**
  - Void, wait, void again
  - May need relaxation or stimulant
Pelvic Muscle Rehabilitation

- **Kegel Exercises** - Stress, Urge, Mixed
  - Requires concentration, motivation
  - Active contraction of pubococcygeal muscle
  - Strengthens pelvic muscles
  - Strengthens muscles to support pelvic structures
  - Strengthens voluntary periurethral muscles

Absorbent Products

- Pads, inserts, briefs, diapers
  - NOT for Urinary Retention
  - Adjunct to Timed Voiding, other treatment methods
- **Pros** - usually cost effective
  - Not usually covered by insurance
  - May need letter of medical necessity
- **Cons** - Caregiver Stress, impaired skin integrity, fungal infections, self-esteem

External Condom Catheters

- Reflex Voiding, incontinence, nocturia, post-prostate surgery
- **Pros** – Non-invasive, ↓ risk bladder stones, measure output
- **Cons** – Leg bag (body image), skin breakdown (insert Foley to heal), adhesive problems, short penis
- Correct size and type
- Daily change – wash with gentle soap, dry well
- Avoid Lotions and oil based ointments
Intermittent Catheterization

**Urinary retention or overflow**
- Neurogenic bladder dysfunction, spinal shock, post SCI, enlarged prostate, high PVR
- Minimize urinary retention
- Safely empty bladder
- Consistent intervals (4-6hrs)
- Fluid management

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**Intermittent Catheterization**

- SCI below C7 can usually manage self IC
- Clean technique (hospital-sterile)
- Pros - ↓ risk UTI's, bladder stones, less upper tract complications
- Cons – risk of trauma/stricture, false passage, bacteruria,
- Contraindications - ♀ with adductor spasms
  - Poor hand/eye coordination, poor cognition, poor motivation, urethral false passage

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**Indwelling Catheter**

- Pros – for long term use, patients who cannot do IC, lifestyle, caregiver resources, increase tone of detrusor
- Cons - ↑ risk UTI’s, epididymitis, bladder stones, renal inflammation, bladder cancer, detrusor contractions, false passage, sphincter spasms, urethral trauma
Medications

Spastic Bladder (upper motor neuron)
Anticholinergics (Ditropan, Oxytrol Patch, Detrol, Enablex, Sanctura)
• Relaxes smooth muscle to increase bladder capacity
• Common Side Effects - dry mouth, dry eyes, constipation, nausea, dizzy
• Contraindicated in narrow angle glaucoma
• Check PVR after initiating therapy

Medications

Alpha Blockers (Hytrin, Minipress, Flomax, Uroxatrol)
• Relaxes smooth muscle to decrease outlet obstruction at bladder neck and sphincter
• Start med at night to avoid dizziness due to hypotension

Medications

Stress Incontinence
• Estrogens (oral or vaginal): restore mucosa, increase vascularity & tone – postmenopausal
  (progesterone may be given intermittently)
• Antihistamine: pseudoephedrine- Increases urethral resistance by contracting sphincter
Medications

- **Urinary Anti-infective Agents** (Hiprex and Mandelamine)
- Decrease bacterial growth
- Supplement with Vitamin C 500 mg bid
  (makes formaldehyde to decrease bacterial growth)

Urinary Problems in Rehabilitation

- Foley Catheter Issues
  - Bleeding
  - Obstruction
- Difficult Catheterization
  - Lidocaine Gel
  - Urological Consult
- No Urine Output
  - Consider dehydration/hemodynamic compromise
- Swollen Testicles (Epididymitis or Sarcoma)
- Bladder Stones (Hematuria, persistent UTIs, catheter obstruction)
- Infection

Urinary Tract Infections

- Symptoms: elevated temperature, increased WBC, confusion/change in mental status
- Treat with Culture Sensitive Antibiotic
- GU Irrigant – Neosporin solution
Complications of Antibiotics

• **C-difficile** - add Flagyl or oral Vanco
• **Yeast** - Diflucan
• **Resistance** – Neosporin Irrigation
• **Common side effect** - GI complaints
• **Monitor renal function** if on IM or IV routes

Bladder Management

• **Largest impact on quality of life & patient outcomes**
• **Integral component of rehabilitation nursing practice**
• **Interventions essential to successful outcomes**
• **Independent realm of nursing practice as well as collaboration with medical**
• **Promote continence or reduce frequency of incontinence**

Thank You!
Objectives

- Describe the incidence and prevalence of decubitus ulcers in various rehab healthcare settings
- Explain the relationship between critical physiological issues such as vascularity, temperature, age, oxygenation and skin integrity
- Discuss the appropriate strategies for the prevention of impaired skin integrity

Functions of Skin

- Thermoregulation
- Protection from injury
- Shields underlying tissue
- Communication with the environment
Pressure Ulcers

