Pediatrics Clerkship Curriculum

The curriculum is outlined on this site. You can read portions of the curriculum or print it in its entirety by using the navigation tools indicated throughout this site.

Rationale:

The pediatric clerkship addresses issues unique to childhood and adolescence by focusing on human development, and by emphasizing the impact of family, community and society on child health and wellbeing. Additionally, the clerkship focuses on the impact of disease and its treatment on the developing human, emphasizes growth and development, and the principles of health supervision and recognition of common health problems. The role of the pediatrician in prevention of disease and injury and the importance of collaboration between the pediatrician and other health professionals is stressed. The student is to acquire the knowledge, skills and attitudes regarding Pediatric medicine necessary to become a competent general physician.

The pediatric clerkship experience introduces the student to the field of pediatrics. It emphasizes those aspects of general pediatrics important for all medical students and will provide a foundation for those students who elect to further study the health care of infants, children and adolescents. Students have the opportunity to participate in the clinical activities of both general and subspecialty pediatric services, but the emphasis in all services is placed on basic issues and common illnesses important for the education of the general physician.

Goals of the Core Curriculum:

The goals of this core curriculum in Pediatrics are to foster:

- Acquisition of basic knowledge of growth and development (physical, physiologic and psychosocial) and its clinical application from birth through adolescence.
- Development of communication skills that will facilitate the clinical interaction with children, adolescents and their families and thus ensure that complete, accurate data is obtained.
- Development of competency in the physical examination of infants, children and adolescents.
- Acquisition of the knowledge necessary to provide appropriate nutritional and fluid support for infants, children and adolescents.
- Acquisition of the knowledge necessary for the diagnosis and initial management of common acute and chronic illnesses, as well as common emergencies in pediatrics.
- An understanding of the impact of congenital and inherited diseases on children and their families.
- Development of clinical problem-solving skills.
- An understanding of the influence of family, community and society on the child in health and disease.
- Development of strategies for health promotion as well as disease and injury prevention.
- Development of the attitudes and professional behaviors appropriate for clinical practice.
Recommended Books:

Any of the following texts will be adequate:

- Rudolph's Fundamentals of Pediatrics (2002)*
- Oski's Pediatric Fundamentals (1996)
- Pediatrics, A Primary Care Approach (1996)

* Most of the references in the Self-Assessment Quizzes are from this book.

Other references that previous students have used successfully include the following:

- Appleton and Lange Review series
- Pediatrics Recall
- Pediatrics, an Interactive Approach (CD-ROM)
- Child Development CD-ROM

We recommend *against* your use of a quiz-book or NMS-type book as a stand-alone text.
Goals and Objectives of Learning Modules
There is a self-assessment quiz ranging from 5 to 12 questions in length for each of the learning modules on our website. You can access these by pressing the link to the Self-Assessment Quiz menu option.

HEALTH SUPERVISION

RATIONALE
Health supervision includes assessment of growth and development, prevention of disease by immunization, prevention of injury by education, screening for treatable conditions and promotion of a healthy environment and a healthy lifestyle. A physician uses anticipatory guidance to explain to parents, older children and adolescents the changes that will occur in an individual's behaviors, exposures and risks as growth and development proceed. Much of what is included broadly in Health Supervision will also be detailed in other sections of this curriculum.

PREREQUISITES
• Basic data gathering skills and the ability to communicate effectively
• Basic concepts of nutrition, immunology, and epidemiology.
• Knowledge of the appropriate uses of screening in clinical medicine and the characteristics of a good screening test (i.e. sensitivity, specificity, positive and negative predictive values).

LEARNING OBJECTIVES
1. List the most common preventable morbidities in childhood and describe strategies for prevention.
2. Describe the components of health supervision visits at various ages (newborn, infant, preschool, school age, adolescent).
3. Discuss the appropriate use, interpretation, and limitations of
   a. Neonatal screening
   b. Developmental screening
   c. Hearing and vision screening
   d. Lead screening
   e. Anemia screening
   f. Tuberculosis screening
4. Understand the importance of immunizations in health supervision (see Prevention).
5. Define anticipatory guidance and recognize how it changes, based on the age of the child.
6. Recognize how injury prevention strategies change as an individual grows (see Prevention).

COMPETENCIES
1. Know how the physician’s responsibility to promote a healthy lifestyle is carried out in health supervision visits as an individual grows from infancy to adolescence, including the appropriate use of screening tools and immunizations.
2. Demonstrate the ability to gather health supervision data that is appropriate for various ages.
3. Know when to employ screening during health supervision, including environmental lead questionnaire, domestic violence screening, CBC, urinalysis, blood lead level, PPD.
4. Be able to interpret the results of screening tests
5. Provide age-appropriate examples of anticipatory guidance about nutrition, behavior, immunizations, injury prevention, pubertal development, sexuality, and substance use and abuse.

**GROWTH**

**RATIONALE**

Growth is the defining feature of childhood. Genetic and environmental factors influence the rate of growth and the final stature and body habitus the child attains. Regular monitoring of growth provides the clinician with one of the best indicators of the underlying health of the child.

**PREREQUISITES**

1. Genetic, endocrine and psychosocial influences on growth.

**LEARNING OBJECTIVES**

1. Explain the importance of monitoring the growth of a child.
2. Explain the use and interpretation of growth charts in the longitudinal evaluation of height, weight, head circumference, and body-mass index.
3. Recognize variants of growth in healthy children, (e.g. familial short stature and constitutional delay).
4. Recognize abnormalities of growth that warrant further evaluation and discuss their basic causes (e.g. crossing lines on a growth chart, discrepancies among height, weight and head circumference, short stature, failure to thrive, obesity, microcephaly and macrocephaly, and growth abnormalities related to specific physical findings).

**COMPETENCIES**

1. Include measurement and assessment of growth in all patient evaluations.
2. Accurately measure height, weight and head circumference, and plot the data on the most current age- and sex-appropriate growth chart.
3. Identify growth that deviates from expected patterns, based on the family growth history and the child’s previous growth, and explain the initial assessment.
4. Know how to assess body-mass index (BMI) using the nomograms. Discuss the implications of an elevated BMI.
5. Outline the differential diagnosis and the initial evaluation of an infant or child with failure to thrive.
6. Outline the differential diagnosis and the initial evaluation of a child or adolescent with obesity.

**DEVELOPMENT**

**RATIONALE**

The physical maturation and intellectual, social and motor development of the child follow predictable patterns, and provide the physician with a good indicator of the child's health and neurological function. The clinician must be familiar with normal patterns of development in order to detect deviations that might be the first sign of a
medical or psychosocial problem.

**PREREQUISITES**

- Basic knowledge of the human life span from conception to death.

**LEARNING OBJECTIVES**

1. Describe age-related developmental changes in children and explain why they are important
   - Infant – Disappearance of primitive reflexes; Changes in tone and posture; cephalocaudal progression of motor milestones during the first year; stranger anxiety.
   - Toddler/child - Separation and autonomy in two to three-year olds; sequence of language development; concept of school readiness.
   - Adolescent - Sequence of physical maturation and sexual maturity rating (Tanner staging); stages of psychosocial and emotional development.
2. Explain the importance of monitoring the development of a child.
3. Discuss tools that can be used to assess developmental progress (e.g. Denver Developmental Screening Test 2 (DDST2)). Be able to
   - Describe the appropriate use of the test at various ages.
   - Describe how to perform the screening test.
   - Determine whether the results of a test are consistent with expected patterns of development.

**COMPETENCIES**

1. Include an assessment of development on all patients as part of the health supervision visit or inpatient evaluation. Utilize such resources as Bright Futures, the DDST2, and the Tanner pubertal development scales.
2. Interpret a developmental screening test (e.g. DDST2).
3. Demonstrate the ability to explain important developmental changes to parents and to patients at all ages. (See also sections on newborns and adolescence for specific issues.)

**BEHAVIOR**

**RATIONALE:**

Attention to the non-medical concerns of infants, children, and adolescents and their families enhances total patient care by providing preventive service and anticipatory guidance especially in the areas of normative or expected behaviors, stress and coping, child rearing issues, school-related expectations and problems, and the effects of illness on behavior. Such an approach will increase self-confidence in patients and their families, resulting in less anxiety and fewer problems. Knowledge of age-appropriate behavior also allows the physician to recognize significantly deviant behaviors and facilitates earlier intervention.

