CORE PEDIATRIC CLERKSHIP CURRICULUM

Adapted from the General Pediatric Clerkship Curriculum produced by joint effort of the APA (American Pediatric Association), COMSEP (council on Medical Student Education in Pediatrics) and AMSPDC (Association of Medical School Pediatric Department Chairman).

Definition of terms in the document:

**Rationale:** this section outlines the reasons that a specific topic or clinical issue is included in the curriculum.

**Prerequisites:** Knowledge of the material in this section is assumed. A student should have acquired the knowledge and developed the skills and attitudes listed in this section before the beginning of the pediatric clerkship (e.g. preclinical courses, introduction to clinical medicine course, or previously completed clerkships). This material will not be covered, per se, during the pediatric clerkship, although practical applications, obviously, will be included. Due to variations in medical schools, occasionally prerequisites may need to be covered during the clerkship.

**Learning Objectives:** A student will be expected to acquire the knowledge, skills and attitudes outlined in the objectives during the clerkship. The objectives will be the basis of part of the evaluation of a student's performance in the clerkship.

**Competencies:** These practical applications of the objectives will be used to evaluate a student's performance.

**Clinical Problems:** These are brief scenarios of clinical problems dealt with in general pediatrics. These problems are designed to stimulate clinical application of knowledge. A student should develop a knowledge base sufficient to allow assessment of the issues raised by each clinical problem. When an approach to evaluation is requested, a student should be able to discuss what additional information from history, physical examination and laboratory or imaging studies, as appropriate, is required to develop a problem list, a differential diagnosis and an initial management plan.

II. Professional Conduct and Attitudes

**Rationale:**

Professional conduct is complex and difficult to define, but is at the core of a physician's daily activities. Knowledge, diagnostic skills and problem solving abilities are necessary, but not sufficient to guarantee successful clinical interactions. The physician also must have well developed interpersonal skills that facilitate communication and must demonstrate attitudes, behaviors and beliefs that promote the patient's best interest. In particular, the physician who provides medical care to infants, children, and adolescents must remember that the patient and the clinical interaction will change continuously under the influence of growth and development. How the physician communicates can have a lasting effect in how the parents handle situations and communicate with the physician. The evolving family structure also will influence the physician's interaction with both the patient and the family. Lastly, the physician must have a commitment to lifelong learning to ensure that the medical care provided to patients is the most appropriate effective treatment available.

**Prerequisites:**
Well developed data gathering skills and knowledge of ethical principles are essential foundations for the student. Important personal characteristics that should be encouraged in students 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.

Such concepts can be learned to some degree in the abstract, but will be acquired 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.

Learning Objectives:

The attitudes, beliefs and behaviors central to the professional conduct of all physicians will be enhanced by a student's experience in pediatrics. Specific issues during clinical pediatrics are highlighted here. However, interaction with children and adolescents (and their families) during the pediatric clerkship will require students to develop their own attitudes, beliefs, ethical and legal concepts and professional conduct.

1. The patient constantly changes as growth and development proceed, and the family, likewise, develops and changes as the child grows and as subsequent children are born. The patient's ability to participate 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 change. Students must work to adapt their clinical approach, as appropriate to the developmental stage of the child or adolescent and family.

2. 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. The student must still 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.

3. Acute and chronic illness and disability test the physician's clinical and interpersonal skills. The student must learn how to communicate clearly and sensitively. In such situations the health care team plays an important role and the student must learn to work within a team, treating each member of the team with courtesy and respect and recognizing the contributions of each to the clinical interaction.

4. There are unique ethical issues in pediatrics. The student must have a firm foundation in basic ethical principles and must develop an appreciation of the ethical challenges specific to clinical interactions with children, adolescents and their families.

5. At the core of the physician's professional conduct are attitudes, skills and knowledge that evolve as the individual's experiences grow. Intellectual curiosity, initiative and willingness to assume responsibility for the continued development of clinical skills are crucial for the lifelong learning demanded by a career in medicine.

Competencies:

1. Demonstrate the professional conduct necessary for a successful clinical interaction
2. Demonstrate tolerance of parent and family differences in attitudes, behaviors and lifestyles, but recognize when a child or adolescent is at risk and know when and how to intervene. Provide examples that demonstrate how childrearing practices differ across cultural and ethnic groups and in socioeconomic situations.
3. Explain in general terms how to conduct an interview and physical exam of an adolescent with his or her parent. In addition, outline how the results of the examination and any diagnostic tests should be discussed with the adolescent and parent.
4. Discuss how to relate news of a serious acute or chronic illness or a congenital abnormality to parents.
How would your discussion differ with the child or the adolescent?
5. Demonstrate intellectual curiosity, initiative, responsibility, and reliability.

III. Skills

Rationale:

There are five general skill areas introduced and reinforced during the pediatric clerkship: conducting an interview, performing a physical exam, communicating information, identifying and solving clinical problems, and developing an initial diagnosis and therapeutic plan. These are fundamental competencies and will be taught in some form in all the third year clerkships. Aspects of these skills that are unique to pediatrics are identified in the curriculum. The development of competent clinical skills requires both practice and supervision with feedback.

Prerequisites:

Prior knowledge and skills acquired during the preclinical years should include:
1. Basic knowledge of the general history and physical examination, including an understanding of different styles of questions used in the medical interview, such as open-ended, directed, follow-up, and summary questions.
2. Elementary knowledge of growth and development.
3. Basic clinical organization and problem solving skills.

Learning Objectives:

Interviewing
1. Patient interviews occur in variety of clinical settings, including: initial history for a hospital admission of first ambulatory visit, health maintenance visit, acute care visit, interim visit for a child with an acute or chronic health condition. The student should develop an awareness that in conducting medical interview in a variety of settings, it is sometimes appropriate to obtain a complete medical history, while at other times a more limited, focused or interval history is appropriate. Initially, the emphasis should be on obtaining complete medical histories. Opportunities to do more focused work-ups should be available as the student builds competence.
2. Obtain a medical history from a second party (usually the parent), as well as from the patient, noting the increased reliability of obtaining directly from the patient as the patient matures. The student must be aware of issues of appropriate privacy at all ages and confidentiality in older children and adolescents.
3. Obtain a relevant history that is unique to pediatrics in addition to the standard medical history.

Past history: Neonatal history, including birth weight; approximate gestational age; maternal complications, such as extent of prenatal care, infections, exposure to drugs, alcohol or medications; and problems in the newborn period, such as prematurity, respiratory distress, jaundice and infections.

