

THE AMERICAN BOARD OF PEDIATRICS®

CONTENT OUTLINE

Developmental-Behavioral Pediatrics

**Subspecialty In-Training, Certification, and
Maintenance of Certification (MOC) Examinations**

INTRODUCTION

This document was prepared by the American Board of Pediatrics Subboard of Developmental-Behavioral Pediatrics for the purpose of developing in-training, certification, and maintenance of certification examinations. The outline defines the body of knowledge from which the Subboard samples to prepare its examinations. The content specification statements located under each category of the outline are used by item writers to develop questions for the examinations; they broadly address the specific elements of knowledge within each section of the outline.

Developmental-Behavioral Pediatrics

Each Developmental-Behavioral Pediatrics exam is built to the same specifications, also known as the blueprint. This blueprint is used to ensure that, for the initial certification and in-training exams, each exam measures the same depth and breadth of content knowledge. Similarly, the blueprint ensures that the same is true for each Maintenance of Certification exam form. The table below shows the percentage of questions from each of the content domains that will appear on an exam. Please note that the percentages are approximate; actual content may vary.

	Content Categories	Initial Certification and In-Training	Maintenance of Certification (MOC)
1.	Foundations of Developmental-Behavioral Pediatrics	5%	5%
2.	Biological Mechanisms in Development and Behavior	5%	4%
3.	Family and Social Factors	5%	5%
4.	Elements of Assessment and Management	6%	7%
5.	Adaptation to General Health Problems and Their Treatment	5%	5%
6.	Developmental-Behavioral Aspects of Chronic Conditions and Treatment	8%	8%
7.	Cognitive/Adaptive Disabilities	5%	6%
8.	Specific Learning Disorders	6%	6%
9.	Motor Disabilities and Multiple Handicaps	4%	4%
10.	Autism Spectrum Disorder	7%	7%
11.	Attention Deficit Hyperactivity Disorder (ADHD)	7%	7%
12.	Externalizing Conditions	5%	5%
13.	Internalizing Behaviors and Conditions	5%	6%
14.	Substance Use Disorder	2%	2%
15.	Child Abuse and Neglect	2%	2%
16.	Somatic Symptom and Related Disorders	1%	1%
17.	Sleep Problems and Sleep-Wake Disorders	4%	4%
18.	Feeding and Eating Problems	3%	3%
19.	Elimination Disorders	3%	3%
20.	Sexuality	1%	1%
21.	Atypical Behaviors	2%	2%
22.	Law, Policy, and Ethics	3%	3%
23.	Core Knowledge in Scholarly Activities	6%	4%

Developmental-Behavioral Pediatrics

1. Foundations of Developmental-Behavioral Pediatrics

A. Domains of development

1. Motor

- a. Know the developmental milestones of normal gross motor development in the first year after birth
- b. Know that the progression of gross motor development proceeds in a cephalocaudal fashion
- c. Know the developmental milestones of normal fine motor development in the first year after birth
- d. Know that the progression of fine motor development proceeds in a midline to lateral fashion
- e. Know the developmental milestones of normal gross motor development in the toddler age group (12-36 months of age)
- f. Know the developmental milestones of normal gross motor development in the preschool age group (36-60 months of age)
- g. Know the developmental milestones of normal fine motor development in the toddler age group (12-36 months of age)
- h. Know the developmental milestones of normal fine motor development in the preschool age group (36-60 months of age)
- i. Know the age ranges for the developmental milestones of normal gross motor development in children above 60 months of age
- j. Know the developmental milestones of normal fine motor development in children above 60 months of age

2. Speech and language

- a. Know the developmental milestones of normal language/speech development in the first year after birth
- b. Know the developmental milestones of normal language/speech development in the toddler age group (12-36 months of age)
- c. Know the developmental milestones of normal language/speech development in the preschool age group (36-60 months of age)
- d. Know the developmental milestones of normal language/speech development in the school age group (5-12 years of age)
- e. Understand the typical progression of normal speech and language development

3. Social-emotional

- a. Know the developmental milestones of normal social-emotional development in the first year after birth
- b. Know the developmental milestones of normal social-emotional development in the toddler age group (12-36 months of age)
- c. Know the developmental milestones of normal social-emotional development in the preschool age group (36-60 months of age)
- d. Know the developmental milestones of normal social-emotional development in the school age group (5-12 years of age)
- e. Know the developmental milestones of normal social-emotional development in adolescents (13-21 years of age)

- f. Understand the typical progression of normal social-emotional development
- 4. Cognitive-Adaptive
 - a. Know the developmental milestones of normal cognitive-adaptive development in the first year after birth
 - b. Know the developmental milestones of normal cognitive-adaptive development in the toddler age group (12-36 months of age)
 - c. Know the developmental milestones of normal cognitive-adaptive development in the preschool age group (36-60 months of age)
 - d. Know the developmental milestones of normal cognitive-adaptive development in the school age group (5-12 years of age)
 - e. Know the developmental milestones of normal cognitive-adaptive development in the adolescent age group (13-21 years of age)
 - f. Understand the typical progression of normal cognitive-adaptive development
- B. Theoretical frameworks
 - 1. Criteria for evaluating theories
 - a. Recognize the characteristics of a good developmental theory
 - 2. Maturational theory (Gesell)
 - a. Know that maturational theory (Gesell) proposes that development proceeds in a systematic direction (principle of developmental direction)
 - b. Understand the major components of Gesell's maturational theory
 - c. Know the limitations of Gesell's maturational theory in explaining child development
 - d. Understand the relationship between the maturational theory and developmental testing
 - e. Describe developmental tests based on Gesell's theory
 - 3. Cognitive (Piaget)
 - a. Differentiate between assimilation and accommodation as cognitive processes described by Piaget to facilitate the learning of new information
 - b. Understand how disciplinary strategies are best adapted to the conceptual development of the child (pre-operational, concrete operational, formal operational)
 - c. Know the implications of a belief in immanent justice and magical thought for young children's understanding of illness and loss
 - d. Understand the characteristics of the four stages of conceptual development as described by Piaget
 - e. Formulate a developmentally appropriate explanation of illness or loss for a child in any one of the conceptual stages described by Piaget
 - f. Know how to design treatment plans for common medical conditions in ways that would facilitate the adjustment of children at various conceptual stages described by Piaget
 - g. Understand the relevance of object permanence to the development of stranger anxiety and sleep problems in infancy
 - h. Understand the limitations of Piaget's theory of cognitive development
 - i. Describe developmental tests based on Piaget's theory
 - 4. Psychodynamic (Freud)
 - a. Understand the three primary motivating forces of psychosexual development

- b. Distinguish between the concepts of conscious/unconscious/ subconscious awareness
 - c. Recognize the role of denial in response to a death, chronic illness, disability, or other significant stress
 - d. Differentiate between signs of regression and of projection
 - e. Understand the impact of transference and counter-transference on the relationship of physician and patient
 - f. Know the characteristics of the stages of psychosexual development as described by Freud
 - g. Understand the limitations of Freudian theory of psychosexual development
 - h. Understand that parental anger toward healthcare providers may be a result of projection
5. Social-emotional (Erikson)
- a. Know the parallels between Erickson's and Freud's stages of development from infancy to adolescence
 - b. Know the components of the stages of Erickson's paradigm
 - c. Appreciate the impact of unsuccessful resolution of one of Erickson's stages on children's ability to meet the challenges of subsequent stages
 - d. Know the implications of succeeding at the various stages described by Erickson for success in relationships and school
6. Attachment (Mahler, Bowlby, Ainsworth)
- a. Appreciate the reciprocal contributions of infants and caregivers on the development of attachment
 - b. Understand how attachment theory and cognitive developmental theory together explain the phenomena of separation protest and stranger anxiety
 - c. Differentiate among securely attached, insecurely attached, and ambivalently attached infants using Ainsworth's "strange situation" paradigm
 - d. Recognize the behavioral hallmarks of securely attached infants in the first year of life
 - e. Know the components and parenting styles of child-rearing that promote the development of secure attachment
 - f. Recognize signs of insecure attachment seen in infants
 - g. Know how to advise parents based on Mahler's construct of separation-individuation to help promote psychological separation-individuation
 - h. Understand the limitations of attachment theory
7. Behavioral theory
- a. Distinguish between classical and operant conditioning paradigms
 - b. Understand how modeling and shaping can be used to facilitate the expression of a novel and complex behavior
 - c. Understand how various schedules of reinforcement facilitate learning of a new behavior and maintenance of an established behavior
 - d. Be able to counsel a family on the likelihood of post-extinction burst
 - e. Understand the concept of positive reinforcement in behavior theory
 - f. Understand that reinforcement during a post-extinction burst will render the behavior more resistant to extinction

- g. Understand the problems associated with punishment-based behavior management plans
 - h. Know the limitations of behavioral theory
 - i. Recognize the role of modifying antecedents in changing behavior
 - j. Understand the importance of obtaining a functional behavioral assessment to determine an effective behavior management plan
 - k. Understand the importance of a child's developmental level on implementing behavioral strategies
8. Social learning theory
- a. Know that social learning theories posit that the main determinants of individual behavior are observations and interactions with others
 - b. Understand that according to social learning theories, social hierarchies, family bonds, sex, age, motivation, and perception all influence the rate of an individual's behavior change
 - c. Differentiate methods of behavior change based on operant conditioning versus social learning theory
 - d. Understand how social learning theory is used during parent training programs
 - e. Understand the concepts taught in parent training programs
 - f. Understand the differences between cognitive behavioral and social influence theories
 - g. Understand the distinction between behavioral norms and behavioral values
 - h. Know how social influence theory predicts behavioral norms
 - i. Know the limitations of social learning theory for behavior change
 - j. Distinguish between methods of toilet training based on social learning versus behavioral therapy
 - k. Know how behavioral values are related to the adoption and maintenance of high-risk behaviors
9. Moral reasoning (Kohlberg)
- a. Know that moral reasoning in Kohlberg's theory progresses from explanations based on what feels good to an individual to explanations based on abstract principles of fairness and justice
 - b. Understand the poor association between the level of moral reasoning and the individual's moral behavior
 - c. Understand the stages of moral reasoning as defined by Kohlberg
 - d. Know how to interpret a child's explanations for moral decisions based on Kohlberg's theory
10. Temperament/Individual variation (Chess, Thomas, Birch, Carey)
- a. Understand the concept of "goodness of fit" and implications for interpreting parents' perceptions of their children's temperament
 - b. Identify the major categories used for describing temperament
 - c. Know the temperament characteristics of the "easy child," the "slow to warm child," and the "difficult child" syndrome
 - d. Plan appropriate management for a family concerned by one of their child's temperament characteristics
 - e. Describe long-term behavioral patterns associated with the three categories of temperamental clusters (easy, slow to warm, difficult child)

- f. Know the limitations of temperament as an explanatory concept
- 11. Theories of behavior change
 - a. Know the key health beliefs that, according to the Health Belief Model, produce a readiness to act
 - b. Understand how perceived barriers or costs and perceived benefits of behavior change can influence the efficacy of risk reduction efforts
 - c. Understand the stages of change described by Prochaska in the Transtheoretical Model
 - d. Know how assessment of an individual's stage of change helps in the selection of an appropriate intervention to facilitate behavior change (eg, weight reduction, safe sex practices, stopping cigarette smoking)
 - e. Know the limitations of the Transtheoretical Model of behavior change
 - f. Understand the concept of motivational interviewing and its relationship to theories of behavioral change

2. **Biological Mechanisms in Development and Behavior**

- A. Early development of the central nervous system
 - 1. Understand the neuroanatomic anomalies that arise from perturbations in neural tube development
 - 2. Understand current theories on the genetic control of central nervous system development
 - 3. Recognize the importance of folate in preventing defects in neural tube closure
 - 4. Understand the neuroanatomic abnormalities that arise from perturbations in neuronal migration
 - 5. Understand that developing neurons form complex dendritic arbors with synaptic connections to many other neurons
 - 6. Understand the timing and the process of myelination in the central nervous system
 - 7. Understand the influence of steroid hormones on the organization of the developing brain
 - 8. Understand the effects of stress on the developing brain
- B. Later development of the central nervous system
 - 1. Understand that the post-natal maturation of the central nervous system includes a subtractive process (pruning)
 - 2. Understand that the period of time that synaptic pruning is most active may vary according to region of the brain
 - 3. Realize that synaptic pruning often results in loss of cortical plasticity
 - 4. Know how molecular processes and synaptic activity reflect learning at a cellular level
 - 5. Know the definition of "plasticity" and the neurobiological mechanisms that are believed to underlie plasticity
 - 6. Know the effect of environmental enrichment on neurobiological development
- C. Functional organization of the central nervous system
 - 1. Understand that the cortex is highly interconnected, facilitating interactions between parts of the brain that are engaged in different types of information processing
 - 2. Realize that the brain systems responsible for a given function may be different in children than in adults
 - 3. Know the range of functions that are served by the frontal lobes
 - 4. Know the range of functions that are served by the parietal lobes