**PREREQUISITES:**

- Recognize that the developmental tasks of infancy, childhood and adolescence differ.
- Understand that behavior and behavioral patterns result from genetic and
LEARNING OBJECTIVES:

1. Identify behavioral and psychosocial problems using the medical history and physical examination.
2. Describe the typical presentation of common behavioral problems and issues in different age groups such as:
   a. infants: sleep problems
   b. toddler: temper tantrums, toilet training, eating
   c. school age: enuresis, encopresis, attention deficit
   d. adolescence: conduct disorders, eating disorders, risk-taking behavior
3. Recognize that somatic complaints may represent psychosocial problems (e.g. recurrent abdominal pain, headache, fatigue, and neurologic complaints)
4. Recognize that alterations in school performance or social structures may reflect emotional or medical conditions
5. Understand the types of situations where pathology in the family contributes to childhood behavior problems (e.g. alcoholism, domestic violence, depression)

COMPETENCIES:

1. Take a complete and relevant history and perform a pertinent physical examination on a patient who presents with a potential behavioral problem.
2. Elicit age-appropriate behavioral concerns during the health care supervision visit.
3. Distinguish between age-appropriate behavior, inappropriate or abnormal behavior, and those that suggest severe psychiatric illness in children of different ages.
4. Demonstrate an ability to counsel parents and children about the management of common behavioral concerns such as discipline, toilet training, and eating disorders.

NUTRITION

RATIONALE

Proper nutrition promotes growth and helps maintain health. Some degree of assessment of nutrition is a component of every pediatric medical visit. In a number of pediatric conditions presenting with abnormal growth, nutritional assessment is central to diagnosis and treatment.

PREREQUISITES

1. The appropriate balance of food groups (e.g., the food pyramid of the United States Department of Agriculture/Department of Health and Human Services).
2. The basic biochemistry and physiology of proteins, carbohydrates and fats.
3. The basic vitamin groups and their common dietary sources.
4. The role of nutrition in preventive health (e.g., the National Cholesterol Education Program guidelines for adults).

LEARNING OBJECTIVES

1. State the components of a routine diet history for infants, children and
adolescents.
2. State the calories/kg/day needed to support growth in infants.
3. Identify the major differences between human milk and commonly available formulas.
4. Describe the advantages of breastfeeding and recognize common difficulties experienced by breastfeeding mothers.
5. Describe a diet that promotes health in children and adolescents.
6. List the consequences of common vitamin deficiencies and excesses and indicate which vitamins and minerals may require supplementation in infants, children and adolescents.
7. Recognize nutritional factors that contribute to the development of childhood obesity and to failure to thrive.
8. Describe the endocrine, cardiovascular, and orthopedic consequences of childhood obesity.
9. Identify individual and family risk factors for cardiovascular disease and diabetes that can be addressed with nutritional modification.
10. Recognize that chronically ill children may have special nutritional needs often requiring the assistance of a nutritionist.

COMPETENCIES

1. Obtain a routine infant diet history that includes the type, amount and frequency of administration of milk feeding (breast vs. formula), solid foods, and dietary supplements (vitamins, iron, fluoride).
2. Determine the caloric adequacy of an infant’s diet.
3. Provide nutritional advice to families regarding
   a. Breastfeeding vs. formula feeding
   b. Addition of solids to an infant’s diet
   c. Introduction of cow’s milk to an infant’s diet
   d. Healthy food choices for children and adolescents.
4. Provide advice to families about the prevention of common nutritional deficiencies, specifically iron and calcium.
5. Discuss risk factors for cardiac disease and diabetes with families.
6. Recognize the need for nutritional assessment in children beyond infancy in situations when growth is inadequate or excessive or when family risk factors suggest the possibility that nutritional modification will be needed.

PREVENTION

RATIONALE

Physicians routinely incorporate strategies for prevention of illness and injury into routine health supervision. Immunizations have resulted in a drastic reduction in the rates of certain infectious diseases. Injuries cause the majority of deaths in childhood and adolescence. Illness and injury prevention must be a prominent and recurrent theme during health maintenance and other health care visits. The American Academy of Pediatrics most medical groups no longer use the term "accident" as most childhood injuries are believed to be predictable and preventable. Unfortunately, not all injury is unintentional. Some are self-inflicted and some intentionally caused by others. Motor vehicle injuries, homicide and suicide are the three leading causes of death for adolescents. Abuse also occurs at all ages.

Note: There is a significant amount of overlap with the Health Supervision portion of the curriculum. Poisoning is covered in a separate section. Violence is also addressed
in the sections on Behavior, Issues Unique to Adolescence, and Child Abuse.

**PREREQUISITES**

- Basic knowledge of epidemiology, biostatistics and prevention.
- Understanding of the impact that culture, socioeconomic status and environment have on illness and injury prevalence and patterns.
- Students should review their personal immunization status and obtain any necessary immunizations. Similarly, review of tuberculin sensitivity is important and, if necessary, a PPD should be obtained.
- An understanding of development is essential to providing age appropriate prevention strategies.

**LEARNING OBJECTIVES**

1. Describe how risk of illness and injury change during growth and development. Give examples of the age-and development-related spectrum of illness and injury.
2. List the immunizations currently recommended from birth through adolescence. Discuss the benefits, limitations, adverse side effects, and contraindications of each immunization.
3. Provide examples of anticipatory guidance aimed at prevention for different ages for the following: motor vehicle safety, infant sleeping position, falls, burns, poisoning, fire safety, choking, water safety, firearms and weapons.
4. Outline the physician’s role in the prevention of sports injuries, including the pre-participation sports physical.
5. Provide examples of risk factors that can be assessed for violence prevention counseling.

**COMPETENCIES**

1. Include a discussion of prevention in every clinical encounter to include
   a. assessment of immunization status
   b. inquiry into safety and injury prevention
   c. identification of personal and family habits that pose risks
2. Initiate a discussion about immunizations with the family of an infant, a toddler and a child about to enter school. Include immunization side effects.
4. Provide anticipatory guidance about injury prevention to the family of an infant, toddler, preschool age child, school age child, and an adolescent. Demonstrate the ability to counsel families about the risk of motor vehicle accidents, gun shot wounds, burns, falls, drowning, and choking.
5. Explain how screening for family violence serves as an important preventive health practice. In particular, demonstrate the ability to counsel schoolage children, adolescent and families about the basics of violence prevention at home, at school, and among peers.

**ISSUES UNIQUE TO ADOLESCENCE**

**RATIONALE**

Adolescence represents the stage of human growth and development between
childhood and adulthood. It encompasses physical changes in addition to cognitive and psychosocial maturation. Medical problems common in adolescents reflect, in part, the interplay between physical and psychosocial development.

**PREREQUISITES**

- Basic communication and interviewing skills
- Anatomy, physiology, and endocrinology related to growth and reproduction

**LEARNING OBJECTIVES**

1. Recognize unique features of the physician-patient relationship during adolescence, including confidentiality and consent.
2. List the components of health supervision for an adolescent, including personal habits, pubertal development, immunizations, acne, scoliosis, sports pre-participation evaluation, and indications for pelvic exam.
3. Describe an approach to the psychosocial interview of an adolescent, e.g. HEADS method.
4. Discuss the characteristics of early, mid and late adolescence in the terms of cognitive and psychosocial development.
5. Discuss the sequence of the physical changes of puberty.
6. Describe the sexual maturity rating scale (Tanner Stages), and understand its use in measuring physical maturity.
7. Recognize common risk-taking behaviors of adolescents, such as alcohol and other drug use, sexual activity and violence.
8. Understand the contributions of unintentional injuries, homicide, suicide and HIV/AIDS to the morbidity and mortality of adolescents.
9. Recognize the features of common mental health problems in adolescence, including school failure, attention deficit, eating disorders, depression and suicide.
10. Discuss an approach to preventive counseling for risk behaviors of adolescents, including: sexuality/sexual activity (sexual orientation, contraception and sexually transmitted diseases), substance abuse, and personal safety (firearms, motor vehicles and violence, including sexual abuse/coercion, and date rape.)
11. List the components of a pre-participation sports physical and discuss its role in prevention of injury.
12. Recognize the unique difficulties encountered by adolescents with chronic diseases, including compliance and issues of autonomy vs. dependence.

**COMPETENCIES**

1. Conduct a health supervision visit for a healthy adolescent, incorporating a psychosocial interview, developmental assessment and appropriate screening and preventive measures.
2. Interview an adolescent patient, using the HEADS method, to ask sensitive questions about lifestyle choices that affect health and safety (e.g. sexuality, drug, tobacco and alcohol use) and give appropriate counseling.
3. Include questions in the medical interview that address common mental health problems, including school failure, attention deficit, eating disorders, depression, and suicide. Interpret the adolescent’s responses and note whether risks were identified.
4. Conduct a physical examination of an adolescent that demonstrates respect for privacy, modesty, employing a chaperone when appropriate.
5. Identify the sexual maturity of adolescent males and females using the Tanner scale.
6. Conduct a pre-participation sports examination and demonstrate the key components of that examination necessary to clear an individual for participation in strenuous exercise (special senses, cardiac, pulmonary, neurological, musculoskeletal).