Immunizations
Development, noting the importance of assessing developmental milestones in evaluating the health of the child.
Diet, noting the importance of assessing the amount, type, and method of infant feeding.

Family History: Number and ages of siblings; consanguinity, known genetic disorders, early childhood deaths, cardiovascular disease, depression and alcohol abuse.

Social History: Assessment of the home environment, school and peer relationships.
Review of Systems: The relevant items are limited, but expand as the patient’s age increases.

4. Modify the medical history depending on the age of the child, with particular attention given to the following age groups: neonate, infant, toddler/preschool aged child, school aged child adolescent.

Physical Examination

1. Establish rapport with children of various ages in order to perform the physical examination.
2. Recognize the important role of observation as a method of obtaining data in the assessment of the child.
3. Recognize the important role of observation as a method of obtaining data in the assessment of the child.
4. Perform complete physical examinations on an infant, child and adolescent, including the observation and documentation of normal physical findings.
5. Demonstrate the appropriate use of the limited or focused examination, particularly in ambulatory setting.
6. Use developmental assessment as part of the physical examination for all ages.

- Observe how normal behaviors, such as stranger anxiety, affect the ability of the examiner to perform the examination, and develop strategies for improving rapport.
- Perform the Denver development Screening Test, and know how it is used to assess motor, language and social development.
- Identify the physical changes of puberty and be able to conduct Tanner staging.

7. Observe and demonstrate physical exam findings unique to the pediatric age group, and understand how findings have different clinical significance depending on the age of the child. Some examples are:

   Appearance – 1) recognize signs of acute illness in an infant, toddler and child by evaluating skin color, respiration, hydration, metal status, cry social interaction; and 2) recognize the importance of observing the psycho-social condition of the child, including behavior, development, body habits (height, weight, body fat), relationship to parent and examiner, and general condition.

   Vital signs – 1) measure heart rate respiratory rate, blood pressure and temperature in an infant and child, demonstrating knowledge of the appropriate sized blood pressure cuff, interval to count respirations, and normal variation in temperature depending on the route of measurement (oral rectal, auxiliary or tympanic); 2) understand that normal values of heart rate, respiratory rate and blood pressure change with age; and 3) recognize the importance of assessing vital signs in the evaluation of acute illness.

   Measurements – 1) accurately measure height, weight and head circumference; 2) plot the data on an appropriate growth chart; 3) understand the normal relationships between height, weight and head circumference; and 4) recognize the usefulness of longitudinal data.

   HEENT – 1) identify the anterior and posterior fontanels and assess them for fullness or turgor; 2) 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; 3) recognize the red reflex and strabismus; 4) assess hydration of the mucous membranes; and 5) examine the tympanic membranes using pneumatic otoscopy.

   Neck – 1) palpate lymph nodes, know what anatomic areas they drain; 2) know that lymph nodes are more prominent during childhood; and 3) recognize and demonstrate maneuvers that test for nuchal rigidity.

   Chest – 1) recognize how the rate and pattern of respirations change with age, and that abdominal respirations are normal in infants; 2) observe the rate and effort of breathing as a measure of respiratory distress; 3)
recognize stridor, wheezing and rales and be able to distinguish between inspiratory and expiratory obstruction; and 4) interpret less serious respiratory sounds such as transmitted upper airway sounds.

Cardiovascular –1) palpate pulses in the upper and lower extremities and auscultate the heart for rhythm, rate, quality of the heart sounds and murmurs.

Abdomen –1) understand that the liver edge, spleen tip and kidneys may be palpable in the normal newborn; 2) examine the umbilical cord for signs of infection; 3) examine the abdomen for distention, tenderness, rebound and mass lesions in an infant or young child with lethargy, irritability or signs of acute illness, noting the inability of the patient to communicate symptoms of abdominal complaints; and 4) be able to do a rectal examination and recognize when it is indicated.

Genitalia –1) recognize the appearance of normal male and female genitalia in newborn; 2) recognize abnormalities, including cryptorchidism, hypospadias, testicular mass in the male; 3) be able to examine the external genitalia of a female patient, and 4) recognize the need for privacy at all ages.

Extremities –1) examine the hips of a newborn for dysplasia; 2) recognize arthritis; and 3) evaluate gait and limp.

Back –know how to test for scoliosis.

Neurologic examination –1) elicit primitive reflexes; 2) assess tone, gait, strength and reflexes, recognizing the importance of symmetry; 3) assess developmental milestones; and 4) recognize that much of the neurologic examination of infants and children is accomplished through observation alone.

Skin –1) recognize jaundice, petechiae, purpura, common birth marks (such as nevus flammeus and Mongolian spots), vesicles, diaper dermatitis and viral exanthems, 2) recognize common skin findings associated with child abuse; and 3) assess skin turgor.

Communication Skills

1. Communication with the patient and/or family
   - Establish rapport with the patient and family.
   - Identify the primary concerns of the patient and/or family.
   - Recognize the triangular relationship between physician, patient and parent and be able to communicate information to both the patient and parent, making sure both understand the diagnosis and treatment plan and have the opportunity to ask questions; be aware that the relationship changes with increasing age of the child.
   - Provide anticipatory guidance during health maintenance visits, including the newborn nursery visit.
   - Recognize the important role of patient education in management of acute and chronic illnesses.

2. Written communication skills
   - Write a complete summary of the history and physical examination in a timely manner, which is suitable to place in the patient’s chart.
   - Outline the different formats for documenting the history and physical examination, which may be used in different clinical settings.
   - Write admission orders for a hospitalized patient.
   - Write a prescription (see Therapeutics section).
3. Oral communication skills

- Present a complete, well organized summary of the findings of the patient’s history and physical examination, modifying the presentation to fit the situation.
- Communicate effectively with other health care workers, including consultants, nurses and social workers.
- Explain the thought process that led to the diagnostic and therapeutic plan.
- Use precise descriptions of physical findings and avoid vague terms and jargon, such as "clear" and "WNL".

