Michigan State University
College of Nursing

NUR 307

Concepts of Nursing Care of Children and Their Families

Course Syllabus: Required on Campus
Section 1

Course Faculty:
Mary Kisting, RN, MS
Linda Spence, RN, PhD

Spring, 2002
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COURSE DESCRIPTION

NUR 307 is designed to acquaint the student with the nursing care of infants and children within the framework of normal physical, cognitive, and psychosocial development. Nursing care is viewed as well-child health supervision, ambulatory child health care and care of the child in the acute care setting.

NUR 307 assists the student in developing a concept of family-centered care from infancy to adolescence. The course focuses upon the care of the child during health and illness. Emphasis is placed upon planning, administering and evaluating nursing care based upon the developmental needs of the child, and the problems confronting him and his family within their cultural, ethical and social structure. The most common medical-surgical problems of each age group are considered; integrating nutritional, psychological, pharmacological, teaching-learning, habilitational and rehabilitational aspects throughout the course. Clinical experience is provided concurrently within a pediatric setting.

COURSE OBJECTIVES

At the completion of NUR 307, the student will be able to:

1. Describe the family centered approach to the care of children and their families.
2. Describe the child's response to health/health care, illness and hospitalization using a holistic model.
3. Examine medical, nursing, ethical, cultural, and legal issues that impact the health care of children.
4. Identify appropriate nursing interventions for health promotion, disease prevention, and illness management for children across the developmental continuum.
5. Identify safety and health promotion issues that impact children and their families.
6. Demonstrate an understanding of the home, ambulatory, and hospital nursing care of children throughout the developmental continuum.

INSTRUCTIONAL MODEL

Lecture format and collaborative prospects with supportive readings. **STUDENTS ARE EXPECTED TO HAVE READ ASSIGNED READINGS PRIOR TO CLASS.**
GRADING

The student's course grade will be determined as follows.

<table>
<thead>
<tr>
<th>Examination</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination #1</td>
<td>20%</td>
</tr>
<tr>
<td>Examination #2</td>
<td>20%</td>
</tr>
<tr>
<td>Examination #3</td>
<td>20%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>40%</td>
</tr>
</tbody>
</table>

EXAMINATIONS

Three examinations will be given, two one-hour examinations and a cumulative final examination. Students will be held responsible for material discussed in class, information from prior courses, and assigned readings.

All students are expected to take the exams at the designated date unless PRIOR arrangements are made with the course chairperson. If not able to contact her call the College of Nursing office (355-6523) immediately and leave a message regarding the reason for absence. It will be your responsibility to reach the faculty as soon as possible following the administration of the exam. At the time of contact, a health provider’s statement will be requested for an illness excuse. Arrangements to take the exam must be made with the faculty member at the time she is notified of the reason for the delay.

Students who make alternate arrangements to take the exam may be given a different exam which may include essay questions. No grade alterations will be made later than two (2) weeks after the exam date.

POLICY OF UNANNOUNCED QUIZZES:

Unannounced quizzes may be given at any time during the class period.

When a quiz is given, the points will count toward the NEXT scheduled examination.

EXAMPLE:

<table>
<thead>
<tr>
<th>Total Possible Points</th>
<th>Your Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz on 9-13-01</td>
<td>3 points</td>
</tr>
<tr>
<td>Quiz on 9-27-01</td>
<td>5 points</td>
</tr>
<tr>
<td>Examination #1</td>
<td>65 points</td>
</tr>
</tbody>
</table>

Make up quizzes will only be administered in case of personal or immediate family illness. A health providers statement may be requested.
GRADING CRITERION

The following grading system will be used to determine course grades. For conversion purposes, the student should use the following scale:

<table>
<thead>
<tr>
<th>PERCENTAGE (%)</th>
<th>GRADE POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>94-100</td>
<td>4.0</td>
</tr>
<tr>
<td>85-93</td>
<td>3.5</td>
</tr>
<tr>
<td>80-84</td>
<td>3.0</td>
</tr>
<tr>
<td>75-79</td>
<td>2.5</td>
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<tr>
<td>70-74</td>
<td>2.0</td>
</tr>
<tr>
<td>65-69</td>
<td>1.5</td>
</tr>
<tr>
<td>60-64</td>
<td>1.0</td>
</tr>
</tbody>
</table>

STUDENT-FACULTY CONFERENCES

Feel free to make an appointment with course faculty to discuss your performance, or clarify course content. They may be contacted before or after class, or by leaving a message in the College of Nursing office (A-230 Life Sciences).

MANDATORY CLASS ATTENDANCE

Nursing is a professional program and classroom attendance is an expectation.

*Roll will be taken at each **CLASS and you will be penalized if you DO NOT attend class.

For each 3 classes missed, the final grade will be decreased by .5.

EXAMPLES:

<table>
<thead>
<tr>
<th>ABSENCES</th>
<th>GRADE</th>
<th>FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>3.0</td>
<td>2.5</td>
</tr>
<tr>
<td>06</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>09</td>
<td>3.0</td>
<td>1.5</td>
</tr>
<tr>
<td>12</td>
<td>3.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**CLASS is defined as the entire period of time from 1:00 pm - 2:50 pm.

*Roll = Each student must assume personal responsibility for making certain that they sign the list. If your signature is NOT on the list you will be marked absent.

Failure in NUR 307 will occur if anyone is caught forging a signature.
ACADEMIC DISHONESTY POLICY

Michigan State University adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades, and in the all-University Policy on Integrity of Scholarship and Grades, which are included in Spartan Life: 1998 Student and Handbook and Resource Guide and on the MSU Web site.

Academic dishonesty in ANY FORM will NOT be tolerated. Any student involved in academic dishonesty will be reported to the Student Affairs Committee and a grade of 0.0 will be issued for the course.

REMINDER:

RIGHTS AND RESPONSIBILITIES OF THE STUDENT 2.3.5. The student’s behavior in the classroom shall be conducive to the teaching and learning process for all concerned. (SPARTAN LIFE).

REQUIRED TEXTS


COURSE FACULTY

<table>
<thead>
<tr>
<th>NAME</th>
<th>OFFICE NO.</th>
<th>OFFICE PHONE</th>
<th>CON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary Kisting, RN, MS</td>
<td>A115 Life Sciences</td>
<td>355-3309</td>
<td>355-6523</td>
</tr>
<tr>
<td>(email: <a href="mailto:kisting@msu.edu">kisting@msu.edu</a>)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(home: 381.8986)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linda Spence, RN, PhD</td>
<td>A102 Life Sciences</td>
<td>353-8684</td>
<td></td>
</tr>
<tr>
<td>(email: <a href="mailto:lindas@msu.edu">lindas@msu.edu</a>)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Office hours available by appointment
Michigan State University  
College of Nursing  

Nursing 307  

Concepts of Nursing Care  
of Children and their Families  

Course Timeline  

<table>
<thead>
<tr>
<th>Date</th>
<th>Content</th>
<th>Faculty</th>
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</thead>
<tbody>
<tr>
<td>January 10, 2002</td>
<td>Course Introduction Health Care Concepts for Children</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>January 17, 2002</td>
<td>Alterations in Neuro/Trauma</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>January 24, 2002</td>
<td>Alterations in Neuro/Sensory</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>January 31, 2002</td>
<td>Exam I</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>February 7, 2002</td>
<td>Alterations in Oxygenation – Respiratory pathologies</td>
<td>L. Spence</td>
</tr>
<tr>
<td>February 14, 2002</td>
<td>Alterations in Oxygenation (cont’d)</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>February 21, 2002</td>
<td>Alterations in Oxygenation &amp; Alterations in Elimination (Renal)</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>February 28, 2002</td>
<td>Exam II</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>March 7, 2002</td>
<td>Spring Break</td>
<td>Enjoy</td>
</tr>
<tr>
<td>March 14, 2002</td>
<td>Alterations in Elimination (GI)</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>March 21, 2002</td>
<td>Alterations in Oxygenation (Cardiac)</td>
<td>L. Spence</td>
</tr>
<tr>
<td>March 28, 2002</td>
<td>Alterations in Oxygenation (Cardiac)</td>
<td>L. Spence</td>
</tr>
<tr>
<td>April 4, 2002</td>
<td>Exam III</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>April 11, 2002</td>
<td>Alteration in Mobility (Musculoskeletal)</td>
<td>M. Kisting</td>
</tr>
<tr>
<td>April 18, 2002</td>
<td>Chronic Illness &amp; the Dying Child</td>
<td>L. Spence</td>
</tr>
<tr>
<td>April 25, 2002</td>
<td>Chronic Illness</td>
<td>L. Spence</td>
</tr>
<tr>
<td>Self Study</td>
<td>Endocrine</td>
<td>Students</td>
</tr>
<tr>
<td>May 1, 2002</td>
<td>Final examination – Room A 131LS</td>
<td></td>
</tr>
</tbody>
</table>

NUR 307 Spring 2002
UNIT: CHILD HEALTH CARE CONCEPTS

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Compare the physical assessment of the child to the adult.
2. Describe the social, cultural, and religious influences on child health care.
3. Identify the nurse's role in caring for children and families.
4. Describe the family influences on child health care.
5. Identify developmental milestones of the infant, toddler, pre-schooler, school-age child, and adolescent.
6. Determine appropriate communication strategies to be utilized by the nurse in caring for the infant, toddler, pre-schooler, school-age child and adolescent.
7. Identify appropriate nursing care strategies based upon the developmental levels of infants, children and adolescents.
8. Identify the role of feeding and nutrition for the physical and psycho-social health of children.

REQUIRED READINGS:

NURSING 307
■ Pediatric Nursing
  - family centered care
    • partnership
  - atraumatic care

■ Applicability to other areas

NURSING 307
■ Pediatric Nursing Role
  - advocate
  - educator
  - support
  - restoring/maximizing role
  - collaborator
  - researcher
  - planner

NURSING 307
■ CRITICAL THINKING

NURSING 307
■ Nursing Process
  - Assessment
  - Diagnosis
  - Planning
  - Implementation
  - Evaluation
  - Documentation

NURSING 307
■ Family influences
■ Family Theories
  - family systems
  - family stress theory
  - developmental theory
■ Family structure and function

NURSING 307
■ Cultural and Religious influences
■ Cultural health practices
■ Affects on nursing care
NURSING 307
- One generation plants the trees; another gets the shade.
  - Chinese proverb

NURSING 307
- Growth and Development
  - Stages
  - Patterns

NURSING 307
- Physiologic differences between children and adults
  - Metabolism affects caloric requirements
  - Temperature decreases with maturity
  - Sleep requirements also decrease

NURSING 307
- Theories of Personality development
  - Psychosocial (Erikson)
  - Psychosexual (Freud)
  - Cognitive (Piaget)
  - Language
  - Moral (Kohlberg)
  - Spiritual

NURSING 307
- Erickson
  - (0-1) Trust vs mistrust
  - (1-3) Autonomy vs shame, doubt
  - (3-6) Initiative vs guilt
  - (6-12) Industry vs inferiority
  - (12-18) Identity vs role confusion

NURSING 307
- Piaget
  - Sensorimotor (0-2)
  - Preoperational (2-7)
  - Concrete operations (7-11)
  - Formal operations (11-15)

NURSING 307
- PLAY is essential

NURSING 307
- Factors influencing development
  - heredity
  - neuroendocrine
  - nutrition
  - relationships
- socioeconomic  
- disease  
- environment  
- stress  
- mass media

NURSING 307  
- General approaches to children  
  - Sequencing exams  
  - Preparing the child  
  - Physiologic measurements

NURSING 307  
- Pediatric differences  
  - Head - larger proportion to body  
    - control 4 mos.  
    - position  
  - Skin - smooth  
  - Nails - affected in growth  
  - ENT

NURSING 307  
- Pediatric differences (cont’d)  
  - chest  
  - lungs  
  - heart  
  - abdomen

NURSING 307  
- Pediatric differences  
  - extremeties  
  - genitalia  
  - developmental assessment
UNIT: ALTERATION IN NEURO/TRAUMA -- CHILD MALTREATMENT

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Differentiate between child abuse and neglect.
2. Define physical and emotional abuse and neglect of children.
3. Identify current epidemiological trends in child abuse.
4. Describe common characteristics of abused children and their abusive parents.
5. Recognize pertinent cues indicative of child abuse.
6. Understand the nurses legal and ethical responsibility for reporting child abuse.
7. Describe strategies for family intervention where abusive behavior exists.
8. Describe community resources available to abusive families.
9. Identify professional disciplines which may become involved with abusive families and their potential roles.
10. Identify ethical issues involved regarding the rights of individuals vs. rights of families vs. rights of the wider society.
11. Distinguish between the types of head injuries and the serious complications.

REQUIRED READINGS:

Altered States of Consciousness

Increased Intracranial Pressure
- Components - brain, CSF, blood
- Compensation
- Deterioration

Increased ICP Assessment
Early signs
- Infant
  - bulging fontanels
  - irritable
  - high-pitched cry
  - distended scalp veins
  - changes in feeding
- Child
  - headache
  - nausea/vomiting
  - diplopia
  - seizures
  - restlessness
  - drowsiness, lethargy
  - memory loss
  - inability to follow commands

Increased Intracranial Pressure
Late signs
- Decreased responsiveness
- Pupillary changes
- Posturing
- Respiratory pattern abnormalities
- Papilledema

Altered States of Consciousness
- Level of consciousness is the earliest indicator of neuro status
- Glasgow Coma Scale (GCS)
  - Maximum score is 15
  - Normal is 14-15
– Score <8 require airway

**Neurologic evaluation**

• Vital signs
• Skin
• Pupils
• Motor function

**Neurologic evaluation**

• Diagnostic tests
  – Lumbar puncture (LP)
  – Electroencephalography (EEG)
  – Computerized tomography (CT) scan
  – Radiography
  – Magnetic resonance imaging (MRI)
  – Angiography

**Neurologic evaluation**

• Preparation
  – age appropriate, including parents
  – sedation

• Support

• Recovery
  – positioning
  – assessment
  – emotional reassurance

**Unconscious child**

• Routine monitoring
• Respiratory management
  – temporary
  – long-term

**Intracranial Pressure monitoring**

• Indications
  – monitoring
  – drainage

• Types
• Management

**Unconscious child**

• Nutrition

• Hydration
  – SIADH vs DI
• Medications
• Thermoregulation
• Elimination

**Unconscious child**
• Hygiene
• Positioning
• Stimulation
• Support

**Cerebral trauma**
• Causes
• Mechanism of injury
  – acceleration-deceleration
  – coup-contrecoup

**Cerebral trauma**
• Concussion
• Contusion/laceration
• Fractures
• Hemorrhage
• Edema

**Concussion**
• Common
• Associated with confusion & amnesia

**Contusion & laceration**
• Small hemorrhages on brain surface
• Symptoms vary with extent of injury
• Less common in infants
• Laceration associated with fracture

**Fractures**
• Types
  – linear
  – depressed
  – compound
  – basilar
  – diastatic

**Epidural hemorrhage**
• Between dura and skull
• Usually arterial
• Low incidence in children <4 yrs
• Signs and symptoms
  – general
Subdural hemorrhage
• Bleeding below dura
• Usually venous
• Peak incidence 6 months
• Tends to spread slowly - generalized effect
• Symptoms follow increased ICP signs

Cerebral edema
• Peaks at 24-72 s/p injury
• Primary injury
• Secondary anoxia
• Compression

Diagnosis of cerebral trauma
• History
• Initial assessment
  – ABCD
  – Cervical spine stabilization
  – Constant monitoring
• Diagnostic tests
  – CT
  – MRI

Management
• Minor injuries managed at home
• Fluids based on LOC
• Medications as needed
• Position
• Surgery
• Education & support
• Prognosis

Cerebral trauma
• Rehabilitation
  – physical
  – cognitive
  – emotional
  – social
• Prevention
  – education
Near-drowning
• Incidence
• Primary problems
  – hypoxia
  – aspiration
  – hypothermia
Near-drowning
• Management
  – restore oxygenation
  – monitor for complications
• Support
• Prevention
Child maltreatment
• Physical
  – abuse
  – neglect
• Emotional
  – abuse
  – neglect
• Sexual abuse
Child neglect
• Etiology
  – similar to abuse
  – lack of knowledge
  – lack of resources
• Types
  – physical
  – emotional
Physical Abuse
• Unknown etiology
• Contributing factors
  – parent
  – child
  – environment
Sexual Abuse
• Several forms
• Typical abuser
• Typical victim
• Situations

Assessment of maltreatment
• Early identification
• Provide open environment for child
• Look for pattern
• Parental/child behaviors
• Protect child & parent/suspect

Management of maltreatment
• First priority is protection of the child
• Accurate documentation is essential
• Treatment is as indicated
• Therapeutic relationship
• Support for discharge
• Prevention
REPORTING CHILD ABUSE AND NEGLECT IN MICHIGAN


WHO REPORTS AND UNDER WHAT CONDITIONS:

"A physician, coroner, dentist, medical examiner, nurse, audiologist, certified social worker, social worker, social worker technician, a person licensed to provide emergency medical care, psychologist, family therapist, school administrator, school counselor or teacher, law enforcement officer, or duly regulated child care provider" is required to report if they have "reasonable cause to suspect child abuse or neglect."