5. Know the range of functions that are served by the temporal lobes
6. Know the range of functions that are served by the occipital lobes
7. Know the range of functions that are served by the cerebellum
8. Know the range of functions that are served by the basal ganglia
9. Explain the theory of dual cortical streams for visual-spatial processing
10. Understand the layered and columnar organization of the normal neocortex

D. Genetics

1. Know how to characterize the different Mendelian modes of genetic inheritance
2. Understand genomic imprinting and its implications for genetic inheritance
3. Understand the pattern of inheritance associated with mitochondrial genetic disease
4. Understand the phenomenon of anticipation, associated with triplet repeat genetic disease
5. Understand the concept of contiguous gene deletion syndromes
6. Understand the continuing interaction between genes and environment that influences development and behavior
7. Understand the limitations in interpreting heritability parameter (h^2) that is used in population genetic studies
8. Differentiate between malformations and deformations
9. Know genetic mechanisms that contribute to the etiology of developmental and behavioral disorders
10. Understand how to interpret a pedigree for genetic risk
11. Understand the concept of behavioral phenotypes
12. Understand the concept of uniparental disomy and its role in genetic disorders (eg, Prader-Willi and Angelman syndromes)
13. Recognize developmental-behavioral disorders associated with single gene mutations (Fragile X syndrome, Rett syndrome, Lesch-Nyhan syndrome, etc.)
14. Understand the epigenetic phenomenon of methylation and its implications for developmental-behavioral disorders
15. Understand the concept of mutations or polymorphisms/copy number variations

E. Biological risk factors to neurobiological development

1. Understand how biomedical risk factors (eg, infection, trauma, hypoxia-ischemia, toxins, nutritional deficiencies) jeopardize neurobiological development
2. Recognize factors that may mitigate biomedical risks to neurobiological development (eg, other biological factors, genetic factors)
3. Recognize the phenotypic features of 22q.11.2 deletion syndrome

3. Family and Societal Factors

A. Structural factors

1. Recognize common challenges to the psychosocial development of children in blended families (eg, insecurity associated with loss of a parent, difficulties with attachment to a new parent, reactions to new siblings, inconsistent discipline practices, etc)
2. Understand how parental sexual orientation may impact childhood development (academic achievement, psychological adjustment, and psychosexual development)
3. Understand typical reactions that children whose parents are separated or divorced have to their families at various developmental stages

4. Recognize possible effects of new relationships of either parent, after divorce or separation, on children's behavior (eg, bedwetting, separation difficulties, attentional difficulties, depression, hostility or jealousy toward the new adult and/or children)
 5. Know how to counsel parents who are separating in order to minimize the adverse effects on their children
 6. Understand the ways a single parent can best support her/his child(ren)
 7. Recognize typical responses of children at different developmental stages to the loss of a parent by death or disappearance
 8. Recognize common symptoms of attachment disorders at various ages
 9. Understand the benefits and potential problems of kinship versus non-kinship adoption
 10. Understand issues related to children's development and behavior as a result of adoption at different ages
 11. Recognize ways adopting parents can assist the adjustment of children from an ethnic/national group different from their own
 12. Know the developmental periods that are particularly challenging for children who have been adopted and for their parents
 13. Understand the risks of repeated or prolonged foster care arrangements
 14. Understand the risks to child development and behavior of group care in large institutions
 15. Recognize the challenges to parent-child interactions that may be associated with using modern forms of assisted reproduction
 16. Understand the effects of sibling number and order on children's developmental and behavioral challenges
 17. Recognize the influences of parental divorce on child development and behavior at different ages
 18. Know child factors that affect adjustment to foster care
 19. Be able to counsel parents and children about issues related to sexual orientation and/or gender identity
 20. Recognize the special challenges to children's development and behavior of parenting without a partner as a result of choice, death, or divorce
 21. Know the typical developmental and behavioral problems that occur commonly among international adoptees
 22. Understand the potential problems and benefits pertaining to child behavior and development of multigenerational households
- B. Functional factors
1. Know the impact of parental depression on young children (eg, childhood depression, delayed language development)
 2. Know the genetic and familial risk of various psychiatric disorders in children whose parent(s) have the disorder (eg, schizophrenia, obsessive compulsive disorder)
 3. Know the impact of parental intellectual ability and educational attainment on child development and behavior
 4. Understand how being from an immigrant family may impact childhood development and education
 5. Understand the influence of religious affiliation and values on children and families
 6. Understand the effects on children's development and behavior of a chronic physical illness or disability in a parent or grandparent

7. Recognize the protective factors associated with the integrity and functioning of the nuclear and extended family
 8. Recognize children's loyalty to and protection of their parents even in the face of neglect or abuse
 9. Understand the vulnerabilities of siblings in a family in which a child has a chronic health condition or disability
 10. Distinguish among permissive, restrictive, and authoritative parenting
 11. Understand the mechanisms by which parental conflict affects children's behavior and development
 12. Recognize the effects of temperament variations on the relationships among siblings
 13. Identify predictors of successful adolescent functioning
 14. Understand the effects on children of parental substance and/or alcohol use disorders
- C. Socioeconomic diversity
1. Recognize the influences of poverty on the epidemiology of developmental and behavioral disorders
 2. Know the range of recommendations that might be made to help families with limited resources facilitate their child's development
 3. Know the cumulative risks for children with disability, underrepresented group membership, poverty, and social isolation
- D. Societal factors
1. Geographic
 - a. Understand common stresses on families living in urban areas
 - b. Understand common stresses on families living in rural/isolated areas
 2. Education
 - a. Understand the significance of school-community relationships in the educational success of children
 - b. Understand how community values influence educational processes in schools
 - c. Understand the impact of parental involvement in schools for educational success of children
 - d. Understand issues associated with each of the various school arrangements that are available to families (eg, home schooling, charter schools, private and parochial schools)
 - e. Understand how the structure and administrative characteristics of schools can be associated with school behavior and learning problems
 - f. Know the effects of full-day kindergarten for children's development
 - g. Know the benefits of early childhood education programs (eg, Head Start) on children's development
 - h. Know the benefits of Early Intervention Programs on children's development
 - i. Understand the impact of different types of childcare on child development
 - j. Know how to advise a school about developing programs to minimize bullying and to handle any incident of bullying for both the victim and the bully
 - k. Understand the child, school, and family factors which contribute to school refusal
 - l. Know how to work collaboratively with schools and families to design an intervention plan for a youngster with school refusal
 3. Media
 - a. Know the health problems associated with TV or video watching

- b. Understand the risks of excessive media coverage of student suicide
 - c. Understand the influences of media exposure on child development and behavior
 - d. Know the mechanisms by which TV or video watching contributes to health problems
- 4. Discrimination
 - a. Recognize the effects of stigmatization and discrimination on children and families who are in some way different from their community
 - b. Know the range of recommendations for parents to help children to recognize, confront, and protect themselves from the damaging effects of social discrimination
 - c. Know the range of recommendations for schools to minimize isolation and stigmatization of children with individual or family differences
- 5. Violence
 - a. Know the detrimental effects on children of being a witness, victim, or perpetrator of domestic or community violence
 - b. Understand the co-occurrence of spouse or partner violence and violence against children
 - c. Know how to recognize signs of a child being the victim of a bully
 - d. Know how to counsel a family about helping their child cope with a bully either at school or in the community
 - e. Know the factors that contribute to a child becoming a bully
 - f. Know the impact of relational aggression and ostracism on a child
- 6. Housing
 - a. Recognize the influences of homelessness on child development and behavior
- 7. Exposure to disasters
 - a. Know recommendations for helping children and families in the face of natural disasters (eg, flood, hurricane, fire)
 - b. Know recommendations for helping children and families cope with the occurrence of human disasters (eg, mass shootings, automobile or bus accidents)
 - c. Understand common behavioral symptoms of functional and dysfunctional coping in the face of a disaster
 - d. Know recommendations for helping community groups (eg, schools) cope with the occurrence of disasters
- 8. Access to health care
 - a. Understand the risks to child development of inadequate access to health care
 - b. Understand the potential contribution of the "medical home" concept to promoting optimal child development and behavior
- 4. **Elements of Assessment and Management**
 - A. Assessment
 - 1. Know the principles of developmental surveillance and screening
 - 2. Understand the characteristics of a good screening test
 - 3. Distinguish between developmental surveillance, developmental screening, and developmental assessment
 - 4. Know the psychometric properties and proper use of common parent-completed questionnaires available for developmental surveillance and screening

5. Know the psychometric properties and proper use of common directly administered developmental screening tools
6. Know the psychometric properties and proper use of common parent- completed behavioral and emotional screening tools
7. Know the standardized measures for assessing the home environment
8. Differentiate global from domain-specific developmental and behavioral screening instruments
9. Understand the issues important to hearing screening for infants in the newborn period and beyond and describe strategies to reduce loss to follow-up
10. Know the methods for assessing hearing at different developmental stages including physiologic measures, behavioral audiometry, conditioned response audiology, play audiometry, and sound field audiometry
11. Know the methods for assessing vision at different developmental stages
12. Be able to identify common dysmorphic features
13. Know appropriate assessments to evaluate a child's motor coordination
14. Know the procedures to evaluate a child's mental status
15. Know interview and screening methods to assess a child's or adolescent's emotions and moods
16. Understand the important historical information required to assess the possible etiologies for developmental delay/disabilities
17. Know the appropriate laboratory evaluation for developmental delay
18. Know the indications for different types of molecular genetic tests
19. Know the indications for cytogenetic testing
20. Know the indications for biochemical/metabolic testing
21. Know the indications for neuroimaging
22. Understand the importance of identifying child and family strengths in the process of planning intervention
23. Know how to interpret results of infant cognitive assessments
24. Know how to interpret results of verbal and non-verbal cognitive assessments in children
25. Know how to interpret results of academic achievement testing
26. Know how to interpret results of motor assessments
27. Understand the implications of neuromaturational delays for a child with school problems
28. Recognize the impact of cultural differences on developmental testing performance
29. Know how to obtain and interpret a genogram for the understanding of family function
30. Know the principles of behavioral screening
31. Know the psychometric properties and proper use of common child or adolescent self-report behavioral and emotional screening measures
32. Know methods to assess a child's or adolescent's attention span, impulsivity, and hyperactivity
33. Know methods to assess the significance of a child's or adolescent's defiant or aggressive behaviors
34. Know methods to assess an adolescent's substance use
35. Know methods to assess an adolescent's sexual behaviors
36. Know methods to assess family functioning

37. Know methods to assess a child's or adolescent's peer relationships
38. Know methods to assess for social stressors
39. Know interviewing techniques appropriate for children of various ages and developmental levels
40. Know how to interpret results of adaptive skill assessments
41. Know how to interpret results of speech and language assessments
42. Understand current classifications of behavioral health disorders in infants and toddlers
43. Know the indications for fluorescence in situ hybridization (FISH) testing
44. Know the indications for neuroelectrophysiological studies (e.g., electroencephalography)
45. Know methods to assess for autism spectrum disorders
46. Know methods to assess executive functions

B. Management

1. Communication skills
 - a. Understand how to inform parents of a diagnosis of a developmental disability, behavioral/mental health disorder, or life-threatening condition in their child
 - b. Understand how to effectively elicit parents' opinions and concerns for their child's development
2. Anticipatory guidance/health promotion
 - a. Know how to counsel families on the potential negative effects of physical punishment
 - b. Know specific recommendations for parents to limit the influence of the media on their child's development and behavior
 - c. Know how to advise a family of a toddler on knowing when the child is ready to initiate toilet training
 - d. Know how to advise parents to address resistance to toilet training
 - e. Know how to advise parents on sleep hygiene to avoid problematic sleep associations and bedtime resistance
 - f. Know how to advise parents to approach discussions with their child regarding high-risk behaviors at different ages and developmental levels
 - g. Know how to advise parents concerned about their child's sexual behaviors at different ages and developmental levels and in different settings
 - h. Know recommendations that could be given to parents to help them facilitate their child's adjustment to a new sibling at different ages and development levels
 - i. Know how to advise parents on key features of quality child care programs
 - j. Understand the importance of sexuality education for teenagers with developmental disabilities and describe key features of effective education
 - k. Know the developmental and behavioral advantages of breast-feeding
 - l. Know how to advise parents on disciplinary strategies appropriate for children of different ages and developmental levels
 - m. Know how to advise parents on habits and repetitive behaviors at different ages and developmental levels
 - n. Know how to advise parents whose child is having temper tantrums or breath holding spells