Clinical Problem-Solving Skills

1. Develop a complete problem list and a differential diagnosis for each problem; combine problems where appropriate to develop a differential diagnosis for the patient’s unique combination of symptoms.
2. Use knowledge of key signs and symptoms and the frequency and prevalence of diseases at different ages when developing a differential diagnosis.
3. Formulate and initial diagnostic and therapeutic plan, considering the cost risk, benefits and limitations of laboratory tests, imaging studies, medications, consultations, hospitalization, and more conservative measures such as observation.
4. Interpret the results of commonly ordered laboratory tests, such as the CBC, urinalysis, and serum electrolytes, and recognize that the normal values of some tests may vary with the age of the patient.
5. Use the pediatric literature to research the diagnosis and management of clinical problems.
6. Develop critical thinking skills and the ability to use scientific evidence in making clinical decisions.
7. Recognize that physicians work in collaboration with other care providers in both the medical center and the community, including the school, Public Health Department, social service agencies and the Child Protective Service.

Procedures:

Understand the indications for procedures such as a lumbar puncture, parental fluids including intravenous and intra-osseous fluids, and emergency procedures such as intubation. Observe how to provide emotional support for patients undergoing procedures. The technical aspects of doing procedures should be introduced, although there is no expectation of mastery at third year student level.

COMPETENCIES:

1. Evaluate patients from infancy through adolescence in a variety of clinical settings, establishing rapport with the patient and family in order to obtain a complete history.
2. Prepare a complete written summary of the history and physical and orally present the case in a focused and chronological manner.
3. Identify clinical problems and outline an initial diagnostic and therapeutic plan.
4. Know when hospitalization and diagnostic tests are indicated.
5. Select the diagnostic tests, which are most likely to be useful and be aware of their costs and limitations.
6. Effectively communicate information relevant to the diagnosis and treatment of the patient, performing a literature search and critical of the literature.
7. Obtain up-dated information relevant to the diagnosis and treatment of the patient, performing a literature search and critical review of the literature.
IV. Knowledge

1. 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:

1. Basic data gathering skills and the ability to communicate effectively with patients and families.
2. Understand the basic concepts of human growth and development, nutrition, immunology, epidemiology.
3. Demonstrate appropriate uses of screening in clinical medicine and the characteristics of a good screening test.

Learning Objectives:

1. Explain how the physician develops a therapeutic alliance and how this physician-patient-family relationship changes as the child grows and develops.
2. Explain the use of anticipatory guidance and give specific examples.
3. Recognize how injury prevention strategies change as an individual grows.
4. Identify the reasons for providing the different types of immunizations in childhood.
5. Summarize the uses of screening in pediatric health supervision and describe its applications and limitations.
6. Describe ways a physician can promote a health lifestyle as an individual grows from infancy to adolescence.

Competencies:

1. Describe the content of a health supervision visit and the factors used to determine the frequency of such visits.
2. Gather health supervision data from a focused history and physical examination.
3. Discuss the appropriate use and interpretation of the following screening tests:
   - Neonatal Screening
   - Developmental Screening
   - Hearing and vision Screening
   - Lead Screening
   - Drug Screening
4. Demonstrate the ability to provide anticipatory guidance about nutrition, behavior, immunizations, injury prevention, pubertal development, sexuality, and substance use and abuse.

2. 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:

Genetic, emotional and endocrine influences on growth.

Learning Objectives:

1. Explain the use of growth charts in the longitudinal evaluation of height, weight and head circumference.
2. Recognize abnormalities of growth which warrant further evaluation, such as crossing lines on a growth chart, discrepancies between height, weight and head circumference, short stature, failure to thrive, obesity, microcephaly and macrocephaly.
3. Identify intrauterine factors which affect growth of the fetus.
4. Recognize normal variants of growth, such as familial short stature and constitutional delay.

Competencies:

1. Accurately measure height, weight and head circumference and plot the data on an appropriate chart.
2. Include an assessment of growth in the patient work-up.
3. Identify abnormal growth patterns and explain the initial assessment.
4. Outline the initial evaluation of a child with failure to thrive.

3. 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 neurologic function. The clinician must be familiar with normal patterns of development in order to detect deviations which might be the first sign of a medical or psychological problem.

Learning Objectives:

1. Recognize how the following developmental issues are important in clinical care:
   --Infant-changes in reflexes, 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; concept of school readiness.
   --Adolescent - sequence of physical maturation and sexual maturity rating (Tanner); stages of emotional development
2. Identify early signs of mental retardation and cerebral palsy.
3. Recognize the appropriate use of the Denver Development Screening Test (DDST).

Competencies:

1. Perform appropriate developmental screening on all patients as part of the health maintenance visit or inpatient evaluation.
2. Perform and interpret a DDST.
3. Summarize the main adolescent developmental changes that are important to discuss with parents and
adolescents.
4. Explain how to perform the sexual maturity rating (Tanner).

4. 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:

Basic knowledge of the appropriate developmental tasks of each stage of childhood and adolescence.
Stages of family development.

Learning Objectives:

1. Identify behavioral and psycho-social problems using the medical history and physical examination.
2. Discuss the typical presentation of common behavioral problems at various developmental levels and ages (e.g. infant: sleep problems; toddler/preschool: temper tantrums, toilet training, eating problems; elementary school age: enuresis, attention deficit disorder; middle school/high school: conduct disorders, eating disorders, risk taking behaviors).
3. Recognize that somatic complaints may represent psycho-social problems (e.g. recurrent abdominal pain, headache, fatigue, and neurological complaints.)
4. Recognize 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 behavioral problem.
2. Elicit age appropriate behavioral concerns during the health supervision visit.
3. Distinguish between age-appropriate "normative" behavior and serious psychiatric illness.

5. NUTRITION

Rationale:

Proper nutrition promotes growth and helps maintains health. A number of pediatric conditions present as aberrations of growth where nutritional assessment is central to diagnosis and treatment.

Prerequisites

1. Appropriate balance of food groups (e.g., the food pyramid from the United States Department of Agriculture/Department of Health and Human Services.
2. The basic biochemistry of a protein, carbohydrate and fat and caloric content of each.
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).
5. The physiology of glucose metabolism, including glucolysis and gluconeogenesis.

Learning Objectives:

1. State the calories/kg/day needed for normal growth in infants and small children.
2. Identify the major differences between human milk and commonly available formulas.
3. Describe the advantages of breast feeding and recognize common difficulties experienced by breast-feeding mothers.
4. Recognize factors that contribute to the development of obesity or failure to thrive in childhood.
5. State the components of a routine infant diet history.
6. Indicate which vitamins and minerals commonly require supplementation in infants, children and adolescents.
7. Explain the way a diet designed to promote cardiovascular health in children and adolescents differs from diets for adults.
8. Recognize that chronically ill children may have special nutritional needs requiring unique diets, supplements, or feeding methods. Identify ways diet can be an essential aspect of treatment.