**ISSUES UNIQUE TO THE NEWBORN**

**RATIONALE**

The transition from intrauterine life to extrauterine independent existence is a major event: physiologically for the baby, emotionally for the family, and medically for the health care team. The events before, during and after delivery can have profound and lifelong effects on the baby, and therefore physicians must have an appreciation for the physiologic changes a newborn experiences. The newborn has unique needs and vulnerabilities that are distinct from other periods of infancy. Most of the information covered in this section is pertinent in the first few hours and days of life. However, the newborn period extends through to the first month of life.

**PREREQUISITES**

- Embryology
- Fetal physiology
- Knowledge of the basics of antepartum and intrapartum care, particularly maternal screening tests and common maternal complications that can affect the newborn.

**LEARNING OBJECTIVES**

1. List the information from the history of pregnancy, labor, and delivery that have implications for the health of the newborn.
2. List the key components of the physical examination of the newborn.
3. Discuss how gestational age can be assessed with an instrument such as the Ballard scale, identify key indications of gestational maturity, and discuss the effects of gestational age on the newborn infant.
4. Discuss the transition from the intrauterine to the extrauterine environment, including temperature regulation, cardiovascular/respiratory adjustment, metabolic fluctuations, state control, initiation of feeding, and managing the stress of the birth process.
5. Understand the transition of the parents into a family, taking into account the parents’ life stage. Discuss factors that affect the family’s transition to home, and the transition to the community medical provider.
6. Understand the appropriate care of the newborn and anticipatory guidance including
   - Feeding:
     - the basics of breastfeeding and formula feeding
     - its benefits of breast-feeding for the newborn and mother
     - the management of common problems (spitting, not interested)
   - Elimination patterns
   - Sleep
   - Skin care
   - Newborn screening; metabolic and hearing screening
• Safety:
  o car seats
  o back to sleep recommendation,
• Immunizations
• Medications
• Circumcision controversy

7. Describe the presentation of the following common problems that may occur in the newborn
• Jaundice
• Respiratory distress
• Feeding problems
• The infant at risk for sepsis
• State abnormalities: temperament vs. pathology
• Large and small for gestation infants
• The near-term infant

COMPETENCIES

1. Gather history from the parents and the medical record regarding the pregnancy, labor and delivery, and interpret the information obtained.
2. Demonstrate the ability to perform a physical examination of the newborn infant, noting key physical findings
3. Perform an assessment of gestational age using the Ballard Scale and describe how gestational age affects risks in the newborn period
4. Provide anticipatory guidance for parents about infant care, including nutrition, expectations for developmental progress in the first weeks of life, and safety.
5. Recognize patterns of illness in the newborn infant, including jaundice, respiratory distress, cyanosis, and lethargy. Discuss the major causes of each.

<table>
<thead>
<tr>
<th>Table 1. Problems of Newborns</th>
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<tbody>
<tr>
<td><strong>Clinical Problems</strong></td>
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<td>Jitteriness or Seizures</td>
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<td>Jaundice</td>
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<td>Lethargy or Poor Feeding</td>
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<td>Respiratory Distress</td>
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<td>Cyanosis, Heart Disease,</td>
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</table>
### Pulmonary Disorders, Other
- Poor lung expansion
- Persistent pulmonary hypertension
- Acrocyanosis
- Diaphragmatic hernia

### Bilious Vomiting
- Intestinal atresia
- Volvulus
- Overfeeding
- Necrotizing enterocolitis
- Esophageal atresia
- Sepsis

### Non-bilious Vomiting
- Gastroenteritis reflux
- Pyloric stenosis
- CNS anomalies, insults
- Inborn errors of metabolism

### Hypoglycemia
- IDM (Infant of diabetic mother)
- Prematurity
- Small or large for gestational age
- Perinatal asphyxia
- Hemolytic disease
- Polycythemia

### Sepsis
- Bacterial infection
- Viral infection
- Perinatal/maternal infections
- Congenital infections, e.g. TORCH

### Rashes
- Erythema toxicum
- Mongolian spot
- Nevus flammeus
- Hemangiomas

### Delayed Passage of Meconium
- Hirschsprung's disease
- Meconium plug syndrome
- Cystic fibrosis

*These diagnoses are not intended to be the limit of conditions to consider, but are to help students focus learning key conditions.

## MEDICAL GENETICS AND DYSMORPHOLOGY

### RATIONALE

A physician should be able to distinguish between congenital disorders (disorders present at birth) that are genetic from those that are non-genetic, as well as recognize common genetic diseases presenting later in childhood. Genetic abnormalities may produce congenital malformations, metabolic disturbances, specific organ dysfunction, abnormal growth patterns, and abnormalities of sexual differentiation. Growth and development may be adversely affected by both genetic and non-genetic disorders. There is a genetic contribution to many disorders that are multifactorial in etiology. Greater understanding of an individual’s genetic make-up may reveal the risk of many diseases. New technology and knowledge of genetics have raised ethical questions that physicians and society will need to address.

### PREREQUISITES

1. Basic knowledge of gene structure, regulation and function
2. Basic knowledge of the Human Genome Project and the role of genetic inheritance in multifactorial diseases, such as cancer, heart disease and diabetes
3. Basic mechanisms of Mendelian inheritance, multifactorial inheritance, the
“carrier” state, incomplete penetrance, variable expression, spontaneous mutations, genes and linkage, and mitochondrial inheritance.

4. Basic embryology and teratology
5. History taking and physical examination skills

LEARNING OBJECTIVES

1. List common prenatal diagnostic assessments (e.g. maternal serum screening, amniocentesis, and ultrasonography) and understand their use
2. List common medical and metabolic disorders (e.g. hearing loss, hypothyroidism and PKU) detected through newborn screening
3. Discuss the effects of maternal health and potentially teratogenic agents on the fetus and child, including maternal diabetes, tobacco, alcohol, illicit drug use, and prescribed medications such as phenytoin, valproate, and retinoic acid
4. Explain the use of the family history to construct a pedigree in the evaluation of a possible genetic disorder
5. Describe the approach to the evaluation of a patient with a possible genetic disorder, such as developmental delay, mental retardation or short stature
6. List the indications for obtaining chromosome studies
7. Discuss the role of genetics in common multifactorial conditions (e.g. inflammatory bowel disease, pyloric stenosis, congenital heart disease, congenital hip dysplasia, diabetes and cancer) and describe how recurrence risk is estimated
8. Recognize the role of careful history-taking and physical examination in the evaluation of a patient with structural or developmental abnormalities (e.g. facial features, palmar crease, measurements, symmetry)

COMPETENCIES

1. Recognize the various causes of malformations and genetic disorders and have a basic knowledge of the appropriate diagnostic tests and clinical course for common disorders such as:
   - Common malformation syndromes
   - Common chromosomal abnormalities, (e.g. trisomy 21, Turner syndrome, Klinefelter syndrome)
   - Syndromes due to teratogens (e.g. fetal alcohol syndrome)
   - Patterns with unknown etiology (e.g. VATER syndrome)
   - Single malformations with multifactorial etiology (e.g. spina bifida, congenital heart disease, cleft lip and palate)
   - Common inborn errors of metabolism (e.g. PKU, Tay-Sachs, MCAD deficiency)
   - Other common genetic disorders (e.g. cystic fibrosis, sickle cell disease, hemophilia)
2. Discuss the newborn screening program for your specific state, including the disorders for which screening is done and the key factors that ensure reliable testing.

COMMON ACUTE PEDIATRIC ILLNESSES

RATIONALE

The presentation of childhood illnesses differs from that of adults in several ways. Patients often come to medical attention because of a clinical problem. The problem may be a complaint (something hurts) or a complex of symptoms and signs (e.g. fever, rash and sore throat) that prompts the visit to the physician; or the problem
may be identified as a finding on physical examination or from the results of laboratory tests or imaging studies. The physician must solve the problems posed by the patient using information obtained from the history, the physical examination and, when appropriate, laboratory tests and/or imaging studies. In the problem-solving process, the physician typically develops a problem list that includes differential diagnoses for each of the problems identified. The diagnostic process demands knowledge of disease etiology, pathophysiology and epidemiology and of the patient's gender, ethnicity, environment and prior health status.

When the patient is an infant, child, or adolescent, the physician must also consider the effects of age, physical growth, developmental stage and family environment. Commonly occurring illnesses will be the first considered, but other, less common disorders may need to be included in the evaluation of various clinical problems.