- o. Know how to advise parents of children engaging in aggressive behavior at different ages and developmental levels
 - p. Know how to advise parents on strategies they can use to promote the development and academic success of their children
 - q. Know how to advise parents on strategies to promote their child's self-esteem at different ages and developmental levels
 - r. Know how to advise parents who are concerned about their infant's crying
 - s. Know how to advise parents concerned about sibling rivalry at different ages and developmental levels
 - t. Know how to advise parents about the use of transitional objects at different ages and developmental levels
 - u. Know how to advise parents about fears or anxieties in their child at different ages and developmental levels
 - v. Know how to advise parents concerned about their child's feeding behaviors at different ages and developmental levels
 - w. Know how to advise parents on promoting toilet training for a preschool-age child
 - x. Know how to advise parents on promoting toilet training for a developmentally delayed school-age child
 - y. Identify strategies to guide families in building coping and resilience and avoiding overprotection in a child with a developmental disability
3. Counseling
- a. Understand how reframing can be used within counseling as a therapeutic maneuver
 - b. Understand the important role providing information about a condition can play in therapy
 - c. Understand how strategic family therapy can be used to challenge the family with particular tasks to improve existing maladaptive patterns of problem solving or communication
 - d. Understand the key constructs of family systems theory
 - e. Understand how cognitive restructuring and attribution retraining can be employed in cognitive-behavioral counseling to address disorders of mood or emotion
 - f. Know the benefits of group therapy for enhancing social skills and behaviors
 - g. Appreciate conditions for which group therapy is most appropriate
 - h. Understand the components of and indications for cognitive behavior therapy
4. Behavioral interventions
- a. Understand conditions in which classical conditioning is utilized for treatment
 - b. Differentiate among schedules of reinforcement most appropriate for a behavior management plan (eg, fixed and variable; ratio and interval)
 - c. Understand that reinforcing incompatible behavior is an alternative to planned ignoring of the target behavior
 - d. Know the various forms of punishment, including natural consequences, logical consequences, behavioral penalties, physical punishment, and time out
 - e. Understand the importance of identifying the function of a behavior in selecting a behavior management technique
 - f. Know the important components of a successful time-out procedure
 - g. Know how to initiate a token economy within a home or school

- h. Identify situations in which planned ignoring or time-out would not be an appropriate recommendation to decrease a problem behavior
 - i. Know how to initiate a school-home note as a behavioral intervention
 - j. Know the important components of a successful extinction procedure
5. Basic pharmacotherapy
- a. Understand the physiologic activity of various neurotransmitters (eg, dopamine, norepinephrine, serotonin, gamma-aminobutyric acid, acetylcholine)
 - b. Know how to apply the principles of pharmacodynamics
 - c. Know how to apply the principles of pharmacokinetics
 - d. Know how common psychotherapeutic agents are metabolized and excreted
 - e. Understand the issues related to the combined use of psychopharmacologic agents
 - f. Understand the pharmacodynamic and pharmacokinetic properties of stimulant medications
 - g. Know indications for the use of stimulant medications
 - h. Understand the clinical use of stimulant medications
 - i. Know the side effects and appropriate monitoring of stimulant medications
 - j. Know indications for the use of selective serotonin reuptake inhibitors
 - k. Understand the clinical use of selective serotonin reuptake inhibitors
 - l. Know the side effects and appropriate monitoring of selective serotonin reuptake inhibitors
 - m. Know indications for the use of mood stabilizers
 - n. Understand the clinical use of common mood stabilizing medications
 - o. Know the side effects of common mood stabilizing medications
 - p. Know indications for the use of tricyclic antidepressants
 - q. Understand the clinical use of tricyclic antidepressants
 - r. Know the side effects and appropriate monitoring of tricyclic antidepressants
 - s. Know indications for alpha-adrenergic agonists
 - t. Understand the clinical use of alpha-adrenergic agonists
 - u. Understand the side effects and appropriate monitoring of alpha-adrenergic agonists
 - v. Know indications for the use of anti-anxiety medications
 - w. Understand the clinical use of common anti-anxiety medications
 - x. Know the side effects and appropriate monitoring of common anti-anxiety medications
 - y. Know indications for the use of antipsychotic medications for problems seen in developmental and behavioral pediatrics
 - z. Understand the clinical use of antipsychotic medications for problems seen in developmental and behavioral pediatrics
 - aa. Know the side effects and appropriate monitoring of antipsychotic medications
 - bb. Understand the clinical use of norepinephrine re-uptake inhibitors
 - cc. Know the side effects and appropriate monitoring of norepinephrine re-uptake inhibitors
 - dd. Know the clinical use of atypical antidepressants (eg, bupropion, clomipramine, etc)
 - ee. Know the side effects and appropriate monitoring of atypical antidepressants (eg, bupropion, clomipramine, etc)

- ff. Know how to monitor for side effects of antipsychotic medications
- gg. Understand the basic principles of pharmacogenomics
- 6. Other strategies
 - a. Understand the importance of adequate basal treatment of pain
 - b. Understand how to formulate a pain management plan
 - c. Understand the principles and techniques of hypnosis
 - d. Understand the principles and techniques of biofeedback
 - e. Know appropriate advice for a school on the appropriate timing and nature of memorialization activities after the death of a student
 - f. Understand principles in providing post-suicide intervention services in a high school
 - g. Know how to evaluate the utility of non-standard therapies for developmental and behavioral disorders
 - h. Know the risks of special diets, supplements, and other common alternative treatments that are often recommended for children with developmental disabilities
 - i. Know how to counsel families who are utilizing non-standard (alternative) therapies
- C. Team processes
 - 1. Principles of collaboration
 - a. Know the importance and process of identifying the underlying agenda for consultation requests from community sites
 - b. Know the steps in establishing a collaborative relationship with community organizations and agencies
 - c. Know how developmental-behavioral pediatricians can serve as consultants to schools
 - d. Know the steps in conducting an evaluation of a child as a school consultant
 - e. Know how to conduct an evaluation of a child as a consultant to a child care center
 - f. Understand the benefits and challenges of multidisciplinary evaluations within a collaborative team model
 - g. Understand how the role of consultant to a school system differs in quality and scope to the role of the physician seeing a patient in the office
 - h. Understand issues of confidentiality as they relate to the role of consultant to a school system
 - 2. Knowledge of other health professionals' roles and methods
 - a. Be familiar with the elements of a psychological and educational evaluation conducted as part of a multidisciplinary team evaluation for a child with learning and/or behavior problems
 - b. Understand common behavioral assessment techniques
 - c. Understand the elements of a neuropsychological evaluation of a child
 - d. Recognize the indications for neurological consultation in a child with a developmental or behavioral problem
 - e. Know the role of genetic consultation and counseling in a child with developmental disabilities
 - f. Know the indications for speech and language evaluation and treatment in a child with developmental or behavioral disorders

- g. Know how speech and language testing evaluates pragmatics, semantics, and syntax
- h. Differentiate between the evaluations and services provided by physical therapy and occupational therapy
- i. Recognize the role of occupational therapy in evaluation and treatment of children with developmental disorders
- j. Know controversial therapies (eg, sensory integration, optometric training, facilitated communication, etc) and their current status (eg, unproven, questionable, unsafe, proven ineffective, etc)
- k. Recognize indications for psychiatric consultation in a child with a developmental or behavioral problem
- l. Recognize the role of physical therapy in evaluation and treatment of children with developmental disorders
- m. Differentiate among the evaluations and services provided by a play therapist, behavioral counselor, behavior analyst, psychodynamic therapist, and family therapist
- n. Know the role of a vision specialist and orientation and mobility specialist in the treatment of a child with visual impairment
- o. Know the role of a teacher of the deaf in the treatment of a child with permanent hearing loss

5. Adaptation to General Health Problems and Their Treatment

A. Acute illness

- 1. Know the impact of a child's acute illness on the child's behavior and the family's functioning
- 2. Understand child and family factors that might moderate the stress reaction during an acute illness
- 3. Identify sources of family stress during a child's acute illness
- 4. Understand methods of prevention and management of behavioral problems that develop during or immediately after an acute illness
- 5. Know the sequence of development of children's concepts of illness causation

B. Chronic conditions

- 1. Understand the different strategies of clinical management that lead from a non-categorical approach to special health care needs and a diagnostically specific approach
- 2. Understand the benefits and limitations of using a non-categorical approach to special health care needs in public policy
- 3. Know the sources of stress for children who require medical technology and for their families
- 4. Understand the functional domains that may be affected in children with chronic illness or disabilities
- 5. Understand the international classification systems related to developmental-behavioral pediatrics
- 6. Understand how social determinants of health and other factors are related to the identification and/or prevalence of disabilities in US children (eg, age, race/ethnicity, socioeconomic status)

7. Differentiate between major depression versus depressed mood secondary to adjustment to a chronic condition
8. Know the factors that affect the social relationships of children with special health care needs
9. Understand the benefits of the inclusion of children with disabilities or chronic illness in mainstream schools and community activities
10. Know appropriate management to support parents and siblings of children with special health care needs
11. Know the factors (child, family, and societal) that promote resilience to the stresses of chronic health conditions
12. Know how to counsel parents on dividing responsibility for day-to-day management of a chronic illness between the parent and the child
13. Know the impact of painful procedures on children with chronic illnesses
14. Know how to minimize the impact of painful procedures on children
15. Understand the difficulties associated with the inclusion of children with disabilities or chronic illnesses in mainstream schools and community activities
16. Know that the prevalence of behavioral health disorders is increased in children with special health care needs
17. Know the effects of chronic health care conditions on child development
18. Know how to counsel families experiencing stress related to a child's chronic condition

C. Hospitalization

1. Know how to advise families about behavioral problems that are commonly seen after hospitalization
2. Know how to prepare a child for a planned hospitalization
3. Know appropriate management for a child who has behavior problems after hospitalization or during prolonged hospitalization
4. Know the benefits of therapeutic play programs for children in hospitals
5. Know how to advise families and health care providers about strategies to help children better cope with hospitalization and/or medical procedures.

D. Terminal illness

1. Understand differences in children's responses to life-threatening illness at various age levels
2. Know how to plan appropriate psychosocial support for a child or adolescent with a terminal illness
3. Know how to plan appropriate psychosocial support for the family of a child with a terminal illness
4. Differentiate between acute grief and clinical depression

E. Death

1. Understand the development of children's concepts of death and the psychosocial implications of their perceptions
2. Understand the factors that may affect children's concepts of death
3. Know appropriate advice for parents on how to explain to children of various ages the death of a family member
4. Understand the impact on children of the death of a peer
5. Know how to advise families on whether a child should attend a funeral

6. Understand the variations in response of children at various age levels to the death of a family member

F. Adherence

1. Differentiate between adherence and compliance
2. Identify child factors that affect likelihood of adherence to a complex medical or behavioral plan
3. Know how to develop a management plan to promote adherence to therapeutic regimens in children and adolescents at various developmental levels
4. Identify family factors that affect likelihood of adherence to a complex medical or behavioral plan
5. Identify community factors that affect likelihood of adherence to a complex medical or behavioral plan

G. Vulnerable child

1. Know the hallmark features of the vulnerable child syndrome
2. Be able to provide advice to parents to prevent the development of the vulnerable child syndrome in the aftermath of a child's life-threatening illness

H. Impact of treatments for chronic conditions on development/behavior

1. Know the behavioral effects of commonly used medications
2. Recognize behavioral effects of sympathomimetic medications
3. Recognize the behavioral effects of anti-epileptic drugs
4. Understand the developmental and behavioral effects of central nervous system ventricular shunts
5. Understand the developmental and behavioral effects of cranial radiation
6. Understand the developmental and behavioral effects of the anesthetic and bypass/circulatory arrest procedures used during cardiac surgery in infants
7. Recognize the behavioral effects of chemotherapeutic drugs
8. Recognize the long-term developmental and behavioral outcomes of survivors of childhood cancer

6. Developmental-Behavioral Aspects of Chronic Conditions and Treatment

A. Prematurity and adverse prenatal conditions

1. Prematurity and small for gestational age (SGA) infants
 - a. Know the major and minor morbidity outcomes associated with prematurity
 - b. Know the most prevalent special health care needs affecting children born prematurely
 - c. Understand the neonatal medical/surgical conditions that are associated with adverse developmental and behavioral outcomes in children born prematurely
 - d. Understand the association of socioeconomic factors and outcome in children born prematurely
 - e. Plan appropriate management for children and families in the neonatal intensive care unit to maximize the child's developmental and behavioral outcomes
 - f. Understand the pathogenesis of cerebral palsy and associated brain lesions in infants born prematurely
 - g. Understand the natural history of increased muscle tone in infants born prematurely
 - h. Understand the pathogenesis of visual impairment in infants born prematurely
 - i. Understand the pathogenesis of hearing impairment in infants born prematurely
 - j. Understand the typical growth patterns of premature infants