"... a pregnancy or the presence of a venereal disease in a child who is less than 12 years of age shall be reasonable cause to suspect child abuse."

"If reporting person is a member of a hospital, agency, or school staff, he shall notify the person in charge thereof of his finding that the report has been made, and make a copy of the written report available to the person in charge."

"In addition to those persons required to report ... any person, including a child, who has reasonable cause to suspect child abuse or neglect, may report ..."

DEFINITIONS:

"Child abuse" means harm or threatened harm to a child's health or welfare by a parent, legal guardian, or any other person responsible for the child's health or welfare or by a teacher or teacher's aide which occurs through nonaccidental physical or mental injury; sexual abuse; sexual exploitation; or maltreatment.

"Child neglect" means harm or threatened harm to a child's health or welfare by a parent, legal guardian, or any other person responsible for the child's health or welfare which occurs through either of the following:
(i) Negligent treatment, including the failure to provide adequate food, clothing, shelter, or medical care.
(ii) Placing a child at an unreasonable risk to the child's health or welfare by failure of the parent, legal guardian, or any other person responsible for the child's health or welfare to intervene to eliminate that risk when that person is able to do so and has or should have, knowledge of the risk.
WHEN TO REPORT AND TO WHOM:

An initial oral report shall be made immediately to the State Department of Social Services and a written report shall be filed within 72 hours with the State Department of Social Services of the county in which suspected abused or neglected child is found.

CONTENT OF REPORT:

"The written report shall contain the name of the child and a description of the abuse or neglect. If possible, the report shall contain the names and address of the child's parents, guardian or other persons with whom the child resides, and the child's age. The report shall contain other information available to the reporting person which might establish the cause of abuse or neglect and the manner in which it occurred."

CONFIDENTIALITY:

"The identity of a reporting person shall be confidential subject to disclosure only with the consent of that person or by judicial process."

IMMUNITY:

"A person acting in good faith who makes a report or assists in any other requirement of this act shall be immune from civil or criminal liability which might otherwise be incurred thereby. A person making a report . . . shall be presumed to have acted in good faith."

PRIVILEGED COMMUNICATION:

"any legally recognized privileged communication except that between client and attorney is abrogated and shall neither constitute grounds for excusing a report otherwise required to be made nor for excluding evidence in a civil child protective hearing . . . "

FAILURE TO REPORT:

"A person required to report an instance of suspected child abuse or neglect who fails to do so is civilly liable for the damages proximately cause by the failure."
UNIT: ALTERATIONS IN NEURO/SENSORY STATUS

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Describe the components of a comprehensive assessment of a child and his/her family with alterations in neurological function.

2. Describe the acute care specific for children who have increased intracranial pressure, who are comatose, and who require neurosurgery.

3. Define the clinical manifestations, treatment, and principles of nursing management for major congenital malformations of the central nervous system.

4. Describe the clinical manifestations, diagnostic methods, treatment, and principles of nursing management for the child experiencing a seizure.

5. Correlate the clinical manifestations with the methods of diagnostic evaluation, treatment, and principles of nursing management for children with infectious processes that affect the central nervous system.

6. Examine how development influences alterations in neurological function in children from infancy through adolescents.

REQUIRED READINGS:


SPECIAL ATTENTION TO:

Hydrocephalus, pp. 1107-1112
Meningomyelocele, pp. 1253-1258
Meningitis, pp. 1092-1096
Brain tumors, pp. 1086-1092
Seizures, pp. 1098-1106
Cerebral palsy
Spinal muscular atrophy
Tumors of the Nervous System
• CNS tumors account for 20% of all childhood cancers
• Minimal improvement in prognosis

Brain tumors
• Most are infratentorial (60%)
• Rest are supratentorial
• Tumors can develop from any cranial cell

Brain tumors
• Diagnosis can be difficult
  • symptoms undetectable for some time
  • signs can be vague (Table 28-2, pp. 1087)
• MRI most commonly used for objective diagnosis
• Histology is definitive diagnostic tool

Brain tumors
• Management
  • Surgery, radiation, chemotherapy
  • Neurologic baseline
  • Preparation and education
  • Post-op complications & support
• Prognosis
  • Variable
  • Prevention

Neuroblastoma
• 75% cases <4 years old
• Originate in embryonic adrenal medulla and sympathetic fibers
• 70% not diagnosed until after metastasis

Neuroblastoma
• Diagnosis (See Table 28-6, pp. 1091)
  • urine lab studies
• Management
  • Staging essential
  • Surgery, radiation, chemotherapy
• Prognosis
  • 75% survival < 1 year
  • 50% survival > 1 year
**Intracranial infections**

- Site
  - Meningitis
  - Encephalitis
  - Myelitis
- Causative agents
  - Bacterial
  - Tuberculotic
  - Viral

**Bacterial meningitis**

- Incidence
  - reduced with vaccine
  - Peak incidence 1 month - 5 years
- Pathophysiology
  - via bloodstream
  - via direct access
  - invasion, inflammation, exudate, hyperemia, edema, fibrin, adhesions

**Bacterial meningitis**

- Diagnosis
  - LP
    - Clinical manifestations (Box 28-7, pp. 1093)
- Management
  - isolation
  - antibiotics
  - symptomatic therapy

**Bacterial meningitis**

- Prognosis
  - age, organism, duration, severity
  - sequelae highest < 2 months
  - high mortality rate for pneumococcal
- Prevention
  - Vaccines
- Family support
Aseptic meningitis
• Causative agents - viruses
• Symptoms similar to bacterial meningitis
• Diagnosis
• Treatment symptomatic

Encephalitis
• Commonly caused by viruses
• Diagnosis
  • clinical presentation - varies
  • biopsy, lab studies
  • Prognosis

Reye Syndrome
• Toxic encephalopathy
• Associated with varicella & influenza
• Pathophysiology
  • noninflammatory encephalopathy & hepatopathy
• Diagnosis
• Management

Rabies
• Infection of the CNS
• Cause - animal bite
• Incidence
• Diagnosis - clinical presentation and history
• Management
  • wound cleansing & HRIG

Seizure disorders
• Electrical malfunction
• Presentation varies
  • LOC
  • behavior
  • motor
  • perceptions
  • sensations

Epilepsy
• Chronic seizures - unprovoked
• Cause - idiopathic or acquired
• Incidence
• Seizures
  • sudden
  • transitory

Seizures
• Partial - limited foci
  • simple - no altered LOC
  • complex - impaired LOC
• progress to generalized

Seizures
• Generalized (Grand mal)
  • involves both hemispheres
  • preceded by loss of consciousness
• Absence
  • subtle behavior changes
• Atonic and Akinetic
• Myoclonic
• Infantile spasms

Seizures
• Diagnosis
  • classify
  • identify cause
• Management
  • control
  • correct
  • support

Seizures
• Status epilepticus
  • continuous or in a series
  • treat ABCs
  • Valium, Phenobarbital, Ativan

Epilepsy
• Prognosis
  • 55% go into remission
  • most will have no intellectual impairment

Management focus
• Observe & document activity
  • note time
  • behavior
  • characteristics
  • level of consciousness
  • postictal state
  • safety

Management focus
• Education
  • Medications
  • Activity
  • Changes in behavior
  • Avoiding triggering factors
Febrile seizures
- Incidence
- Type - generalized
- Temperature >38.8C during the rise
- Accompany respiratory or GI infection
- Treatment
- Education

Cerebral Malformations
- Cranial deformities
- Hydrocephalus

Cranial deformities
- Microcephaly
  - small FOC
  - no treatment
- Craniosynostosis
  - premature suture closure
  - surgically repaired

Hydrocephalus
- Production or absorption imbalance
- Pathophysiology
  - Two types
    - communicating
    - noncommunicating
- Diagnosis
  - Increased FOC
  - General neurologic signs

Hydrocephalus
- Management
  - surgery
    - removal of obstruction
    - ventriculoperitoneal shunt placement
    - occlusion
    - infection
  - feeding considerations
  - IV access
- Prognosis varies

Cerebral palsy
- Early onset impaired movement & posture
- Accompanied by neurologic impairments
- Etiology unclear
- Pathophysiology
  - Anoxia is most significant
Cerebral palsy
• Diagnosis
  • History
  • Clinical presentation
• Management
  • Diagnosis
  • Optimizing development
Cerebral palsy
• Management
  • Orthopedic
  • Pharmacological
  • Technical aids
  • Physical therapy, speech therapy
  • Education and support
• Prognosis
Spina bifida
• Myelomeningocele
• Neural tube defects
• Types
  • Occulta
  • Cystica
    • meningocele
    • myelomeningocele
Cerebral palsy
• Pathophysiology
  • failure to close
  • reopen
  • associated with hydrocephalus
• Diagnosis
  • Prenatal
  • Postnatal
Cerebral palsy
• Management
  • Pre-op care
  • Early surgical repair
  • Orthopedic issues
  • GU function
  • Latex allergy
Cerebral palsy
Unit: ALTERATIONS IN OXYGENATION – RESPIRATORY & CARDIAC

Objectives:
At the completion of this unit students will be able to:

1. Describe the differences between cyanotic and cyanotic heart defects.

2. Identify the clinical manifestations of congenital heart disease in children.

3. Develop a nursing management plan of care for both the child with a congenital heart defect and his/her family.

4. Identify key history and physical assessment skills needed to assess respiratory function.

5. Identify the clinical manifestations and nursing management plan for a child with an acute respiratory infection.

Required Readings:


Special Attention To:

A. Respiratory Dysfunction:


   Acute Viral Naso Pharyngitis
   Acute Streptococcal Pharyngitis
   Tonsillitis
   Otitis Media


4. Infection Lower Airways - 841-843.


8. Asthma (see article above)

(continued on next page)
B. Cardio Vascular Dysfunction -
   1. Assessment of Cardiac Function - pp. 933-936.
   2. Congenital Heart Disease - pp. 936-949.
   3. Clinical Consequences of Congenital Heart Disease - pp. 949-959.
   4. Nursing Care of the Family and Child with Congenital Heart Disease - pp. 960-965.

REQUIRED MEDIA

WHEN: Prior to the class on Thursday.

TITLE: Assessment of Respiratory Distress in Infants and Children

LENGTH: 20 Minutes

REVIEW: This video describes how to perform a respiratory assessment of infants and children with mild, moderate, and severe distress. It defines respiratory distress and failure and explains the physical differences between the pediatric and adult respiratory systems. It also shows several babies in mild, moderate, and severe distress. Demonstrates abnormal signs of distress, including stridor, wheezing, grunting and retractions. Reviews assessment in 4 parts: Level of consciousness, respiratory rate, efforts and mechanics of respiration, and evaluation of skin and mucous membranes.

HINT: Examination questions will be taken from this video.
Pathogenesis of Asthma

- Infection
- Irritants
- Allergens
- Cold
- Stress
- Exercise

IgE-mast cell-mediated immune (Antigen-Antibody) response

- Release of biochemical mediators from MAST cells in bronchial epithelium

- Histamine
  - SRS-A
  - Eosinophilic Chemotactic Factor
  - Platelet Activating Factor

Asthma Attack:
1. Inflammation
2. Bronchospasm

Obstruction of Large and Small Air Ways
- Air Trapping
- Air Hunger
- Hyperventilation
- Respiratory Acidosis
- Hypoxemia
ASTHMA

INDICATIONS OF SEVERITY

1. Disturbance of consciousness
2. Central cyanosis
3. Sternocleidomastoid retractions
4. HR > 130 (older children)
5. Pulsus Paradoxus
6. Gross overinflation (x-ray)
7. $P_{a}O_2 < 60$ mmHg
8. $P_{a}CO_2 > 40$ mmHg
9. EKG abnormalities
10. Pneumothorax and/or pneumomediastinum

SIGNS/SYMPTOMS IMPENDING DEATH MALADAPTATION

1. Change in level of consciousness
2. Obvious exhaustion
3. Silent chest
4. CO retention
5. FEV < .5 L
   FCV < 1.0 L
6. Pneumothorax
   Pneumomediastinum
Respiratory Dysfunction

- Upper airway = nose and pharynx

- Lower respiratory tract = bronchi and bronchioles (includes trachea, larynx, and epiglottis)

- Infectious agents = don’t know course material

Respiratory Dysfunction

- Respiratory = most common acute illness

- Viral vs. bacterial

- Peak periods:
  - 3-6mos
  - toddler, preschool years

Respiratory Dysfunction

- Unique characteristics of children
  - Airway diameter smaller
  - Shorter distance to travel
  - Exposure to other children
  - Short and open eustachian tubes easy route
  - Caregiver smoke
  - Weather/season effects
Respiratory Dysfunction
Pediatric assessment
◇ Fever
◇ Neuro signs
◇ GI symptoms
◇ Upper respiratory tract effects
◇ Lung sounds

Respiratory Dysfunction
Assessment
◇ Rate
◇ Depth
◇ Ease
◇ Rhythm

Respiratory Dysfunction
General Treatment
◇ Support effort
◇ Rest
◇ Comfort measures
◇ Limit spread of infection
◇ Control temp
◇ Promote hydration & nutrition
◇ Household support and education

Respiratory Dysfunction
Upper respiratory tract infections
◇ Nasopharyngitis is the common cold
   ◦ Viral, viral, viral
   ◦ Fever children > older children
   ◦ Treatment is palliative
   ◦ Warning signs

Respiratory Dysfunction
Upper respiratory tract infections
◇ Pharyngitis
   ◦ Pathogens
     ◦ Group A beta-hemolytic strep
     ◦ 80-90% are viral
   ◦ Complications that follow can be significant
Respiratory Dysfunction
Upper respiratory tract infections

Symptoms of Pharyngitis
- asymptomatic to severe
- Onset - rapid
- sore throat/inflamed pharynx
- fever
- headache
- tonsils and pharynx inflamed with exudate
- anterior cervical lymphadenopathy

Respiratory Dysfunction
Upper respiratory tract infections
Pharyngitis diagnosis
- Throat cultures may present confusing picture
- Antibody levels are retrospective
- Diagnostic kits have limitations with sensitivity and false positives

Respiratory Dysfunction
Upper respiratory tract infections
Treatment for Pharyngitis
- Oral antibiotics
- Comfort measures
- Limiting spread

Respiratory Dysfunction
Upper respiratory tract infections
Tonsils filter & protect
Several tonsils in the oropharynx
Tonsillitis can occur with pharyngitis
- presentation:
  - difficulty swallowing
  - difficulty breathing through the nose
  - discomfort

Respiratory Dysfunction
Upper respiratory tract infections
Treatment for tonsillitis
- throat cultures for strep vs viral
- tonsillectomy
  - recurrent, frequent, abscess, hypertrophy
- adenoidectomy
  - hypertrophy
Respiratory Dysfunction
Upper respiratory tract infections