Instructions for use of this section:
The format of this section differs from that of the other sections of the curriculum because the Objectives and Competencies refer to all of the clinical problems listed in the tables rather than a listing of specific knowledge, skills or attitudes. Common clinical problems are presented with key conditions for the students to learn about. These have been adapted from the actual data from ambulatory pediatric practices. There are some medical problems or presentations that are unique to children, or rarely seen in adults. These are included in the significant other conditions to consider list. In addition, a second table of physical/laboratory findings and associated diagnoses has been developed to guide student teaching.

PREREQUISITES
1. Pathophysiology of common diseases.
2. Fundamentals of epidemiology.
3. Principles of pharmacology,
   • knowledge of major drug and medication classes and types.
   • knowledge of actions and interactions of drugs.
4. Basic clinical data gathering skills.

LEARNING OBJECTIVES
1. For each of the presenting complaints, physical findings or diagnostic test results in the table, list common conditions that could cause the finding.
2. For each of the common conditions, describe:
   • Etiology and/or pathophysiology
   • Natural history of the disease
   • Presenting signs and symptoms
   • Initial laboratory test and/or imaging studies indicated for diagnosis
3. For the significant other conditions, identify:
   • Etiology and/or pathophysiology
   • Presenting signs and symptoms
   • Initial laboratory test and/or imaging studies indicated for diagnosis.
4. List indications that determine whether an illness should be managed in the hospital or outpatient setting.

COMPETENCIES
1. Gather all pertinent information from the history and physical examination for
each of the common presenting complaints or findings and formulate an initial differential diagnosis.

2. Based on the differential diagnosis, develop an initial diagnostic plan for each problem that includes appropriate tests and imaging studies.

3. Explain how the physical manifestations of disease and the evaluation and management may vary with the age of the patient. Be able to give specific examples.

4. Discuss the characteristics of the patient and the illness that must be considered when making the decision to manage the patient in the hospital or in the outpatient setting.

Table 2. Presenting Complaints

<table>
<thead>
<tr>
<th>Common Conditions</th>
<th>Other conditions to Consider</th>
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<tbody>
<tr>
<td><strong>COUGH AND/OR WHEEZE</strong></td>
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<tr>
<td>Upper respiratory infection</td>
<td>Gastroesophageal reflux (GERD)</td>
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<tr>
<td>Asthma</td>
<td>Aspiration, foreign body</td>
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<tr>
<td>Pneumonia</td>
<td>Pertussis</td>
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<tr>
<td>Croup</td>
<td>Tuberculosis</td>
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<td>Bronchiolitis</td>
<td>Cystic fibrosis</td>
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<td>Sinusitis</td>
<td>Chlamydia pneumonia</td>
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<tr>
<td>Allergic rhinitis</td>
<td>Habit cough</td>
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<tr>
<td><strong>FEVER</strong></td>
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<tr>
<td>Viral illnesses</td>
<td>Osteomyelitis</td>
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<td>Urinary tract infection</td>
<td>Septic arthritis</td>
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<td>Occult bacteremia</td>
<td>Cellulitis</td>
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<tr>
<td>Bacteremia/sepsis</td>
<td>Kawasaki Disease</td>
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<td>Meningitis</td>
<td>Juvenile arthritis</td>
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<td>Malignancy</td>
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<tr>
<td></td>
<td>Acute Rheumatic fever</td>
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<tr>
<td></td>
<td>Lyme Disease</td>
</tr>
<tr>
<td><strong>SORE THROAT</strong></td>
<td></td>
</tr>
<tr>
<td>Viral illnesses</td>
<td>Tonsillar abscess</td>
</tr>
<tr>
<td>Group a streptococcal pharyngitis</td>
<td>Peritonsillar abscess</td>
</tr>
<tr>
<td>Mononucleosis</td>
<td>Retropharyngeal abscess</td>
</tr>
<tr>
<td>Postnasal drip</td>
<td>Epiglottitis</td>
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<tr>
<td>Allergic rhinitis</td>
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<tr>
<td><strong>EAR PAIN</strong></td>
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<tr>
<td>Otitis media, Acute and Recurrent</td>
<td>Dental caries</td>
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<tr>
<td>Otitis media with effusion</td>
<td>Pharyngitis</td>
</tr>
<tr>
<td>Otitis externa</td>
<td>Mastoiditis</td>
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<tr>
<td><strong>RUNNY NOSE</strong></td>
<td></td>
</tr>
<tr>
<td>Viral URI</td>
<td>Nasal foreign body</td>
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<tr>
<td>Allergic rhinitis</td>
<td>Vasomotor rhinitis</td>
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<tr>
<td>Sinusitis</td>
<td>Syphilis</td>
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<tr>
<td><strong>ABDOMINAL PAIN</strong></td>
<td></td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>Henoch Schönlein purpura</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>Intussusception</td>
</tr>
<tr>
<td>Constipation/encopresis</td>
<td>Gastritis</td>
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<tr>
<td>Pelvic inflammatory disease</td>
<td>Peptic ulcer disease</td>
</tr>
<tr>
<td>Colic</td>
<td>Lead toxicity</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>Inflammatory bowel disease</td>
</tr>
<tr>
<td>Functional abdominal pain</td>
<td>Ovarian or testicular torsion</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Malignancy</td>
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<tr>
<td></td>
<td>Incarcerated hernia</td>
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<table>
<thead>
<tr>
<th>DIARRHEA</th>
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<tbody>
<tr>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>Toddler’s diarrhea</td>
</tr>
<tr>
<td>Celiac Disease</td>
</tr>
<tr>
<td>Malabsorption</td>
</tr>
<tr>
<td>Inflammatory Bowel Disease</td>
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<table>
<thead>
<tr>
<th>VOMITING</th>
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<tbody>
<tr>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>Gastroesophageal reflux</td>
</tr>
<tr>
<td>Pyloric stenosis</td>
</tr>
<tr>
<td>Extra-intestinal infections</td>
</tr>
<tr>
<td>Pregnancy</td>
</tr>
<tr>
<td>Volvulus/bowel obstruction</td>
</tr>
<tr>
<td>Diabetic Ketoacidosis</td>
</tr>
<tr>
<td>Intracranial process (increased intracranial pressure)</td>
</tr>
<tr>
<td>Pyelonephritis</td>
</tr>
<tr>
<td>Hepatitis</td>
</tr>
<tr>
<td>Congenital adrenal hyperplasia</td>
</tr>
<tr>
<td>Inborn errors of metabolism</td>
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<table>
<thead>
<tr>
<th>DERMATITIS OR RASH</th>
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<tbody>
<tr>
<td>Viral exanthems</td>
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<tr>
<td>Atopic dermatitis</td>
</tr>
<tr>
<td>Contact dermatitis</td>
</tr>
<tr>
<td>Impetigo</td>
</tr>
<tr>
<td>Monilial and tinea infections</td>
</tr>
<tr>
<td>Scabies</td>
</tr>
<tr>
<td>Urticaria</td>
</tr>
<tr>
<td>Drug reaction</td>
</tr>
<tr>
<td>Stevens-Johnson Syndrome</td>
</tr>
<tr>
<td>Erythema multiforme</td>
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<tr>
<td>Inborn errors of metabolism</td>
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<table>
<thead>
<tr>
<th>JOINT AND LIMB PROBLEMS</th>
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<tbody>
<tr>
<td>Infections</td>
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<tr>
<td>Toxic synovitis</td>
</tr>
<tr>
<td>Septic arthritis</td>
</tr>
<tr>
<td>Osteomyelitis</td>
</tr>
<tr>
<td>Reactive arthritis</td>
</tr>
<tr>
<td>Tendonitis</td>
</tr>
<tr>
<td>Developmental Hip Dysplasia</td>
</tr>
<tr>
<td>Fracture</td>
</tr>
<tr>
<td>Nursemaid’s elbow</td>
</tr>
<tr>
<td>Sickle cell crisis</td>
</tr>
<tr>
<td>Osgood Schlatter disease</td>
</tr>
<tr>
<td>Legg-Calve-Perthes disease</td>
</tr>
<tr>
<td>Slipped capital femoral epiphysis</td>
</tr>
<tr>
<td>Acute Rheumatic Fever</td>
</tr>
<tr>
<td>Malignancy</td>
</tr>
<tr>
<td>Juvenile Arthritis</td>
</tr>
<tr>
<td>Lupus erythematosus</td>
</tr>
<tr>
<td>Lyme arthritis</td>
</tr>
<tr>
<td>Henoch Schönlein purpura</td>
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<table>
<thead>
<tr>
<th>CNS PROBLEMS</th>
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<tbody>
<tr>
<td>Headache</td>
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<tr>
<td>Migraine</td>
</tr>
<tr>
<td>Tension</td>
</tr>
<tr>
<td>Sinus</td>
</tr>
<tr>
<td>Seizures</td>
</tr>
<tr>
<td>Increased ICP</td>
</tr>
<tr>
<td>Brain tumor</td>
</tr>
<tr>
<td>Hydrocephalus</td>
</tr>
<tr>
<td>Metabolic disorders</td>
</tr>
</tbody>
</table>
- Febrile – simple and complex
- Idiopathic
- Traumatic/post traumatic
- Ingestions