Competencies:

1. Discuss the nutritional advice to provide families regarding: infant breast feeding vs. formula feeding; why solids are added to an infant's diet; use of cow's milk.
2. Discuss how to advise families about the dietary prevention and treatment of common pediatric mineral (iron, fluoride, calcium) and vitamin deficiencies.
3. Obtain a routine diet history on an infant that includes: the type of feeding (breast vs. formula) with amount and frequency, types and approximate amounts of solids, and diet supplements given (vitamins, fluoride, iron).
4. Determine whether a formula-fed infant is receiving adequate calories.
5. Recognize when nutritional assessment is necessary beyond infancy, and demonstrate how to obtain a daily diet diary with the assistance of a nutritionist.

6. PREVENTION OF ILLNESS AND INJURY

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 and, consequently, on their attendant morbidity and mortality. Currently, injuries, rather than infections, 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. Unfortunately, not all injury is unintentional. Some are self-inflicted and some intentionally caused by others. Motor vehicle accidents, homicide and suicide are the three leading causes of death for adolescents. Abuse also occurs at all ages.

Prerequisites:

1. Basic knowledge of epidemiology, biostatistics and prevention.
2. Understanding of the impact that culture, socioeconomic status and environment have on illness and injury prevalence and patterns.
3. 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.

Learning Objectives:

1. Summarize the basic types of illness and injury prevention routinely provided to different ages.
2. List the immunizations currently recommended from birth through adolescence including adverse side effects and contraindications of each.
3. Provide examples of anticipatory guidance aimed at preventions for different ages.
4. Recognize how risk of illness and injury change during growth and development. Give examples of the age-and development-related spectrum of illness and injury.
5. Outline the physician's role in the prevention of sports injuries. Recognize how the risks of injury vary with pubertal development.

Competencies:

1. Initiate a discussion about immunizations with the family of an infant, a toddler and a child about to enter school. Include immunization side effects.
2. Counsel an adolescent about hepatitis B prevention.
3. Provide anticipatory guidance about injury prevention to the family of an infant, a toddler, a preschool age child, school age child and adolescent. Also, direct prevention strategies to older children/adolescents.
4. Demonstrate the inclusion of prevention in every clinical encounter, including the assessment of immunization status.

7. 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 psycho-social maturation. Medical problems common in adolescents reflect, in part, the interplay between physical and psycho-social 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. Describe strategies for interviewing and counseling adolescents.
3. Discuss the characteristics of early, mid, and late adolescence in terms of physical, cognitive, and psycho-social growth and development.
4. List the major causes of mortality and morbidity in adolescents.
5. Review the concepts of "risk-taking behavior" and "high-risk" youth.
6. Discuss approach to preventive counseling and identification of risk behaviors for these key areas: sexuality/sexual activity (sexual orientation, contraception and sexually transmitted diseases), substance abuse, and personal safety (firearms, violence, motor vehicles.)
7. Identify medical and psycho-social difficulties encountered by adolescents with chronic diseases (also see
8. Recognize the features of psycho-social and mental health problems common in adolescence, including school avoidance/failure, eating disorders, depression and suicide.

Competencies:

1. Conduct a health maintenance visit on a healthy adolescent incorporating a developmental assessment, risk behavior assessment, and preventive counseling.
2. Describe pertinent features of the history, physical examination when evaluating a boy or girl with delayed pubertal development.
3. Describe one's approach to counseling a teenager concerned about contraception and sexually transmitted diseases and AIDS, or a youth who engages in smoking or "binge" drinking.

8. ISSUES UNIQUE TO THE NEWBORN

Rationale:

The transition from intrauterine life to extraterine 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, whether as primary care providers or as specialists, must have an appreciation for the physiologic changes a newborn experiences. The newborn has unique needs and vulnerabilities which 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 to the first month of life.

Prerequisites:

The transition from fetal to neonatal physiology

Issues surrounding perinatal obstetrics: Pregnancy complications/medical problems during pregnancy associated with fetal or neonatal risk; Abnormalities of amniotic fluid volume; oligohydramnios, polyhydramnios.

Learning Objectives:

1. Describe the important historical information, physical exam findings, and laboratory data helpful in developing the differential diagnosis for a newborn with the following presentations:

<table>
<thead>
<tr>
<th>Clinical Problems</th>
<th>Common Problems*</th>
<th>Significant other Problems to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jitteriness or Seizures</td>
<td>drug withdrawal</td>
<td>intracranial bleed</td>
</tr>
<tr>
<td></td>
<td>hypoglycemia</td>
<td>inborn metabolic disorders</td>
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<tr>
<td></td>
<td>hypocalcemia</td>
<td></td>
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<tr>
<td></td>
<td>perinatal asphyxia</td>
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<tr>
<td>Jaundice</td>
<td>physiological jaundice</td>
<td>biliary atresia</td>
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<tr>
<td></td>
<td>hemolytic disease</td>
<td>inborn metabolic disorders</td>
</tr>
<tr>
<td></td>
<td>inadequate intake</td>
<td>hepatitis</td>
</tr>
<tr>
<td>Medical Condition</td>
<td>Possible Diagnoses</td>
<td></td>
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<td>-------------------</td>
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<tr>
<td>Lethargy or Poor Feeding</td>
<td>sepsis, immaturity, perinatal asphyxia, neuromuscular problems</td>
<td></td>
</tr>
<tr>
<td>Respiratory Distress</td>
<td>respiratory distress syndrome, transient pneumonia, meconium aspiration, sepsis, congenital heart disease, pneumothorax, tachypnea</td>
<td></td>
</tr>
<tr>
<td>Cyanosis</td>
<td>cyanotic congenital heart disease, airway compromise, poor lung expansion, pulmonary disorders, acrocyanosis</td>
<td></td>
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<tr>
<td>Non-bilious vomiting</td>
<td>overfeeding, gastroenteritis reflux, esophageal atresia, sepsis, CNS problems, metabolic errors, pyloric stenosis</td>
<td></td>
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<tr>
<td>Hypoglycemia</td>
<td>IDM (infant of a diabetic mother), prematurity, small or large for gestational age, perinatal asphyxia, hemolytic disease, polycythemia</td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td>bacterial infection, viral infection, perinatal/maternal infections, congenital infections (e.g. TORCH)</td>
<td></td>
</tr>
</tbody>
</table>

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

2. Demonstrate knowledge of risk of maternal/fetal HIV transmission and prevention, as well as indications for newborn HIV screening.
3. Identify which diseases are detected by neonatal blood screening.
4. Recognize factors in the maternal and newborn history which may put a neonate at risk for medical problems.
5. Describe the special methods involved in performing a newborn physical examination (i.e. assessment of hip dysplasia, eye exam).
6. Identify the key concepts used in the clinical evaluation of gestational age and stability at birth (e.g. the Dubowitz exam and the APGAR). Use weight and gestational age to categorize potential clinical problems.
7. Identify what medications are routinely given to all newborns (e.g. vitamin K, Hepatitis B vaccine, ophthalmological prophylaxis).