- Total National cost of pressure ulcer treatment is more than $11 billion annually
- Estimated $2,000-$70,000 per pressure ulcer
- 60,000 people die from pressure ulcer complications each year
- More than 1 million people have pressure ulcers in acute care and skilled nursing facilities

Definition Of A Pressure Ulcer

- Definition: A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction. (New NPUA Guidelines February, 2007)
- Generally pressure ulcers occur when a person is sitting or lying in one position for too long without shifting their weight
- The constant pressure against the skin causes a decreased blood supply to that area; without sufficient blood supply, that area of tissue dies

Pressure Ulcer Formation

- Local Ischemia: Pathological changes to capillaries and tissues. May occur in less than 2 hours
- Cell Death: Progression of tissue change in response to obstruction of capillary blood flow. Patient may report pain, warmth to area and slight edema
- Tissue Collapse: Non reversible. Area will be cool to the touch, may feel hard or indurated, or soft and boggy
- Infection: No swab cultures as pressure ulcers are generally colonized and may not reveal an underlying soft tissue infection or osteomyelitis
Where do Pressure Ulcers occur the most often?

A. Heels  
B. Sacrum  
C. Hips  
D. Ischium

Locations Of Pressure Ulcers

- Ischium 24%
- Sacrum 23%
- Trochanter 15%
- Heel 8%
- Malleolus 7%
- Knee 6%
- Iliac Crest 4%
- Elbow 3%
- Pretibial Crest 2%
- Skull 1%

Unstageable Pressure Ulcer

Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed.
Unstageable Pressure Ulcer

Unstageable Pressure Ulcer

Unstageable Pressure Ulcer

FIGURE 2. Unstageable pressure ulcer in which the base is partially covered by slough
**Stage I Pressure Ulcer**

- Definition: Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.
- In individuals with darker skin discoloration, warmth, edema, induration or hardness may also be indicators.

**Stage II Pressure Ulcer**

Definition: Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.
Stage II Pressure Ulcer

Definition: Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.

Stage III Pressure Ulcer

Definition: Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.
Stage III Pressure Ulcer

Stage IV
Pressure Ulcer

Definition: Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.
Suspected Deep Tissue Injury

- Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.
Infected Pressure Ulcer

- Marked by increased wound size, perilesional warmth and tenderness, erythema on the surrounding skin, malodorous base, and increased wound exudate

Stage the Following Wounds
Audience Participation

- The following should be staged as pressure ulcers:
  - Skin tears
  - Sacral slits
  - Incontinence associated dermatitis

A. True  B. False

Not a Pressure Ulcer

- Skin Tear
- Sacral Slit
- Incontinence Associated Dermatitis

Not Pressure Ulcers
Risk Assessment for Pressure Ulcers

Factors that place persons at risk
- Inability to perceive pressure/temperature
- Exposure to incontinence, moisture, chemicals or radiation
- Decreased activity level
- Smoking
- Diabetes

Risk Assessment for Pressure Ulcers Continued
- Inability to reposition
- Poor nutritional intake/hydration
- Friction and shear
- Medications
- Skin care products
- Psychosocial factors/life satisfaction

Addressing the Risk Factors for Prevention of Pressure Ulceration
- Turning/repositioning schedule
- Mattress overlays/beds/wheelchair seating
- Nutritional supplements
- Skin protection
Pressure Ulcer Risk Assessment Tools

- A. Braden Scale - assesses 6 client factors: mobility, activity, moisture, sensory perception, nutrition, friction and shear
- B. Norton Scale - assesses 5 factors: physical condition, mental condition, activity, mobility and incontinence

Braden Scale

- Highest possible score is a 23
- Lowest possible score is a 6
- Mild risk = 15-18
- Moderate risk = 13-14
- High Risk = 10-12
- Very High Risk <9

Pressure Redistribution

- Bed bound patients must be repositioned at least every 2 hours and chair bound patients every 15 minutes.
- Reposition while on special beds and overlays
- Persons must be turned at least 30 degrees to redistribute pressure from the sacrum
- Use wedges and pillows to support bony prominences
- Float heels off the bed surface
Horizontal Support Surfaces

- DMERC Category 1: static overlays, non-powered mattresses and powered mattresses with an air lift < 2.5 inches
- Durable Medical Equipment Regional Carrier

Horizontal Support Surfaces

- DMERC Category 2: alternating pressure, air flotation mattress or overlay greater than 3 inches or a powered overlay, mattress or bed

Horizontal Support Surfaces

- DMERC Category 3: An air-fluidized bed is a device employing the circulation of filtered air through silicone coated ceramic beads, creating the characteristics of fluid. When the patient is placed in the bed, his/her body weight is evenly distributed over a large surface area, which creates a sensation of floating.
Chair Support Cushions

- Use Pressure distributing cushions
- Instruct patient and family members to relieve pressure while seated every 15 minutes (including when patient is in the shower chair or on a commode)
- Consider tilt/reclining chair for more pressure distribution

Wheelchair Cushions

- Foam - from 1-4 inches thick and range from soft to firm density; need to be replaced frequently
- Floatation - air, water or gel-some contain cells that function independently
- Air cycling-customized inflation and cycling action
Interface Pressure Mapping

- A tool that provides a way for us to assess the interface pressure between an individual and their seating surface.
- The main purpose of is to look at the distribution of the pressure over their seated surface and note peak areas.