**SIGNIFICANT PHYSICAL FINDINGS**

**BRUISING/PETECHIAE/PURPURA**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Diagnosis</th>
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<tbody>
<tr>
<td>Trauma</td>
<td>Thrombocytopenia</td>
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<tr>
<td>Viral infections</td>
<td>Coagulopathies</td>
</tr>
<tr>
<td>Streptococcal infections</td>
<td>Systemic bacterial infection</td>
</tr>
<tr>
<td>Vasculitis, e.g. Henoch Schönlein purpura</td>
<td>Meningococcus</td>
</tr>
<tr>
<td>Cough and vomiting</td>
<td>Sepsis/DIC</td>
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</tbody>
</table>

**PALLOR**

<table>
<thead>
<tr>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia, Iron deficiency</td>
</tr>
<tr>
<td>Poor perfusion, e.g. dehydrated</td>
</tr>
<tr>
<td>Leukemia</td>
</tr>
</tbody>
</table>

**HEART MURMUR**

<table>
<thead>
<tr>
<th>Murmurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innocent murmurs</td>
</tr>
<tr>
<td>Septal defects, atrial and ventricular</td>
</tr>
<tr>
<td>Coarctation of the aorta</td>
</tr>
<tr>
<td>Valvular defects</td>
</tr>
<tr>
<td>Patent Ductus</td>
</tr>
<tr>
<td>Myocarditis</td>
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**LYMPHADENOPATHY**

<table>
<thead>
<tr>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral illnesses</td>
</tr>
<tr>
<td>Kawasaki disease</td>
</tr>
<tr>
<td>Malignancy</td>
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<tr>
<td>Lymphoma</td>
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<tr>
<td>Leukemia</td>
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<tr>
<td>Neuroblastoma</td>
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<tr>
<td>Bacterial adenitis</td>
</tr>
<tr>
<td>Mycobacterial adenitis</td>
</tr>
<tr>
<td>Streptococcal pharyngitis</td>
</tr>
<tr>
<td>Mononucleosis</td>
</tr>
<tr>
<td>Epstein Barr Virus</td>
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<tr>
<td>Cytomegalovirus</td>
</tr>
<tr>
<td>Toxoplasmosis</td>
</tr>
<tr>
<td>Cat scratch disease</td>
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<tr>
<td>HIV</td>
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**SPLENOMEGALY**

<table>
<thead>
<tr>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systemic infectious diseases</td>
</tr>
<tr>
<td>Mononucleosis</td>
</tr>
<tr>
<td>Malignancy</td>
</tr>
<tr>
<td>Hemolytic anemia</td>
</tr>
<tr>
<td>Sickle cell anemia (infancy)</td>
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</tbody>
</table>

**HEPATOMEGALY**

<table>
<thead>
<tr>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis</td>
</tr>
<tr>
<td>Congestive heart failure</td>
</tr>
<tr>
<td>Systemic infectious diseases</td>
</tr>
<tr>
<td>Cirrhosis</td>
</tr>
<tr>
<td>Inborn errors of metabolism</td>
</tr>
</tbody>
</table>

**ABDOMINAL MASS**
### Constipation
- Pregnancy

### Malignancy
- Neuroblastoma
- Wilm’s tumor
- Lymphoma
- Renal anomalies
- Intussusception

### Impaired Vision
**Refractive errors**
- Myopia
- Hyperopia
- Strabismus/amblyopia
- Glaucoma

**Congenital cataract**
- Retinopathy of prematurity

### White Pupillary Reflex
- Retinoblastoma
- Cataracts

### Delayed Language Development
- Impaired hearing
- Speech delay, isolated
- Global developmental delay

**Autism**
- Pervasive developmental delay

### Diagnostic Test Results

#### Anemia
- Iron Deficiency
- Occult blood loss
- Hemoglobinopathies
  - Sickle cell anemia
  - Thalassemia

**Malignancy**
- Hemolysis
- Hemolytic anemia, congenital or acquired
- Hemolytic-uremic syndrome
- Marrow failure

#### Hematuria, Microscopic and Macroscopic
- Urinary tract infection
- Benign familial hematuria
- Trauma
- Hypercalciuria

**Glomerulonephritis**
- Hemolytic uremic syndrome
- Hemorrhagic cystitis
- Kidney stones

#### Proteinuria
- Orthostatic proteinuria
- Transient proteinuria (benign)

**Nephrotic syndrome**
- Glomerulonephritis

#### Positive Mantoux Test (PPD)
- Latent tuberculosis
- Active tuberculosis

**BCG immunization**

#### Common Chronic Illness and Disability

**Rationale**

Chronic illness in children presents the physician and family with many challenges.
The challenges for the physician include accurate diagnosis of the disorder, evaluation and management of acute exacerbation of the disorder, and understanding the long term medical needs, implications and complications of the disorder for the patient as well as the family. The challenges for the family include understanding the needs of a child with a chronic illness or disorder, and the implications that this may have on the family dynamics.

**PREREQUISITES**

An understanding of the pathophysiology and epidemiology of the following chronic illnesses: (Allergies, asthma, sensory impairment, cerebral palsy disability, cystic fibrosis, sickle cell disease, seizure disorder, diabetes mellitus, childhood malignancy, AIDS).

**LEARNING OBJECTIVES**

1. List the clinical signs and symptoms of the most prevalent chronic disorders of childhood including
   - Allergies
   - Asthma
   - Sensory impairment
   - Cerebral palsy
   - Cystic fibrosis
   - Diabetes mellitus
   - HIV/AIDS
   - Malignancy
   - Sickle cell disease
   - Seizure disorder
2. Discuss how chronic illness can influence a child’s growth and development, educational achievement, and psychosocial functioning.
3. Discuss the impact that chronic illness has on the family emotional, economic and psychosocial functioning.
4. Recognize the impact of a patient’s culture on the understanding, reaction, and management of a chronic illness
5. Define the unique contributions of each member of a multidisciplinary health care team in caring for children with a chronic illness.
6. Identify the key components of delivering “Bad News” in relation to chronic illness.

**COMPETENCIES**

1. Demonstrate the ability to recognize the clinical signs and symptoms of the most prevalent chronic disorders of childhood and adolescence (allergies, asthma, sensory impairment, cerebral palsy, cystic fibrosis, sickle cell disease, seizure disorder, diabetes mellitus, childhood malignancy, AIDS).
2. Explain the common management strategies for each of the chronic illnesses above.
3. Perform a medical interview and a physical examination for a patient with a chronic illness. Demonstrate the ability to obtain information about the effects of the chronic illness on growth and development, and on the emotional, economic and psychosocial functioning of the patient and family. Elicit information about treatments used, including “complementary and alternative therapies.”
THERAPEUTICS

RATIONALE

Informed use of medications and therapeutic agents is essential, especially in pediatrics. Appropriate and successful treatment requires choice of the correct medication, the appropriate dose, and both a dosage form and a dosing regimen that will maximize compliance. The pharmacokinetics (absorption, metabolism, distribution and elimination) of medications change under the influence of growth and physiologic maturation. In addition, both the therapeutic and the adverse effects of medications vary as the child grows and matures. Child behavior and psychomotor development influence the form of medication dispensed and the expectation for compliance.

PREREQUISITES

• Basic pharmacology and the pathophysiology of common illnesses.
• Basic human growth and development.
• Physiologic and behavioral changes that occur during development from infancy to adolescence.

LEARNING OBJECTIVES

1. Describe the ways that physical and physiologic growth changes the pharmacokinetics of commonly used medications in pediatrics. Specifically address drug absorption, distribution, metabolism and elimination.
2. Discuss the ways that pharmacokinetics affects the dosing of a medication.
3. List drugs that are contraindicated or must be used with extreme caution in specific pediatric populations.
4. Describe the appropriate use of the following common medications in the outpatient setting, including when it is NOT appropriate to treat with a medication:
   • Analgesics / antipyretics
   • Antibiotics
   • Bronchodilators
   • Corticosteroids
   • Cough and cold preparations
   • Ophthalmic preparations
   • Otic preparations
   • Vitamin / mineral supplements
5. List the components of a prescription.
6. Discuss how body size and weight or surface area are used to calculate medication doses.
7. Recognize the importance of patient education in ensuring adherence with treatment regimens.
8. Summarize the factors that affect drug excretion into breast milk.