- k. Understand the effectiveness of early intervention for children born prematurely
- l. Understand the variations in developmental and behavioral outcomes after premature birth as a function of the child's birth weight and gestational age
- m. Know the developmental and behavioral outcome for children who are small for gestational age
- n. Plan the developmental monitoring of a child born prematurely or with low birth weight
- o. Understand components of effective early intervention programs for children born prematurely
- 2. Prenatal drug exposure
 - a. Recognize specific medications that are known teratogens
 - b. Know the developmental and behavioral consequences of prenatal exposure to illicit drugs (eg opioids, cocaine, methamphetamines)
 - c. Know the features of fetal alcohol spectrum disorders
 - d. Understand the developmental and behavioral characteristics of children with fetal alcohol spectrum disorders
 - e. Know the developmental and behavioral consequences of prenatal exposure to tobacco
 - f. Know the developmental and behavioral consequences of prenatal exposure to anticonvulsants
 - g. Know the developmental and behavioral consequences of prenatal exposure to selective serotonin reuptake inhibitors
- 3. Prenatal infections
 - a. Know how to plan the laboratory evaluation of a child with a suspected prenatal infection
 - b. Understand the usual route of transmission of common prenatal and perinatal infections (eg, herpes, HIV)
 - c. Recognize the features of congenital syphilis
 - d. Recognize the features of congenital herpes simplex and varicella zoster infections
 - e. Know the epidemiology of cytomegalovirus infection
 - f. Recognize the features of congenital cytomegalovirus infection
 - g. Recognize the features of congenital rubella infection
 - h. Recognize the features of congenital Toxoplasma infection
 - i. Know the developmental and behavioral outcomes associated with specific prenatal infections
- 4. Maternal adverse effects
 - a. Know the effects of maternal toxemia (preeclampsia) on fetal growth and development
 - b. Understand the developmental and behavioral consequences for children born of mothers with diabetes mellitus
 - c. Know the developmental and behavioral consequences for the child of maternal chronic illness or malnutrition during pregnancy
- B. Adverse perinatal conditions
 - 1. Know the criteria for identifying perinatal (intrapartum) asphyxia as the cause of developmental disabilities
 - 2. Know the developmental and behavioral outcomes associated with perinatal asphyxia

C. Chromosomal and genetic disorders

1. Down syndrome

- a. Understand that the phenotypic expression of Down syndrome may be caused by trisomy 21, translocation of chromosome 21, or mosaicism
- b. Know the epidemiology of Down syndrome
- c. Know the typical IQ range and changes over time of children with Down syndrome
- d. Differentiate between language and visual-spatial skills in the development of children with Down syndrome
- e. Identify factors contributing to speech and language delays in children with Down syndrome
- f. Understand how to evaluate a child with Down syndrome who presents with behavior problems
- g. Understand the reasons for multi-modal language training for toddlers with Down syndrome
- h. Know how to plan appropriate management of a neonate, child, or adolescent with Down syndrome
- i. Know the medical problems commonly associated with Down syndrome
- j. Recognize the typical phenotypic features associated with Down syndrome
- k. Know the evaluation and recommendations for a child with Down syndrome who wants to participate in athletic activities
- l. Know the neurologic complications associated with Down syndrome

2. Fragile X syndrome

- a. Understand the pathogenesis of fragile X syndrome
- b. Know the appropriate laboratory evaluation to establish the diagnosis of fragile X syndrome
- c. Recognize the phenotypic features of boys and men with fragile X syndrome
- d. Know the prevalence of fragile X syndrome
- e. Know the developmental and behavioral characteristics of boys with fragile X syndrome and premutation carriers
- f. Understand the developmental and behavioral characteristics of girls with fragile X mutation
- g. Know the medical problems commonly associated with fragile X syndrome
- h. Understand the wide range of outcomes in children with fragile X syndrome
- i. Understand the importance of evaluating family members of children identified with fragile X syndrome
- j. Know the medical problems in adult fragile X premutation carriers with fragile X tremor ataxia syndrome

3. Sex chromosome abnormalities

- a. Recognize the phenotypic features of Turner (XO) syndrome
- b. Know the developmental and behavioral characteristics of girls with Turner (XO) syndrome
- c. Recognize the phenotypic features of boys with a karyotype of 47, XYY
- d. Know the developmental and behavioral characteristics of boys with a karyotype of 47, XYY
- e. Know the developmental and behavioral characteristics of boys with Klinefelter (XXY) syndrome

- f. Know the developmental and behavioral characteristics of girls with a 47, XXX karyotype
- g. Recognize the phenotypic features of Klinefelter (XXY) syndrome at different ages
- h. Know the cytogenetic heterogeneity associated with Turner (XO) syndrome
- i. Know the natural history of Turner (XO) syndrome
- j. Know the medical problems commonly associated with Turner (XO) syndrome
- 4. Rett syndrome
 - a. Know the developmental and behavioral characteristics of Rett syndrome at different stages
 - b. Recognize the physical signs and symptoms of Rett syndrome at different stages
 - c. Know the etiology and appropriate laboratory evaluation of Rett syndrome
 - d. Know how to plan the management of a child with Rett syndrome
 - e. Understand the prognosis for a child with Rett syndrome
 - f. Recognize the broader phenotype of children with MECP2 mutations who do not fit the clinical criteria for Rett syndrome
- 5. Trisomy 13 and Trisomy 18
 - a. Recognize the phenotypic features of Trisomy 13
 - b. Know the developmental and behavioral characteristics of children with Trisomy 13
 - c. Recognize the phenotypic features of Trisomy 18
 - d. Know the developmental and behavioral characteristics of children with Trisomy 18
- 6. Williams syndrome
 - a. Know the developmental and behavioral characteristics of children with Williams syndrome
 - b. Recognize the phenotypic features of Williams syndrome
 - c. Know the medical problems commonly associated with Williams syndrome
 - d. Know the etiology and appropriate laboratory investigation for diagnosis of Williams syndrome
- 7. Prader-Willi syndrome and Angelman syndrome
 - a. Know the developmental and behavioral characteristics of children with Prader-Willi syndrome
 - b. Know the etiology and appropriate laboratory evaluation for diagnosis of Prader-Willi syndrome
 - c. Understand the natural history of Prader-Willi syndrome
 - d. Know how to plan the management for a child with Prader-Willi syndrome
 - e. Know the developmental and behavioral characteristics of children with Angelman syndrome
 - f. Recognize the phenotypic features of Prader-Willi syndrome at different developmental stages
 - g. Recognize the phenotypic features of Angelman syndrome
 - h. Know the etiology and appropriate laboratory evaluation to establish the diagnosis of Angelman syndrome
- 8. 22q11.2 deletion syndrome
 - a. Know the appropriate laboratory evaluation to establish the diagnosis of 22q11.2 deletion syndrome

- b. Know the developmental and behavioral characteristics of children with 22q11.2 deletion syndrome
 - c. Recognize the phenotypic features of 22q11.2 deletion
- 9. Other genetic disorders
 - a. Know the etiology and appropriate laboratory evaluation to establish the diagnosis of Smith-Magenis syndrome
 - b. Know the developmental and behavioral characteristics of children with Smith-Magenis syndrome
 - c. Know the etiology of neurofibromatosis types I and II
 - d. Know how to plan the diagnostic evaluation of a child with neurofibromatosis types I and II
 - e. Know the medical problems commonly associated with neurofibromatosis types I and II
 - f. Know the developmental and behavioral characteristics of children with neurofibromatosis types I and II
 - g. Know the etiology and appropriate medical evaluation to establish the diagnosis of tuberous sclerosis
 - h. Recognize the phenotypic features of tuberous sclerosis
 - i. Know the developmental and behavioral characteristics of children with tuberous sclerosis
 - j. Know the medical problems commonly associated with tuberous sclerosis
 - k. Recognize the phenotypic features of neurofibromatosis types I and II
 - l. Know the phenotypic features of other neurocutaneous syndromes, eg, Sturge-Weber, incontinentia pigmenti
 - m. Know the developmental and behavioral characteristics of children with other neurocutaneous syndromes
- D. Metabolic disorders
 - 1. Phenylketonuria (PKU)
 - a. Understand the importance of neonatal screening for PKU
 - b. Know the principles of dietary treatment of individuals with PKU
 - c. Know how to plan appropriate counseling for a girl with PKU about sexuality, pregnancy, and genetic risks
 - d. Know the phenotypic features of PKU
 - e. Know the developmental and behavioral characteristics of children with PKU
 - f. Know the evaluation of suspected PKU
 - 2. Mucopolysaccharidoses
 - a. Understand the usual natural history of developmental skills in children with mucopolysaccharide disorders
 - b. Recognize the phenotypic features suggestive of a mucopolysaccharide disorder
 - c. Know the etiologies and appropriate laboratory evaluation to establish the diagnosis of the major mucopolysaccharide disorders
 - d. Know the developmental and behavioral characteristics of children with mucopolysaccharide disorders
 - 3. Purine metabolism
 - a. Know the developmental and behavioral characteristics of children with Lesch-Nyhan syndrome

- b. Know the evaluation of suspected Lesch-Nyhan syndrome
 - c. Recognize the phenotypic features of Lesch-Nyhan syndrome
 - d. Plan the management of a child with Lesch-Nyhan syndrome
- E. Infectious diseases
 - 1. Meningitis and encephalitis
 - a. Recognize the neurological, developmental, and behavioral complications of various forms of meningitis
 - 2. HIV/AIDS
 - a. Know the neurological, developmental, and behavioral complications of pediatric HIV/AIDS and its treatment
 - b. Understand the natural history of pediatric HIV/AIDS
 - c. Understand the epidemiology of pediatric HIV/AIDS
 - 3. Chronic otitis media
 - a. Know the sensory, developmental, and behavioral consequences of chronic otitis media with effusion
- F. Central nervous system (CNS) disorders
 - 1. Seizures and epilepsy
 - a. Differentiate between seizures and epilepsy
 - b. Understand the international classification of epileptic syndromes
 - c. Know how to plan the evaluation of a child with staring spells
 - d. Know that the prevalence of seizures and epilepsy is higher in children with developmental disorders than in the general population
 - e. Know the appropriate management for a child with epilepsy and attention deficit hyperactivity disorder
 - f. Know that developmental and behavioral difficulties are more common in children with epilepsy than in children with other types of chronic physical illnesses
 - g. Know how to plan the evaluation of a child with suspected seizures
 - h. Know the etiologies and natural history of infantile spasms
 - 2. Hydrocephalus
 - a. Know the causes of hydrocephalus in children
 - b. Know the developmental and behavioral characteristics of children with hydrocephalus
 - 3. Stroke
 - a. Understand the developmental and behavioral sequelae following a stroke at different ages
 - b. Understand the natural history of language development in children following a stroke at different ages
 - c. Know the causes of pediatric stroke at different ages
 - 4. Traumatic Brain Injury (TBI)
 - a. Differentiate between mild, moderate, and severe head injury on the basis of the Glasgow coma score
 - b. Know the long-term management for a child with traumatic brain injury
 - c. Understand the pathogenesis of brain injury with penetrating head trauma
 - d. Know the developmental, cognitive, and behavioral consequences of penetrating injury to specific brain regions
 - e. Understand the pathogenesis of brain injury with closed head trauma

- f. Know the developmental, cognitive, and behavioral consequences of mild, moderate, and severe closed head injury
- 5. Central nervous system (CNS) tumors
 - a. Know the developmental, cognitive, and behavioral consequences in children who have had CNS tumors
 - b. Know the behavioral, developmental and neurological symptoms suggestive of a CNS tumor
- 6. Congenital CNS malformation
 - a. Know brain malformations that may be found in individuals with no developmental or behavioral disabilities
 - b. Know the brain malformations most commonly found in individuals with developmental disabilities (eg, holoprosencephaly, schizencephaly, lissencephaly)
- G. Sensory defects
 - 1. Visual impairments
 - a. Know the leading causes of visual impairment in childhood
 - b. Understand the importance of a functional vision assessment in determining which literacy media to use with significant visual impairment or blindness (eg, Braille, large print, optical modifications)
 - c. Know how to assess development in children who are visually impaired
 - d. Know how to plan the management of developmental/behavioral issues in children with a range of visual impairments
 - e. Understand the developmental and behavioral problems associated with severe visual impairment
 - f. Understand the developmental and behavioral problems associated with mild to moderate visual impairment
 - g. Understand the developmental maturation of visual acuity in early childhood
 - h. Understand the meaning of cortical visual impairment, and other forms of visual impairment
 - 2. Hearing loss
 - a. Recognize the typical audiogram of a child with conductive or sensorineural hearing loss
 - b. Know the effectiveness of teaching sign language to children who have severe to profound hearing loss
 - c. Know how to plan the developmental assessment of a child with severe/profound hearing loss
 - d. Know the impact of deafness on development, behavior, and academic achievement
 - e. Understand the efficacy of cochlear implantation for children with profound hearing loss
 - f. Understand the factors that affect decisions on use of cochlear implants
 - g. Recognize the importance of early language exposure and instruction for children with hearing impairment
 - h. Know the three common educational/communication methods for children with hearing impairments: oral, manual, and total language and reasons for choosing each
 - i. Know the leading causes of severe hearing impairment

- j. Know the criteria for amplification with hearing aids
- k. Understand the developmental and behavioral consequences of mild or moderate hearing loss
- l. Understand the developmental and behavioral consequences of unilateral hearing loss
- m. Understand the developmental-behavioral consequences of severe or profound hearing loss