- Post-operative care
  - comfort measures
  - positioning
- Education & teaching
  - drainage, ID fresh blood
  - pain medications
  - avoid red/brown fluids - otherwise unrestricted

Respiratory Dysfunction
Upper respiratory tract infections

- Influenza
  - numerous strains
  - seasonal
  - infectious 1 day before and after symptomatic

Respiratory Dysfunction
Upper respiratory tract infections

- Influenza
  - Symptoms vary from absent to severe
    - Mucous membranes dry
    - Dry cough
    - Fever & chills
    - Photophobia
    - Myalgia
    - Hyperesthesia

Respiratory Dysfunction
Upper respiratory tract infections

- Influenza management
  - symptomatic treatment
- Prevention
  - vaccines
  - indications

Respiratory Dysfunction
Upper respiratory tract infections

- Otitis media
  - Highest incidence 6mo - 2yrs
  - Decreases with slight increase on entering school
  - Seasonal incidence
  - Environmental factors
  - Feeding
Respiratory Dysfunction
Upper respiratory tract infections
❖ Otitis media commonly due to Strep pneumoniae & H-flu

❖ Eustachian tube obstructed causing pressure build-up, pulling in bacteria to middle ear

Respiratory Dysfunction
Upper respiratory tract infections
❖ Diagnosis of Otitis Media
   – Otoscopy
   – Drainage
   – Hearing evaluation

Respiratory Dysfunction
Upper respiratory tract infections
❖ TERMS
   – Otitis media (OM)
   – Acute otitis media (AOM)
   – Otitis media with effusion (OME)
   – Chronic otitis media with effusion

Respiratory Dysfunction
Upper respiratory tract infections
❖ Otitis media management
   – Antibiotic therapy controversy
   – Myringotomy
   – Tympanoplasty (PE tubes)
   – Steroids, decongestants, antihistamines contraindicated

Respiratory Dysfunction
Upper respiratory tract infections
❖ Otitis media caregiver teaching points
   – Medication use
   – Drainage/ear canal care
   – Hearing loss
   – Activity limitations
   – Displacement
   – Complications
   – Prevention
Respiratory Dysfunction
Croup Syndromes

• Acute Epiglottitis
• Acute laryngotracheobronchitis (LTB)
• Laryngitis
• Tracheitis

Respiratory Dysfunction
Croup Syndromes

• Epiglottitis
  – Most common in 2-5 yrs
  – Potentially life-threatening
  – Usually H-flu

Respiratory Dysfunction
Croup Syndromes

• Epiglottitis
  – Rapid onset
  – Starts with sore throat
  – High grade fever
  – Position upright, leaning, chin out, tongue lolling - may have retractions
  – Drooling, no coughing
  – Agitated, restless, breathing regular

Respiratory Dysfunction
Croup Syndromes

• Epiglottitis
  – INSPECTION MAY CAUSE RESPIRATORY DISTRESS AND COMPLETE OBSTRUCTION
    – DONE ONLY WHEN AIRWAY MANAGEMENT SUPPORT AVAILABLE

Respiratory Dysfunction
Croup Syndromes

• Epiglottitis Treatment
  – Lateral neck films
  – Maintain position of comfort
  – Antibiotic therapy
  – Steroid therapy
  – Vaccination

Respiratory Dysfunction
Croup Syndromes

• Acute Laryngitis
  – More common in older children
  – Etiology usually viral
  – May be systemic involvement
  – Self limited
Respiratory Dysfunction
Croup Syndromes

◊ Acute Laryngotracheobronchitis (LTB)
  – Children < 5 years
  – Viral agent
  – Starts with respiratory tract infection
  – Low grade fever
  – Edema narrows airway - bary cough
  – Obstruction - hypoxia

Respiratory Dysfunction
Croup Syndromes

◊ LTB treatment goals:
  – maintain airway
  – support respiration
  – home management for exertion stridor
  – humidity
  – nebulized epinephrine - risk of relapse
  – comfort measures

Respiratory Dysfunction
Croup Syndromes

◊ Acute Spasmodyc Laryngitis
  – 1- 3 years
  – periodic attacks
  – usually occur at night
  – mild URI symptoms
  – slight fever to afebrile
  – dyspnea with agitation

Respiratory Dysfunction
Croup Syndromes

◊ Spasmodyc Laryngitis
  – Home managed
  – Humidity
  – Cold air exposure
  – Self limited

Respiratory Dysfunction
Croup Syndromes

◊ Bacterial Tracheitis
  – 1 month - 6 years
  – Staphylococcus aureus most common pathogen
  – Complication of LTB
  – Copious, purulent secretions
Respiratory Dysfunction
Croup Syndromes

- Bacterial Tracheitis management
  - Humidified oxygen
  - Antipyretics
  - Antibiotics
  - Intubation and suctioning
Infections of the Lower Airways
- Reactive tissue is the bronchi and bronchioles
- Cartilage is not as developed in children, so affects airway constriction

Infections of the Lower Airways
- Bronchitis (tracheobronchitis)
  - large airways
  - usually comes with URI
  - dry, hacking, nonproductive cough
  - coughing worse at night
  - cough becomes productive

Infections of the Lower Airways
- Bronchitis treatment
  - palliative treatment
    ■ analgesics, antipyretics, humidity
  - cough suppressants limit clearing secretions
  - self-limiting

Infections of the Lower Airways
- Respiratory Syncytial Virus (RSV) - Broncholitis
  - viral
  - attacks bronchioles
  - seasonal
  - Adenovirus and parainfluenza are possibility

Infections of the Lower Airways - bronchiolitis
- What happens?
  - Bronchioles are swollen, mucus-filled
  - Bronchi/bronchioles are invaded by inflammatory cells
  - tissue around the bronchioles becomes inflamed
    ↓
    OBSTRUCTION
Infections of the Lower Airways - bronchiolitis

Bronchioles dilate on inspiration

Narrow on expiration

Air is trapped

Infections of the Lower Airways - bronchiolitis

Diagnosis

- Associated with URI, otitis media, conjunctivitis
- Increased respiratory distress
- CXR - consolidation
- Two tests (ELISA & IFA) done on nasal aspiration or nasal washing

Infections of the Lower Airways - bronchiolitis

- Apnea may be first sign in very young
- Severe status indicated by:
  - increased PaCO2
  - causing acidosis and hypoxemia

Infections of the Lower Airways - bronchiolitis

Treatment

- Symptomatic - at home for mild cases
  - humidity
  - hydration
  - rest
- Hospitalization
  - heart or lung disease
  - debilitated
  - caregiver inadequate

Infections of the Lower Airways - bronchiolitis

Other indications for hospitalization

- tachypnea
- retractions
- altered LOC
- poor po

Infections of the Lower Airways - bronchiolitis

Additional hospital therapy

- Mist therapy with oxygen
- IV hydration
- Unproven treatments
  - steroids
  - theophylline
  - diuretics
- Ribavirin
Infections of the Lower Airways - bronchiolitis

- Prevention
  - RSV immune globulin (RSV-IGIV) or Respigam
  - Monoclonal antibody, palivizumab (Synagis)
  - In the hospital - isolation and HANDWASHING
  - Nursing assignments

Infections of the Lower Airways

Pneumonias

- Inflammation of pulmonary parenchyma
- May be primary or secondary
- Categorization based on location
  - lobar pneumonia
  - bronchopneumonia
  - interstitial

Infections of the Lower Airways

Pneumonias

- Pneumonitis
- Categorized by causative agent
  - viral
  - bacterial
  - atypical (mycoplasmal)
  - foreign body
  - fungal

Infections of the Lower Airways

Pneumonias

- General Presentation
  - fever
  - cough
  - rhonchi or fine crackles
  - dullness with percussion
  - increased respiratory effort
  - CXR with infiltrates
  - GI symptoms
  - Neuro

Infections of the Lower Airways

Pneumonias

- Treatment
  - supportive and symptomatic
  - close respiratory monitoring
  - oxygen and antibiotic therapy
  - po if appropriate
  - position for comfort
— suctioning as needed
— chest P & PD
— emotional support

**Infections of the Lower Airways**

**Miscellaneous infections**

■ Pertussis (whooping cough)
  — <4 years without immunization
  — contagious
  — seasonal (spring and summer)
  — URI infection

**Infections of the Lower Airways**

**Miscellaneous infections**

■ Tuberculosis
  — source for children - household member
  — gender influences - higher in adolescent girls
  — age - higher in adolescence
  — concurrent infections - measles, pertussis

**Infections of the Lower Airways**

**Miscellaneous infections**

■ Management of TB lesions in children
  — nutrition
  — support
  — chemotherapy
  — prevent opportunistic infections
  — rarely hospitalized
  — occasional surgical resection
  — good prognosis

**Dysfunction of the Airways**

**Noninfectious Agents**

■ Foreign body (FB) aspiration
  — most common <3 years
  — usually round foods
    ■ hot dog
    ■ round candy
    ■ peanut
    ■ grape
  — nondissolvable, enlarge, high fat, sharpness, round,

**Dysfunction of the Airways**

**Noninfectious Agents**

■ Diagnosis - by history & physical
  — “I can’t breathe”
  — symptoms may be mild to severe
    ■ stridor
    ■ wheezing
retractions

Dysfunction of the Airways

Noninfectious Agents

Management

- Older children - abdominal thrusts
- Younger infants - back blows & chest thrusts
- Bronchoscopy as soon as possible

Aspiration Pneumonia

- PREVENTION
  - difficulty swallowing
  - congenital anomalies
  - absent cough
  - force-fed
- Food or secretions
- Lipids, talcum powder, barium, hydrocarbons

Inhalation Injuries

- injury depends on substance, space and duration
- may not be physical burns associated
- local injury and systemic injury

Monitor respiratory status & provide support

Passive smoking

- Increased
  - # respiratory illnesses
  - ER visits
  - asthma symptoms
  - medication use
  - stillbirths and preterm deliveries
  - incidence of SIDS

- Decreases
  - PFT's
  - fetal growth
  - recovery from hospitalization for acute asthma
CONGENITAL HEART DISEASE
CLASS NOTES

Prevalence
4 -10/ 1000 live births
Major cause of death in 1st year other than prematurity

Hemodynamic Approach
1. Normal pressures, pO2, and resistance relationships
2. Implications for assessment, intervention and long and short term care

Assessment
1. General appearance:
   --size --appetite
   --wellness(history of URIs) -- position
   --activity
2. Color:
   skin (not very useful in children), --central vs peripheral cyanosis
   nailbeds, clubbing -- effect of activity
   mucous membranes
3. Palpation:
   --pulses (presence, quality, equality-R to L and U to L)
   --liver, spleen
   --temperature of extremities
4. Auscultation:
   --rate
   --rhythm (sinus arrhythmia-increases with inspiration-normal)
   --S1, S2 - split which decreases on inspiration
   --extra sounds, murmurs-sys, dias, continuous
   --lung sounds
   --B/P on all 4 extremities (cuff size)

Stenotic/Obstructive lesions
VSD as a model of left>right shunt and acyanotic congenital heart disease
1. most common defect alone or in combination
2. L → R shunts increase volume to right side of heart and to lungs
3. Increased volume to lungs leads to frequent pulmonary problems (URIs)--short term
Pulmonary hypertension/pulmonary vascular obstructive disease (permanent) long term

4. Priority long term problem is pulmonary disease/damage

5. Size of shunt determines the degree of volume overload and thus symptoms.

6. Moderate to large VSDs often lead to CHF in infancy

**Congestive Heart Failure in Infants and Children**

1. Cause in order of frequency
   a. volume overload--by far the most common, first symptoms usually appear at 6-8 weeks of age when prenatal/neonatal pulmonary resistance begins to drop.
   b. pressure overload--stenotic lesions
   c. myocardial disease--very rare in children
   d. arrythmias--also rare as cause of CHF

**Assessment**

--tachypnea particularly at rest
--tachycardia--sleeping rate over 160 in infants
--excessive diaphoresis
--hepatosplenomegaly
--weight gain out of proportion to intake
--feeding difficulty and FTT secondary to tachypnea and tachycardia
--wheezing, rales, and retractions
--peripheral edema--late sign and usually periorbital and facial in preambulatory children, extremities in school age

--First five are the primary signs of CHF in infancy.

**Clinical Management of CHF**

1. On-going assessment and compare

2. Accurate I, O, and daily weight---same scale, same time of day before fdg
   --Use this info don't just record it

3. Calculate fluid intake for weight or surface area and compare to client's--don't usually need to restrict due to feeding difficulties.

4. Na restriction--check orders. Usually no restrictions. Na content in commercial baby food has been reduced. Low Na formulas are not very palatable to babies.

5. Small, frequent feedings.
   --Increase calories (higher metabolic rate)--poor caloric intake is a serious and frequent problem,
Calculate what caloric intake should be and use caloric supplements as needed. Consult with a dietician.

Time so child can rest—q 3 hours usually good.

6. Elevate HOB/use infant seat with proper positioning

7. May need O2

8. Digoxin—very effective—

--Dose is very finely calculated, comes in 50mcg/cc= .05mg/cc.

--Always check the dose for the infant's weight. It is started with digitalizing dose given over 24 hours then moved to a maintenance dose twice a day.

--There is NO ANTIDOTE.

--The liquid form taste good.

--Always check apical pulse for one full minute before administering

---if too low (under 90-110 for infants; under 70 for children) hold and contact pediatric cardiologist before administering.

9. Diuretics—Lasix is most common. Again accurate dose calculation is crucial. Observe response to dose and follow electrolytes—especially K+.

10. Rest and decrease stimuli

11. Protect from infection—especially respiratory

12. Emotional support of infant and family.

13. Many people confuse congestive heart failure and cardiac arrest. Be VERY clear with families what it is and what it does AND does not mean.

Timing of closure may be affected by access to and the availability of this specialized care (distance, early recognition of defect etc)

**Tetralogy of Fallot as a model for cyanotic congenital heart disease-Bidirectional shunts**

1. VSD, PS, RVH, dextraposition of the aorta—in varying severities

2. Most common form of cyanotic congenital heart disease

3. Cyanotic defects tend to be more complex and difficult to repair

4. Central cyanosis is due to **decreased PaO₂** usually due to mixture of venous and arterial blood in arterial circulations. Primary cause is PaO₂ of blood going out through the aorta not the volume of blood to the lungs. Avoid getting caught in this trap. Children with pulmonic stenosis
and no other defects are not usually cyanotic because the PaO2 is normal.

**Assessment**

1. Exertional dyspnea—children restrict their own activity but exertional dyspnea may lead to delayed motor development and feeding difficulty
2. Knee chest and squatting—thought to increase venous return
3. Polycythemia—(Hgb > 20gms/Hct > 63)—rarely seen with the early repairs but long term central cyanosis from any cause can lead to this. Bone marrow response to hypoxemia. Long term can lead to CVA and cerebral thrombosis. Dehydration an impt. risk for thrombosis.
4. Growth is not necessarily affected. Children with CHF from acyanotic lesions tend to have greater growth problems.