Pressure Mapping

- Before and after a wedge was added

Wound Treatment: Debridement

- Sharp
- Enzymatic
- Mechanical
Wound Treatment: Debridement

• Enzymatic

Wound Treatment: Debridement

• Mechanical: wet to dry dressings

Wound Treatment: Cleansing

• Normal Saline
• Commercially prepared solutions
Wound Treatment: Dressings

- Gauze
- Transparent Film
- Hydro gels
- Alginites
- Hydro colloids
- Foams
- Absorptive fillers
- Regranex

Wound Treatments: Absorptive Fillers

- Absorptive fillers: Used to absorb exudates and fill dead space.
- Generally covered with transparent film or hydrocolloid dressing

Wound Treatments: Gauze

- Purpose to absorb; supports moist wound healing if kept moist; used to fill sinuses or dead space; should be packed lightly to prevent impaired circulation
- Also may be impregnated with petrolatum or gels
Wound Treatments: Transparent Film

- The first occlusive dressings; insulate; protect; and maintain the moist wound surface.
- Permeable to oxygen and water vapor but impermeable to fluids and bacteria
- Non-absorptive

Wound Treatments: Hydro gels

- Gels that may be poured into the wound; mild absorption; may fill dead space; painless

Wound Treatment: Alginates

- Alginates: Occur naturally in seaweed, absorb exudates, maintains a moist wound bed and can be used with either shallow or deep wounds
Wound Treatments: Hydrocolloids

- Hydro colloids: Wafer that protects the moist wound bed yet absorbs exudates; Occlusive and prevents O2 from entering the wound. This occlusion promotes wound healing when growth factors are allowed to proliferate under the dressing.

Wound Treatments: Foams

- Foams: Non-adherent wafers; good absorption; hydrophobic surface repels contaminants.

Wound Treatments: Regranex

- Regranex: wound healing agent and recombinant human platelet derived growth factor
- Works by bringing the cells that the body uses to repair wounds to the site of the ulcer.
**Wound Treatments: VAC**

- Vacuum assisted closure
- Developed by a plastic surgeon and received FDA approval in 1995
- A negative-pressure sponge dressing is placed within the wound to increase blood flow, increase granulation tissue and nutrients to the wound

**CONTRAINDICATIONS**
- Malignancy in the wound
- Untreated Osteomyelitis
- Non-enteric and unexplored fistula
- Necrotic tissue with eschar present
- Do not place V.A.C.® dressing over exposed blood vessels or organs

**PRECAUTIONS**

**PRECAUTIONS**: Precautions should be taken for patients with:
- Active bleeding
- Anticoagulants
- Difficult wound hemostasis
- When placing V.A.C.® dressing in proximity to blood vessels or organs, take care to ensure that all vessels are adequately protected with overlying fascia, tissue or other protective barriers.
- Greater care should be taken with respect to weakened, irradiated or sutured blood vessels or organs.
- Bone fragments or sharp edges could puncture protective barriers, vessels or organs

Follow universal precautions
Wound Treatments: VAC

- Patients can attend therapy
- Battery pack
- Dressing change every 2-3 days

Surgical Management

- Stage III and IV wounds are often closed by myocutaneous flap
- Early closure decreases loss of fluid and nutrients, improves the health status of the client, and leads to earlier recovery and mobilization

Myocutaneous Flap
Burns

Points to Remember

- Pre medicate before shower or wound care
- Allocate enough staff
- Prepare dressings before change
- Ensure that temperature and pressure of water can be regulated
Points to Remember Continued

• Move quickly
• Clean thoroughly
• Remove “egg white” like drainage
• Pat dry lightly
• Cover with dressings
• Compression

Wound Documentation

• On Admission
• Every time the treatment is performed
• Weekly
• Discharge

What to Document?