COMPETENCIES

1. Demonstrate the ability to write a prescription for a common medication such as an antibiotic.
2. Calculate a drug dose for infants and prepubertal children, based on body weight.
3. Demonstrate the ability to choose the appropriate medication(s) for management...
of the following uncomplicated conditions and also know when it is NOT appropriate to treat with a medication:

- Acne
- Allergic rhinitis
- Conjunctivitis
- Eczema
- Fever
- Impetigo
- Otitis media
- Streptococcal pharyngitis
- Urinary tract infection
- Wheezing

**FLUID AND ELECTROLYTE MANAGEMENT**

**RATIONALE**

All human beings need an uninterrupted supply of water, electrolytes, and energy. Excessive or diminished fluid intake or losses may lead to severe physiologic derangements, with significant morbidity and even mortality.

**PREREQUISITES**

1. Water and electrolyte distribution in body compartments.
2. The relationship between basal metabolic rate and daily water requirements.
3. Daily glucose requirements.
4. The role of the adrenal gland and antidiuretic hormone (ADH) in maintaining serum sodium and body water balance.
5. Pathophysiology of hypernatremic and hyponatremic dehydration.

**LEARNING OBJECTIVES**

1. List the daily water and electrolyte requirements for children of all ages.
2. List the factors that increase daily fluid requirements.
3. Define each of the following and discuss how it relates to the fluid management in health and illness: maintenance, deficit, ongoing losses
4. List the key historical and physical exam information necessary to determine the hydration status of a child.
5. Recognize the causes of fluid imbalance leading to dehydration.
6. Describe the physical findings in hypovolemic shock and the approach to restoration of circulating fluid volume (i.e. “rescue” fluid infusion)
7. Discuss the water volume and electrolyte composition of maintenance fluids for children of all ages.
8. Know how to estimate the composition and volume of fluids for patients with fluid deficits.
9. Demonstrate an understanding of the electrolyte composition of standard and replacement oral and IV solutions.
10. Define hypernatremia, hyponatremia, hyperkalemia and acidosis. Describe a common clinical scenario in which each might develop.
11. Describe the effect of pH on serum potassium levels.
12. Know the conditions in which fluid administration may need to be restricted (such as the syndrome of inappropriate ADH secretion, congestive heart failure, or renal failure).
COMPETENCIES:

1. Obtain historical information necessary to assess the hydration status of a child.
2. Recognize the physical examination findings that indicate mild, moderate and severe dehydration, including vital signs, level of alertness, mucous membrane moisture, and skin color, perfusion, and turgor.
3. Calculate and write orders for intravenous maintenance fluids for a child undergoing elective surgery.
4. Calculate and write orders for the fluid therapy for a child with severe dehydration caused by gastroenteritis; include “rescue” fluid to replenish circulating volume, deficit fluid, and ongoing maintenance.
5. Recognize the consequences of electrolyte disturbances, including hypernatremia, hyponatremia, hyperkalemia, hypokalemia, and severe acidosis.
6. Explain to parents how to use oral rehydration therapy for mild to moderate dehydration.

POISONING

RATIONALE

Poisonings, ingestions and injuries are major preventable causes of childhood morbidity and mortality. Poisoning control centers across the U.S. receive more than millions calls a year regarding accidental and non-accidental ingestions and exposures to toxic materials. In the United States, the number of childhood deaths due to injury is four times greater than other causes.

PREREQUISITES

1. Routes of absorption of toxins including the gastrointestinal tract, the skin, and lungs.
2. Students need to understand that a relationship exists between the mechanism of injury, the child and the environment
3. Students should understand the toxic effects and where applicable the therapeutic index of common toxic agents (list)

LEARNING OBJECTIVES

1. Describe the developmental vulnerability for poisoning and accidental ingestions in infants, toddlers, children, and adolescents.
2. Discuss the ages at which prevalence of unintentional and intentional poisonings are highest.
3. Describe the clinical manifestations, toxicity, and basic management of important ingestions (iron, lead, acetaminophen, aspirin, caustic agents, narcotics, PCPs, cyclic antidepressants, hydrocarbons, strong alkali, alcohol, volatile hydrocarbons, and carbon monoxide)
4. Identify the environmental sources of lead and discuss the clinical and social importance of lead poisoning.
5. Know the passive and active interventions that decrease the incidence of childhood ingestions and injuries (i.e. locks or safety caps, pool fences, car restraints).
6. Describe the resources available to the physician for acute poisoning management, including poison information control centers and other resources
7. Recognize that emotions of guilt and anxiety that may be present in the parent, caregiver or child at the time of ingestion.

COMPETENCIES

1. Provide anticipatory guidance regarding home safety and appropriate techniques to prevent accidental ingestion.
2. Elicit an appropriate history to evaluate an unintentional ingestion or exposure to a toxic substance (including the substance, the route of exposure, the quantity, and the timing), demonstrating sensitivity to the emotions of guilt and anxiety that may be present in the patient, parent, or caregiver.
3. Elicit an appropriate history surrounding the intentional ingestion of a toxic substance (including the substance, route of exposure, amount, timing, antecedent events, and stressors) demonstrating sensitivity to the emotions of both the adolescent and the parent or caregiver.
4. Know how to use of the Poison Control Center and other information resources in the management of the patient with an accidental or intentional ingestion.
5. Recognize the acute signs and symptoms of accidental or intentional ingestion of aspirin, acetaminophen, iron, alcohol, PCP, narcotics, cyclic antidepressants, and volatile hydrocarbons.
6. Demonstrate knowledge of the immediate emergency management of children with toxic ingestions of acetaminophen, hydrocarbons, strong alkali, and iron.

PEDIATRIC EMERGENCIES

RATIONALE

All health care providers must be able to identify the infant, child, or adolescent with a medical emergency. A systemic and thorough approach to the seriously ill child may significantly reduce morbidity and mortality.

PREREQUISITES

1. Certification and basic cardiopulmonary resuscitation and an understanding of treatment priorities.
2. The cardiopulmonary responses to decreased or relatively decreased intervascular volume.

LEARNING OBJECTIVES

1. Describe the “ABCD” (the priorities of airway, breathing, circulation) assessment.
2. List the symptoms of and describe the initial emergency management of shock, status epilepticus, respiratory failure or insufficiency, head or cervical spine trauma, coma, apnea, proptosis, and suicidal ideation.
3. Describe the immediate emergency management of a child following trauma to the head, near drowning, or foreign body aspiration.

COMPETENCIES

1. Identify the patient who requires immediate medical attention and intervention using the ABCD” assessment.
2. For each condition listed in the right-hand column of Table 2, describe the acute
clinical presentation, the immediate need for stabilization, and the initial diagnostic assessment.

3. Demonstrate knowledge of the immediate emergency management of a child following trauma to the head, near drowning, or foreign body aspiration.

4. Demonstrate the appropriate anticipatory guidance to prevent future occurrences of life-threatening illnesses (e.g. infant positioning for sudden infant death syndrome (SIDS), supervision to prevent poisoning, falls, choking).

<table>
<thead>
<tr>
<th>Table 3. Acute Clinical Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emergent Clinical Problem</strong></td>
</tr>
</tbody>
</table>
| Shock | • Common: Sepsis, severe dehydration, diabetic ketoacidoses, anaphylaxis, congestive heart failure and ingestion  
• Other diagnoses: Burns, neurogenic shock, and adrenal insufficiency |
| Ataxia | • Ingestion, infection, and tumor |
| Seizures | • Infection (i.e., meningitis or encephalitis), status epilepticus, ingestion, and electrolyte disturbances |
| Delirium / Coma | • Head injury, substance abuse, infection (encephalitis, meningitis), diabetic ketoacidosis, hypoglycemia, abuse. Secondary diagnosis: hepatic failure |
| Airway Obstruction / Respiratory distress | • Foreign body aspiration, anaphylaxis, croup, bronchiolitis, asthma, Pneumonia, and peritonsillar or retropharyngeal abscess |
| Apnea | • Sudden Infant Death Syndrome, acute life-threatening event, seizures, and cardiac dysrhythmias |
| Proptosis | • Tumor and orbital cellulites |
| Suicidal Ideation | • Depression |
| Injuries | • Common Conditions  
  o Sprains and fractures  
  o Burns  
  o Animal bites  
  o Closed head trauma  
• Other conditions to Consider  
  o Nursemaid’s elbow  
  o Toddler’s fracture  
  o Neck injuries  
  o Seatbelt injuries |

**CHILD ABUSE**

**RATIONALE**

The abuse of children and adolescents is a leading public health problem that affects millions of children and families. Physicians will come across the problems of child abuse and family violence in any field of medical practice, and can make important differences in their patients’ lives if they have the ability to recognize and handle these sensitive issues. Abuse causes physical, sexual and/or emotional trauma or may occur in the form of neglect when caregivers fail to provide basic physical,
psychological or medical needs. Medical professionals are required by law in all 50
states to protect children and adolescents by identifying suspected abuse and by
reporting it to child protective services. Students must understand the varying
presentations of abuse. Students must know when to consider abuse in the
differential diagnosis of child or adolescent health problems and must further
understand the legal obligation they will have as mandatory reporters of suspected
abuse. Finally, students should recognize the role of the physician in preventing child
abuse and family violence, through routine assessment of family dynamics, early
identification of children at risk, and cooperation with community services that
support families.