**Clinical Management**

1. Evaluate degree of exertional dyspnea.
2. Feed small frequent feedings to conserve O2
3. Neuro assessment if polycythemia is present
4. Paroxysmal Dyspneic Attacks (Tet Spells)—this is an emergency and important for nurse to know what to do. Not as common since surgery can be done at early age.
   a. Place in knee chest position
   b. Calm the infant
   c. Administer O2
   d. Usually a-c will reverse it
   e. Have morphine available

**Transposition of the Great Arteries**—Implications for care in newborn period.
Surgical Cardiac Repair

- Anatomy dictates physiology
  - know the child’s heart structure

Surgical Cardiac Repair

- Routine post-operative management
  - ECG assessment
  - BP monitoring
  - Fluid & electrolyte evaluation
  - Respiratory monitoring

Surgical Cardiac Repair

- Routine post-operative management
  - Renal status evaluation
  - GI assessment
  - Neurologic monitoring
  - Infection control

Surgical Cardiac Repair

- Effects of Cardiopulmonary Bypass
  - Bleeding
  - Decreased hematocrit
  - Myocardial dysfunction
  - Acidosis
  - Hyper/hypokalemia

Surgical Cardiac Repair

- Effects of Cardiopulmonary Bypass
  - Compromised pulmonary function
  - Hyperglycemia
  - Edema
  - Hematuria/
  - Increased/decreased UO

Surgical Cardiac Repair

- Atrial Septal Defect (ASD)
  - Surgical dacron patch closure
  - Some may be closed through venous access
Surgical Cardiac Repair
• Ventricular Septal Defect (VSD)
  – Closure of opening with suture or patch
  – Device closure in some centers

Surgical Cardiac Repair
• Atrioventricular Canal Defect (AVC)
  – Palliative repair
    • PA band
  – Complete repair
    • Patch closure
    • Repair of valves

Surgical Cardiac Repair
• Patent Ductus Arteriosus
  – Ligate vessel via thoracotomy
  – Thorascopic surgery (VATS)
  – Catheterization approaches

Surgical Cardiac Repair
• Coarctation of the Aorta
  – Resection of affected area
  – Enlargement of affected area with a graft
  – Balloon angioplasty in limited areas

Surgical Cardiac Repair
• Aortic Stenosis
  – Aortic valvotomy - high mortality in infants
  – Balloon angioplasty
  – Konno procedure

Surgical Cardiac Repair
• Pulmonic Stenosis
  – Brock procedure
    • Closed valvotomy for infants
  – Pulmonary valvotomy
    • Cardiopulmonary bypass required for children

Surgical Cardiac Repair
• Tetralogy of Fallot (TOF)
  – Blalock-Taussig (BT) shunt - palliative
  – Complete repair - first year of life

Surgical Cardiac Repair
• Tricuspid Atresia
  – Shunt or banding-palliative
  – Fontan procedure
Surgical Cardiac Repair

• Transposition of the Great Vessels
  – Provide mixing (PgE or Rashkind procedure)
  – Arterial switch done in first weeks of life

Surgical Cardiac Repair

• Total Anomalous

  – Early repair
  – Pulmonary vein connected to left atrium
  – ASD closed
  – Anomalous return ligated

  Pulmonary Venous Return - rare

Surgical Cardiac Repair

• Truncus Arteriosus

  – Close VSD
  – Excise PA from Aorta , attach to RV

Surgical Cardiac Repair

• Hypoplastic Left Heart

  – Staged repair
  – Norwood procedure
    • PA to Ao, create an ASD
  – Bidirectional Glenn shunt
    • SVC to right PA

Surgical Cardiac Repair
UNIT: ALTERATIONS IN ELIMINATION – RENAL & GASTROINTESTINAL

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Describe the components of a comprehensive assessment of a child and his/her family with alterations in elimination.

2. Discuss the relationship of fluid and electrolyte balance in relation to acute gastroenteritis.

3. Identify the clinical manifestations and nursing considerations of the child with acute gastroenteritis.

4. Identify the clinical manifestations and nursing considerations of the child with malabsorption, obstruction and inflammation.

5. Identify the clinical manifestations and nursing considerations of the child with UTI, nephrotic syndrome, acute glomerulonephritis and hydronephrosis.

6. Develop appropriate nursing care plans (including specific nursing and client actions) for children and their families with alterations in elimination.

REQUIRED READINGS:


REVIEW:

Acid-base imbalances. (Pathophysiology)

SPECIAL ATTENTION TO:

Renal System:

Urinary tract disorders, pp. 1034-104
Nephrosis (Nephrotic syndrome), pp. 1043-1046
Acute glomerulonephritis, pp. 1046-1048
Wilm’s Tumor, pp. 1048-1050

Gastrointestinal System:

Gastroenteritis, pp. 883-891
Hypertrophic pyloric stenosis (HPS), pp. 921-923
Hirschsprung Disease, pp. 893-895
Celiac Disease, 926-928
Intussusception, pp 923-924
Gastroesophageal Reflux Disease (GERD), pp. 896-897
Gastrointestinal Dysfunction

- Dehydration
  - Intake < output
  - Insensible fluid loss
    - skin & respiratory
  - Urinary
  - Fecal

Gastrointestinal Dysfunction
- Infant particulars
  - Larger body surface area
  - Increased metabolic rate
  - Immature kidneys
  - Increased fluid requirements

Gastrointestinal Dysfunction
- Potassium intracellular
- Sodium extracellular
- Types of dehydration
  - Isotonic
  - Hypotonic
  - Hypertonic

Gastrointestinal Dysfunction
- Intake & output
  - Daily fluid requirements
    - first 10 kg: 100cc/kg/day
    - Second 10 kg: 50cc/kg/day
    - Remainder: 20cc/kg/day
  - 25 kg requirements
    - 1000+
    - 500+
    - 100=1600cc/day=67cc/hr

Gastrointestinal Dysfunction
- Diarrhea
  - Acute
  - Chronic
Gastrointestinal Dysfunction

*Causes of diarrhea*
- fecal oral route
- Rotavirus is most common
- Salmonella, shigella campylobacter
- Giardia and cryptosporidium
- Antibiotics

Gastrointestinal Dysfunction

*Diagnosis of Dehydration*
- General labs
- Stool cultures
- Stool evaluation

Gastrointestinal Dysfunction

*Management of dehydration*
- Oral rehydration solutions
- Early reintroduction of appropriate nutrients
- Severe cases require IV fluids
  - Rapid replacement in hypo/iso tonic dehydration
  - Gradual replacement in hypertonic dehydration

Gastrointestinal Dysfunction

*Constipation*
- Structural disorders
- Systemic disorders
- Drug use
- Spinal cord injury
- Environmental/psychosocial factors
- Diet

Gastrointestinal Dysfunction - constipation

*Newborn*
- first meconium stool 24-36 hrs.
- meconium plugs

*Infant*
- rare in breastfeeding diet
- may be due to diet change
- R/o medical etiology

Gastrointestinal Dysfunction

*Constipation in the child*
- environmental changes
- developmental issues
Gastrointestinal Dysfunction

Hirschsprung Disease
- Congenital aganglionic megacolon
  - inadequate peristalsis of part of intestine
  - Sphincter does not relax
  - Abdominal distention
  - Can lead to enterocolitis

Gastrointestinal Dysfunction

Hirschsprung Disease
- Diagnosis
  - history
  - clinical signs
  - confirmed by histology (biopsy)
- Treatment
  - Surgical

Gastrointestinal Dysfunction

Hirschsprung Disease
- Unique considerations
  - low-fiber, high-calorie, high protein diet
  - bowel prep depends on age
  - monitor abdominal circumference
  - diapers and surgical site

Gastrointestinal Dysfunction

- Vomiting
  - self-limiting
  - treatment may focus on side-effects
    - dehydration
    - electrolyte imbalances
    - malnutrition
    - Mallory-Weiss syndrome

Gastrointestinal Dysfunction

- Vomiting treatment
  - treat cause
  - prevent complications

Gastrointestinal Dysfunction

- Special considerations for the child vomiting
  - teaching if appropriate
  - goal - maintain hydration
  - side position
• brush teeth & rinse mouth

**Gastrointestinal Dysfunction**

**Gastroesophageal reflux**
- Gastric contents to esophagus
- Due to lower esophageal sphincter relaxation
- Aggravating factors
- Predisposition

**Gastrointestinal Dysfunction**
- GE reflux
  - Diagnosis - pH probe, endoscopy
  - Management
    - feeding modification
    - positioning
    - medication
    - surgery

**Gastrointestinal Dysfunction**
- Acute appendicitis
  - unusual <2yrs of age
  - diagnosis through ultrasonography
  - pain commonly at McBurney point
  - May be treated medically, surgically, laparoscopically

**Gastrointestinal Dysfunction**
- Meckel diverticulum

**Symptoms**
- bleeding
- obstruction
- inflammation
- current jelly stools

**Diagnosis**
- scintigraphy

**Gastrointestinal Dysfunction**
- Biliary Atresia
  - Causes
    - viral
    - immunologic
  - Develops late in gestation or after birth
  - Early treatment is key

**Gastrointestinal Structural Defects**
- Cleft lip/palate (CL/P)
- Causes
  - inheritance
• part of syndromes
• environmental factors
• maternal smoking
• CP can affect feeding

Gastrointestinal Structural Defects
• Management of CL
  • Emotional support
  • Surgical closure
• Management of CP
  • Surgical closure
  • Speech therapy

Gastrointestinal Structural Defects
• Feeding issues for infants with CL/P
  • difficult to draw in fluid
  • route of escape
• Solutions
  • Cleft palate nipples
  • positioning

Gastrointestinal Structural Defects
• Cleft lip repair
  • protect site
  • suctioning
  • clear liquids and advance
• Cleft palate repair
  • abdominal position acceptable
  • return to normal diet

Gastrointestinal Structural Defects
• Esophageal atresia
  • dead-end esophagus
• Tracheoesophageal fistula (TEF)
  • connection between trachea and UGI tract
• More common in premature infants
• Birth weight lower than normal

Gastrointestinal Structural Defects
• TEF diagnosed through radiographic studies
• Treatment
  • prevent complications
  • surgical repair

Gastrointestinal Obstructive Defects
• Hypertrophic Pyloric Stenosis
  • Evident at 1-10 weeks
• vomiting 30-60 minutes after feeding

Treatment
• gastric decompression
• open surgical repair
• laparoscopic repair
• po within 4-6 hrs

Gastrointestinal Obstructive Defects
● Intussusception
  • telescoping of bowel into itself
  • increases pressure
  • causing obstruction and bleeding
  • diagnosis
    • history
    • barium enema after abdominal films
  • treatment

Gastrointestinal Obstructive Defects
● Anorectal malformations
  • numerous anomalies of GU and pelvis
  • imperforate anus

Gastrointestinal Malabsorption Syndromes
● Digestive
  • CF, liver disease, lactase deficiency
● Absorptive
  • Celiac disease, ulcerative colitis
● Anatomic
  • Short bowel syndrome

Genitourinary dysfunction
● Urinary output assessment
  • Normals
    • Infant/toddler 2-3ml/kg/hr
    • School-age 1-2ml/kg/hr
    • Adolescent 0.5-1ml/kg/hr
  • 2 yr old weighs 15kg, has 4 diapers with each weighing 100g (100ml of urine) over 8 hours. How many ml/kg/hr is he/she putting out?

Genitourinary dysfunction
● Calculating output
  • 4 diapers x 100ml = 400ml
  • 400ml/8 hours = 50ml/hr
  • 50ml/hr/15kg = 3.3ml/kg/hr
• Norm for toddler is 2-3ml/kg/hr
• Output is adequate

**Genitourinary dysfunction**

● Urinary tract infections (UTI)
  • Any location in the urinary system
  • Can be symptomatic or asymptomatic
  • Peak at 2-6 yrs, girls>boys
  • Caused by enteric organisms

**Genitourinary dysfunction**

● Predisposing factors for UTI
  • Females have shorter urethra
  • Urinary stasis

● Diagnosis
  • Limitations of collection devices
  • Suprapubic aspiration < 2 yrs
  • Bladder catheterization

**Genitourinary dysfunction**

● Vesicoureteral reflux
  • Flow from bladder into ureters
  • Children are symptomatic
  • Outgrown over years
  • Chronic antibiotic therapy

**Genitourinary dysfunction**

● Obstructive uropathy
  • Urine obstruction
  • Hydronephrosis
  • Associated with other defects

● Treatment
  • Bypass obstruction

**Genitourinary dysfunction**

● External defects
  • Significant psychological impact
  • Ideal age for repair is 6-15 months

**Genitourinary dysfunction**

● Nephrotic Syndrome or minimal change nephrotic syndrome
  • Cause unknown
  • Treatment
    • Corticosteroids - high dose
    • Prevent infection
    • Maintain nutrition
Genitourinary dysfunction
- Acute Glomerularnephritis (AGN)
  - Acute poststreptococcal glomerulonephritis
    - mechanism unknown
    - most strep infections do not cause AGN
  - Treatment-supportive
    - Treat symptoms and prevent complications

Genitourinary dysfunction
- Hemolytic-Uremic Syndrome
  - Manifested by anemia, thrombocytopenia, & renal failure
  - Treatment
    - Renal replacement therapy
    - Permanent renal damage occurs

Genitourinary dysfunction
- Wilm’s tumor (nephroblastoma)
  - favors development in the left kidney
  - clinical signs
    - abdominal swelling
  - various stages based on level of invasion
  - treatment is surgery, chemo and possible radiation

Genitourinary dysfunction
- Acute Renal Failure
  - acute onset
  - d/t poor perfusion, kidney disease, urinary tract obstruction, or medications
  - usually reversible
  - treatment
    - treat underlying cause
    - supportive care/prevent complications

Genitourinary dysfunction
- Chronic renal failure
  - level of compensation
  - asymptomatic until advanced damage to nephrons
  - treatment
    - diet
    - supplementation
    - dialysis & transplant
Genitourinary dysfunction
• Technological management of renal failure
  • Peritoneal dialysis
  • Hemodialysis
  • Hemofiltration

Genitourinary dysfunction
• Renal transplant
  • preferred treatment for children
  • requires immunosuppressive medication
  • rejection is a risk
    • can be treated and reversed
Pathophysiology of Poststreptococcal Acute Glomerulonephritis

Streptococcal Infection

Antigen-Antibody Reaction

Formation of immune complexes which become entrapped in glomerular membrane

- Vasopressor Activity
- Glomerular Proliferation and Damage
- Generalized Capillary Damage

- Vasospasm
- GRF

- Retention of Na+ and H₂O
- Proteinuria, Hematuria, Casts

- ECF
- Hypertension
- Edema
- Edema
## COMPARISON MCNS AND ACUTE POST STREPTOCOCCAL GLOMERULONEPHRITIS

<table>
<thead>
<tr>
<th></th>
<th>MCNS</th>
<th>AGN</th>
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</table>
| **Etiology**     | Autoimmune
glomerular membrane
changes               | Streptococcal
Infection
aubimmune

glomerular
changes               |
| **GRF**          | N                                         | □                                        |
| **Proteinuria**  | Massive                                   | Moderate                                 |
| **Hematuria**    | Rare                                      | Gross                                   |
| **Fluid Volume** | Hypovolemia
(Fluid remains
interstitial)   | Hypervolemia
(Fluid remains
intravascular) |
| **BP**           | N - □                                     | □BP                                     |
| **Edema**        | Pronounced Systemic                       | Usually Face                             |
UNIT: ALTERATIONS IN MOBILITY -- MUSCULOSKELETAL

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Describe the nursing assessment and identification of diagnoses for a child with a musculoskeletal dysfunction.
   
   a. Osteomyelitis
   b. Septic arthritis
   c. Fractures
   d. Club foot
   e. Congenital dislocated hip
   f. Legg-calvé - Perthes Disease
   g. Slipped femoral capital epiphysis
   h. Scoliosis
   i. Duchenne Muscular Dystrophy

2. Describe the nursing management of children immobilized by casts, traction, or braces.

3. Describe nursing interventions used to prevent skin breakdown, control infection and complications, control neurologic and circulatory compromise, prevent complications from appliances and apparatus, and control pain.

4. Describe the developmental, emotional and health maintenance needs related to the child with interferences of mobility.