• Location
• Size-length, width & depth
• Staging if it is a pressure ulcer
• Presence or absence of sinus tracts, tunneling, exudate, odor, necrotic tissue, infection, pain, epithelialization and granulation tissue
• Condition of surrounding skin
• Treatment
Admission Wound Assessment

- All pressure ulcers
- All skin tears, abrasions, surgical wounds, suture lines, burns
- Measurement
- Anatomical Assessment
- Photography

Daily Wound Assessment

- Document the time you observed the wound
- The condition of the wound
- The general condition
- A general note
- Treatment that you employed

Weekly Wound Assessment

- Document the measurements in centimeters
- The status of the wound
- Complete a nursing skin reassessment weekly on the night prior to the doctor’s team conference
Discharge

- Photograph
- Measure
- Nursing skin reassessment within 24 hours of discharge
- Exception-emergent discharges

When to Photograph?

- Newly acquired pressure ulcers or wounds
- Also complete an incident report with any newly acquired wounds
- Healed wounds
- Based on nurses judgment

PAIN MANAGEMENT
Objectives

- Define pain
- Describe types of pain
- Describe treatment modalities for pain

Definition

- Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.
  - “Pain is whatever the person experiencing it says it is and occurs whenever they say it does” (McCaffrey, 1979)

Types of Pain

- Acute Pain: result of trauma or injury (accidents, falls, burns), disease processes or surgical interventions
  - Diminishes with healing; disappears when healing complete
- Chronic (Neuropathic) Pain: lasts more than several months.
  - May be due to acute conditions or unknown processes
    - Cancer
    - Debilitating conditions

American Academy of Pain Management

TYPES OF PAIN

• **Ischemic**: loss of blood flow to tissues in different parts of the body
  – Aching
  – Burning
  – Paresthesia

• **Treatment**: directed at improving blood flow to the area of injury and reducing tissue hypoxia

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Types of Pain

• **Nociceptive**: Occurs with normal processing of pain impulses. Detected by peripheral nervous system and transmitted to brain via spinal cord.

• **Somatic**: Well localized, constant and sharp, aching, throbbing or gnawing. Pain that originates from:
  – bone
  – joints
  – muscles
  – skin
  – connective tissue

• **Visceral**: Cramping or squeezing in nature. Pain that originates in cutaneous tissues, deep somatic tissues or organs.

• **Neuropathic**: Chronic pain that results from long-term changes in nervous system; lacks recognized physiological function.

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Types of Pain

• **Referred**: Perceived pain in an area other than the actual source of injury.
  Examples include the pain from a myocardial infarction that is felt in the jaw or the left arm.
  – Pain is usually referred to other structures within the same sensory dermatone.
**Acute Pain Assessment**

- **Physiological**
  - Acute
    - Respirations
    - Pulse
    - Blood Pressure
    - Dilated pupils

- **Behavioral**
  - Acute
    - Restlessness
    - Distraction
    - Worry
    - Distress

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**Chronic Pain Assessment**

- **Physiologic**
  - Normal respirations
  - Normal pulse
  - Normal pupil size
  - No diaphoresis

- **Behavioral**
  - Reduced physical activity
  - Despair
  - Depression
  - Hopelessness

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**PAIN SCALES**

- Verbal Pain Intensity Scale
- Visual Analog Scale
- Numeric Pain Intensity Scale
- Faces Pain Scale - Revised (FPS-R)
**PQRST: Pain Assessment**

**Provocative or Palliative**
- Ask the patient:
  - What provokes or worsens your pain?
  - What relieves pain or causes it to subside?

**Quality or Quantity**
- Ask the patient:
  - What does the pain feel like?
  - How much pain do you have right now?
  - To what degree does the pain affect your normal activities?
  - Do you have other symptoms along with your pain, such as nausea & vomiting?

**Region and Radiation**
- Ask the patient:
  - Where is your pain?
  - Does the pain radiate to other parts of your body?

**Severity**
- Ask the patient:
  - How severe is your pain? How would you rate your pain on a scale of 0-10, with 0 for no pain and 10 being the worst pain?
  - How would you describe the intensity of your pain?

**Timing:**
- Ask the patient:
  - When did your pain begin?
  - At what time of the day is your pain best? What time is it worst?
  - Is the onset sudden or gradual?
  - Is the pain constant or intermittent?
Physiologic Responses To Pain

- **Autonomic Nervous System**
  - Responsible for much of the physiological response to pain

- **Sympathetic Nervous System**
  - Elevated heart rate
  - Elevated Blood Pressure
  - Elevated Respiratory rate
  - Dilated pupils
  - Perspiration
  - Pallor

Pain Stimulus

- **A-Delta Fibers** - transmit pain very quickly as an initial response to tissue injury
  - Characterized by
    - Stinging
    - Sharpness
    - Localization

- **C-Fibers** - transmit pain impulse slowly
  - Characterized by
    - Dull
    - Aching
    - Poorly localized
Perception

- Awareness of pain sensation
- Influenced by:
  - Attention
  - Distraction
  - Anxiety
  - Fear
  - Fatigue
  - Prior Experience
  - Expectations