**PREREQUISITES**

1. Basic clinical data-gathering skills.
2. Knowledge of growth and development from birth through adolescence.
3. Awareness of adult mental disorders, substance abuse, domestic abuse, elder
   abuse and family dysfunction.
4. Communication skills with families and professionals.

**LEARNING OBJECTIVES**

1. List characteristics of the history that should trigger concern for possible abuse.
2. List the physical and behavioral signs of physical, sexual, and psychological abuse
   and neglect.
3. Know the laws of your state for mandatory reporting of suspected child abuse
   and neglect.
4. Discuss the concurrence of domestic violence and child abuse and outline
   screening measures to identify family violence.
5. Understand the importance of a full, detailed, carefully documented history and
   physical examination in the evaluation of child abuse.
6. Discuss the unique communication skills required to work with families around
   issues of maltreatment.
7. Recognize the role of the physician in the reducing child maltreatment.

**COMPETENCIES**

1. Know the risk factors for child abuse.
2. Summarize the responsibilities of the “mandatory reporter” to identify and report
   suspected child abuse. Know to whom such a report should be made.
3. Recognize responses in the history or findings on the physical examination that
   raise the concern of non-accidental injury, such as inconsistency in the history,
   unexplained delays in seeking care, injuries with specific patterns or distributions
   on the body, or injuries incompatible with the child’s development.
4. Participate with the medical team to discuss the issue of suspected abuse and
   neglect with families.

**CHILD ADVOCACY**

**RATIONALE**

Physicians have a variety of roles in child health, including a public health role
wherein they serve as patient and family advocates. Since children are unable to
advocate for themselves and many of their families are not empowered, physicians
must advocate for them at the individual, local, national and global level.

PREREQUISITES

Understand the role of the physician as an advocate.

LEARNING OBJECTIVES

1. Describe barriers that prevent children from gaining access to health care, including financial, cultural and geographic barriers.
2. Describe specific issues or situations where child advocacy by physicians has resulted in improvements in child health.
3. Describe the types of problems that benefit more from a community approach rather than an individual approach.

COMPETENCIES

1. Identify a specific pediatric healthcare issue and outline a physician’s approach to advocacy.
2. Identify opportunities for advocacy during a health supervision visit.
Skills

RATIONALE

The transition to clinical-based learning is a dramatic shift for many students, involving a move away from a focus on memorization to solving and managing patient problems. The time frame shifts from an academic year to a lifetime of learning. The student needs to become a self-motivated, self-organized, life-long learner. The essential skill for success as a clinician and lifelong learner is clinical problem solving. The process of going from a patient’s chief complaint to the creation of an appropriate differential diagnosis and the formulation of a diagnostic therapeutic plan is the core of clinical medicine. Skills essential for competent medical care include the ability to conduct an interview, perform a physical examination, manage medical data, communicate written and oral information, integrate basic science knowledge, search and read the literature critically, and teach. The care of individual patients requires the application of all of these skills. Communication skills play a central role in establishing a therapeutic alliance with the patient and family. This alliance ultimately determines the success of clinical care.

PREREQUISITES

- Basic knowledge of the general history, including an understanding of different styles of questions used in the medical review, such as open-ended, directed, follow-up, and summary questions.
- General physical examination techniques, including the use of diagnostic instruments.
- General organization and problem-solving skills.
- Awareness of personal and cultural differences.

LEARNING OBJECTIVES

INTERVIEWING SKILLS

1. Compare and contrast the components of the history that should be obtained for different types of visits (e.g., first visit, acute care, health supervision).
2. Determine when it is appropriate to obtain a complete medical history, vs. a focused, or interval history.
3. Describe how to modify the interview depending on the age of the child, with particular attention given to the following age groups: toddler/preschooler, school-aged child, adolescent, including when to address questions to child versus parent.
4. Describe social, language and cultural factors that affect the interaction with the patient and family.
5. Be able to obtain the following information in an appropriate manner from child and or the accompanying adult:

Past History

Neonatal history, including:
- Birth weight and approximate gestational age
- Maternal complications, such as extent of prenatal care, infections, exposure to drugs, alcohol or medications
• Problems in the newborn period, such as prematurity, respiratory distress, jaundice and infections

Immunizations
Growth and development
Nutrition

**Family History:**
- Age and health of family members
- Known genetic disorders
- Diseases with a genetic contribution, such as diabetes, cardiovascular disease, psychiatric illness, cancer
- Drug and alcohol abuse

**Social History:**
- Household composition
- School and peer relationships

**Environmental and Personal Safety Assessment:**
- Seat belts and car seats
- Bicycle helmets
- Firearms in the home
- Smoking
- Lead exposure
- Home safety for infants and toddlers

**PHYSICAL EXAMINATION**

1. Explain how the age of the child influences the physical examination, including the approach to the patient, the sequence of the examination, and the specific components of the examination.
2. Explain how age-appropriate behaviors, such as stranger anxiety, affect the ability of the examiner to perform the examination, and describe strategies to perform a successful examination.
3. Recognize the value of observation as an important assessment tool.
4. Determine when it is appropriate to perform a complete vs. a focused physical examination.
5. Explain how physical exam findings have different clinical significance depending on the age of the child.
6. Be able to perform and interpret the following components of the physical examination:

**Appearance**
- Identify signs of acute illness in an infant, toddler and child as evidenced by skin color, respiration, hydration, mental status, cry and social interaction.
- Interpret the general appearance of the child, including size, morphologic features, development, behaviors and interaction of the child with the parent and examiner.

**Vital signs**
- Measure vital signs, demonstrating knowledge of the appropriate blood pressure cuff size and normal variation in temperature depending on the route of measurement (oral, rectal, axillary or tympanic)
- Identify variations in vital signs based on age of the patient and presence of
disease.

**Growth (See section on Growth)**
- Accurately measure growth and interpret the findings.
- Recognize the usefulness of longitudinal data

**Development (See section on Development)**
- Accurately assess development and maturity.

**HEENT**
- Recognize the need for careful observation of the head size and shape, symmetry, facial features, ear size and hair whorls as part of the examination for dysmorphic features
- Identify the anterior and posterior fontanels and assess them for fullness in infants
- Discuss how the red reflex is used to detect corneal opacities and intraocular masses.
- Describe how the corneal light reflection is used to identify strabismus
- Assess hydration of the mucous membranes.
- Assess dentition.
- Describe the tympanic membrane landmarks and movement using pneumatic otoscopy

**Neck**
- Palpate lymph nodes, know what anatomic areas they drain
- Demonstrate maneuvers that test for nuchal rigidity

**Chest**
- Assess the rate, pattern and effort of breathing.
- Identify normal variations of respiration and signs of respiratory distress.
- Recognize grunting, nasal flaring, stridor, wheezing, crackles and asymmetric breath sounds and be able to distinguish between inspiratory and expiratory obstruction.
- Identify transmitted upper airway sounds.

**Cardiovascular**
- Identify the pulses in the upper and lower extremities through palpation.
- Observe and palpate precordial activity.
- Assess cardiac rhythm, rate, quality of the heart sounds and murmurs through auscultation.
- Assess peripheral perfusion, using a test for capillary refill.

**Abdomen**
- Describe the technique for palpating the liver, spleen and kidneys, and explain how age affects findings, especially in the healthy newborn.
- Examine the umbilical cord in newborns for number of vessels. Identify granulation tissue and umbilical hernias.
- Assess the abdomen for distention, local or rebound tenderness, and masses through observation, auscultation, and palpation.
- Determine the need for a rectal examination, and demonstrate the age-appropriate technique.

**Genitalia**
• Describe the difference in appearance of male and female genitalia at different ages and developmental stages.
• Palpate the testes.
• Recognize genital abnormalities in a boy, including cryptorchidism, hypospadias, phimosis, hernias, hydrocele and testicular mass.
• Recognize genital abnormalities in a girl, including signs of virilization, imperforate hymen, labial adhesions and signs of injury.