REQUIRED READINGS:

Michigan State University
College of Nursing
Nursing 307
Concepts of Nursing Care of Children and their Families
MOBILITY AND MUSCULOSKELETAL DYSFUNCTION

Immobilization
- Use it or lose it
- Primary alterations - musculoskeletal
- Secondary alterations - other organs

**Primary changes from immobilization**
- Muscles weaken
- Bones lose calcium
- Joint mobility decreased
- The longer, the larger, the worse

**Secondary changes from immobilization**
- Cardiac
  - Decreased venous return, decreased CO
  - Decreased vasoconstriction response
- Respiratory
  - Less chest expansion
  - Secretion retention
  - Muscle atrophy

**Secondary changes from immobilization**
- Renal
  - Difficult voiding position
  - Less peristalsis - urinary retention
- Gastrointestinal
  - Distention
  - Gravitational effects of GI flow
- Metabolic
  - Decreased rate, healing, coping

**Psychosocial changes from immobilization**
- Movement is key for children
  - Emotional outlet
  - Environmental experience
  - Promotes language
  - Developmental milestones

**Soft tissue injury**
- Contusion
- Dislocation
- Sprain
- Strain
Soft tissue injury treatment

- ICE
- Immobilization
- Positioning

Fractures

- Activity level predisposition
- Rare in infants
- Commonly involves the clavicle
- Common site is the epiphyseal plate

Fractures

- Types
  - simple
  - compound
  - complicated
  - comminuted

Fractures

- Common pediatric fractures
  - Bend
  - Buckle
  - Greenstick
  - Complete

Fractures

- Diagnosis
  - History questionable
  - 5 Ps
  - X-ray

Fractures

- Management
  - Outpatient
  - Occasionally inpatient

Cast immobilization

- Types
  - Extremity
  - Spinal
  - Spica

Materials

Monitoring

Removal

Traction

- Purposes
  - reduce muscle spasm
  - realignment
  - immobilize
Congenital Defects

Developmental dysplasia of the hip
- Different degrees
- Diagnosis
- Treatment
  - Age specific
  - Degree of displacement dependent
- Caregiver issues

Congenital Clubfoot
- Types - Talipes equinovarus
- Management success varies

Skeletal limb deficiency

Osteogenesis imperfecta

Acquired defects

Legg-Calve-Perthes disease
- Vascular abnormalities of the femoral head
- Commonly in boys 4-8yrs
- Four stages
- Clinical presentation - limp
- Treatment - varies
- Family/caregiver considerations

Slipped femoral capital epiphysis
- Cause is mechanical and biological
- Presentation - pain
- Treatment depends on severity
  - Bedrest
  - Pin/screw fixation

Spinal deformities
- Kyphosis - thoracic
- Lordosis - lumbar or cervical
- Scoliosis

Kyphosis
- Causes can be disease processes or posture
- Treatment varies with severity

Lordosis
- Causes can be trauma or unknown
  - Hip contractures, obesity, congenital abnormalities
• Painful
• Treatment is targeted at cause

**Acquired defects**

- Scoliosis
  • lateral curve, spinal rotation, hypokyphosis
  • congenital or acquired
  • diagnosis is clinical presentation & x-ray
  • treatment varies

**Acquired defects**

- Scoliosis treatment
  • Exercise & bracing
    – Boston brace - utilizes lateral pads
    – Thoracolumbosacral orthotic (TLSO) - customized
  • Surgery
    – Harrington rods
    – L-rods
    – Combination
  • Family/caregiver issues

**Infections of bones & joints**

- Osteomyelitis
  • Cause
    – external
    – internal
  • Pathogens - age specific
  • Clinical presentation
    – symptoms of infection
    – localized signs

**Infections of bones & joints**

- Osteomyelitis
  • Treatment
    – antibiotic therapy x3-4 weeks
    – activity limitations, splints, braces
  • Family/caregiver issues
    – Pain control
    – IV access

- Septic arthritis

**Tumors**

- Affects new growth cells
- Peak incidence in adolescence
- Diagnosis
  • by elimination
  • clinical presentation
Osteogenic sarcoma
- Peak 10-25 years
- Affects long bones
- Management - controversial
  - Amputation
  - Limb salvage
  - Rotationplasty
  - Chemotherapy
- 65-75% long term survival

Ewing Sarcoma
- Occurs in 4-25 year age group
- Site is the marrow of some bones
- Treatment
  - Irradiation
  - Chemotherapy
  - Surgery for specific situations
- Survival best w/o metastasis
PRINCIPLES OF TRACTION

I. Definition:

A pull exerted manually or with mechanical devices.

II. Purposes:

A. To reduce muscle spasm, i.e., fractures, back strain.
B. To immobilize--fractures, tuberculosis, etc.
C. To reduce fractures.
4. To maintain the length and position of an extremity by continuous pull until healing has progressed to the point where the fragments cannot change position. (In some cases, traction is used until muscle spasm has been relieved so that the fragments can be realigned and placed in some other type of fixation.)
E. To correct or prevent development of deformities, i.e., scoliosis.

III. Types of traction:

A. Manual traction:

Definition: A pull exerted with hands.

1. In the reduction of fractures.
2. By the surgeon or his assistant to maintain a steady pull on the limb while mechanical traction is released for adjustment.

Points to remember.

1. Manual traction must be done with a smooth firm grip.
2. Avoid any sudden jerky motions of the limb since this causes severe pain.
3. Never use manual traction without specific orders to do so.

B. Mechanical traction:

1. Skin traction (non-operative):
   a. Traction applied to the skin (therefore, indirectly on the skeleton).
      (1) On extremities with traction strips (sponge rubber or moleskin) fastened with stockinette or woven bandage.
      (2) On the cervical spine with head halters of various types.
      (3) On the pelvis with pelvic sling (for fracture of the pelvis) or with a pelvic belt (for low back pain).
   b. Skin traction may be contraindicated for clients who have circulatory disturbances, dermatitis, varicose veins. May be unsafe for clients with diabetes.
2. Skeletal traction (operative):
   a. Traction applied directly to the bone by means of pins or wires passed through the bone, or tongs anchored in the skull. (Most effective type of traction.)
   b. The most common means of skeletal traction on the extremities are:
      (1) The Kirschner wire which is smallest in diameter and creates negligible disturbance to the bone. Because of its small diameter, the wire must be held rigid with the Kirschner bow which also serves as the attachment to the traction.
      (2) The Steinmann pin, which, because of its greater diameter, is able to maintain its own rigidity.
   c. Other types: crutchfield tongs, halo traction.
   d. Care of mechanical traction equipment.
      (1) Be sure the ends of the pins are covered with cork or adhesive.
      (2) Allow no dressings around the wires unless ordered.

3. Types of pull in extremity traction.
   a. Straight or running.
      (1) This provides a pull upon the affected part but no balanced support. The pull is against the weight of the body and its friction upon the bed.

         Examples: Arm traction
                     Buck's extension
                     Bryant's traction
                     1. under 2 years of age who weigh less than 35 lb.
                     2. buttocks raised slightly off of bed
                     3. both legs always suspended

   b. Balanced traction:
      (1) This provides a running traction plus a balanced or counter-traction.

         Examples: Thomas splint with or without Pearson attachment
                     Russell traction on lower extremity (for hip or femur)
                     Dunlop traction on upper extremity elbow
                     Any hammock or splint traction

C. Plaster traction.
   1. Skeletal traction applied by incorporating the ends of the Steinmann pins or Kirschner wires in a cast.
      a. This provides a threefold advantage.
         (1) It maintains the position of the extremity.
         (2) It provides a fixed traction.
         (3) It allows the patient to move about.

   2. Scoliosis jackets.
      a. "Shift" jacket--a body case applied to hold a growing child so that his growth process will tend to decrease the spinal curvature rather than increase it.
      b. Turnbuckle jackets that allow adjustment to exert pressure for the correction of deformities.

   3. Hyperextension casts:
      a. Applied to hyperextend the spine after a compression fracture. This type of fixation allows the patient to be ambulatory.
IV. Principles of traction:

A. Position of the client--dorsal.
B. Counter traction.
   1. Elevate foot of bed.
   2. Pull client away from foot of bed.
   3. Footplate never come in contact with foot of bed.
C. Friction--none.
D. Continuous.
E. Straight line of pull

V. General care of traction client:

A. Maintain alignment.
   1. Of injured part.
   2. Of body.

B. Learn to care for the client without being tempted to disturb the traction.
   1. Never lift the weights to adjust the bed or the traction.
   2. Never remove weights from client with fracture except when doing number 3
      (below).
   3. If you have permission to make adjustments, see that manual traction is used to
      maintain the pull while the adjustments are made.

C. Traction must be maintained at maximum efficiency 24 hours a day, unless otherwise
   ordered.
   1. Exceptions to the 24-hour a day rule for traction:
      a. Traction applied to relieve the pain of muscle spasm, associated with low back
         pain.
      b. Traction applied to arthritis clients to prevent or correct flexion contractures of
         the joints.
      c. Traction applied for relief of pain and/or muscle spasm in the cervical spine.
   2. Check the orders carefully for specific order to release traction before doing so.
      a. Many clients with the above-mentioned complaints are in continuous traction.

D. Learn in each case exactly what activities are to be allowed (and encouraged) as well
   as what limitations are to be put upon them.
   1. Be sure that the client understands how much activity of the body and of the
      injured part is allowed.
   2. No unnecessary restrictions of motion should be imposed upon traction clients.
      They merely cause:
      a. Unnecessary aches and pains.
      b. Loss of muscle tone.
      c. Unnecessary stiffness.
      d. Atrophy, which, in extreme cases, may result in permanent deformity.
   3. Restriction of motion should be limited to doctor's orders. There is no advantage
      to having a bone healed in proper alignment if the soft tissue is rendered useless
      because of disuse, atrophy or contractures.
4. It is important that the parts of the body not in traction be kept in as good condition as possible. Specific exercises may be ordered later but the client should start at once to:

- Use the trapeze.
- Reach for things.
- Comb his own hair.
- Tie his own gown.
- Perform any other activity that does not interfere with the efficiency of his traction.

5. Check orders carefully on clients with cervical or dorsal spine injuries. Arm activities may be contraindicated.

VI. Questions to ask yourself regarding traction:

A. Is the circulation to extremity adequate? Pallor, cyanosis, numb, cold, edema?
B. Is the condition of the skin around the tape satisfactory? Irritation, pimples, purulent discharge?
C. Is the client warm and comfortable?
D. Is the client's bed position good?
E. Is the foot in treatment protected against footdrop?
F. Is the provision made for maintaining the limb in neutral position and for preventing external rotation?
G. Is there any inversion or eversion of the foot in traction?
H. Is the opposite extremity in good alignment and protected against the pressure of bed clothes?
I. Is the popliteal space free from pressure?
J. Check skin areas around the Achilles tendon and the malleoli carefully.
K. Is the tape slipping at any point?
L. Is the pulley working mechanically? Shallow groove, unmoving pulley?
M. Is the footplate or spreader wide enough to prevent irritation of the malleoli but not so wide that the tapes tend to pull from the limb?
N. Does the footplate or spreader contact the end of the bed?
O. Are the weights at a good level above the floor and a considerable distance below the pulley?
P. Are the knots secure?
Q. Is countertraction provided?
R. Is there any impingement on the ropes--bedclothes, etc.?
S. Does the bed sag under the client's buttocks?
T. Are the heels digging in the mattress?
U. Skeletal traction: Is there any drainage, swelling, edema, redness at the pin site?
# TYPES OF SKIN TRACTION

<table>
<thead>
<tr>
<th>TRACTION TYPE</th>
<th>APPLICATION SITE</th>
<th>WEIGHT</th>
<th>CARE FACTORS</th>
</tr>
</thead>
</table>
| **BUCK'S EXTENSION**  | Arm or leg (one or both)             | 5 to 8 lb per extremity | - Clean and dry the skin. Be sure the client has no open cuts or wounds.  
- Make sure equipment (tape, bandages, traction straps, or both) is new (when appropriate) and functioning properly.  
- Remove the traction apparatus to care for and observe tissues.  
- Teach the client how to use traction at home. |
| **RUSSELL'S EXTENSION** | Leg only (one or both)               | 5 to 10 lb per leg | - Arrange pulleys and ropes, and determine the weight by the principle "for every force in one direction, there's an equal force in the opposite direction."  
- Loosen the knee sling for care and observation.  
- Keep the client recumbent.  
- Remove the traction to care for the client (always check with the physician before removing). |
| **BRYANT'S EXTENSION** | One or both legs (usually both)      | Varies - enough weight to raise the buttocks off the bed | - Use for children under 35 lb.  
- Position both legs at right angles to the buttocks.  
- Position the child's buttocks slightly off the bed to ensure correct amount of pull.  
- Supervise the child closely to maintain the recumbent position.  
- Remove the traction to provide care, according to the physician's orders or institutional policy (requires two people, with one gently maintaining manual traction).  
- Teach the child and parents to guardians how to use this traction at home. |
UNIT: CHRONIC CHILDHOOD ILLNESSES

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Define chronic illness and identify how it influences the child and family at different developmental levels.

2. Describe the components of a comprehensive assessment of a chronically ill child and his/her family.

3. Describe the pathophysiology, clinical manifestations, and nursing management of a child with:
   a. Cystic Fibrosis
   b. Acute lymphocytic Leukemia
   c. Sickle Cell Anemia
   d. Hemophilia

4. Identify nursing strategies to assist families in coping with chronic illness.

REQUIRED READINGS


   b. Acute Lymphocytic Leukemia, pp. 1002-1019.
   d. Hemophilia, pp. 997-999.
INCIDENCE AND PREVALENCE
1. 10 - 20% of children in US
2. Number steadily rising
3. Increased life expectancy and decreased mortality
4. Disproportionate share of total health care used by children

DEFINITION AND CHARACTERISTICS
1. Long duration
2. Need specialized health care
3. On-going management in the home and health care settings
4. Frequently shortened life expectancy
5. No known cure and/or uncertain prognosis
6. Useful to differentiate CI from developmental disabilities because experience is different for child and family

IMPACT ON CHILD AND FAMILY
1. Cannot be predicted by type or severity of the illness.
2. Chronicity has a powerful effect on child development and family functioning
3. Limited number of difficulties experienced frequently by many families
4. Nature of the family rather than the nature of the illness likely to determine which problems arise.
5. Psychosocial impact of CI on the child and family is determined largely by factors not intrinsic to any particular diagnosis.
6. Determined largely by age, developmental level, family, personality, and community factors.

IMPACT ON THE CHILD-Factors that may affect child's response
1. Nature of illness
2. Direct effects on development
3. Separation from family and peers
4. Social isolation & restrictions.
5. Dependency
6. Fear of treatments and procedures
7. Concern about death depends on age--parental anxiety more distressing
8. Quality of family functioning and extent of interference with developmental tasks are the most important factors in child's adjustment to illness.
9. Adjustment is on-going.

IMPACT ON FAMILY
1. Need to know how family functioned prior to Dx in order to determine impact
2. Increased tasks, time demands, financial burden.
3. Society's response to child & family may result in greater distress than illness itself
4. Difficulty finding caretakers

MATERNAL ROLE
1. Mother's often more involved in day to day care, clinic appts, hospitalizations--father's often excluded from last 2 due to work hours
2. Research has focused on mothers
3. Guilt and questions about what they did wrong.

PATERNAL ROLE
1. Often excluded by way health care system is set up
2. Often get info second hand thru mother
3. Fathers generally very involved
4. Feelings of helplessness around lack of control over child's condition.
5. Career mobility and social activities curtailed
6. Pathological if they withdraw into work and spend many hours away from home

MARITAL
1. No increased divorce
2. Less time to spend together as marital partners and in adult activities
3. Some couples report increased closeness and communication
4. Potential sources of strain
• Different coping styles
• Different paces grief/adjustment
• Changes in roles and role expectations

SIBLINGS
1. Siblings at highest risk:
   • In midst of own developmental transition
   • Poorly developed coping skills (very young children)
   • Poor parental relationships
   • Older sisters & younger brothers

FAMILY COPING-Influenced by:
1. Level of communication
2. Cohesiveness-over/under a problem
3. Ability to understand illness.

ADAPTIVE COPING
1. Sharing the burden
2. Normalization
3. Denial during crisis
4. Rationalization
5. Assigning meaning to the illness
6. Effective use of personal and external resources.