H. Other chronic conditions

- 1. Understand the reasons for inclusion of thyroid testing in the neonatal screening battery
- 2. Differentiate between congenital and acquired hypothyroidism in terms of developmental outcomes
- 3. Know the impact of type I diabetes on development and behavior
- 4. Understand the association of recurrent diabetic ketoacidosis and problems in family functioning
- 5. Understand the effects of excess corticosteroids on affect and behavior in children
- 6. Identify the developmental and behavioral consequences of iron deficiency at different ages
- 7. Know the factors that affect the developmental and behavioral outcome of children with congenital heart disease
- 8. Know the nutritional deficiencies associated with developmental and behavioral problems in children
- 9. Understand the impact of prolonged caloric malnutrition (failure to thrive) on development and behavior
- 10. Identify the developmental and behavioral effects of lead exposure
- 11. Understand the risks for lead exposure in children with developmental disabilities
- 12. Understand the impact of iodine deficiency and maternal hypothyroidism on the fetus
- 13. Understand the emotional and family factors that affect symptoms and prognosis in children with chronic illnesses, such as asthma
- 14. Know the factors affecting the developmental and behavioral outcome of children with hematologic disorders
- 15. Know the factors affecting the developmental and behavioral outcome of children with oncologic disorders
- 16. Know the factors affecting the developmental and behavioral outcome of children with rheumatologic disorders
- 17. Know the factors affecting the developmental and behavioral outcome of children with immunologic disorders
- 18. Know the factors affecting the developmental and behavioral outcome of children with pulmonary disorders
- 19. Know the factors affecting the developmental and behavioral outcome of children with renal disorders
- 20. Know the factors affecting the developmental and behavioral outcome of children with gastrointestinal disorders
- 21. Know the developmental risks to the fetus and young child of mercury toxicity

7. **Cognitive/Adaptive Disabilities**

A. Etiology and Evaluation

1. Understand current psychological theories of intelligence
2. Understand the levels of severity of intellectual disability
3. Know the diagnostic criteria for intellectual disability
4. Understand the interaction of environment and biology in the etiology of intellectual disability
5. Know the risk factors related to the causes of intellectual disability
6. Know the conditions that may affect the validity of assessments of intellectual ability
7. Know the differential diagnosis of intellectual disability
8. Know the common etiologies of intellectual disability
9. Plan the medical evaluation of a child with intellectual disability
10. Interpret the psycho-educational assessment of a child with intellectual disability
11. Know the co-morbid conditions associated with intellectual disability
12. Know the epidemiology of intellectual disability
13. Understand the concept of levels of support required by individuals with intellectual disability
14. Understand the special health concerns in adolescents with intellectual disability
15. Know the assessments of adaptive behavior

B. Intervention

1. Understand the specific behavioral, educational, and social challenges associated with each developmental stage for a child with intellectual disability
2. Know the educational interventions available for children with intellectual disability
3. Understand the effects of early intervention for children with or at risk for developmental delays
4. Understand the appropriate educational interventions and accommodations for a child with intellectual disability
5. Plan the treatment of common behavioral and emotional problems associated with intellectual disability
6. Understand the principles of planning for the transition to adulthood for youth with intellectual disability
7. Know the pharmacological interventions for behavioral disorders in children with intellectual disability

C. Outcome

1. Understand the academic potential of individuals with the different levels of severity of intellectual disability
2. Understand the occupational potential of individuals with the different levels of intellectual disability
3. Understand the independent living potential of individuals with the different levels of intellectual disability
4. Know the factors that mediate or moderate the outcome for individuals with intellectual disability
5. Understand the impact of different levels of intellectual disability on social relationships

8. **Specific Learning Disorders**

A. General

1. Understand the discrepancy definition of learning disabilities
2. Understand the low achievement definition of learning disabilities

3. Know how to plan the evaluation of a child for a learning disability
 4. Understand the structure of educational interventions attempting to provide the least restrictive environment (eg, classroom aide, resource room)
 5. Understand the overlap between intellectual disability and learning disorders
 6. Know the epidemiology of learning disabilities
 7. Know the natural history of learning disabilities
 8. Understand the issues related to differentiating learning disabilities from normal variations in academic skill acquisition
 9. Understand the concept of learning disability as a failure to respond to validated intervention
- B. Specific learning disorder with impairment in reading
1. Understand the cognitive and adaptive skills that are necessary for the typical development of reading abilities
 2. Understand the relationship between early language delays and later reading disorders
 3. Understand current concepts of the genetics of reading disorders
 4. Understand the current concepts regarding the underlying neuropsychological deficits in reading disorders
 5. Understand the appropriate educational interventions and accommodations for children with a reading disorder
 6. Understand the range of prognoses for children with a reading disorder
 7. Know the specific CNS localization of deficits related to reading disorder
 8. Know the conditions commonly associated with reading disorder
 9. Understand that reading disorders may result in academic failures in other subject areas
 10. Know the diagnostic criteria for reading disorder
 11. Recognize the symptoms of reading disorder
 12. Know the differential diagnosis for low achievement in reading
 13. Know subtypes of reading disorder (eg, word reading; reading comprehension)
- C. Specific learning disorder with impairment in mathematics
1. Understand the appropriate educational interventions and accommodations for a child with mathematics disorder
 2. Understand the range of prognoses for children with mathematics disorder
 3. Know the conditions commonly associated with mathematics disorder
 4. Know the diagnostic criteria for mathematics disorder
 5. Recognize the symptoms of mathematics disorder
 6. Understand the cognitive and adaptive skills that are necessary for the typical development of mathematics abilities
 7. Know the current concepts regarding the underlying neuropsychological deficits in mathematics disorder
 8. Know the differential diagnosis for low achievement in mathematics
 9. Understand the genetics of mathematics disorder
- D. Specific learning disorder with impairment in written expression
1. Know the diagnostic criteria for disorder of written expression
 2. Understand the cognitive and adaptive skills that are necessary for the typical development of writing and spelling abilities
 3. Know the differential diagnosis of disorders of written expression and spelling

4. Know the components of the evaluation of children for disorders of written expression or spelling
 5. Know the appropriate educational accommodations for children with spelling disorder or disorder of written expression
 6. Recognize the symptoms of disorders of written expression
 7. Know the underlying neuropsychological deficits in disorders of written expression
- E. Nonverbal learning disorder
1. Recognize the signs and symptoms of a non-verbal learning disorder
 2. Understand the natural history of non-verbal learning disorders
 3. Know the conditions commonly associated with non-verbal learning disorders
 4. Know the appropriate educational interventions and accommodations for children with non-verbal learning disorder
- F. Communication disorders
1. Language
 - a. Understand the distinction between speech and language
 - b. Distinguish the phonological, semantic, grammatical, prosodic and pragmatic aspects of language
 - c. Know the differential diagnosis of language disorders
 - d. Understand the role of hereditary factors in language disorders
 - e. Understand theories about the causes of language disorder
 - f. Recognize disorders in semantic skills
 - g. Recognize disorders in phonological skills
 - h. Recognize disorders in syntax
 - i. Recognize impairments in prosodic skills
 - j. Understand the distinction between receptive and expressive language skills
 - k. Know the diagnostic criteria for language disorder
 - l. Know how to plan the evaluation of a child with language delay
 - m. Know how to plan the management of a child with a language disorder
 - n. Know the range of prognoses for children with different types of language disorders
 - o. Understand the neural basis of language functioning and language development
 - p. Understand the impact of exposure to more than one language (bilingual household) on language development
 - q. Understand the role of environmental factors in language disorders
 - r. Understand the neural basis for language disorders
 - s. Know the epidemiology of language disorders
 - t. Recognize the signs and symptoms of language disorders
 - u. Understand gender differences in language development
 2. Speech sound disorders
 - a. Understand the distinctions among articulation, voice/resonance, and fluency
 - b. Know the pathophysiologic factors that affect articulation
 - c. Recognize the developmental progression of articulation skills
 - d. Know the definitions of dysarthria and oral-motor apraxia
 - e. Know the difference between articulation disorders, phonological disorders, and childhood apraxia of speech
 - f. Know how to plan the evaluation of a child with articulation problems

- g. Know the differential diagnosis of a child with articulation delays
 - h. Know how to plan the management of a child with speech abnormalities
 - i. Understand the range of prognoses for children with articulation and phonological disorders
3. Childhood onset fluency disorder (stuttering)
 - a. Understand the normal development of speech fluency and normal dysfluency of childhood
 - b. Understand the normal development of speech fluency
 - c. Know the criteria for referral of a child with speech dysfluency
 - d. Understand the management of a child with speech dysfluency
 - e. Understand the prognosis for a child with speech dysfluency
 4. Voice/resonance
 - a. Know the pathophysiologic factors that affect voice and resonance
 - b. Understand the evaluation of a child with abnormalities of voice or resonance
 - c. Understand the management of a child with abnormalities of voice or resonance
 - d. Know the prognosis for a child with abnormalities of voice or resonance
 - e. Know the role of velopharyngeal function in speech sound production
 5. Social (pragmatic) communication disorder
 - a. Know the criteria for social (pragmatic) communication disorder
 - b. Know the differential diagnosis for social (pragmatic) communication disorder
- 9. Motor Disabilities and Multiple Handicaps**
- A. Cerebral palsy
 1. Recognize signs in early infancy that are associated with the later development of cerebral palsy
 2. Recognize the signs and symptoms of spastic cerebral palsy
 3. Know the prevalence and epidemiology of cerebral palsy
 4. Distinguish the different subtypes of spastic cerebral palsy
 5. Recognize the signs and symptoms of dyskinetic cerebral palsy
 6. Know specific causes of the different types of cerebral palsy
 7. Distinguish cerebral palsy from spinal cord injuries, peripheral motor disorders, and lower motor neuron lesions
 8. Know how to plan the management of a toddler or preschooler with cerebral palsy
 9. Know how to plan the management of a school-age child or adolescent with cerebral palsy
 10. Evaluate early intervention and physical therapy in the management of cerebral palsy
 11. Know the pharmacologic management of spasticity
 12. Know the natural history of cerebral palsy
 13. Know the management of drooling in children with cerebral palsy
 14. Understand the neurological, orthopedic and/or ophthalmological complications associated with cerebral palsy
 15. Know the developmental and behavioral characteristics of individuals with cerebral palsy
 16. Know the range of prognoses for children with different types of cerebral palsy
 17. Understand the classification of cerebral palsy
 18. Characterize degree of impairment in cerebral palsy using the Gross Motor Function Classification System

19. Recognize the signs and symptoms of ataxic cerebral palsy
20. Understand the role of neuroimaging in the assessment of cerebral palsy

B. Myelodysplasia

1. Know the high prevalence of hydrocephalus and Chiari malformation in children with myelodysplasia
2. Understand the relationship between the level of myelodysplasia and motor, cognitive, and adaptive dysfunction
3. Know how to plan the management of children with different levels of myelodysplasia
4. Know the conditions commonly associated with myelodysplasia
5. Understand the relationship between genetic and environmental factors in the etiology and prevention of myelodysplasia
6. Understand the urological, neurological, and/or orthopedic complications associated with myelodysplasia
7. Know the developmental and behavioral characteristics of individuals with myelodysplasia

C. Muscular dystrophies

1. Recognize the signs and symptoms of Duchenne and other muscular dystrophies
2. Understand the long term prognoses for youth with Duchenne and other muscular dystrophies
3. Know how to plan the laboratory evaluation for a child with progressive muscular weakness
4. Understand the genetics of Duchenne and other muscular dystrophies
5. Know how to plan the management of a boy with Duchenne and other muscular dystrophies
6. Understand the neurological and orthopedic complications associated with muscular dystrophy
7. Know the developmental and behavioral characteristics of individuals with muscular dystrophy

D. Other

1. Plan the evaluation of an infant with hypotonia
2. Recognize the typical presentation of developmental coordination disorder
3. Know appropriate management strategies for a child with developmental coordination disorder
4. Know the causes of congenital hypotonia
5. Know the signs and symptoms of spinal muscular atrophy (SMA)
6. Plan the evaluation of a child with developmental coordination disorder

10. Autism Spectrum Disorder

A. Autism spectrum disorder

1. Know the comorbid conditions commonly associated with autism spectrum disorder
2. Know the etiologies of autism spectrum disorders
3. Know the diagnostic criteria and severity levels for autism spectrum disorder
4. Understand the deficits of children with autism spectrum disorder in joint attention, social referencing, and theory of mind
5. Know the differential diagnosis for autism spectrum disorder
6. Know how to plan the psycho-educational evaluation of a child with autism spectrum disorder

7. Develop management plans for children with autism spectrum disorders taking into account age, severity of autistic behaviors, and language and cognitive abilities
8. Understand the role of psychopharmacologic agents in the management of children with autism spectrum disorder
9. Understand the role of behavior therapies in the treatment of children with autism spectrum disorder
10. Know the range of prognoses for a child with autism spectrum disorder
11. Know the neurologic, developmental, and behavioral characteristics of Landau-Kleffner syndrome
12. Know how to plan the medical evaluation of a child with autism spectrum disorder
13. Know appropriate educational interventions and accommodations for a child with autism spectrum disorder
14. Understand the genetics of autism spectrum disorders