Competencies:

1. Gather appropriate history from parents/guardian and chart; perform a physical exam on a well or ill newborn and describe routine issues to counsel parents about.
2. Develop a reasonable differential diagnosis and evaluation scheme for newborns with clinical presentations as described in objective number 1.

### 9. MEDICAL GENETICS AND CONGENITAL MALFORMATIONS
Rationale:

A physician should be able to distinguish between genetic and non-genetic congenital disorders, as well as recognize genetic diseases presenting later in childhood. A genetic disorder, a condition caused by abnormal genes or chromosomes, should be contrasted with a congenital malformation, one which is apparent at birth and not known to be related to any specific genetic abnormality. Genetic abnormalities may produce congenital malformations, metabolic disturbances, specific organ dysfunction and abnormalities of sexual differentiation. Growth and development may be adversely affected by both genetic disorders and congenital malformations.

Prerequisites:

- Basic knowledge of gene structure and function
- Basic mechanisms of inheritance: multifactorial inheritance, the "carrier" state, genes and linkage
- Basic embryology

Learning Objectives:

1. Discuss common physical exam findings and implications associated with the diagnosis of: chromosomal abnormalities (e.g. Trisomy 21); sex chromosome abnormalities (e.g. Turner's syndrome, Klinefelter syndrome, Fragile X syndrome); other genetic disorders (e.g. Cystic Fibrosis, Sickle Cell Disease); congenital malformations (e.g. spina bifida).
2. Identify commonly used prenatal diagnostic techniques and their uses, e.g. alpha fetoprotein, amniocentesis.
3. Discuss the effects of teratogenic agents including: alcohol, hydantoin, maternal tobacco smoking, illicit drug use.
4. Collect relevant information, including history and physical exam, to evaluate a genetic disorder or congenital defect.
5. Construct a family pedigree.

Competencies:

Gather basic data from history/physical exam and consider useful laboratory tests when evaluating a child with a possible common genetic disorder or a congenital malformation

10. COMMON PEDIATRIC ILLNESSES

Rationale:

A patient's illness comes to the physician's attention as a clinical problem. The problem may be a complaint (e.g. headache) 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.
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 (see Appendix). In addition, a second table of physical/laboratory findings and associated diagnoses has been developed to guide student teaching.

Prerequisites:

- Pathophysiology of common diseases
- Fundamentals of disease epidemiology
- Principles of pharmacology, including knowledge of major drug and medication classes and types
- Basic clinical data gathering skills

Learning Objectives:

1. Using the table of clinical presentations for each clinical problem (left hand column) develop a differential diagnosis and rationale assisted by conditions listed (middle and right hand columns).
2. Identify, in addition, for each of the Common Conditions on table (middle column):
   - Etiology and/or pathophysiology
   - Natural history of the disease
   - Presenting signs and symptoms
   - Initial laboratory test and/or imaging studies indicated for diagnosis
   - Plan for initial management
3. Identify also for each of the Significant Other Conditions on the table (right hand column):
   - Etiology and/or pathophysiology
   - Presenting signs and symptoms
   - Initial laboratory test and/or imaging studies indicated for diagnosis

Competencies:

1. Develop a diagnostic approach to any of the clinical problems listed in the Tables 2 & 3 below.
2. Explain how the physical manifestations and the evaluation and management of many pediatric illnesses vary with the age of the patient. Give specific examples.
3. Discuss the characteristics of the patient and of the illness that must be considered when making the decision to manage the patient in the outpatient setting or to admit to hospital.

Common pediatric illnesses are categorized as Clinical Problems each accompanied by a list of the most common diagnoses and a list of less common but important other diagnoses that must be considered in the evaluation of the problem. Although rare conditions occasionally must be considered, they are not usually included in these core lists. A student will need to expand the differential diagnosis beyond the core diagnoses when indicated with individual patients.