Pain Perception

- **Pain Threshold**
  - Level of painful stimulation
  - Varies among individuals
- **Pain Tolerance**
  - The degree of pain that is bearable
  - Varies widely among individuals
- **Pain Expression**
  - How pain is communicated
    - Pacing, grimacing, crying, moaning
    - Muscle guarding, jaw clenching

Treatment Modalities

- Interrupting peripheral transmission
- Modulating pain transmission at the spinal cord level
- Altering the perception and integration of nociceptive impulses in the brain
Interrupting Peripheral Transmission of Pain

- **Non-pharmacologic**
  - Splinting an injured limb alters pain transmission by reducing tissue injury
  - Applying heat or cold alters the blood flow to the area by reducing swelling

- **Pharmacologic**
  - NSAIDs interrupt peripheral transmission at the early stage
    - Acts by inhibiting the production of prostaglandins, thereby reducing the number of pain chemicals available to stimulate nociceptors in the peripheral tissue
    - Prostaglandin inhibition blocks the maintenance of gastric mucosa, thereby resulting in potential GI bleeding
  - NSAIDs decrease platelet aggregation and cause renal insufficiency
  - Knowledge of risk is important for safe patient care

Modulating Pain Transmission

- **Non-Pharmacologic Modalities:**
  - Cutaneous stimulation: acts on large sensory fibers to block central progression of nociceptive transmission
    - Examples include:
      - Transcutaneous electrical nerve stimulation
      - Massage
      - Acupuncture
      - Application of heat and cold
      - Therapeutic touch

Modulating Pain Transmission

- **Pharmacologic Modalities:**
  - Act at the level of the spinal cord and may include epidural and intrathecal analgesia

- **Spinal Analgesia:**
  - Intraspinal opioids bind with opioid receptors in the posterior horn of the spinal cord, thus decreasing release of neurotransmitters
  - Block nerve conduction at the posterior nerve root
    - May include:
      - Opioids
      - Local anesthetic
      - Adrenergic blocking agents (Clonidine)
Altering Pain Perception

- **Opioids:**
  - Highly concentrated in the brain
  - Work on specific receptor sites located throughout the body
  - Alter the perception of pain by the brain
  - Effective in suppressing pain at rest

- **Side effects:**
  - Constipation
  - Respiratory depression
  - Physical dependence
  - Tolerance

Non-Opioids

NSAIDs: Ibuprofen/Naproxen

- Decrease pain, fever and inflammation by blocking prostaglandin synthesis
- Newer NSAIDs only block the COX-2 pathway of prostaglandins; the COX-2 provide more gastrointestinal protection, thus decreasing the incidence of GI bleeding
- Both NSAIDs and COX-2 inhibitors relieve nociceptive and neuropathic pain
- Use caution in patients allergic to aspirin because it inhibits platelet aggregation, increasing the risk for bleeding.

Pain Management

- **Patient Controlled Analgesics:**
  - Allows patient to self-administer small amounts of opioids

- **Conscious Sedation:**
  - Light sedation used during procedures

- **Regional Analgesic:**
  - Nerve blocks

- **Use of Intercostal Blocks**
  - Fractured ribs
  - Thoracic surgery
Pain Management

• **Non-Pharmacologic Regimen:**

  **Distraction Therapy:** relaxation, music  
  Acts by increasing the number of stimuli reaching the brain

  **Imagery:**  
  Alters the perception of painful stimuli in the higher centers of the brain thereby producing relaxation

  **Biofeedback:**  
  Acts as a conditioned response, usually learned as pain control strategy  
  Controls pain by increasing blood flow to the targeted body areas and increases amount of endorphins released

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Pain Management

• **Nonopioids:** Acetaminophen  
  - Relieves pain and reduces fever but offers little anti-inflammatory effect  
    - Caution against ceiling dose; higher dose won’t increase pain relief  
    - Metabolized in the liver; overdose may cause liver failure

  **Anticonvulsants, Benzodiazepines, Tricyclic antidepressants:**  
  - Relieves neuropathic pain  
  - Relieves nociceptive pain by decreasing skeletal muscle activity

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Nursing Interventions

• Establish rapport with patient  
• Teach patient that they are most accurate reporter of pain experience  
• Instruct patient that pain is individualized  
• Educate patient about pharmacological and adjunct interventions. Include patient in plan  
• Evaluate patient’s response to interventions  
• Collaborate with team to advocate for effective interventions
Case Study

Joyce S. is a 64 year old female with a history of ovarian cancer. She has had multiple abdominal surgeries and has recently learned that her cancer has metastasized to her lungs and bones. She is experiencing a significant amount of pain in her back and in her hips. She has been independent, living at home with her husband who has many health issues. Joyce takes care of the house and bills. She also has many grandchildren and enjoys babysitting them. Joyce is afraid pain medication will make her too drowsy to do the things she wants to. What type of pain management program can we put together for her?