11. Attention Deficit Hyperactivity Disorder (ADHD)

A. Etiology

1. Know the epidemiology of ADHD
2. Understand current concepts regarding the underlying neuropsychologic deficits in ADHD
3. Know current research on neuroimaging in ADHD
4. Understand the current research on the neurobiologic etiology of ADHD
5. Know the prenatal and environmental exposures that can cause ADHD symptoms
6. Know the environmental situations that exacerbate ADHD symptoms
7. Know the familial pattern of ADHD
8. Understand the evidence relating specific neurotransmitters to ADHD

B. Evaluation

1. Distinguish between ADHD, problems with and normal variations in activity, impulsivity, and attention at different ages
2. Know the diagnostic criteria for ADHD and differences in criteria between childhood and older adolescents
3. Understand the limitations of the diagnostic criteria for ADHD
4. Know the characteristics and diagnostic criteria for the presentations of ADHD
5. Understand the severity levels of ADHD
6. Know the differential diagnosis of ADHD
7. Recognize the common co-morbid externalizing conditions in ADHD
8. Recognize the common co-morbid internalizing conditions in ADHD
9. Know the motor deficits commonly associated with ADHD
10. Know the common speech and language deficits associated with ADHD
11. Know how to plan the evaluation for children with ADHD
12. Know the issues associated with the assessment of preschool-age children for ADHD
13. Know the issues associated with the assessment of adolescents for ADHD
14. Know the learning disorders commonly associated with ADHD
15. Recognize the frequent co-occurrence of ADHD and tic disorders

C. Treatment

1. Know how to plan the pharmacological management of children with ADHD
2. Know the appropriate dosing of short acting and extended release stimulant medications in treating ADHD

3. Know the limitations and benefits of tricyclic antidepressants in treating ADHD
4. Know the benefits, limitations, and side effects of centrally acting alpha-adrenergic agonists in treating ADHD
5. Understand the rationale and risks associated with combining medications in treating ADHD
6. Know the behavioral management of ADHD in the home setting
7. Know the behavioral management of ADHD that can be utilized in the classroom
8. Know how to plan a comprehensive intervention program for children with ADHD
9. Know the mechanism of action of the stimulants in the treatment of ADHD
10. Know the benefits, limitations, and side effects of short acting and extended release stimulant medications in treating ADHD
11. Know the benefits, limitations, dosing, and side effects of norepinephrine reuptake inhibitors in treatment of ADHD
12. Know the mechanism of action of centrally acting alpha-adrenergic agonists in treating ADHD
13. Know the appropriate dosing of short acting and extended release centrally acting alpha-adrenergic agonists in treating ADHD

D. Outcome

1. Know the relationship between ADHD and motor vehicle accidents
2. Know the range of prognoses for children with ADHD
3. Understand the natural history of ADHD
4. Understand the relationship between ADHD and problems with peer relationships
5. Understand the relationship between diet and ADHD symptoms

12. Externalizing Conditions

A. Aggressive behavior

1. Differentiate aggressive behavior problems from normal variants at different developmental stages
2. Know the factors associated with aggressive and violent behavior at different ages
3. Plan the behavioral management for aggressive behavior at different ages
4. Know the pharmacological interventions for aggressive behavior
5. Characterize effective preventive programs for aggressive behavior
6. Understand the natural history of aggressive behavior
7. Know how to evaluate a child with aggressive behavior
8. Know the epidemiology of aggressive behavior at various stages of development
9. Understand the association between child maltreatment and later aggressive behavior
10. Understand the etiologies of bullying behavior
11. Know how to advise families on the management of bullying behavior
12. Know how to advise a school or day care center on the management of aggressive or bullying behaviors
13. Understand the components of school or community programs to teach social skills and non-violent conflict resolution
14. Understand the epidemiology and management of biting behavior at various stages of development
15. Understand the influences of exposure to violence in media on aggressive behavior in children and adolescents
16. Know how to plan the management of a child with aggressive behavior

17. Understand the association between corporal punishment and aggression in children, adolescents, and adults
- B. Oppositional defiant disorder (ODD)/Conduct disorder/Intermittent explosive disorder
 1. Recognize the natural history of ODD/conduct disorder
 2. Distinguish between ODD, oppositional behavioral problems, and temperamental variations
 3. Recognize the environmental contributors to oppositional and defiant behaviors
 4. Recognize the behavioral and functional characteristics of ODD and the variations in presentation based on developmental stage
 5. Recognize the common co-morbid conditions of ODD
 6. Plan the management of a child with ODD
 7. Understand the range of prognoses for children with ODD
 8. Recognize the environmental situations that contribute to the development and maintenance of antisocial, aggressive, and delinquent behaviors
 9. Recognize the signs and symptoms of conduct disorder at different developmental stages
 10. Recognize the common co-morbid conditions of conduct disorder
 11. Understand the range of prognoses for children with conduct disorder
 12. Know the pharmacologic treatments for conduct disorder
 13. Know the psychologic treatments for conduct disorder
 14. Describe the characteristics of effective training programs for parents of children with ODD/conduct disorder
 15. Understand the stages of development typically associated with oppositional behaviors
 16. Know the diagnostic criteria for ODD
 17. Know how to evaluate a child for ODD/conduct disorder
 18. Understand the benefits and limitations of different venues (eg, family, community, residential) for the treatment of conduct disorder
 19. Know the diagnostic criteria for conduct disorder
 20. Recognize family systems factors that contribute to the development and maintenance of ODD, intermittent explosive disorder, and conduct disorder
 21. Know the diagnostic criteria for intermittent explosive disorder
 22. Recognize the signs and symptoms of intermittent explosive disorder at different developmental stages
 23. Recognize the common co-morbid conditions of intermittent explosive disorder
 24. Be able to differentiate intermittent explosive disorder from ODD and conduct disorders
 25. Know the psychological and pharmacologic treatments for intermittent explosive disorder

13. Internalizing Behaviors and Conditions

- A. Anxiety disorders
 1. Understand the natural history of anxiety disorders
 2. Understand the relationship between temperamental characteristics and anxiety
 3. Recognize the environmental situations that contribute to or exacerbate anxious and fearful behaviors
 4. Recognize the signs and symptoms of phobias and anxiety disorders and the range of common presentations

5. Know the initial management of phobias and anxiety disorders
 6. Know the pharmacologic management of phobias and anxiety disorders
 7. Know the psychological management of phobias and anxiety disorders
 8. Recognize the common co-morbid conditions of anxiety disorders
 9. Understand the typical prognoses and the range of prognoses for children with anxiety disorders
 10. Know the diagnostic criteria for anxiety disorders
 11. Differentiate worries from anxiety disorders
 12. Recognize the signs and symptoms of selective mutism
 13. Differentiate between selective mutism and other conditions affecting speech and language
 14. Know how to plan the evaluation of a child with selective mutism
 15. Know how to plan the management of a child with selective mutism
 16. Differentiate selective mutism from normal variations in a child's comfort speaking in social settings
 17. Understand the etiology of selective mutism
- B. Trauma and stress-related disorders
1. Recognize the signs and symptoms of post-traumatic stress disorder in children and adolescents and the range of common presentations
 2. Plan the treatment of a child or adolescent with post-traumatic stress disorder
 3. Understand the etiology and environmental contributors to PTSD
 4. Understand the role of medication in the management of acute stress disorder
 5. Understand the role of medication in the management of PTSD
 6. Understand the natural history of PTSD
 7. Recognize the importance of active outreach and screening for PTSD after a traumatic event
 8. Recognize that PTSD may have a delayed onset after a traumatic event
 9. Plan the management of a child with acute stress disorder
 10. Differentiate the prognosis and treatment for PTSD from that for an acute stress disorder
 11. Know the diagnostic criteria, treatment and prognosis for a reactive attachment disorder
 12. Know the diagnostic criteria, treatment and prognosis for an adjustment disorder
- C. Depressive disorders
1. Understand the natural history of depressive disorders including disruptive mood dysregulation disorder, persistent depressive disorder (dysthymia), premenstrual dysphoria, and major depressive disorder
 2. Understand the relationship between temperamental characteristics and depressive disorders
 3. Recognize the social and environmental contributors to the development of depressive symptoms
 4. Recognize the signs and symptoms of dysthymia and the variations in presentation based on developmental stage
 5. Recognize the signs and symptoms of major depression and the variations in presentation based on developmental stage
 6. Recognize the common co-morbid conditions of depressive disorders

7. Understand the pharmacologic treatment of depressive disorders
 8. Understand the psychological interventions for the treatment of depressive disorders
 9. Understand the range of prognoses for children and adolescents with dysthymia or depressive disorders
 10. Differentiate between normal grieving associated with a significant loss and major depressive disorder
 11. Know the familial risk of major depressive disorder in children
 12. Know the diagnostic criteria for depressive disorders
 13. Recognize the family systems factors that contribute to depressive disorders
 14. Understand the epidemiology of depression in children and adolescents (eg, gender-based differences, age-based differences, etc)
- D. Bipolar and related disorders
1. Recognize the signs and symptoms of bipolar disorders
 2. Understand the range of prognoses for children and adolescents with bipolar disorders
 3. Know potential side effects of SSRI treatment for teens with bipolar disorders
- E. Ritualistic/obsessive compulsive behavior
1. Know the natural history of OCD
 2. Understand the impact of OCD symptoms on the child's functioning in his family, at school and with peers
 3. Differentiate OCD from normal variations in obsessive or compulsive personality traits
 4. Understand the range of prognoses for children with obsessive-compulsive disorder
 5. Understand the etiologies of obsessive-compulsive disorder
 6. Know the pharmacological treatments for obsessive-compulsive disorder
 7. Know the diagnostic criteria for OCD
 8. Recognize the signs and symptoms of OCD
 9. Understand the genetics of OCD
 10. Know the psychological treatments for OCD
 11. Recognize the common co-morbid conditions that may be associated with OCD
- F. Suicidal behavior
1. Know the risk factors associated with suicidal behavior in children and adolescents
 2. Know the risk factors associated with a poor prognosis for children and adolescents who have attempted suicide
 3. Know the steps in the prevention of suicidal behavior and management of an adolescent at risk of suicidal behavior
 4. Know how to assess a child or adolescent with suicidal ideation
 5. Know the indications for hospitalization of a child or adolescent at risk of suicide
 6. Recognize the impact of suicide on peers and members of the family
 7. Plan the management of a child with suicidal ideation or behavior
- 14. Substance Use Disorder**
- A. General
1. Know the factors that are associated with substance use/abuse
 2. Know the factors that are protective against substance use/abuse
 3. Understand that early academic failure predisposes to adolescent social-emotional dysfunction, including substance use/abuse

4. Know surveillance and screening techniques for detection of substance use disorder in children and adolescents
 5. Know the criteria for substance use disorder
 6. Know the range of substance-induced disorders, including intoxication, withdrawal and other substance/medication-induced mental disorders
 7. Know the ranges of severity of substance use, from mild to severe
- B. Tobacco use
1. Know the factors that predict high risk for the onset of tobacco smoking in adolescents
 2. Understand the major strategies for prevention of tobacco use in adolescents
 3. Know how to plan a smoking cessation intervention directed at adolescents
 4. Understand the natural history of tobacco use during adolescence
- C. Alcohol use
1. Understand that familial tendencies toward violence or alcoholism may involve both genetic mechanisms and social learning
 2. Know how to screen for excessive alcohol use in adolescents
 3. Recognize the behavioral consequences of alcohol use in adolescents
 4. Know the epidemiology of alcohol use among adolescents
 5. Know the health and behavioral effects of alcohol use
 6. Recognize the co-incidence of chronic alcohol use disorder with other health risks during adolescence (eg, tobacco, depression, sexual activity, school failure)
 7. Recognize the signs and symptoms of increasing alcohol tolerance
 8. Know how to plan an intervention for a child whose parent chronically abuses alcohol
 9. Know the familial pattern of alcohol use disorder
 10. Know how to counsel parents regarding prevention and early intervention of alcohol use disorder
 11. Know the epidemiology of alcohol use disorder in adolescents
 12. Know the natural history of alcohol use disorder in children and adolescents
 13. Know the criteria for referral of adolescents for alcohol use disorder
 14. Know the appropriate treatment for alcohol use disorder
 15. Know office-based interventions for adolescents who are abusing alcohol (eg, rescue plans)
 16. Identify the stages in the continuum of alcohol use disorder (eg, alcohol intoxication, alcohol tolerance, alcohol withdrawal)
- D. Illicit drug abuse
1. Recognize the signs and symptoms of illicit drug use, including cannabis, cocaine, and prescription drugs
 2. Recognize the common signs and symptoms of abuse of stimulant drugs
 3. Recognize the common signs and symptoms of abuse of depressant drugs
 4. Understand that there are problems associated both with the particular substance used and with the vehicle of use (eg, needles, sniffing, etc)
 5. Differentiate between patterns of experimentation and evidence of addiction to illicit drugs
 6. Understand the natural history of drug use disorders
 7. Know the elements of treatment for an adolescent who is abusing illicit chemicals (eg, withdrawal, family therapy, group treatment, such as AA/NA)
 8. Understand the use and limitations of urine and serum drug screens