<table>
<thead>
<tr>
<th>Clinical Problems</th>
<th>Common Conditions</th>
<th>Significant Other Conditions to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>upper respiratory infection</td>
<td>cystic fibrosis</td>
</tr>
<tr>
<td>Symptom</td>
<td>Pneumonia</td>
<td>Pertussis</td>
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<tr>
<td></td>
<td>Croup</td>
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<td></td>
<td>Bronchiolitis</td>
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<tr>
<td></td>
<td>Bronchitis</td>
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<td></td>
<td>Asthma</td>
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<td></td>
<td>Sinusitis</td>
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</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Bacteremia</th>
<th>Occult</th>
<th>UtI</th>
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<tbody>
<tr>
<td></td>
<td>Pyelonephritis</td>
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<tr>
<td></td>
<td>Viral illness</td>
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<td></td>
<td>Nonspecific</td>
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<tr>
<td></td>
<td>Viral exanthems:</td>
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<td></td>
<td>Varicella</td>
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<td></td>
<td>Measles</td>
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<td></td>
<td>Fifth disease</td>
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<td></td>
<td>Roseola</td>
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<tr>
<td></td>
<td>Scarlet fever</td>
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</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Pharyngitis</th>
<th>Strep</th>
<th>Scarlet Fever</th>
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<tbody>
<tr>
<td></td>
<td>Strep</td>
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<tr>
<td></td>
<td>Scarlet Fever</td>
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<tr>
<td></td>
<td>Pharyngitis - Other</td>
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<td></td>
<td>Mononucleosis</td>
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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Necrosis media</th>
<th>Recurrent NEC media</th>
<th>Middle ear effusion</th>
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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Conjunctivitis</th>
<th>Cellulitis</th>
<th>Allergic rhinitis</th>
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<td></td>
<td></td>
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<td>Sinusitis</td>
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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Appendicitis</th>
<th>UtI/pyelonephritis</th>
<th>Gastric stenosis</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Gastroenteritis</td>
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<tr>
<td></td>
<td>Constipation</td>
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<td></td>
<td>Pelvic inflammatory disease</td>
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<td></td>
<td>Colic</td>
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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Gastroesophageal reflux</th>
<th>Volvulus/bowel obstruction</th>
<th>Diabetic ketoacidosis</th>
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<tbody>
<tr>
<td></td>
<td>Pyloric stenosis</td>
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<tr>
<td></td>
<td>Gastroenteritis</td>
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<td></td>
<td>Secondary to infections:</td>
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<tr>
<td></td>
<td>Streptococcal pharyngitis</td>
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<td></td>
<td>Otitis</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Gastroenteritis</th>
<th>Failure to thrive</th>
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<tbody>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Fever</th>
<th>Osteomyelitis</th>
<th>Meningitis</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Febrile convulsions</td>
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<td></td>
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<td>Septic arthritis</td>
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<td></td>
<td></td>
<td></td>
<td>Kawasaki's disease</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Juvenile rheumatoid arthritis</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Viral exanthem</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Rubella</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tuberculosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Sore Throat</th>
<th>Meningitis</th>
<th>Peritonitis and retro pharyngeal abscesses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Periorbital/orbital</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Otitis/Ear Pain</th>
<th>Deafness*</th>
<th>Speech and language delay*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mastoiditis*</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>URI</th>
<th>Vasculities (e.g. Henoch Schonlein)</th>
<th>Intussusception purpura</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Gastritis</td>
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<tr>
<td></td>
<td></td>
<td>Pregnancy</td>
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<tr>
<td></td>
<td></td>
<td>Encopresis*</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Inflammatory bowel disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ulcer</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Ovarian/testicular torsion</td>
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<tr>
<td></td>
<td></td>
<td>Psychogenic abd.pain</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Malignancy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incarcerated hernia</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Abdominal Pain</th>
<th>Vomiting</th>
<th>Diarrhea +/- Vomitting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Diarrhea*</td>
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<tr>
<td></td>
<td></td>
<td>Gastrosesophageal reflux</td>
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<td></td>
<td>Pyelonephritis</td>
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<td></td>
<td></td>
<td>Secondary to infections:</td>
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<td></td>
<td></td>
<td>Streptococcal pharyngitis</td>
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<td></td>
<td></td>
<td>Otitis</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Diabetic ketoacidosis</td>
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<tr>
<td></td>
<td></td>
<td>Increased Intracranial pressure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hepatitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pyelonephritis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pregnancy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Congenital adrenal hyperplasia</td>
<td></td>
</tr>
</tbody>
</table>
The following table supplements the common acute illnesses list with the significant physical findings that merit further exploration. Sometimes the first step is to determine if the finding represents a normal variant or a part of a minor or significant pathologic condition. The list is not exhaustive; rather, the primary emphasis is on diagnoses unique to pediatrics.

<p>| Table 3: Significant Physical Findings |</p>
<table>
<thead>
<tr>
<th>Clinical Problem</th>
<th>Common Conditions</th>
<th>Significant Other Conditions to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Murmur</td>
<td>innocent murmurs</td>
<td>acute rheumatic fever</td>
</tr>
<tr>
<td></td>
<td>cardiac septal defects</td>
<td>coarctation of the aorta</td>
</tr>
<tr>
<td></td>
<td></td>
<td>valvular stenosis</td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td>infection-mononucleosis</td>
<td>Kawasaki's Disease</td>
</tr>
<tr>
<td></td>
<td>bacterial adenitis</td>
<td>lymphoma/leukemia</td>
</tr>
<tr>
<td></td>
<td>viral infections</td>
<td>HIV, AIDS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cat scratch disease</td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>systemic infect. disease</td>
<td>tumors/leukemia</td>
</tr>
<tr>
<td></td>
<td>mononucleosis</td>
<td>hemolytic anemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sickle cell disease</td>
</tr>
<tr>
<td>Hepatomegaly</td>
<td>hepatitis</td>
<td>congestive heart failure</td>
</tr>
</tbody>
</table>

*Important related condition, not directly a cause of the clinical problem.*
<table>
<thead>
<tr>
<th>Abdominal Mass</th>
<th>constipation</th>
<th>neuroblastoma lymphoma Wilm's tumor hydronephrosis intussusception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impaired Vision</td>
<td>strabismus/amblyopia myopia/hyperopia</td>
<td>retinoblastoma cataracts</td>
</tr>
<tr>
<td>White Pupillary Reflex</td>
<td>middle ear effusion delayed language development*</td>
<td>neuronal causes of deafness (e.g. antibiotics, meningitis)</td>
</tr>
<tr>
<td>Impaired Hearing</td>
<td>iron deficiency anemia</td>
<td>hemolytic anemia: hereditary/acquired malignancy sickle cell disease occult blood loss</td>
</tr>
<tr>
<td>Pallor/Anemia</td>
<td>lead poisoning</td>
<td>hemophilia/Von Willebrand Henoch-Schonlein purpura leukemia secondaroid to infection/sepsis thrombocytopenia meningiococcemia</td>
</tr>
<tr>
<td>Bruising/Petechiae</td>
<td>trauma vasculitis</td>
<td>acute glomerulonephritis post-streptococcal hemolytic-uremic syndrome Henoch Schonlein purpura</td>
</tr>
<tr>
<td>Hematuria</td>
<td>trauma UTI</td>
<td>nephrotic syndrome glomerulonephritis</td>
</tr>
<tr>
<td>Proteinuria</td>
<td>orthostatic proteinuria</td>
<td></td>
</tr>
</tbody>
</table>

*Important related condition, not directly a cause of the clinical problem

**Common Pediatric Chronic Illnesses/Disabilities**

Principles of chronic illness diagnosis and management in childhood and adolescence are learned best using commonly occurring chronic illnesses; rare chronic illnesses to supplement the learning experience can then be introduced. To aid one in selection of the most common disorders to study, prevalence data on childhood chronic illnesses are given below:
HMO prevalence data per 1000 children/year*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergies</td>
<td>184</td>
</tr>
<tr>
<td>Asthma</td>
<td>119</td>
</tr>
<tr>
<td>Visual impairment</td>
<td>122</td>
</tr>
<tr>
<td>Hearing impairment</td>
<td>21</td>
</tr>
<tr>
<td>Seizure disorder</td>
<td>4</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>2</td>
</tr>
</tbody>
</table>

*This data source (see Appendix) does not include the category of development

Competencies:

1. Demonstrate an understanding of the physician's and parent's role in gradually fostering a child's self-management of a chronic condition.
2. Recognize the impact on school attendance and function caused by chronic illnesses, and distinguish between conditions that affect cognitive function and those that do not.
3. Explain how a physician can promote normal development and maturation in the presence of a chronic medical or disability.
4. Demonstrate knowledge of the common medications/treatment regimes used in the pediatric inpatient and non-acute outpatient treatment of the most common chronic illnesses.