NURSING INTERVENTIONS
1. Developmentally appropriate activity, behavior and limits. Teach and support parents in doing so.
2. Avoid unnecessary restrictions-activity, social, diet.
3. Lack of rules and limits leads to increased anxiety in children--ill or not.
4. Avoid overindulgence, overdependence, overprotection.
5. Support child in moves toward independence and give parents positive reinforcement for allowing it.
CYSTIC FIBROSIS--CLASS NOTES

Definition
1. Generalized dysfunction of the exocrine glands (mucus producing glands) causing the production of VISCOUS mucus that obstructs small passages of bronchi, small intestine, and pancreatic and bile ducts
2. Affects multiple organ systems with varying degrees of severity

Etiology and incidence
1. Autosomal recessive
2. Carried on chromosome 7
3. 1:1600 caucasian births; 1:17,000 African American births and rare in infants of Asian descent

Diagnosis
1. Sweat Test.
2. Pulmonary Function Testing
3. Genetic blood test for CF marker
4. Chest X-ray
5. Family history
6. Stool for enzymes and fat

Pathophysiology
1. Basic biochemical defect thought to be primarily a result of abnormal chloride movement.
1. Primary factor and the one responsible for the multi-system clinical manifestation is mechanical obstruction from the thick, tenacious mucus that accumulates and dilates the mucous producing glands and blocks small passages in organs such as the pancreatic ducts and bronchioles.
Clinical Manifestations
1. Pancreas
   - thick secretions block the ducts
   - Essential enzymes (trypsin, amylase, and lipase) unable to reach duodenum → malabsorption of fats, fat soluble vitamins, and protein → leads to steatorrhea (fat) and azotorrhea (nitrogen)
   - As pancreatic fibrosis progresses the Islets of Langerhans may decrease in number → diabetes
2. Gastrointestinal
   - Large, bulky foul-smelling, floating stools
   - Voracious appetite with weight loss and wasting
   - Meconium ileus

3. Respiratory Tract--most serious threat to life
   - Thick, tenacious sputum
   - Airway obstruction
   - Increased resistance to ciliary action
   - Infection and chronic inflammatory process.
   - Retained mucus good medium for bacterial growth--staph, pseudomonas aeruginosa and cepacia (Burkholderia cepacia- decreases survival)
   - Initial manifestations
   - Progressive pulmonary involvement

4. Liver
   - Focal biliary obstruction and fibrosis

5. Genital Tract
   - Females
     - Males

Therapeutic Management and Nursing Care

Diet
1. Food likes, dislikes and preferences
2. Increased calories (often 1 1/2 - 2x recommended allowance), protein, carbohydrate and normal to low fat
3. Fat soluble vitamins
4. Pancreatic enzyme
5. Assess stools
6. Salt replacement
7. Increase fluids
8. Diet supplements
9. Short term HTN
10. Feeding tube
11. Positive relationship between nutritional status and pulmonary function

Pulmonary Therapy
1. P & PD
2. Aerosols before P & PD

3. Teach and Supervise breathing exercises

4. Encourage exercise

5. Intensive antibiotic therapy

Home Care
1. Include parents and child
2. Aerosols, P&PD, enzymes, Vitamins, IV antibiotics (central line)
3. On-going hospitalizations for pulmonary clean-outs

Advanced Stages
1. GI tract
2. Respiratory
   - Chronic inflammation, obstruction, and infection → fibrotic changes in the lungs
   - Progressive airtrapping
   - These lead to → compression of the pulmonary blood vessels → pulmonary HTN → cor pulmonale, respiratory failure, and death. Decreased paO2, increased paCO2, decreased arterial O2 sat.
   - Above can also lead to erosion of pulmonary vessels → hemoptysis (bleeding out)
   - Orthopnea
   - Hypercapnia

Management in Advanced Stages
   1. Continue aerosol, P&PD, antibiotics, nutrition
   2. Digoxin and diuretics for CHF
   3. Treatment of diabetes if present
   4. O2-watch concentration, night-time O2
   5. Positioning
   6. Chest pain
   7. Hemoptysis
   8. Continue activity as tolerated
   9. Aerosols and P&PD as needed
   10. Skin care/Back rubs
   11. Home IV antibiotics
   12. Discussion of DNR and End of Life care

Research
1. Heart/Lung transplants
2. Gene therapy
LEUKEMIA-CLASS NOTES

Cancer in Children

Overview
1. Leading causes of death in children over one year of age.
2. Malignant cells compete with normal cells for nutrients, blood supply, and space for growth in the involved tissue/organ → decreased and/or loss of function
3. Proliferation of the undifferentiated cells.
4. May be in form of neoplasm (tumor) but the commonest form in children is Acute Lymphoblastic Leukemia.

Treatment
1. Most treatment protocols involve chemotherapy
2. All chemotherapy creates some degree of immune suppression.
3. Combination chemotherapy.

ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)

Overview
1. Peak incidence 3-5 years of age
2. Proliferation of undifferentiated (immature) white blood cells in the body.

3. ANC (absolute neutrophil count)-Multiply the % of neutrophils (segs) plus % of bands times the number of WBCs (total WBC). The value plays an essential role in nursing care.

4. Prognosis: With ALL 95% achieve initial remission and there is an 85% chance of survival for 5 years

Clinical Manifestations
1. Decreased mature WBCs lead to infection and fever
2. Decreased platelets lead to bruising, petechiae, nosebleeds, and bleeding gums.
3. Decreased RBCs result in anemia, weakness, malaise, fatigue and pallor.
4. Infiltration of organs and tissue may result in bone pain, migratory joint pain, splenomegaly, hepatomegaly, lymphadenopathy.
5. Bone marrow suppression from chemo can also lead to the first 3 manifestations and the first 2 (infection and bleeding) are crucial to safe nursing care.
**Diagnosis**
1. Often present with nondescript S&S that are seen in common childhood illnesses.
2. CBC with peripheral smear to look for blast cells.
3. Bone marrow aspiration should always be done before making diagnosis.
4. Lumbar puncture to assess for CNS involvement
5. Bone scan or skeletal survey to assess bone involvement
6. Renal, liver and spleen scans to assess leukemic infiltrates

**Treatment-Goal is to achieve a primary remission that lasts**
1. Remission = absence of detectable leukemic cells in marrow.
2. Induction chemotherapy (3-6 weeks) to induce remission. Most intensive and potentially the most life threatening secondary to the degree of bone marrow suppression. Common drugs are prednisone, vincristine, L-asparaginase. THERE IS A HIGH RISK FOR INFECTION AND BLEEDING!!!!!!
3. Consolidation (2-3 weeks) extension of intensive phase to combat CNS involvement and other vital organs.
4. Maintenance (2-3 years) to sustain remission.
5. Relapse if it is going to occur usually occurs in the first year.

**Nursing Care**
The nurse must follow the CBC closely and know what the values mean and the nursing implications. The actual values of the following labs guide the nursing interventions.

1. Decreased ANC/WBC (depending on the value) may indicate need for:
   - Prevention of infection/protective isolation-child should wear mask when around other people.
   - Hold chemo
   - Assess vital signs and other S&S of infection
1. Assess mucous membranes for lesions and indications of fungal infection, these lesions are painful and effect food and fluid intake
   - No live virus vaccines when on chemo. Chickenpox can be life threatening.

2. Decreased platelets may indicate risk for bleeding
   - Nosebleeds, gums, bruising--good mouth care with swabs and mouthwash-no toothbrush
   - Assess for CNS, joint and GI bleeding
   - No ASA or nonsteroidal anti-inflammatories
   - No IMs--if absolutely necessary use the smallest gauge needle possible
   - Avoid overinflating B/P cuff
   - Monitor toys and play
   - May need platelet transfusion

3. Decreased RBC--anemia
   - Assess change in P and R
   - Adapt activity to P and R
   - Assess color of mucous membranes and nailbeds

4. Fluid and electrolytes
   - Maintain hydration. Some of the drugs cause renal failure and serious complications if child is not adequately hydrated to clear breakdown products
   - Some drugs require certain urine pH
   - Mouth pain and fungal infections may lead to need for bland fluids

5. Nausea and Vomitting
   - Avoid foods with distinctive smells
   - Avoid strong perfumes---visitors too!
   - Increase calories and protein. Water, caffeine, and red meats are often tolerated poorly
   - Small frequent meals
   - Often medicate for n/v prior to chemo administration

6. Chemotherapy Drugs
   - Dosages are calculated very specifically by Kg or m2
   - Should be administered by nurses who give peds chemo regularly and are familiar with the drugs, dosages, toxicity and side effects.
## LEUKEMIA

<table>
<thead>
<tr>
<th>CLINICAL MANIFESTATIONS</th>
<th>PATHOLOGIC BASIS</th>
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</thead>
</table>
| 1. Bone Marrow Depression | Anemia □ □ RBC, □ O\(_2\)  
Carrying capacity of Blood |
| Malaise  
Fatigue  
Weakness  
Pallor |  |
| Fever  
Frequent Infections | 1. Infection - □ Immune System  
2. □ Metabolism by Neoplastic Cells |
| Bleeding:  
Petechiae  
Ecchymosis  
Gingival Bleeding  
Epistaxis | □ Thrombocytes (platelets) □  
□ Clotting Ability |
| 2. Bone Pain and Tenderness  
Migratory Joint Pain  
pathological Fractures | Subperiosteal bone Infiltration □  
Weakbone |
| 3. Headache, Nausea and Vomiting  
Papilledema  
Cranial Nerve Palsies  
Nuchal Rigidity  
Seizures  
Coma | Leukemic Filtration of CNS □ ICCP,  
Meningeal Irritation |
| 4. Abdominal Discomfort -  
Fullness, Pain | Generalized Lymphadenopathy  
Hepatomegaly  
Enlarged Kidney  
Splenomegaly  
R/T Leukemic Cell Infiltration |
| □ Vulnerability To Infections –  
Especially:  
Pulmonary  
Urinary  
Blood  
Peri-rectal | 1. Immaturity of WBC  
and  
2. Ineffective Immune System |
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<tr>
<th>CLINICAL MANIFESTATIONS</th>
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<tr>
<td>6. Hematologic Abnormalities -</td>
<td>Physical and Metabolic</td>
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<tr>
<td>Anemia - Weak, Pale</td>
<td>Encroachment of Leukemic Cells on RBC and Thrombocyte Precursors</td>
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<tr>
<td>Thrombocytopenia</td>
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<tr>
<td>7. Lymph Node Tenderness</td>
<td>Lymphadenopathy</td>
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<td>8. Hyperuricemia</td>
<td>Abnormal Metabolism of Leukemic Cells</td>
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<tr>
<td>□ Renal Damage □ Renal Failure</td>
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<tr>
<td>9. Hypermetabolism -</td>
<td>Cell Deprivation of Nutrients by Invading Cells</td>
</tr>
<tr>
<td>Muscle Wasting</td>
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<tr>
<td>Weight Loss</td>
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<td>Anorexia</td>
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<tr>
<td>Fatigue</td>
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**GENERAL CARE OF CHILDREN RECEIVING CHEMO THERAPY**