9. Know surveillance and screening techniques for detection of substance use in adolescents

15. Child Abuse and Neglect

A. Physical abuse

1. Know the parental risk factors associated with physical abuse of young children (eg, stress, isolation, parental abuse, substance abuse, poverty)
2. Know the child risk factors that predispose to physical abuse (eg, prematurity, disability, irritability, male gender)
3. Describe common screening techniques to identify children at risk of physical abuse
4. Recognize signs and symptoms of physical abuse
5. Understand the legal and clinical implications of reporting physical abuse
6. Recognize characteristics of fractures caused by physical abuse
7. Know the signs and symptoms of abusive head trauma
8. Know the appropriate management for a child suspected of having been abused
9. Know the advantages and disadvantages of "family preservation" vs removal of the child from the home in the face of repeated serious physical abuse
10. Know the components of effective programs for the prevention of child abuse
11. Know the long-term outcome of physical trauma

B. Sexual abuse

1. Know the risk factors for sexual abuse
2. Recognize physical signs and symptoms of sexual abuse
3. Recognize psychological symptoms of sexual abuse
4. Know appropriate interviewing techniques for assessing possible victims of sexual abuse
5. Know how to plan the management of a child who has been sexually abused
6. Know the long-term outcomes of childhood sexual abuse
7. Know the epidemiology, including the most common perpetrators, of sexual abuse
8. Know the components of effective school-based programs to prevent sexual abuse
9. Recognize the heightened risk of individuals with developmental disabilities to become victims of sexual abuse
10. Know how to evaluate a child for possible sexual abuse

C. Psychological abuse

1. Know the risk factors for psychological abuse
2. Recognize the signs and symptoms of psychological abuse
3. Know how to plan the management of a child who has been psychologically abused
4. Know the long term outcomes including impact on somatic health, mental health, and future parenting of own children

D. Factitious disorder imposed on another (Munchausen syndrome by proxy)

1. Recognize signs and symptoms suggestive of factitious disorder imposed on another
2. Know family risk factors often seen in cases of factitious disorder imposed on another
3. Know how to plan the management of cases of factitious disorder imposed on another
4. Know how to diagnose factitious disorder imposed on another

E. Child neglect

1. Know common developmental and behavioral sequelae of chronic neglect
2. Understand how the developmental and behavioral symptoms of neglected children vary with stages of development

3. Know the legal definition of child neglect
4. Know how to plan the management of chronic neglect
5. Know the parental risk factors associated with child neglect
6. Recognize child neglect as the most common form of child maltreatment
7. Know the child risk factors that predispose to child neglect
8. Describe interventions that can lower the risk of child neglect (eg, home nurse visits)

16. Somatic Symptom and Related Disorders

A. Chronic pain syndromes and somatic symptom disorder

1. Recognize patterns of chronic or recurrent pain that are commonly seen without evidence of associated tissue damage
2. Know the psychological symptoms and disorders commonly associated with chronic pain
3. Know how to plan initial treatment strategies for a child/adolescent with a recurrent pain syndrome
4. Know the appropriate evaluation of a child with recurrent pains
5. Know the diagnostic criteria for a somatic symptom disorder
6. Know the differential diagnosis for somatic symptom disorder
7. Know the signs and symptoms of complex regional pain syndrome
8. Know the signs and symptoms of fibromyalgia
9. Understand the interaction between psychologic and physiologic factors that produce pain
10. Understand the principles underlying effective medication regimens for the treatment of chronic pain

B. Conversion disorders

1. Know how to plan the management of children/families with somatic symptoms not fully explained by a medical condition
2. Know how to plan the evaluation for a child/adolescent suspected of having a conversion disorder
3. Recognize the common complications of conversion disorders
4. Understand the distinction between primary and secondary gain in conversion disorder
5. Understand the etiology of conversion disorder
6. Understand the importance of symptom modeling in the development of conversion symptoms (eg, pseudoseizures in a patient with seizures)
7. Understand the natural history of conversion symptoms
8. Understand the role of psychosocial stressors in conversion disorder
9. Understand the role of social and cultural factors in the development of somatic symptoms
10. Understand that the particular manifestations of a conversion disorder result from an unconscious process
11. Understand that conversion disorder rarely presents prior to 5 years of age
12. Understand the characteristics and management of group conversion disorder (ie, mass hysteria)

C. Factitious disorder

1. Differentiate between a conversion disorder and a factitious disorder

D. Dissociative disorders

1. Recognize the symptoms of a dissociative disorder

17. Sleep Problems and Sleep-Wake Disorders

A. General

1. Recognize the cultural variations in acceptance of co-sleeping and sleep expectations
2. Know the association of sleep disorders with other psychiatric, developmental, and behavioral disorders
3. Know the different stages of sleep
4. Understand the changes in sleep cycles with development
5. Understand the physiology of sleep cycles
6. Know the behavioral effects of sleep deprivation
7. Understand the changes in the need for sleep with age
8. Know the effects of commonly used medications on sleep

B. Night-time awakening

1. Know the concept of "sleep associations" and its relevance to night-time awakening
2. Know the management of frequent night awakenings
3. Know the epidemiology of night-time awakening
4. Know how to evaluate a child with frequent night-time awakenings

C. Bedtime resistance

1. Relate the ages of peak bedtime resistance to developmental theory
2. Know how to manage bedtime resistance in a developmentally appropriate way
3. Know the classifications of sleep disorders
4. Know how to evaluate a child with bedtime resistance
5. Understand factors that contribute to bedtime resistance
6. Know the epidemiology of bedtime resistance

D. Narcolepsy

1. Recognize the signs and symptoms of narcolepsy
2. Know the familial pattern of narcolepsy
3. Know how to plan the laboratory evaluation of narcolepsy
4. Know the treatment of narcolepsy

E. Breathing-related sleep-wake disorders

1. Know the signs and symptoms of obstructive sleep apnea
2. Understand the impact of obstructive sleep apnea on development and behavior
3. Know the treatment of obstructive sleep apnea
4. Differentiate among obstructive sleep apnea, central sleep apnea, and sleep-related hypoventilation

F. Insomnia disorder

1. Know the criteria for insomnia disorder in children and adolescents
2. Know the differential diagnosis of insomnia
3. Know how to plan the management of a child or adolescent with insomnia
4. Know common pharmacologic management of insomnia

G. Parasomnias

1. Know the primary parasomnias
2. Understand the physiology of sleepwalking and night terrors
3. Know the management of common parasomnias
4. Know the sleep stages associated with common parasomnias
5. Know the epidemiology of common parasomnias
6. Differentiate between night terrors and nightmares

- H. Circadian rhythm sleep-wake disorders
 - 1. Know the criteria for delayed and advanced sleep phase type
 - 2. Know the criteria for irregular sleep-wake type
 - 3. Know the differential diagnosis for circadian rhythm sleep-wake disorders
 - 4. Know the treatment for circadian rhythm sleep-wake disorders
- I. Restless legs syndrome
 - 1. Know the criteria for restless legs syndrome
 - 2. Know the differential diagnosis for restless legs syndrome
 - 3. Know the treatment for restless legs syndrome
- J. Other sleep problems
 - 1. Know the criteria for rapid eye movement sleep behavior disorder
 - 2. Know the criteria for substance/medication-induced sleep disorder
 - 3. Know the differential diagnosis for substance/medication-induced sleep disorder

18. Feeding and Eating Problems

- A. Obesity
 - 1. Know the diagnostic criteria for obesity
 - 2. Know the epidemiology of obesity
 - 3. Describe the environmental factors that contribute to obesity
 - 4. Know the psychosocial problems commonly associated with obesity
 - 5. Know how to plan the management of an infant, child, or adolescent with obesity
 - 6. Recognize the importance of behavioral interventions in the prevention and treatment of obesity
 - 7. Know how to plan an obesity prevention program
 - 8. Know how to evaluate a child with obesity for an underlying endocrinopathy or genetic syndrome
 - 9. Understand the risk for obesity in children receiving atypical antipsychotics
- B. Failure to thrive (FTT)
 - 1. Know how to identify failure to thrive (FTT)
 - 2. Understand the etiology of FTT
 - 3. Understand the importance of the social circumstances for a child with FTT
 - 4. Recognize the developmental and behavioral conditions associated with FTT
 - 5. Understand the prognosis for children with FTT
 - 6. Know how to plan the management of behavioral and developmental conditions associated with FTT
- C. Anorexia nervosa, bulimia nervosa, and binge eating disorder
 - 1. Know the diagnostic criteria for anorexia nervosa
 - 2. Know the diagnostic criteria for bulimia nervosa
 - 3. Know the diagnostic criteria for binge-eating disorder
 - 4. Understand the association of body-image disorders with anorexia and bulimia
 - 5. Know the pre-morbid behaviors that may be associated with anorexia or bulimia
 - 6. Recognize the signs and symptoms of anorexia, bulimia, and binge eating disorder
 - 7. Know the differential diagnosis of a patient with anorexia, bulimia, and binge eating disorder
 - 8. Recognize the medical complications of anorexia, bulimia, and binge eating disorder
 - 9. Know the criteria for hospitalization of a patient with anorexia or bulimia
 - 10. Know the psychiatric co-morbidity of anorexia, bulimia, and binge eating disorder

11. Understand the prognoses of anorexia and bulimia

D. Disorders of feeding in infants and toddlers

1. Know the developmental progression of food selectivity in children
2. Know the diagnostic criteria for avoidant/restrictive food intake disorder
3. Know the medical, developmental, and psychosocial factors that affect appetite
4. Understand the benefits of a mealtime routine
5. Understand the development of feeding skills in healthy children
6. Know the medical factors that increase risk for feeding disorders in infants and toddlers
7. Know the developmental and behavioral conditions associated with feeding disorders
8. Understand that impairments in feeding skills may manifest as food selectivity
9. Know the physiologic phases of swallowing
10. Recognize the signs and symptoms of gastroesophageal reflux
11. Understand the importance of feeding observation for patients with feeding disorders
12. Know how to evaluate a child who is a picky/selective eater
13. Know how to evaluate a child with rumination
14. Know how to evaluate an infant or toddler with a feeding skill disorder
15. Be able to evaluate whether a child with oral-motor dysfunction is safe to feed orally
16. Know how to plan the management for infants or toddlers with feeding disorders
17. Know the management of a child with picky eating
18. Know the management of avoidant/restrictive food intake disorder
19. Know the differential diagnosis of avoidant/restrictive food intake disorder

19. Elimination Disorders

A. Normal development of continence

1. Know the sex related variability in the development of urinary daytime and night time continence
2. Know the typical developmental course for acquiring stool continence in American children
3. Know the cultural variability in the development of urinary continence

B. Encopresis

1. Know the epidemiology of encopresis
2. Know the medical and psychosocial factors that may predispose to encopresis
3. Know the psychological and behavioral complications of encopresis
4. Understand the pathophysiology of encopresis
5. Understand the role of initial catharsis in the treatment of encopresis
6. Know how to evaluate a child with encopresis
7. Know the treatment of a child with encopresis
8. Understand the time course of recovery of normal bowel function during treatment for encopresis
9. Formulate the differential diagnosis for encopresis
10. Know the diagnostic criteria for encopresis

C. Enuresis

1. Recognize the medical disorders that can present with urinary incontinence
2. Know the pathophysiologic theories of primary enuresis
3. Know that genetic factors, including sex, may predispose a child to nocturnal enuresis
4. Understand the natural history, including spontaneous remission, of nocturnal enuresis

5. Differentiate between primary and secondary enuresis and their etiologies
6. Know how to evaluate a child with nocturnal enuresis
7. Know how to treat a child with nocturnal enuresis
8. Understand the theoretical psychological explanation for the efficacy of urinary alarms
9. Know the indications for pharmacologic management of nocturnal enuresis
10. Know how to evaluate a child with diurnal enuresis
11. Know how to treat a child with diurnal enuresis
12. Know the pharmacologic interventions for nocturnal enuresis
13. Know the epidemiology of enuresis
14. Know the potential side effects of medications used in the treatment of nocturnal enuresis

20. Sexuality

A. Stages of development

1. Know how children of various ages understand sexuality
2. Understand the typical development of sexual behaviors during childhood and adolescence
3. Know the appropriate content of school-based programs on sexuality, at different grade levels

B. Gender dysphoria in children and adolescents

1. Gender dysphoria
 - a. Know the diagnostic criteria for gender dysphoria in children
 - b. Know the variable manifestations of gender dysphoria in prepubertal females and males
 - c. Know the diagnostic criteria for gender dysphoria in adolescents
 - d. Know the variable manifestation of gender dysphoria in adolescent females and males
 - e. Know the comorbidities of gender dysphoria in children and adolescents
2. Sexual deviance
 - a. Recognize children whose sexual interests or activities suggest a history of sexual abuse
 - b. Recognize symptoms of pathological sexual development
 - c. Know approaches to management of sexual deviance in children
3. Sexual orientation
 - a. Understand that sexual orientation is a spectrum
 - b. Know the typical stages of development of sexual orientation in males and females
 - c. Understand the difficulties from the isolation and stigmatization that may occur secondary to sexual orientation and/or gender identity
 - d. Know the impact of sexual orientation and/or gender identity on adolescent development
 - e. Know the range of responses and needs of parents regarding their youth's sexual orientation and/or gender identity
 - f. Know the typical age of self-identification of sexual orientation in the U.S.
 - g. Know the impact of sexual orientation and/or gender identity on the risk of tobacco, alcohol, and other substance abuse