**Extremities**
• Examine the hips of a newborn for congenital dysplasia using the Ortolani and Barlow maneuvers.
• Discuss age-related changes in gait.
• Identify age-related variations in the examination, such as tibial torsion, genu valgus, flat feet, etc.
• Recognize pathology, such as restricted or excessive joint mobility, joint effusions, signs of trauma, and inflammation.

**Back**
• Describe the procedure used to screen for scoliosis.
• Examine the back for midline tufts of hair, pits, sacral dimples, or masses.

**Neurologic examination**
• Describe the primitive reflexes that are present at birth and how they change as the child develops.
• Assess the quality and symmetry of tone, strength and reflexes, using age-appropriate techniques.
• Assess developmental milestones.
• Describe the role of observation as part of the neurological examination.

**Skin**
• Assess turgor, perfusion, color, pigmented lesions, and rashes through observation and palpation.
• Identify jaundice, petechiae, purpura, vesicles, and urticaria.
• Examine the skin for common birthmarks and skin conditions unique to children.

**CLINICAL PROBLEM SOLVING**

1. Interpret history and physical exam findings based on the age of the child.
2. Develop a complete problem list and prioritize problems, taking into account the age of the child. Combine problems where appropriate to develop a specific differential diagnosis for the patient’s combination of symptoms.
3. Create a sufficiently broad initial differential diagnosis for each problem (or combined problems). Ensure that the differential diagnosis is appropriate for the age of the child.
4. Choose appropriate laboratory and diagnostic tests, and be able to justify those decisions taking into account a test’s sensitivity, specificity, and predictive value, as well as its invasiveness, risks, benefits, limitations, and costs.
5. Interpret the results of diagnostic tests, recognizing the age-appropriate values for commonly used laboratory tests, such as the CBC, urinalysis, and serum electrolytes.
6. Describe the most common treatments for the final diagnosis.
7. Formulate a clinical question relative to a patient’s problem. Conduct an effective
search of the medical literature. Critically read the pediatric literature and apply the information in developing a differential diagnosis, diagnostic plan, or management plan.

COMMUNICATION SKILLS

Verbal Communication
- Organize a case presentation to reflect accurately the reason for the evaluation, the chronology of the history, the details of physical findings, the differential diagnosis, and the suggested initial evaluation.
- Include age-specific information.
- Use precise descriptions of physical findings, and avoid vague terms and jargon, such as "clear" and "normal."
- Explain the thought process that led to the diagnostic and therapeutic plan.
- Communicate effectively with other health care workers.

Written Communication
- Use precise descriptions of physical findings and avoid vague terms and jargon, such as "clear" and "normal."
- Use appropriate formats for documenting history and physical examination depending on the purpose of the written document: inpatient admission and progress notes, office or clinic visits for acute illness, health supervision visits, and interval care visits.
- Write admission orders for a hospitalized patient
- Write a prescription (see Therapeutics section)

Communication with the patient and/or family
- Use communication techniques that enable development of a therapeutic alliance
  with the patient and family, being sensitive to the unique social condition and cultural background of the family.
- Identify the primary concerns of the patient and/or family.
- Describe the triangular relationship between physician, patient and parent and its effect on communication.
- Discuss medical information in terms understandable to patients and families.
- Avoid overuse of medical jargon and be able to explain medical terminology.
- Recognize the important role of patient education in treatment of acute and chronic illness, and prevention of disease.
- Describe the process of "breaking bad news" to patients and families, demonstrating knowledge about an individual’s reaction to such information, and ability to use basic skills of communication.

PROCEDURES

1. Understand the indications and potential risks, benefits and costs of commonly used procedures.
2. Describe how to provide emotional support for patients undergoing procedures.

COMPETENCIES

1. Conduct an effective interview
   - by adapting the interview to the visit (e.g., first visit, acute care, health supervision), or chief complaint,
   - in a manner that is sensitive to the age of child and the social and cultural
context.
2. Conduct a pediatric physical examination appropriate to
   • the nature of the visit or complaint (complete vs. focused), and
   • the age of the patient
3. Demonstrate sensitivity to confidentiality, privacy, and modesty, during the
   medical interview and physical examination
4. Generate an appropriate initial differential diagnosis based on the interview and
   physical examination
5. Outline an initial evaluation based on the differential diagnosis, and be able to
   discuss the diagnostic tests selected.
6. Give suggestions for the therapeutic plan appropriate to the final diagnosis
7. Present a complete, well-organized verbal summary of the findings of the
   patient’s history and physical examination, modifying the presentation to fit the
   situation.
8. Prepare a complete written summary of the history and physical examination.
9. Effectively communicate information about the diagnosis and treatment to the
   patient and family.
10. Demonstrate the ability to communicate “bad news” to parents, children and
    adolescents, aided by resident or staff physicians.
11. Critically use the medical literature to obtain current information relative to the
    patient’s problem.
Professional Conduct & Attitudes

RATIONALE

Knowledge, skills, clinical reasoning, and informed decision making while crucial to a physician’s practice of medicine, are insufficient to guarantee successful clinical interactions. A physician must have well-developed interpersonal skills that facilitate communication, and must also demonstrate attitudes, behaviors and beliefs that serve to promote the patient’s best interest. Students can learn to be professional, at least to a certain degree, in the abstract, but will acquire professional characteristics most effectively through contact with physicians chosen to serve as role models. Ethical principles, likewise, while learned in the abstract, must be applied clinically; the importance of suitable role models cannot be overemphasized.

In particular, each student must recognize that pediatrics poses unique challenges to professional conduct and attitudes. The patient constantly changes as growth and development proceed. The patient’s ability to participate actively in the clinical interaction progresses, as do his or her knowledge, experience and concerns. The adolescent presents specific challenges, including such issues as privacy, risk-taking behaviors, confidentiality and personal involvement with health. The role of parents in the clinical interaction, and their knowledge, experience, and concerns also develop and change as an individual child grows and as subsequent children are born. The way a physician communicates can have a lasting effect in how parents, children and adolescents handle situations and interact with the physician.

Cultural, ethnic and socioeconomic factors also affect personal and family traits and behaviors, with varying effects on child rearing practices. Recognition of and respect for difference are important, yet the student must be alert for the child or adolescent at risk in different family environments, given that the physician's primary obligation is to promote the best interest of the patient.

Professional conduct extends to the educational process: Students have a personal responsibility for their own education and for development of life-long learning skills. They must interact with peers and teachers in a manner that demonstrates respect for each individual and that promotes personal and group learning.

PREREQUISITES

Well-developed data gathering skills, knowledge of ethical principles, and a basic understanding of health law issues are essential foundations for the student.

Important personal characteristics that should be encouraged include, but are not limited to caring, compassion, empathy, enthusiasm, adaptability, flexibility, patience, gentleness, cultural sensitivity, tolerance of difference, willingness to listen and explain, personal honesty, respect for privacy and confidentiality, commitment to work, and dedication to learning.

LEARNING OBJECTIVES

1. Describe ways that development from infancy through adolescence affects the interaction between the physician, the patient and the family.
2. Discuss the way that communication skills affect the interactions with the
growing and developing child or adolescent and his/her family.
3. Describe ways that respect for modesty, privacy, and confidentiality affect clinical interactions.
4. Discuss the general influences of cultural, ethnic, and socioeconomic factors on personal and familial traits, beliefs, and behaviors.
5. Discuss the practical applications of the major ethical principles (Respect for autonomy, beneficence, non-malfeasance, justice), and demonstrate an understanding, in particular, of the ways that these principles contribute to the physician’s responsibility to promote the best interest of all patients and families.
6. Identify key members of the healthcare team and discuss their roles.
7. Realistically self-appraise and explore personal strengths, weaknesses, and goals.
8. Recognize the impact of stress, fatigue, and personality differences on learning and performance.

**COMPETENCIES**

A student will demonstrate the professional conduct necessary for successful clinical interactions by demonstrating the ability to:
1. Function as a member of the healthcare team, demonstrating collegiality and respect for all members of the team.
2. Interact effectively and sensitively with patients and families.
3. Demonstrate respect for modesty, privacy, and confidentiality.
4. Show tolerance of patient, parent, and family attitudes, behaviors and lifestyles, paying particular attention to cultural, ethnic, and socioeconomic influences.
5. Identify at-risk situations for infants, children, adolescents, and families that must be recognized, despite cultural difference.
6. Demonstrate behaviors and attitudes that promote the best interest of patients and families in all clinical interactions.
7. Have a positive attitude and regard for education by demonstrating intellectual curiosity, initiative, responsibility, reliability, and respect for peers, colleagues, and teachers.
8. Actively seek feedback about performance and demonstrate appropriate actions in response to that feedback.