11. THERAPEUTICS

Rationale:

Informed use of medications and therapeutic agent 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 medication changes 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 change the pharmacokinetics of commonly used medications in pediatrics. Specifically address drug absorption, distribution, metabolism and elimination.
2. Recognize drugs that are contraindicated or must be used with extreme caution in specific pediatric populations.
3. Summarize the factors that affect drug excretion into breast milk.
4. Be cognizant of the importance of patient education in ensuring compliance with prescribed treatment regimens.
5. Understand 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
   - optic preparations
   - vitamin/mineral supplements

Competencies:

1. Demonstrate the ability to write a prescription.
2. Explain how a drug dose is calculated for Infants and prepubertal children.
3. List the most common generic types of medications used for management of the following uncomplicated conditions:
   - otitis media
   - wheezing
   - conjunctivitis
   - allergic rhinitis
   - urinary tract infection
   - impetigo
   - eczema
   - fever
   - streptococcal pharyngitis
   - Acne

12. FLUID AND ELECTROLYTE MANAGEMENT

Rationale:

The need for an uninterrupted supply of water, electrolytes and an energy source are particularly important in infants and young children because of their high total body water, basal metabolic rate and daily turn-over of water. When a child is unable to take oral fluids, appropriate intravenous fluids must be given to prevent dehydration and electrolyte imbalance. When infants and children experience excessive fluid losses, they become dehydrated. Left untreated this can lead to an altered level of consciousness, vascular collapse, renal failure and death. Young infants with gastroenteritis are particularly vulnerable to dehydration and electrolyte imbalance. This remains a major cause of infant and child morbidity worldwide.

Prerequisites:

Basic science correlates:

- Water and electrolyte distribution in body compartments.
• Change in total body water with age: newborn, under age 2, older than age 2.
• Relationship between basal metabolic rate and daily water requirements.
• Daily glucose requirements to prevent ketosis.
• Role of the adrenal of renal function and the ability to distinguish between renal and pre-renal azotemia.

Learning Objectives:

1. When a pediatric patient requires maintenance fluids, demonstrate knowledge of the following:
   • Pathophysiology of hypernatremic and hyponatremic dehydration.
   • Daily water and electrolyte requirements.
   • Factors which increase daily fluid requirements.
   • Conditions in which fluid administration may need to be restricted (Syndrome of Inappropriate ADH secretion (SIADH), congestive heart failure, renal failure)

2. When a pediatric patient requires a fluid deficit replaced, demonstrate knowledge of the following:
   • Causes of excessive fluid loss leading to dehydration.
   • Clinical complications of electrolyte disturbances, including hypernatremia, hyponatremia, hyperkalemia, and acidosis.
   • Effect of pH on serum potassium levels.
   • Electrolyte composition of standard oral and IV solutions.
   • Appropriate laboratory studies and their interpretation.

Competencies:

1. Obtain historical information to assess state of hydration.
2. Recognize the physical exam findings of dehydration.
3. Calculate and write IV orders for initial fluid replacement and maintenance fluids for a patient with dehydration from 1) gastroenteritis, or 2) diabetic ketoacidosis.
4. Explain the clinical consequences of electrolyte disturbances including hypernatremia, hyponatremia, hyperkalemia, and hypokalemia and discuss the effect of pH on the serum potassium level.
5. Explain to parents how to use oral rehydration therapy for mild/moderate dehydration.

13. POISONING/PREVENTION & TREATMENT

Rationale:

Poisoning and ingestions are major preventable causes of childhood morbidity and mortality. Poison control centers across the U.S. receive more than 2 million calls a year regarding accidental ingestions and exposures to toxic material.

Prerequisites:

• Routes of absorption of toxins, including GI, skin, eye, and lung.
• Basic mechanisms of action of common toxic substances (examples: aspirin, organophosphates, acetaminophen, iron, tricyclics).
Learning Objectives:

1. Describe the epidemiology and developmental vulnerability for poisoning and accidental ingestions of infants, toddlers and children.
2. Discuss the reasons for intentional ingestions in adolescents, including substance abuse, experimentation and suicide.
3. Describe the clinical manifestations, toxicity, and basic management of ingestions of iron, lead, aspirin, acetaminophen, tricyclics, caustic agents and hydrocarbons and exposure to carbon monoxide.
4. Describe the resources available to the physician for acute poisoning management, including Poison Information Control Centers and textbooks.
5. Know how/when to stop the absorption of an ingested substance.
6. Identify the environmental sources of lead and discuss its clinical and social importance of lead poisoning.
7. Demonstrate sensitivity to the emotions of guilt and anxiety that may be present in the parent or caregiver at the time of an ingestion.

Competencies:

1. Provide anticipatory guidance regarding home safety and appropriate techniques to prevent accidental ingestions.
2. Elicit an appropriate history surrounding an ingestion (type, route, amount, timing), demonstrating sensitivity to the emotions of guilt and anxiety that may be present in the parent or caregiver.
3. Demonstrate knowledge about the use of the poison control center and other information resources in the management of the patient with ingestion.

14. PEDIATRIC EMERGENCIES

Rationale:

Identify an infant, child or adolescent with a medical emergency, and approach the patient in an organized and aggressive fashion, may significantly reduce morbidity and mortality.

Prerequisites:

- Certification in basic cardiopulmonary resuscitation and an understanding of treatment priories.
- Wound and burn treatment, stabilization of orthopedic trauma, recognition and initial management of shock and coma, head and cervical spine trauma are topics covered in surgical/emergency rotations.
- The specific initial management issues for abrasions, bites, burns, contusions, fractures, lacerations, near drowning, and sprains including tetanus prevention are assumed to be covered in other emergency based rotations.