*Side effects depend on the drug(s) being used.*

<table>
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<tr>
<th>POTENTIAL PROBLEMS</th>
<th>INTERVENTIONS</th>
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</table>
| 1. Bone marrow depression.  
  A. Leukopenia. | A. 1. Monitor WBC: Notify physician of decrease in WBC.  
  a. Protect patient from infection and exposure to infections.  
  b. Isolate when needed (when ANC is below 500).  
  c. Instruct patient and family, and visitors about infection risk. Restrict visitors if necessary.  
  d. Teach temperature taking/reading. No rectal temps.  
  e. Instruct on strict handwashing with Betadine.  
  f. Observe for early signs of infections:  
      1. Decreased B/P.  
      2. Decreased or increased temperature.  
      3. Assess common sites of infection every shift.  
      4. Personality changes (lethargy, irritability). |
|                     | 2. Maintain skin integrity:  
  a. Turn every 2 hours.  
  b. Keep skin clean, dry.  
  c. Massage potential pressure areas. |
|                     | 3. Maintain urinary tract integrity:  
  a. Perineal care b.i.d. and p.r.n. with diaper changes.  
  b. Foley cath care every shift and prn.  
  c. Encourage fluids.  
  d. Assess for burning or pain with urination.  
  e. Assess characteristic of urine. |
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<tr>
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</table>
| 4. Maintain respiratory tract integrity.  
   a. Cough, deep breathe every 2 hrs.  
   b. Auscultate lung sounds every shift and p.r.n. Notify physician if significant change present.  
   c. Assess sputum for color, consistency and amount. Send specimen to Lab if ordered.  
   d. Encourage frequent ambulation.  
   e. Encourage adequate rest periods. |
| 5. Administer antibiotics as ordered.  
   a. Bactrim/Septra as a prophylaxis for pneumocystis carinii pneumonia.  
   b. Antibiotics appropriate for infective organism. |
| 6. Discharge teaching.  
   a. Stress importance of having blood counts done as ordered.  
   b. Stress importance of avoiding crowds when WBC's are low. |
| B. Thrombocytopenia. | B. 1. Monitor platelet count and notify physician if decrease occurs.  
   2. Observe for signs of bleeding.  
      a. Bruising or petechiae.  
      b. Hematuria. (Dipstick)  
      c. Tarry stools. (Hemacult)  
      d. Oozing from venipuncture.  
      e. Oral or nasal hemorrhage.  
      f. Vital signs every 2 hours.  
      g. Monitor for signs of internal bleeding.  
      h. Check for signs of abnormal bleeding. |
<table>
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<tr>
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</table>
| 3. Avoid invasive procedures.  
  a. Avoid injections - apply pressure 3-5 minutes after necessary injections. If injection is necessary use smallest gauge needle possible (27 gauge long needle).  
  b. Avoid rectal/vaginal suppositories.  
  c. No rectal temperatures unless ordered by physician.  
| 4. Administer stool softeners as ordered to prevent trauma to rectal mucosa.  
| 5. Use electric razors, not straight razors, and toothettes instead of toothbrushes to avoid trauma.  
| 6. Do not give aspirin or aspirin-containing products unless ordered by physician.  
| 7. Discharge teaching:  
  a. Reinforce all of the above.  
  b. No sports, athletics, or rigorous play when platelet count low.  |
| C. Anemia. | C. 1. Plan activities to allow for rest periods.  
| 3. Administer PRBC's as ordered.  
| 4. Administer oxygen as ordered.  
| 5. Assess patient's skin color.  
| 6. Always clarify use of irradiated blood products for transfusions.  
| 7. Monitor/assess for chest pain and dyspnea.  
<p>| 8. Keep warm. |</p>
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<tr>
<th>POTENTIAL PROBLEMS</th>
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<tr>
<td>2. G.I. complications--nausea, vomiting, diarrhea.</td>
<td>2. A. Nausea and vomiting:</td>
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<tr>
<td></td>
<td>1. Give antiemetics routinely as ordered.</td>
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<td>2. Encourage food and fluids in small amounts frequently.</td>
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<td>4. Keep environment pleasant and free of odors.</td>
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<td></td>
<td>a. Open tray away from patient to dispense food odors.</td>
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<td>b. Remove soiled bedpans, commodes--use air fresheners if tolerated by patient.</td>
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<td>5. Have emesis basin at bedside.</td>
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<td>6. Accurate Intake and Output.</td>
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<td>7. Weight daily.</td>
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<td>9. Report symptoms of imbalance:</td>
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<td></td>
<td>a. Confusion</td>
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<td>b. Lethargy</td>
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<td></td>
<td>c. Tremors</td>
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<td>d. Poor or decreased skin turgor.</td>
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<td>e. Absence of tears.</td>
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<td>f. Decreased urine output.</td>
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<td>g. Dry mucous membranes.</td>
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<td>10. Urine specific gravity and dip-stick every 8 hours; every 4 hours and p.r.n. if abnormal.</td>
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<td>11. If vomiting or diarrhea persists, obtain IV order from physician for fluid maintenance requirements.</td>
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<td>POTENTIAL PROBLEMS</td>
<td>INTERVENTIONS</td>
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<tr>
<td>B. Diarrhea.</td>
<td>1. Medicate with anti-diarrheals, as ordered.</td>
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<td>2. Document frequency, consistency, amount and number of stools.</td>
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<td>3. Check stools for occult blood and notify physician.</td>
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<td></td>
<td>4. Maintain skin integrity.</td>
</tr>
<tr>
<td></td>
<td>a. Keep perineum clean and dry.</td>
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<td>b. Use A &amp; D Ointment or Calmosephine Ointment as needed to protect skin.</td>
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<td></td>
<td>c. Air dry buttocks and perineum p.r.n. for excoriation.</td>
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<td>5. Encourage constipating foods, i.e., BRATY diet (bananas, rice, applesauce, toast, yogurt.</td>
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<td>3. Hemorrhagic cystitis.</td>
<td>3. A. Force fluids - amount per physician's order.</td>
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<td>B. Run IV fluids at ordered rate.</td>
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<td>C. Instruct patient to void often and especially to empty bladder before bedtime.</td>
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<td></td>
<td>D. Check urine for color, amount and presence of blood after each voiding. (Dip stick)</td>
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<td>E. Notify physician of any complaint of burning on urination.</td>
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<td>F. Maintain accurate intake and output.</td>
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<td>G. Obtain order for urinary catheterization if urine output not adequate according to physician specifications. Know normal safe urinary output for age/weight.</td>
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<td>H. Obtain order for foley if patient not potty-trained to prevent urine stasis and G/U irritation.</td>
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<td></td>
<td>I. Attempt to give early in day to decrease opportunity for urine stasis overnight.</td>
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<td>POTENTIAL PROBLEMS</td>
<td>INTERVENTIONS</td>
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<td>4. Alopecia.</td>
<td>4. A.  Explain to patient/parent that hair may fall out.</td>
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<td>B.  Encourage patient/parent to be gentle with hair.</td>
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<tr>
<td></td>
<td>1.  No permanents.</td>
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<td>2.  No hair coloring.</td>
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<td>3.  Use soft bristle brushes.</td>
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<td>C.  Encourage patient/parent to talk about feelings about hair loss.</td>
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<td></td>
<td>D.  Offer assistance to obtain wig.</td>
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<td>E.  Explain regrowth after treatment.</td>
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<td>F.  Explain loss of body heat from the head and exposure.</td>
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<td></td>
<td>1.  Encourage use of head covering (i.e., hats or scarves).</td>
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<tr>
<td>5. Stomatitis and oral yeast infections.</td>
<td>5. A.  Observe daily for white patches in mouth.</td>
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<td>B.  Instruct patient and parents on importance or oral care every 2 hours while awake, especially after meals.</td>
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<td>C.  Oral care solutions:</td>
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<td>1.  1/4 tsp. baking soda and 1/4 tsp. salt in 1 cup warm water, or 1/2 strength hydrogen peroxide and water.</td>
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<td>D.  No commercial mouthwashes.</td>
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<td>E.  Use toothettes or soft bristle brushes.</td>
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<td>F.  Bland diet.</td>
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<td>G.  Give medications as ordered to control pain.</td>
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<td>1.  Xylocaine viscous.</td>
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<td></td>
<td>2.  Mycostatin.</td>
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<tr>
<td></td>
<td>3.  Mycostatin and Benadryl.</td>
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<tr>
<td>6. Perineal yeast infection.</td>
<td>6. A.  Observe buttocks and perineal area for signs of yeast infection.</td>
</tr>
<tr>
<td></td>
<td>1.  Redness and/or edema.</td>
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<tr>
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<td>2.  White thick drainage.</td>
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<td>3.  Burning and/or itching.</td>
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<td>B.  Peri-care every 4 hours and p.r.n. with diaper changes.</td>
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<td>C.  Obtain order for yeast culture.</td>
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<td>D.  Topical antibiotics as ordered.</td>
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<td>E.  Air dry buttocks and perineal area for excoriation.</td>
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<td>POTENTIAL PROBLEMS</td>
<td>INTERVENTIONS</td>
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</tbody>
</table>
| 7. Extravasation of drug. | 7. A. Check IV site prior to infusion, during and after administration of drug for:  
2. Redness.  
3. Edema.  
4. Stopped flow of IV fluids.  
B. If extravasation occurs, notify IV nurse or chemotherapy nurse who will follow EXTRAVASATION PROTOCOL.  
Do not remove IV catheter!  
C. Notify physician. |
B. Prevent constipation by:  
1. Checking for bowel movement daily.  
2. Encouraging fluids (i.e., fruit juices).  
3. Instruct importance of stool softeners and laxatives as ordered - offer as needed.  
C. Observe for abdominal pain and distention every 8 hours and p.r.n.  
D. Palpate and auscultate abdomen every 8 hours and p.r.n.  
E. Record quality of bowel sounds every 8 hours and p.r.n.  
F. Evaluate for peripheral neuropathy.  
1. Numbness and tingling.  
2. Loss of deep tendon reflex. |
| 9. Cardiac toxicity. | 9. A. Physician may order baseline EKG and/or ECHO prior to administration of drug.  
B. Observe for signs of CHF.  
1. Weight gain, edema, inadequate output, dyspnea, hypertension.  
C. Observe apical and radial pulses for regularity.  
1. Notify physician of irregularity.  
2. Obtain EKG if ordered.  
3. Obtain Echocardiogram as ordered by physician. |
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<tr>
<th>POTENTIAL PROBLEMS</th>
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<tr>
<td>10. Red-colored urine.</td>
<td>10. A. Inform patient and parents that red-colored urine is an expected but harmless response to the drug.</td>
</tr>
</tbody>
</table>
| 11. Renal toxicity. | 11. A. Force fluids - obtain order from physician for fluid maintenance requirements.  
B. Check BUN, Creatinine, and notify physician of increase.  
C. Maintain accurate I & O.  
D. Maintain good skin care.  
E. Instruct patient to void frequently.  
F. Daily weight.  
G. Specific gravity and dip stick every 8 hours.  
H. Give mannitol as ordered.  
I. Maintain urine pH ≥ 7.0 when indicated. |
| 12. Chemically induced fever. | 12. A. Monitor temperature every 4 hours during administration of drug - every 2 hours if elevated.  
B. Encourage fluid intake.  
C. Give antipyretics as ordered.  
D. Tepid sponge baths.  
E. Prevent chills.  
F. Inform parents that elevated temperature is common with this drug and not necessarily an infection. |
| 13. Folic acid deficiency (with high dose MTX). | 13. A. Observe for:  
1. Mucositis.  
2. Diarrhea.  
3. Leukopenia.  
4. Anemia.  
5. Thrombocytopenia.  
B. Careful, exact administration of leukovorin per physician's orders. |
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<tr>
<th>POTENTIAL PROBLEMS</th>
<th>INTERVENTIONS</th>
</tr>
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<tbody>
<tr>
<td>15. Pulmonary fibrosis and chest pain.</td>
<td>15. A. Auscultate lungs every 8 hours and p.r.n.; notify physician of significant changes.&lt;br&gt;B. Assess for dyspnea.&lt;br&gt;C. Observe for signs of respiratory distress:&lt;br&gt;1. Color changes - cyanosis.&lt;br&gt;2. Nasal flaring.&lt;br&gt;3. Retractions.&lt;br&gt;4. Tachypnea.&lt;br&gt;D. Encourage patient to cough and deep breath every 2 hours.&lt;br&gt;E. Record and record exact location, type and duration of chest pains.</td>
</tr>
<tr>
<td>POTENTIAL PROBLEMS</td>
<td>INTERVENTIONS</td>
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</table>
| 17. Flushing of skin with rapid infusion (2-4 hours). | 17. A. Explain to patient and parents that this may happen.  
B. Infuse as slowly as can within time frame ordered (eg, if ordered over 3-4 hours, infuse over 4 hours). |
| 18. Neurological changes. | 18. A. Monitor neurological status:  
1. Headache, drowsiness, blurred vision.  
2. Convulsions.  
3. Changes in motor functioning.  
4. Ataxia, dizziness.  
B. P.T. consult may be helpful for assistive devices.  
C. Encourage/assist patient to maintain independence.  
D. Allow patient and parent to ventilate feelings. |
| 19. Anaphylaxis. (Asparaginase EL-Spar) | 19. A. Skin test prior to giving - usually one time before first dose.  
1. Standard dose is 2 IU  
B. Assess for: Rapid onset of  
1. Urticaria  
2. Chills  
3. Fever  
4. Flushing  
5. Fall in B.P.  
6. Dyspnea  
C. Give IM in one injection - do not divide dose into 2 syringes. |
Pediatric Oncology -- Diet Recommendations for Immunosuppressed Patients

*Eat a variety of health foods, including grains and fiber foods. Drink as many fluids as possible, especially the day before chemotherapy and for 48 hours after chemotherapy.

*Restrict foods that many introduce pathogenic organisms into the GI tract. This includes the following:

- Do not eat fresh strawberries or raspberries. Wash, cook or peel all other fresh fruits and vegetables.
- Do not eat raw or undercooked meat, fish, shellfish, poultry, game, eggs, hot dogs, tofu* sausage or bacon.
- Do not eat cold-smoked fish or lox or pickled fish.
- Do not eat or drink unpasteurized products such as milk, milk products, cheese, yogurt, commercial fruit or vegetable juices, cider, or honey. This includes raw honey and milk.
- Do not eat aged cheeses (such as Brie, Camembert, blue Roquefort, sharp Cheddar or Stilton); do not eat Mexican hot cheese, farmer’s cheese or feta cheese.
- Do not eat refrigerated cheese-based salad dressing (such as blue cheese) which are not shelf-stable.
- Do not eat miso products (including miso soup), tempe (tempeh) or mate tea.
- Do not use raw, uncooked Brewer’s yeast.
- Do not eat moldy or out-dated food products.

*Cut tofu into 1 inch cubes and boil it for 5 minutes in water or broth before adding the tofu to a recipe or consuming it. Quickly stir-frying tofu is insufficient as the only cooking method.

*Use safe practices in the preparation, handling and storage of food, including good hand washing and refrigeration.

*Test well water once a year for pathogens. Contact your local health department for more information about testing well water.
ALLOPURINOL

Action: Metabolic inhibition of the enzyme xanthine oxidase, which is necessary for the formation of uric acid from purine.

Use: Prophylactic treatment to prevent tissue urate deposition, renal calculi, or uric acid nephropathy in those with leukemias, lymphomas and malignancies who are receiving chemotherapy.

Baseline Lab

Test:  
1 CBC  
2 Renal and hepatic function tests  
3 Serum uric acid (Nitrogenous waste product found in blood. Derived from breakdown of purines from the nucleic acids of cells and xanthines [purine compounds found in most body tissues]).

= hyperuricemia
  a marked cellular destruction
  b Leukemia \(^2\) to = production and destruction of WBC, resulting in an rate of turnover of the nucleic acid of those cells, leading to purine catabolism.
<table>
<thead>
<tr>
<th>NURSING GOALS</th>
<th>NURSING INTERVENTIONS</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Ensure adequate hydration</td>
<td>1. Accurate I &amp; O Normal output for child = 50 ml/kg/24hrs. Output ( &lt; ) than 0.5 ml/1kg/hr suggests pathologic oliguria</td>
<td>1. To determine whether or not the patient's intake and output is adequate for age/wt.</td>
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<td></td>
<td>2. Encourage liberal fluid intake (unless contraindicated): 100 ml/kg for 1st 10 kg of Body Weight 50 ml/kg for next 20 kg of Body Weight 20 ml/kg for weights above 20 kg</td>
<td>2. Minimizes uric acid precipitation thus preventing urate stones and kidney damage.</td>
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<td></td>
<td>3. ( \square ) Urine specific gravity NB - 1.001-1.020 Child - 1.001-1.020</td>
<td>3. Helps assess patients fluid needs ( \square ) 1.030 = fluid depletion (measure of the density of urine compared with the density of ( \text{H}_2\text{O} ) (1.000) or the weight of urine compared to the weight of an equal volume of distilled ( \text{H}_2\text{O} )).</td>
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<td>4. ( \square ) Urine osmolality</td>
<td>4. ( \square ) Osmolality = fluid depletion (urine osmolality - measurement of the concentration of urine and reflects the total number of osmotically active particles in urine).</td>
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<td></td>
<td>5. ( \square ) Urine Ph</td>
<td>5. Uric acid in the form or urates, will crystallize in acid urine and form renal stones.</td>
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<td>6. Diet Restrictions</td>
<td>6. AVOID: (produce acid waste products) shell fish, asparagus, mushrooms, spinach, roe, scallops, broth, consomme, mincemeat, sardines, anchovies, organ meats, poultry, meats, fish cheese, eggs, bread ENourage: alkaline-ash foods; most fruits and vegetables (except corn, lentils, plums, prunes, cranberries)</td>
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<td></td>
<td>7. Administer: ( \text{NaHCO}_3, \text{K}^+ \text{Citrate, Diamox} )</td>
<td>7. Produce alkaline urine</td>
</tr>
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<td>8. Administer with full glass of ( \text{H}_2\text{O} ), food or meals, or immediately p.c.</td>
<td>8. To minimize gastrointestinal side effects.</td>
</tr>
<tr>
<td>uric-acid stone formation</td>
<td>10. May become severe - exfoliative, urticarial, or purpuric lesions, Stevens-Johnson Syndrome (erythema multiforma)</td>
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<tr>
<td>10. Assess for skin rash</td>
<td>11. Drowsiness may occur</td>
<td></td>
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<tr>
<td>11. Assist with ambulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CELL</td>
<td>NORMAL VALUES</td>
<td>FUNCTION</td>
</tr>
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<td>--------------------------</td>
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<td>-----------------------------------------------</td>
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</tbody>
</table>
| Leukocytes (Differentials) | 5,000-10000/cu.mm. | First line of defense against invading micro-organisms. | Leukocytosis (> 10,000/cu.mm.)
|                          |               |                                               | -- evidence of healthy host response to infection
|                          |               |                                               | -- tissue destruction
|                          |               |                                               | -- metabolic toxic states
|                          |               |                                               | -- certain drugs and chemicals
|                          |               |                                               | -- following acute hemorrhage of with hemolytic anemia
| A. Granulocytes          |               |                                               | Leukopenia (< 3,000/cu.mm.)
| 1. Neutrophils           | 3,000-7,000/cu.mm. | Phagocytosis (Engulfs and destroys bacteria) | -- inability to maintain immune response
|                          | (>60% of all WBC) |                                               | -- certain viral infections (hepatitis)
|                          |               |                                               | chemicals, drugs, blood diseases (aplastic anemia)
|                          | 3-5% of WBC | Juvenile or immature neutrophils | □ 2° to tissue damage, inflammation and exudate release and migration of neutrophils from bone marrow storage to injury site.
| a. "bands" (stabs)      |               | Segmented or mature neutrophils | Predominance of bands over segs indicates overwhelmed defense system.
|                          | 50-400/cu.mm. | ? aids in detoxification by breaking down protein material associated with allergic reaction and antihistamine production. | Normal bands: segs ratio indicates infection under control.
| b. "segs"               |               |                                               | □ in allergy, hay fever, asthma.
| 2. Eosinophils           |               |                                               | □ in patient with insulin, ACTH, epinephrine levels. |
### Basic Hematologic Tests