Myths About Pain

• There are some kinds of pain that can’t be relieved
• Pain medication causes heavy sedation
• For pain to be real, it must have an associated physical cause
• It is best to save the stronger pain relievers “until the very end”
• Once you start pain medicines, you always have to increase “that dose”
• Pain medications always lead to addiction

Questions?

THANK YOU!
Nursing Care of Stroke Patients

OBJECTIVES

• Describe physiological changes that occur after a stroke

• Describe various nursing interventions for stroke rehabilitation

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 700,000 new or recurrent strokes each year
  - 500,000 first
  - 200,000 recurrent
  - 25% of stroke survivors will have second within 5 years
- Third leading cause of death in Western countries
- Approximately 23% die within first year
- Stroke occurs every 45 seconds
- Leading cause of adult disability

Epidemiology

- Twice as many women die from stroke as breast cancer yearly
- 80% of strokes are preventable
- Majority of caregivers are women (as high as 75%)

Costs

2007 Total Costs=$62.7 Billion annually

- Includes direct medical costs and lost productivity
Modifiable Risk Factors

- Hypertension
- Obesity
- Elevated Cholesterol
- Smoking
- Cardiac Disorders
- Substance Abuse
- Heavy Alcohol Consumption

Fixed Risk Factors

- Age
- Gender
- Race
- Family History
- Additional Medical Conditions

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

Frontal Lobe
- Planning, organizing, problem solving, selective attention
- Prefrontal controls personality & higher cognitive functions (behavior/emotions)
- Back of frontal lobe consists of pre-motor and motor areas (produce and modify movement)

Parietal Lobes
- Primary sensory cortex
  -- Control sensation
    --- Touch
    --- Pressure
    --- Judgment of texture
    --- Weight and size
    --- Shape
Temporal Lobes
- Differentiate smells & sounds
- Assist in sorting new information (may be responsible for short-term memory)
  -- Right lobe=visual memory
  -- Left lobe=verbal memory

Occipital Lobe
- Processes visual information
  -- Visual reception
  -- Visual recognition of shapes/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. Carotid Arteries
     -- Externals supply face and scalp
     -- Internals supply anterior 3/5 of cerebrum, except parts of temporal and occipital lobes
  2. Vertebral Arteries
     -- Travel along spinal column
     -- Join to form single basilar artery
     -- Supply posterior 2/5 of cerebrum, part of cerebellum and brain stem
Blood Flow to Brain

- Internal carotid & vertebobasilar arteries connect through Circle of Willis
  -- Loops around brainstem
  -- Anterior, Middle and Posterior Cerebral

Major Causes of Stroke

1. Ischemic
   --Thrombosis
   --Embolism
2. Hemorrhagic
   --Intracerebral
   --Subarachnoid
3. Hypotension and Bloo
Ischemic Stroke (80%)

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
   -- Major Risk Factor—Precede 20%-40% of ischemic strokes

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
   -- Usually associated with cardiac disease (Atrial Fibrillation)
   -- Neurological dysfunction is more sudden
Hemorrhagic Strokes (20%)

a. Intracerebral Hemorrhage
   -- Frequently caused by hypertension
   -- Small, deep-penetrating vessels rupture
   -- Released blood puts pressure on tissue/surrounding vessels
   -- Hematoma acts as space-occupying lesion

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

2. Functions of Right Hemisphere
   -- Controls spatial orientation and non-verbal communication
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 (Safety)
6. Emotional lability
7. Time disorientation
Deficits Following Right Hemisphere Stroke

1. Directional Concepts
2. Figure-Ground and Spatial Relationships
3. Hemianopsia
4. Unilateral neglect: inability to integrate sensory or perceptual stimuli from one side of body
5. Apraxia: inability to perform tasks or movements when asked
   -- Request/command understood
   -- Willing to perform task
   -- Muscles needed to perform the task work properly
   -- Task may have been learned

Deficits Following Brainstem Stroke

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

1. Dysarthria (articulation)
2. Dysphagia
3. Ataxia, staggered gait
4. Quadripareis 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

Communication Deficits

- Aphasia
  -- Acquired language disorder
  -- Results in difficulty
    -- Expressing oneself when speaking
    -- Understanding the speech of others
  -- Reading
  -- Writing
Fluency vs. Nonfluency

- Fluent; Wernicke’s; Receptive
  - Normal/excessive rate of speech
  - Normal length of utterance
  - Normal melodic contour
  - Overall ease of production
  - Normal articulation

Fluency vs Nonfluency

- Nonfluent; Broca’s; Expressive
  - Slow rate of speech
  - Short sentence length
  - Reduced melody of speech
  - Effortful production