- h. Know the impact of sexual orientation and/or gender identity on the risk for emotional and behavioral disorders (eg, restrictive eating disorders, depression, and suicide)
- C. Sexuality in developmental disorders
 - 1. Recognize the healthy drive for sexuality among individuals with developmental disabilities
 - 2. Know the challenges to sexuality that face individuals with developmental disorders
 - 3. Be able to develop a plan for sexuality counseling directed to individuals with developmental disabilities

21. Atypical Behaviors

- A. Repetitive behaviors and habits
 - 1. Differentiate between normal variations in repetitive behaviors and stereotypic movement disorder
 - 2. Know the potential medical complications of repetitive behaviors such as nail-biting, nose-picking, and hair-pulling
 - 3. Know how to evaluate a child with repetitive behaviors such as nail-biting, nose-picking, and hair-pulling
 - 4. Know how to plan the treatment for a child with repetitive behaviors such as nail-biting, nose-picking, and hair-pulling
 - 5. Know the theories related to the etiology of repetitive behaviors
- B. Tics
 - 1. Differentiate tics from voluntary and other involuntary movements, such as chorea, athetosis, and ballismus
 - 2. Know the epidemiology of tics and tic disorders
 - 3. Know the diagnostic criteria for tic disorders, including provisional tic disorder, persistent motor or vocal tic disorder, and Tourette disorder
 - 4. Describe the natural history of tics and tic disorders
 - 5. Know the conditions commonly associated with Tourette disorder (eg, ADHD and OCD)
 - 6. Understand the pathophysiology of Tourette disorder
 - 7. Plan the evaluation of a child with a tic disorder
 - 8. Plan the treatment for a child with a tic disorder
 - 9. Know the pharmacologic interventions that can be helpful in management of tics
 - 10. Recognize the behavioral and developmental complications of Tourette disorder
 - 11. Understand the genetics of Tourette disorder
- C. Self-injurious behaviors without developmental disabilities
 - 1. Know the epidemiology of self-injurious behavior in children without developmental disabilities
 - 2. Understand the natural history of self-injurious behavior in children without developmental disabilities
 - 3. Recognize the signs of self-injurious behaviors that occur in adolescents without developmental disabilities
 - 4. Distinguish between self-injurious behaviors that are suicidal in intent, and those that are not
 - 5. Know how to evaluate an adolescent without disabilities who engages in self-injurious behaviors

6. Know how to plan the treatment of an adolescent without disabilities who engages in non-suicidal self-injurious behaviors
7. Know the potential causes and associated conditions of self-injurious behavior in children without developmental disabilities
8. Know the conditions commonly associated with self-injurious behavior in children without developmental disabilities

D. Repetitive/disruptive/self-injurious behavior in dev. disabilities

1. Know the epidemiology of self-injurious behavior among children with developmental disabilities
2. Recognize the specific genetic disorders that are associated with an increased risk of self-injurious behavior
3. Describe the complications that may result from self-injurious behavior in children with developmental disabilities
4. Understand the etiologies of self-injurious, repetitive, and disruptive behavior among children with developmental disabilities
5. Understand the role of functional behavioral analysis in the evaluation of self-injurious, repetitive, and disruptive behaviors in children with developmental disabilities
6. Know how to plan the management for patients with developmental disabilities who engage in self-injurious, repetitive, or disruptive behavior
7. Know the pharmacologic treatment of self-injurious behaviors
8. Recognize the spectrum of repetitive behaviors that may be seen in children with autism spectrum disorder
9. Know that some self-injurious, disruptive, or repetitive behaviors may be the result of an unrecognized medical disorder in patients with developmental disabilities
10. Know how to evaluate a child with a developmental disability who engages in repetitive, disruptive, or self-injurious behaviors
11. Know the pharmacologic management of repetitive behaviors in individuals with developmental disabilities
12. Know the pharmacologic management of disruptive behaviors in individuals with developmental disabilities
13. Know the behavioral treatments that may be used for self-injurious, repetitive, or disruptive behaviors in children with developmental disabilities

E. Alterations in mental status

1. Recognize the signs and symptoms of delirium
2. Recognize the signs and symptoms of dementia
3. Understand the heightened risk for delirium or dementia in some disorders causing developmental disabilities
4. Know the differential diagnosis for delirium and dementia
5. Plan the evaluation of a child with delirium or dementia

22. Law, Policy, and Ethics

A. Legal rights and processes

1. Individuals with disabilities
 - a. Know the criteria for early intervention or special education for children from birth through 21 years of age

- b. Understand the different implications of the Americans with Disabilities Act for public, private, and parochial schools
 - c. Know the components of an Individual Family Service Plan (IFSP)
 - d. Understand parents' rights to participate in special education decisions as described in the Individuals with Disabilities Education Act (IDEA)
 - e. Understand how to apply the concept of least restrictive environment to designing an educational program for a child with a disability
 - f. Understand the importance to special education of the related concepts of natural environments, inclusion, and mainstreaming
 - g. Appreciate the right to a publicly funded evaluation and special education services for all children in need, including those attending private and parochial schools
 - h. Recognize the necessity to provide medical services within the school setting if required by a child in order to participate in an educational program
 - i. Understand the components of the Individuals with Disabilities Education Act (IDEA)
 - j. Describe the eligibility criteria for services described in the Individuals with Disabilities Education Act (IDEA)
 - k. Know the guidelines for school disciplinary procedures described in the Individuals with Disabilities Education Act (IDEA)
 - l. Know the application of the Americans with Disabilities Act and special education law to higher education
- B. Educational administration and processes
 - 1. Understand the role of a pediatrician in initiating and participating within a school evaluation of a child with learning problems
 - 2. Know the purpose and limitations of an individualized education program
 - 3. Know the differences between special education services provided under an individualized education program and those provided under Section 504 of the Rehabilitation Act
- C. Health care structures and processes
 - 1. Understand the impact of various healthcare financing arrangements on the quality of services for children with special healthcare needs
 - 2. Appreciate the financial incentive for insurance companies to discourage enrollment of children with special healthcare needs
 - 3. Know the ethical implications of financial disincentives to specialty referrals within managed care systems and its differential impact on children with special healthcare needs
 - 4. Be familiar with issues relating to the impact of mental health carve-outs on the quality of and access to mental health services for children
- D. Advocacy (See also XVIII.D.)
 - 1. Know how to advocate within a school system for a child with learning problems, utilizing both informal means and due process
 - 2. Know how to advocate for children with disabilities at the local, state, and federal level
- E. Ethics
 - 1. Treatment

- a. Understand the ethics of participation of the competent adolescent patient in decisions to withhold treatment in serious, life-threatening medical conditions
- b. Understand the appropriateness of psychiatric hospitalization of a young adolescent who the clinician feels is at serious risk of self-harm when the parent and child do not agree to hospitalization
- c. Understand the legal and ethical implications of drug screening in adolescents
- d. Understand the ethical implications of potential financial conflicts of interest of treating physicians and how to avoid and manage such potential conflicts
- e. Know the limits of confidentiality of disclosures of child patients to physicians

23. Core Knowledge in Scholarly Activities

A. Principles of Use of Biostatistics in Research

- 1. Types of variables
 - a. Distinguish types of variables (eg, continuous, categorical, ordinal, nominal)
 - b. Understand how the type of variable (eg, continuous, categorical, nominal) affects the choice of statistical test
- 2. Distribution of data
 - a. Understand how distribution of data affects the choice of statistical test
 - b. Differentiate normal from skewed distribution of data
 - c. Understand the appropriate use of the mean, median, and mode
 - d. Understand the appropriate use of standard deviation
 - e. Understand the appropriate use of standard error of the mean
- 3. Hypothesis testing
 - a. Distinguish the null hypothesis from an alternative hypothesis
 - b. Interpret the results of hypothesis testing
- 4. Statistical tests
 - a. Understand when to use and how to interpret the chi square test
 - b. Understand when to use and how to interpret tests comparing continuous variables between two groups (eg, t test, Mann Whitney U)
 - c. Understand when to use and how to interpret tests comparing continuous variables between three or more groups (eg, ANOVA, Kruskal-Wallis)
 - d. Understand when to use paired tests
 - e. Understand the appropriate use of parametric versus nonparametric tests
 - f. Interpret a p value
 - g. Interpret a p value when multiple comparisons have been made
 - h. Interpret a confidence interval
 - i. Identify a type I error
 - j. Identify a type II error
- 5. Measurement of association and effect
 - a. Understand how to interpret relative risk and absolute risk
 - b. Understand how to interpret odds ratio
 - c. Understand how to interpret number needed to treat or harm
 - d. Understand how to interpret hazard ratio
 - e. Understand when to use and how to interpret correlation coefficient
- 6. Regression
 - a. Understand when to use and how to interpret regression analysis (eg, linear, logistic)

- b. Understand when to use and how to interpret survival analysis (eg, Kaplan Meier)
- 7. Diagnostic tests
 - a. Recognize the importance of an independent "gold standard" in evaluating a diagnostic test
 - b. Interpret sensitivity and specificity
 - c. Interpret positive and negative predictive values
 - d. Understand how disease prevalence affects the positive and negative predictive value of a test
 - e. Interpret a receiver operating characteristic curve
- 8. Systematic reviews and meta-analysis
 - a. Understand the purpose of a systematic review
 - b. Understand the advantages of adding a meta-analysis to a systematic review
 - c. Interpret the results of a meta-analysis
- B. Principles of Epidemiology and Clinical Research Design
 - 1. Assessment of study design, performance and analysis (internal validity)
 - a. Recognize and understand the strengths and limitations of a cohort study, case control study, and randomized controlled clinical trial
 - b. Recognize the use and limitations of surrogate endpoints
 - c. Understand the use of intent-to-treat analysis
 - d. Understand how sample size affects the power of a study
 - 2. Assessment of generalizability (external validity)
 - a. Understand how nonrepresentative samples can bias results
 - b. Assess how the data source (eg, diaries, billing data, discharge diagnostic code) may affect study results
 - 3. Bias and confounding
 - a. Identify common strategies in study design to avoid or reduce bias
 - b. Identify common strategies in study design to avoid or reduce confounding
 - 4. Causation
 - a. Understand the difference between association and causation
 - 5. Incidence and prevalence
 - a. Distinguish disease incidence from disease prevalence
 - 6. Screening
 - a. Understand factors that affect the rationale for screening for a condition or disease (eg, prevalence, test accuracy, risk benefit, disease burden, presence of a presymptomatic state)
 - 7. Cost benefit, cost effectiveness, and outcomes
 - a. Interpret cost-effectiveness ratios
 - b. Distinguish costs from charges
 - c. Understand quality-adjusted life years
 - 8. Measurement
 - a. Understand the types of validity that relate to measurement (eg, face, construct, criterion, predictive, content)
 - b. Distinguish accuracy from precision
 - c. Understand when to use and how to interpret a kappa coefficient
- C. Ethics in Research
 - 1. Professionalism and misconduct in research

- a. Identify and manage potential conflicts of interest in the funding, design, and/or execution of a research study
 - b. Identify various forms of research misconduct (eg, plagiarism, fabrication, falsification)
 - c. Know how, and to whom, to report concerns of research misconduct
- 2. Principles of research with human subjects
 - a. Understand and contrast the functions of an Institutional Review Board and a Data Safety Monitoring Board
 - b. Recognize the types of protections in designing research that might be afforded to children and other vulnerable populations
 - c. Understand the federal regulatory definitions regarding which activities are considered research and what constitutes human subjects research
 - d. Understand the federal regulatory definition of minimal risk and apply this to research involving children
 - e. Understand the ethical considerations of study design (eg, placebo, harm of intervention, deception, flawed design)
- 3. Principles of consent and assent
 - a. Understand what constitutes informed consent in research
 - b. Distinguish between consent and assent in research involving children
- D. Quality Improvement
 - 1. Design of a Project
 - a. Understand various models of quality improvement and recognize that all utilize a data-informed, iterative process using tests of change to achieve a stated aim
 - b. Understand that the aim of any quality improvement project should be specific, measurable, achievable, realistic, and time-limited
 - c. Understand strategies to optimize identification of key drivers and interventions to achieve a specific aim
 - d. Understand tools to facilitate completion of quality improvement work, including key driver diagrams and process maps
 - e. Understand each phase of a Plan-Do-Study-Act (PDSA) cycle
 - 2. Data and Measurement
 - a. Differentiate between process, outcome, and balancing measures
 - b. Interpret a run chart and identify shifts, trends, and outliers in data
 - c. Differentiate between a run chart and a control chart
 - d. Differentiate between common cause and special cause variation