<table>
<thead>
<tr>
<th>CELL</th>
<th>NORMAL VALUES</th>
<th>FUNCTION</th>
<th>IMPLICATIONS OF ALTERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Basophils</td>
<td>25-100/cu.mm.</td>
<td>Produce histamine and heparin—help prevent blood from clotting in fibrinolysis and anaphylactoid states.</td>
<td>□ in chronic myelogenous Leukemia, irradiation, hemolytic anemia, splenectomy.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>□ states have not been identified.</td>
</tr>
<tr>
<td>B. Lymphocytes</td>
<td>1,000-4,000/cu.mm.</td>
<td>Responsible for antibody production Circulates, identifies foreign cell, produces antibodies, destroys toxic products of protein metabolism.</td>
<td>□ infection, viral disease (mono, influenza, hepatitis), Lymphocytic Leukemia □ 2&lt;sup&gt;0&lt;/sup&gt; to bone marrow suppression of other WBC need for antibodies □ in stress reaction from burns or trauma, or patient taking ACTH or cortisone □ = marked inability to build and sustain a defense.</td>
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<tr>
<td></td>
<td>Children and adolescents - 1,500-8,500/cu.mm</td>
<td></td>
<td></td>
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<tr>
<td>C. Monocytes</td>
<td>100-600/cu.mm.</td>
<td>Macrophages (clean up debris of abscess or infection) phagocytosis (ingest bacteria, Protozoa, foreign particles).</td>
<td>□ in T.B., monocytic Leukemia, subacute bacterial endocarditis □ in bacterial infection □ is rare because count is normally low.</td>
</tr>
</tbody>
</table>
Anemias
- RBCs and/or Hgb low
- Oxygen carrying capacity decreased
- Less oxygen available

Clinical presentation
- general physical findings of less oxygen
- central nervous system changes
- progressive deterioration

Laboratory studies

Treatments are specific to each type of anemia

Supportive care
- Preparation and education
- Minimize oxygen demands
- Prevent complications

Sickle cell anemia

Sickle cell anemia vs sickle cell disease

Sickle cell anemia
- age of occurrence
- prevalence
- genetic determination

Pathophysiology
- Obstruction
  - stasis
  - infarction
  - scarring
- Destruction

Clinical presentation
- symptoms vary in severity
- acute symptoms = crises
  - vaso-occlusive
  - sequestration
  - aplastic
  - hyperhemolytic
• CVA
• chest syndrome

Sickle cell anemia

■ Diagnosis
  • newborn screening
    ■ Sickledex
    ■ Hemoglobin electrophoresis
  • crisis with infection

Sickle cell anemia

■ Management
  • prevent further sickling
  • treat crisis

Sickle cell anemia

■ Prevention of further sickling of RBCs
  • decrease oxygen expenditure
  • hemodilution
  • normalizing electrolytes
  • pain management
  • antibiotic therapy

Sickle cell anemia

■ Treat crisis
  • short term oxygen therapy
  • exchange transfusions
  • splenectomy
  • aspiration of corpora cavernosum

Sickle cell anemia

■ Prognosis
  • variable

■ Research areas
  • bone marrow transplant
  • hydroxyurea and erythropoiten

Sickle cell anemia

■ Assessment parameters
  • abdominal palpation
  • pulse oximetry
  • strict intake and output
  • daily weight
  • VS
  • neuro status

Sickle cell anemia

■ Family issues
  • affected child’s concerns
  • sibling effects
  • marital stress
  • childbearing attitudes
Hemophilia

- Bleeding disorder
  - coagulation factors inadequate
- X-linked recessive disorder

Common forms

- factor VIII deficiency
- factor IX deficiency
- von Willebrand disease

Sites

- joints
- muscles
- neck & mouth
- head
- GI tract

Screening

- Platelet count
- Prothrombin time
- Partial thromboplastin time
- Functional assays of factors

Treatment

- Replacement
- Steroids and nonsteroidal antiinflammatory drugs
- Exercise and physical therapy
- Timely therapy

Management

- prevent bleeding
- control bleeding
- prevent joint degeneration
- family issues
SICKLE CELL ANEMIA

Sickled Red Blood Cells
(Rigid, Fragile, Hemolyzed)

☐

☐ Ability to Flow Easily Thru Tiny Capillaries

☐

Clumped ☐ Obstruction

☐

Impairment of Blood Flow

☐

Tissue Hypoxia

☐

More Sickling

☐

Infarcts and Necrosis
UNIT: CHILDREN AND DEATH

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Describe the components of a comprehensive assessment of a dying child and his/her family.

2. Identify a child's concept of death at different developmental levels.

3. Describe several methods of assessing pain in children.

4. Identify both pharmacologic and non-pharmacologic methods of treating pain in children.

REQUIRED READINGS:

CHILDREN AND DEATH-Class Notes

OVERVIEW
1. Cognitive and psychosocial development
2. Time trajectories
3. Anticipatory grief

CHILDREN'S CONCEPTS OF DEATH
1. Birth - 12 months: Major fear is loss of "love object"/primary caregiver

2. 1 - 3 years: Major fear is still loss of "love object"/primary caregiver

3. 3 - 6 years: Major fear is bodily damage, mutilation.

4. 6 - 10 years: Major fear is destruction

5. 10 years and older: Major fear is loss of control and loss of intimacy

NURSING CARE
1. Help parents understand child's concept of death
2. Avoid conspiracy of silence
3. If children have been included in illness from the beginning this becomes more natural
4. Children know when they are dying. Often protect parents
5. Talk with parents about nurse and/or physician beginning discussion with parents present
6. Talk with child about his perceptions of death
7. Touch
8. Comfort

FAMILY RESPONSE
1. Death of a child is untimely in our society.
2. Meaning of this particular child to the family.

PARENTS
1. Compassion and concern
2. Try not to take anger personally.
3. Is there someone you can call for them.
4. Support them in not being overindulgent.
5. Parents may feel they are losing control of their child and relinquishing their parental role to health professionals.
6. Fathers and mothers do not respond the same
7. Grandparents may be problematic

SIBLINGS - may show behavior problems
Sources of stress:
1. Emotional realignment of family.
2. Separation from family members.
3. Disruption in family routines, activities, and socialization
4. Feelings of separating r/t lack of info, decreased family involvement, and insufficient social support.
5. Increased parental expectations, decreased parental tolerance, emotional deprivation.
6. Maybe fearful of having wished sibling ill or dead
7. May need reassurance that they will not die of the same thing (unless it's genetic)
8. Parents may become overprotective.

Positive effects for siblings
1. Increased sensitivity and empathy for ill child,
2. Personal maturation
3. Increased family cohesion.
4. Elective participation and visitation with support can be helpful

DECISIONS TO DISCONTINUE TREATMENT
1. Difficult decision: d/c treatment generally means treatment toward cure
2. No code/DNR
3. Alternative environment

CRITERIA FOR HOME CARE (Martinson)
1. Cure oriented treatment is dc'd
2. Child wants to be home.
3. Parents want the child at home.
4. Parents recognize their own ability to care for child
5. Nurse willing to be available 24 hours/day
6. Child's physician is willing to be on call.

FINAL STAGES
1. Pain management
2. Physical appearance
3. Allow to eat whatever they want
4. N/V/Anorexia

Parents need to know what to anticipate
1. Cheyne-Stokes
2. Decreased alertness.
3. Poor skin color—mottled, cold
4. Hearing is last sense lost

AFTER DEATH
1. Parents may participate
2. Body is cleaned and positioned carefully
3. Treat body with respect
4. Allow parents time with child's body.

FUNERALS
1. Children under 10 years and certainly under 7 years should be given the choice about attending.
2. Need preparation if the are going to attend.
3. Close, adult friend should stay with child during service and provide support and explanation.
4. Need an opportunity to talk about funeral afterwards.

HEALTH CARE PROFESSIONALS
1. Recognize own needs--We can give to others only from our own energies and resources and some days we are depleted too.
2. Need a source of support--just as for the family, many professionals and non-professionals are particularly uncomfortable with the death of a child.
3. Impacts the whole staff.
UNIT: ALTERATIONS IN REGULATORY MECHANISMS -- ENDOCRINE

OBJECTIVES:

At the completion of this unit the student will be able to:

1. Discuss the interferences with regulatory mechanisms and metabolic process that affect the child.

2. Consider the assessment factors that assist the nurse in developing an individualized plan of nursing management.

3. Discuss nursing management of the child with interferences with regulatory mechanisms and metabolic process.

4. Describe the developmental, emotional and health maintenance needs related to the child with interferences with regulatory mechanisms and metabolic process.

REQUIRED READINGS:


SELF-STUDY

Hyper/hypopituitarism
Diabetes insipidus
Congenital hyper/hypothyroid
PKU (Phenylketonuria)
Galactosemia
Pheochromocytoma
Hyper/hypo parathyroid

REVIEW

Diabetes Mellitus
Pituitary disorders

- Review Table 29-1
  - endocrine glands
  - their hormones
  - their effects

Hypopituitarism

- Growth hormone deficiency
  - Variety of causes
  - Most often idiopathic

Hypopituitarism

- Growth hormone deficiency
  - Diagnosis
    - chief complaint - short stature
    - growth hormone levels
  - Treatment
    - correct underlying cause
    - replacement
    - education & support

Pituitary Hyperfunction

- Opposite situation
- Excess Growth hormone (GH)
  - before epiphyseal shaft closure
  - after epiphyseal closure

Pituitary Hyperfunction

- Diagnosis
  - history
  - increased levels of GH
- Treatment
  - early identification
  - surgery or radiation therapy
  - replacement
  - support

Precocious puberty

- Early sexual development
- More common in girls than boys
  - Management
    - treat cause
Lupron
education and support

Juvenile Hypothyroid
- One of the most common endocrine problems in children
- Deficiency of thyroid hormone (TH)
- Causes
- Manifestations vary - rarely neuro involvement
- Treatment - replacement

Hyperthyroidism (Graves disease)
- Enlarged thyroid
- Peaks in adolescence
- More common in girls
- Etiology unclear
- Diagnosis through labs

Hyperthyroidism (Graves disease)
- Management
  - Anti-thyroid drugs
  - Subtotal thyroidectomy
  - Ablation
  - Control activity
  - Support and education

Hypoparathyroid
- Autoimmune hypoparathyroid
  - Inadequate parathormone
- Pseudohypoparathyroidism
  - Unresponsive to parathormone

Hypoparathyroid
- Diagnosis - symptoms and labs
- Treatment
  - Acute
  - Long-term

Adrenal gland
- Adrenal cortex
  - Glucocorticoids
  - Mineralcorticoids
  - Sex steroids
- Adrenal medulla
  - Catecholamines
  - Epinephrine
Cushing syndrome

- Group of symptoms from increased cortisol

Causes
- Excessive pituitary stimulation
- Adrenal neoplasms
- Neoplasms mimicking adrenal gland
- Exogenous corticosteroids
- Sensitivity to gastric inhibitory polypeptide

Cushing syndrome

- Diagnosis
  - Differentiates affected from obese

Management
- Treat cause
- Education

Congenital Adrenogenital Hyperplasia (CAH)

- Excessive adrenal cortex androgens

Diagnosis
- Females - masculinization
- Males - precocious genital development
- Definitive diagnosis via lab values

Congenital Adrenogenital Hyperplasia

Management
- Confirm sex
- Cortisone
- Surgical reconstruction
- Education
- Support
- Counseling

Pheochromocytoma

- Benign adrenal tumor
- Secretes catecholamines

Treatment
- Surgery
- Replacement therapy
- Avoid palpation of mass
ASTHMA

CLASS NOTES

Definition: chronic airway inflammation (primary event) → hyper-reactivity of the airways to stimulants/ triggers → smooth muscle contraction and spasm → edema → increase secretions & increased spasm → airtrapping and areas of atelectasis → decreased Forced Expiratory Volume (FEV) and increased functional Residual Volume (RV).

--amount of chronic inflammation varies among individuals
--role of allergens vs triggers
--common triggers

Etiology and Prevalence
Most common chronic condition in children
Remember: All that is asthma does not wheeze and all that wheezes is not asthma !
-- # of children under 4yo with asthma in the US rose 160% between 1980 and 1993.
--17/10,000 Michigan residents are hospitalized each year with asthma
--In every classroom of 30 children at least 2 have asthma
--One of the leading causes of school absence
--Between 1980 and 1993 the death rate from asthma rose 118% --Remember that self care is an important issue in morbidity and mortality
--Death from asthma in children
  -Rarely occurs after child has been hospitalized
  -Either have severe chronic asthma
    OR
  -Sudden, unexpected acute episode that rapidly progresses to death

Clinical Management
Inflammation- Maintenance
--Long acting bronchodilators - β adrenergic agonists--eg Serevent
--Leukotriene modifiers/agonists - eg Accolate, Singulair
--Inhaled corticosteroids--eg Flovent, Pulmocort, Azmacort

Long term systemic (oral, IV) corticosteroids are avoided in children → masks infection, immunesuppression, rebound effect. Over time → growth retardation, osteoporosis

Acute symptoms/ Exercise induced asthma-Rescue drugs
β adrenergic agonists -- eg Albuterol (Proventil, Ventolin)
--first line therapy
--usually administered by metered dose inhaler
--less acute attacks
--Child, family, teachers and YOU MUST know which drug/inhaler is for "rescue" ---acute symptoms.
Assessment of Clinical Status--Clues to impending status asthmaticus

History
1. Change in pattern of symptoms
   a. wheezing: increased severity or frequency, particularly at night
   b. worsening dyspnea: progressive exertional dyspnea, dyspnea at rest, orthopnea or fatigue.
   c. cough with tenacious sputum: difficult to expectorate or decrease in daily volume; change in color.
2. Refractoriness to drugs: increased use with decreased relief, loss of improvement in PFTs after bronchodilator.

Physical Assessment
1. Anxiety
2. Increase respiratory effort--use of accessory muscles
3. Dyspnea limiting speech
4. Pursed lip breathing
5. Prolonged expiration with inspiratory wheeze
6. Tachypnea
7. Sympathetic discharge→ diaphoresis, increased B/P, tachycardia, flushing
8. Cyanosis--this is a late sign--indicates impending respiratory failure

Indications of Severity
1. Disturbance of consciousness
2. Central cyanosis
3. Sternocleidomastoid retractions
4. HR > 130 (in older children)
5. Pulsus paradoxus (significant decrease in systolic B/P during inspiration -norm is 5-20mmHg. Due to decrease dias. Filling of ventricle from traction on the pericardium during inspiration or diaphragm doesn't lower fully)
6. Gross overinflation (xray)
7. PaO2 < 60mmHg
8. PaCO2 > 40 mmHg

Signs/Symptoms of Impending Death
1. Change in level of consciousness
2. Obvious exhaustion
3. Silent chest
4. CO2 retention (pCO2 > 60mmHg)
5. FEV1 < .5L
6. FVC < 1.0 L
7. Pneumothorax and/or pneumomediastinum
Clinical Management of Status Asthmaticus
Pharmacological Therapy
1. ß adrenergic agonists -- Continuous Albuterol Nebulization
2. Systemic corticosteroids--usually IV to decrease inflammation
3. Aminophylline/Theophylline
   -- Controversy regarding role and effectiveness
   -- currently not generally recommended
   -- if used must be titrated to achieve therapeutic blood levels
   -- usually a bolus is administered followed by continuous infusion
   -- potent drugs with unpleasant side effects-- must calculate IV dose carefully

Fluids
-- May need to force fluids to 'rehydrate'
-- Risk of fluid volume overload and resulting pulmonary edema
-- Calculate fluids by weight or m2
-- Accurate I and O with weight

Humidified O2
-- check toys and other firehazards
-- Beware of CO2 narcosis
   -- Do not take off O2 to go to bathroom or elsewhere-- blood gases are too unstable
   -- Monitor ABGs

Assisted Ventilation - if pCO2 > 60mmHg
-- have intubation equipment available and ready
-- Increased anxiety-- intubated patients cannot talk
-- Be calm. Don't leave patient alone
-- May use paralytic agents but NO sedation

Positioning-- HOB, good alignment, nothing including you in front of face

Feeding- fluids only or small frequent feedings to pressure on diaphragm

Breathing exercises-improve ventilation and can decrease anxiety
-- Pacing
-- Pursed lip
-- Increasing expiration-straw and cotton

Flow sheets:
-- I and O with wt
-- VS
-- ABGs
-- Electrolytes
-- CXR
-- CBC