Aphasia
Global Aphasia

Pathophysiology - Anterior & posterior lesions

Characteristics:
-- Severe impairment in all modalities
-- Uniformly poor speech, auditory processing, reading & writing
-- May be sensitive to nonverbal communication (gestures, facial expressions)

Communication Tips

- Review Speech Therapist's recommendations
- Accept emotionality; Treat patient as adult
- Avoid long explanations; Don't shout
- Encourage and use meaningful gestures;
- Don't speak for patient; Offer choice of words
- Provide recommended communication aids
- Be Patient

Case Study

- Mr. Henry F. has suffered a stroke and is struggling with aphasia. It is obvious he knows what he wants to say, but cannot verbalize. Ultimately, he becomes very frustrated, raising his voice and becoming red faced. After a few minutes of this, he shakes his head and refuses to communicate. What strategies can we use to decrease his frustration? What has been the most successful strategy you have used in the past?
Dysphagia

Cranial Nerves Involved in Swallowing
1. Trigeminal #5
2. Facial #7
3. Glossopharyngeal #9
4. Vagus #10
5. Spinal Accessory #11
6. Hypoglossal #12

Four Phases of Swallowing
1. Oral Prep Phase
2. Oral Phase
3. Laryngeal Phase
4. Esophageal Phase

Dysphagia 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

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 Diets)

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*

**WHAT IS A FREE WATER PROTOCOL?**
- Based on Frazier Rehabilitation Institute (KY) protocol developed in 1984
- Allows patients with dysphagia free access to water
  - Neutral Ph
  - Absorbed by lung mucosal tissue/no obstruction
  - No evidence that aspiration of water is harmful
- Promotes thorough oral hygiene
  - Prevent infections (pneumonia, thrush, gingivitis)
  - Prevent malnutrition & dehydration

**OUTCOMES**
- Increased opportunity to practice swallowing
- Reduced risk for aspiration pneumonia
- Improved oral hygiene practices ***
- Increased patient satisfaction and control
- Improved quality of life
Elimination Problems

Urinary incontinence common after stroke
-- 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/protocol
- 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 sensations
- 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)
   --- Improved hand function moot without shoulder integrity
2. Transfers- Safety is paramount
3. Fall Prevention- Safety; majority rehab falls stroke patients
4. Pain Management
5. Prevent skin breakdown
6. Gentle ROM
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 & 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 & prioritize information
3. Speak in concrete terms; avoid abstract
4. Encourage participation in decisions; 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 & friendly behavior to reduce fear & anxiety
10. Assess for depression (sleep disturbances, tearfulness, decreased appetite, sad appearance, withdrawal)
11. Report findings to team. May need antidepressants/therapy
1. Sensory/Motor Deficits-Some loss of sensation/function
2. Sexual Dysfunction-Not always, studies show considerable decrease in sexual activity, not necessarily 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 Related to Sexuality
1. Encourage use of times of day when patient rested
2. Provide education and support with significant other
3. Discuss positioning
4. Openly discuss fear of another stroke
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: Psychosocial Needs
1. Provide time for verbalization & counseling
2. Facilitate team & family conferences
3. Provide socialization opportunities (meals, support groups)
4. Discuss role changes with patient & family
5. Allow time to grieve losses (function, role, relationships)
6. Reduce stress when possible; allow patient/family to have control over care as appropriate
7. 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

Focus is on Preventive Future
Critical Thinking

• Not new for nursing

• Thinking process that guides nursing practice must be:
  – Organized
  – Purposeful
  – Disciplined

• Not limited to problem solving or decision making. Use critical thinking to:
  – Make observations
  – Draw conclusions
  – Create information and ideas
  – Evaluate
  – Improve knowledge base
Critical Thinking and Nursing Judgment

• How do we make decisions?
• How do nurses make decisions about patient care?
• What do we rely on to help us in decision making?

Critical Thinking and Nursing Judgment

• Critical thinking involves the use of several concepts, including: exploring, analyzing, prioritizing, explaining, deciding, and evaluating to identify solutions and determine a course of action to solve patient care problems.

Critical Thinking

• Critical thinking is reasonable and rationale
  – Critical thinkers do not jump to conclusions
  – Collect data (vital signs)
  – Weigh the facts (BP high, Headache)
  – Think the matter through (Check orders for medications or call MD)
Critical Thinking

• Critical thinking is reflective
  – Think the matter through
  – Weigh the facts and evidence (Does patient have history of hypertension, did he have his medications today, were they given on time)

Critical Thinking

• Critical thinking inspires an attitude of inquiry
  – Critical thinker wants to know how things work and why the body responds the way it does to disease, treatment, medications, etc.

Critical Thinking

• Critical thinking is autonomous thinking
  – Critical thinkers are not easily manipulated (i.e. patient demanding medications for pain)
  – Need specifics, i.e. How much pain, where, for how long, how often, is there a history, etc.
Critical Thinking

• Critical thinking includes creative thinking
  – Nurses come up with original ideas for day-to-day problems

Critical Thinking

• Critical thinking is fair thinking
  – Not biased or one-sided
  – Frequently about setting rules

Critical Thinking

• Critical thinking focuses on deciding what to believe or do
  – Used to decide on course of action
  – Make reliable observations
  – Draw sound conclusions and inferences
  – Solve problems
  – Evaluate policies and actions
  – Reflecting
Critical Thinking Competencies

- Scientific Method
- Problem Solving
- Decision Making
- Diagnostic Reasoning and Inferences
- Clinical Decision Making
- Nursing Process

Critical Thinking

- **Exploring** encourages you to identify all the variables within a situation.
- **Analyzing** is the process of studying each variable to understand its meaning and its relationship to the other variables.
- **Prioritizing** requires you to weigh the relative importance of each variable to the others, at a given point in time.

Critical Thinking

- **Explaining** the variables involves the exercise of amplifying each variable to understand its meaning in the situation and to the involved parties.
- **Deciding** means to choose a specific course of action.
- **Evaluating** requires the thinker to assess how correct the thinking process was, and if further action is needed.
Critical Thinking

- Lifelong Process
- Flexible, open process
- Learn to think and to ANTICIPATE
- What, Why, How questions
- Look beyond the obvious (but don’t forget obvious)
- Reflect on past experience
- New knowledge challenges traditional ways

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Critical Thinking

- Mr. George is your patient. He is a 18 year old young man thrown from the van in which he was riding, when it was hit head on by an oncoming car. He is unconscious and has a cervical fracture. He has no movement of his extremities. Suddenly during the middle of the night, his legs begin to move. On each of the 5 components of critical thinking, write down what could be going on with your patient.

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Critical Thinking

- **Exploring**: what could be causing the movement in Mr. George’s legs?
- Spinal Reflexes
- Purposeful movement
- Muscular spasms
Critical Thinking

- **Analyzing:** what other information can I gather to help me narrow down the possible causes of his movement?
- Are the movements purposeful?
- Can the movements be duplicated?
- How much movement is possible?
- Does the patient report any changes in sensation?

Critical Thinking

- **Prioritizing/Deciding:** is this change significant to this patient, and do I need to even look further? This also includes the decision that is made whether to inform the physician of the change in their patient’s status. What would you say?
- With the patient having a stable overall status, it would most likely be best to report this to the physician first thing in the morning.

Critical Thinking

- **Evaluating:** after reporting the alteration to the patient’s Physician, he orders the following:
  - Spine CT
  - Neurological Consult
  - Every 4 hour neurological checks
- At this point, the Physician’s orders indicate to you that he is thinking along the same lines as you did, and your thinking process was complete
Mrs. Harmon, a 67-year-old patient who suffers from COPD has been admitted to your unit from another facility. Upon admission you note her to be alert, oriented, and appropriate. She provides you with information to complete her history. After completing & charting your assessment, you leave her to see to your other patients. An hour later when you return, you note that Mrs. Harmon does not seem as alert, and appears to be confused. On each of the 5 components of critical thinking, write down what could be going on with your patient.

Exploring: what could be causing this previously alert woman to be so suddenly confused?
- Hyoxia
- Hypotension
- Fatigue
- Infection
- Medications
- Unfamiliar Surroundings
- Stroke

Analyzing: what other information can I gather to help me narrow down the possible causes of her confusion?
- Vital Signs
- Oxygen Saturation / ABG
- Medications taken & last dose time
- Further assessment of confusion level
- Previous history of confusion?
- Potential infection sites & their appearance
Critical Thinking

- **Prioritizing/Deciding:** is this change significant to this patient, and do I need to even look further? This also includes the decision that is made whether to inform the physician of the change in their patient’s status. What would you say?

- Considering that Mrs. Harmon is a new patient, and that this is a sudden change, it is potentially clinically significant, and should be investigated thoroughly, and reported to the Physician right away.

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Critical Thinking

- **Evaluating:** after reporting the alteration to the patient’s Physician, he orders the following:
  - STAT ABG & STAT Portable CXR
  - Blood Cultures
  - Urine & Sputum Cultures
  - Head CT in the morning if confusion doesn’t resolve
  - Discontinue all medications that could cause confusion
  - At this point, the Physician’s orders indicate to you that he is thinking along the same lines as you did, and your thinking process was complete

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Critical Thinking

- Now the next time you have a patient who suddenly presents with confusion, you have a “history” with that experience, and have a knowledge base to draw from.
Thank you!

Questions?