Learning Objectives:

1. Identify the patient who requires immediate medical attention and intervention
2. Describe the initial emergency management of shock, seizures, severe respiratory distress, head trauma and cervical spine trauma in childhood. Recognize those situations in which concern about intentional injury should be raised.
3. Describe findings suggestive of non-accidental trauma.
4. For the following acute clinical presentations, discuss the clinical findings, and distinguish between different diagnoses, for an infant/child taking into account the age of the patient:

<table>
<thead>
<tr>
<th>Acute Clinical Problem</th>
<th>Diagnoses to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shock</strong></td>
<td>sepsis</td>
</tr>
<tr>
<td></td>
<td>meningococcemia</td>
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<tr>
<td></td>
<td>dehydration</td>
</tr>
<tr>
<td></td>
<td>diabetic ketoacidosis burns</td>
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<tr>
<td></td>
<td>anaphylaxis</td>
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<tr>
<td></td>
<td>adrenal insufficiency (adrenogenital syndrome)</td>
</tr>
<tr>
<td></td>
<td>ingestion</td>
</tr>
<tr>
<td><strong>Ataxia</strong></td>
<td>ingestion</td>
</tr>
<tr>
<td></td>
<td>infection</td>
</tr>
<tr>
<td></td>
<td>tumor</td>
</tr>
<tr>
<td></td>
<td>febrile seizure</td>
</tr>
<tr>
<td></td>
<td>status epilepticus</td>
</tr>
<tr>
<td></td>
<td>epilepsy</td>
</tr>
<tr>
<td></td>
<td>ingestion (see Poisoning section)</td>
</tr>
<tr>
<td></td>
<td>toxic encephalopathy</td>
</tr>
<tr>
<td></td>
<td>increased intracranial pressure</td>
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<tr>
<td></td>
<td>electrolyte disturbances (sodium, calcium, glucose)</td>
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<tr>
<td><strong>Delirium/Coma</strong></td>
<td>head injury</td>
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<tr>
<td></td>
<td>substance abuse</td>
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<tr>
<td></td>
<td>infection (encephalitis, meningitis)</td>
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<td></td>
<td>hepatic failure</td>
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<td></td>
<td>Rye syndrome</td>
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<tr>
<td></td>
<td>Diabetic ketoacidosis</td>
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<tr>
<td></td>
<td>hypoglycemia</td>
</tr>
<tr>
<td><strong>Airway Obstruction/Respiratory Distress</strong></td>
<td>foreign body aspiration</td>
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<tr>
<td></td>
<td>anaphylaxis</td>
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<tr>
<td></td>
<td>epiglottitis</td>
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<tr>
<td></td>
<td>croup</td>
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<td>ashtma</td>
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<td>bronchiolitis</td>
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<td></td>
<td>pneumonia</td>
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<td></td>
<td>peritonsillar or retropharyngeal abscess</td>
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<tr>
<td><strong>Apnea</strong></td>
<td>SIDS (sudden infant death syndrome)</td>
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<tr>
<td></td>
<td>ALTE (acute life threatening event)</td>
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<tr>
<td></td>
<td>seizure disorder</td>
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<td></td>
<td>cardiac arrhythmia</td>
</tr>
</tbody>
</table>

**Competencies:**

1. Recognize how the signs of shock in a child differ from those of an adult.
2. For each condition listed in the right hand column of Table 4, provide the acute clinical presentation and use diagnostic assessment.
15. CHILD ABUSE (PHYSICAL AND SEXUAL)

Rationale:

Abuse of children and adolescents is part of the spectrum of family dysfunction and results in injury and death to millions of children each year in the United States. Abuse causes physical, sexual and/or emotional trauma or may occur in the form of neglect when caregivers fail to provide basic physical, emotional or medical needs. Medical professionals are required by law in all 50 states to protect children and adolescents by identifying abuse and by reporting it to child protective services. Students must understand the varying presentations of abuse and must recognize the physical, emotional and social factors that put a child at risk for 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 eventually have as mandatory reporters of abuse.

Prerequisites:

- Basic clinical data-gathering skills
- Knowledge of physical growth and development from birth through adolescence.
- Knowledge of infant, child and adolescent behavior.
- Knowledge of adult depressive disorders, domestic abuse, elder abuse and family dysfunction.

Learning Objectives:

1. List the physical and behavioral signs of physical abuse, sexual abuse and neglect.
2. List the risk factors for domestic violence and child abuse.
3. Describe the specific types or patterns of injury that suggest physical abuse.
4. List which family, social and environmental history items are important when considering possible abuse.
5. Summarize the physical findings expected in an infant who has been subjected to abuse by shaking (i.e. the shaken baby syndrome).

Competencies:

1. Know the types of questions to ask in assessment of a child for non-accidental injuries and child abuse.
2. Summarize the ethical responsibilities to identify and report child abuse and the obligation placed on reporters by community or state.

16. CHILD ADVOCACY

Pediatrics encompasses children's health as well as threats to children's health. Habits adopted during childhood have broad implications throughout life, and practicing preventive pediatrics is important to all physicians caring for children. Although most children in this country enjoy good health, medical as well as social problems can adversely impact a child's well-being. Children in low-income or dysfunctional families have a higher incidence of disease and have less access to well-child and acute illness care than their more affluent counterparts. Pediatricians have a variety of roles in child health. In addition to patient care they serve as advocates for individual children and families. At the local level, they function as consultants to schools and health care agencies. Their efforts at legislative change have improved car safety, lowered the incidence of aspirin ingestion and helped bring about funding of health care for children. Internationally, pediatricians have been active in a broad range of issues as well.

Prerequisites:
• Principles of community medicine and public health.

Learning Objectives:

1. Recognize that children are frequently unable to advocate for themselves in a variety of institutional and policy making settings and physicians need to advocate for them.
2. Identify specific issues where child advocacy by physicians has results in improvements in child health.

Competencies:

1. Identify the ways that practicing physicians can advocate for children.
2. Describe the types of problems that benefit more from a community approach rather than an individual patient approach.

APPENDIX 1: Source Notes

1. Prevalence of common outpatient problems - these diagnoses were used to develop the framework of common presenting problems that a student should learn to approach. The actual percentages in pediatric practice are given below (listed as % of outpatient visits to pediatricians).

Cough (7.3%)
Fever (6.855)
Sore Throat (4.3%)
Otitis Media (8%)
URI (3.1%)
Allergic rhinitis (2%)
Skin problems (6.1%)
Allergic skin reactions (3.6%)
Skin wounds (1.6%)
Abdominal pain (1.6%)
Vomiting/diarrhea (1.6%)
Lower extremity problems (1.1%)
Other CNS problems (1.8%)
Accidents and poisonings (4.7%)
General exam (25%)

Source: National Ambulatory Care Survey

2. HMO prevalence data for Childhood Chronic Illnesses


3. Sources that lead to inclusion of other symptoms/signs:


