Project TIE (Teams in Early Intervention) was conceptualized to meet the need for: (1) involvement of formerly "ancillary" service professionals in early intervention for children with disabilities, (2) high quality family-centered services, and (3) training in the team approach. The project provides training to four groups that might constitute an early intervention team--speech/language pathologists, motor therapists, health care professionals, and family members. The goal of this training module is to have team members understand how health care professionals approach developmental concerns. The module presents reasons for consulting with health care professionals, a framework for effective communication, medical risk factors for developmental problems, the medical work-up of a child with developmental delay, growth parameters, what other team members want from health care professionals, and application of the health care professional's expertise to the Performance Competence Model (which determines how children interact with their environment). The module includes an outline of content in each of these areas and copies of 16 overheads and handouts. (JDD)
TEAMS IN EARLY INTERVENTION

Healthcare Professional Module

Cate McClain, M.D., P.T.
Stan Handmaker, M.D., Ph.D.
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This module was designed to be used in conjunction with the INTRODUCTORY MODULE which includes the background and philosophical framework for the project as well as the essential information needed to use this module effectively. Read the INTRODUCTORY MODULE before using information in this module.

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    B. 1 year old - A Child with Down Syndrome
    C. 2 year old - A Child with Delayed Language Development
I. REASONS FOR CONSULTING WITH HEALTH CARE PROFESSIONALS (HCP)

CONTENT SUMMARY: Health care professionals may be consulted because of acute medical needs, such as ear infections and sore throats, or for management of chronic health needs, such as seizure control or asthma management. One might also consult a health care professional about medical issues related to a specific disability or to seek a second opinion or more information about a particular diagnosis or treatment plan. Contact with a health care professional may be necessary in order to obtain a prescription or referral for services.

GOAL: Participants will come away with an understanding of how a health care professional might approach a developmental concern. The primary goal of the health care professional is to establish whether the presenting complaint is acute or chronic in nature. Once this is established, a diagnostic work-up can be pursued and a treatment plan initiated.

A. Presenting Concerns

1. Changes in behavior or deviation of behavior
   a. Rule out an acute infectious, pulmonary, neurologic, metabolic, or surgical problem.
   b. Neurologic/developmental work-up
   c. Possible referrals

2. Motor Delays and Movement Difficulties
   a. Rule out acute process
   b. Orthopedic/neurologic/developmental/metabolic work-up
   c. Appropriate referrals
3. Feeding Difficulties
   a. Rule out acute process
   b. G.I./neurologic/metabolic/developmental work-up
   c. Appropriate referrals

4. Speech and language difficulties
   a. Rule out hearing loss
   b. Neurologic/developmental work-up
   c. Appropriate referrals
II. FRAMEWORK FOR EFFECTIVE COMMUNICATION

CONTENT SUMMARY: For the child and family to receive optimum care, effective communication must be established.

GOAL: Participants will understand the role of the medical personnel in the team process.

A. The Evolution of the Medical Role in Early Intervention Services

B. The Medical Team Collaboration with the Family in Caring for the Child

C. The Physician/Nurse Can Provide
   1. Interpretation of medical information
   2. Medical diagnosis and possible prognosis
   3. Etiologic information
   4. Anticipatory guidance
   5. Information as to how medical diagnosis may relate to specific developmental concern
   6. Support
III. MEDICAL RISK FACTORS FOR DEVELOPMENTAL PROBLEMS

CONTENT SUMMARY: A discussion of prenatal, perinatal and postnatal risk factors that have been related to subsequent developmental problems.

GOAL: Participants will understand the broad etiologic categories that might result in delayed or disordered development.
IV. THE MEDICAL WORK-UP OF A CHILD WITH DEVELOPMENTAL DELAY

CONTENT SUMMARY: The content of a complete medical evaluation of a child with a developmental disability will be discussed.

GOAL: Participants will understand the basic areas covered in the medical evaluation.

A. Perinatal History
B. Medical History
C. Family History
D. Developmental and Growth History
E. Physical Examination
   1. General appearance and behavior
   2. Growth parameters
   3. General physical examination
   4. Dysmorphology examination
   5. Neurologic examination
   6. Vision and hearing screening
V. GROWTH PARAMETERS

CONTENT SUMMARY: The ascertainment of accurate growth data (weight, height, and head circumference) as part of the complete medical evaluation of any child will be discussed, as well as why they are so important. Normal and abnormal growth patterns, both prenatal and postnatal, will be discussed. The accurate measurement of head circumference and the relationship of head circumference to development will be discussed.

GOAL: Participants will understand how growth data is obtained and what variations in growth patterns may indicate.

A. Accurate Growth Data Collection and Plotting
   1. Weight and height (standing and supine)
   2. Head circumference
   3. Plotting the data on growth charts

B. Prenatal and Postnatal Growth
   1. Newborn growth charts
   2. Growth charts for ages 0-36 months (male and female)
   3. Growth charts for ages 2-18 years (male and female)
   4. Nellhaus growth charts for head circumference

C. Possible Etiologies of Aberrant Growth and Relationship of Head Circumference to Development.
I. SYNOPSIS OF INFORMATION SHARED IN OTHER GROUPS

GOAL: HCPs will learn the information that was shared by each of the other groups of families and professionals.

CONTENT SUMMARY: A condensed version of the major points covered in the HCP content for the other three groups (OT/PT, SLP, and Families) will be discussed.

A. Communication Issues Between The HCP and Families or Other Professionals

1. The “medical model”
2. Collaboration with others
3. What the HCP can provide for the team

B. Reasons for Consulting With a HCP

C. Medical Risk Factors for Developmental Problems

D. Medical Work-Up of A Child With Developmental Delay

E. Growth Parameters
II. WHAT DO OTHER TEAM MEMBERS WANT FROM HCPs?

GOAL: HCPs will understand what the other team members need from them in order for the team to work effectively with a child. Participants will collaborate and develop suggestions based on what they learned from the other disciplines.

A. Families

B. Occupational/Physical Therapists

C. Speech/Language Pathologists
III. APPLICATION OF THE HCP EXPERTISE TO THE PERFORMANCE COMPETENCE MODEL

CONTENT SUMMARY: Examples of particular medical issues, such as colic and recurrent otitis media, and how these might interfere with a child's performance and competence will be discussed using the Performance Competence Model. The participants in the HCP group will generate other examples of how medical issues could relate to development using the Performance Competence Model.

GOAL: The Performance Competence Model will be used to understand development as a whole. Particular emphasis will be placed on the possible interference of development by medical issues.

A. Givens

1. Predispositions
2. Basic biological drives

B. Underlying Factors for Producing An Efficient Adaptive Response

1. Internal self-regulatory functions
2. Purposive systems
3. Ability to achieve, change, and maintain a state of arousal
4. Freedom and control of movement
5. Orientation to stimulus
6. Discrimination
7. Attention (or selective attention)
Healthcare Professional Module

C. Developmental Sequence
1. Comfort and safety
2. Confidence
3. Risk-taking
4. Competence

D. What We Think, Feel, and Do
1. Spiritual
2. Emotional
3. Intellectual
4. Physical

E. Environment and Culture
1. Quality of life
2. Membership
3. Personal sense of competence
IV. CASE STUDY APPLICATION TO THE PERFORMANCE COMPETENCE MODEL

CONTENT SUMMARY: Participants will discuss specific aspects of three different children's performance in relation to the Performance Competence Model. (See game cards in Introductory Module.)

GOAL: The HCPs will use mini-case studies to practice the use of the model to provide information about the performance of young children for other team members within a common framework.

A. Newborn—A Child Prenatally Exposed to Drugs/Alcohol

B. 1 year old—A Child with Down Syndrome

C. 2 year old—A Child with Delayed Language Development
OVERHEADS

&

HANDOUTS
<table>
<thead>
<tr>
<th>Presenting Concerns (acute vs. chronic)</th>
<th>Possible Medical/Organic Causes</th>
<th>Response to Concern When Organic Causes Ruled Out/Parent Perceptions + Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Irritability/lethargy</td>
<td>- Infectious - meningitis, sepsis</td>
<td>- Detailed description of circumstances surrounding concerning behavior</td>
</tr>
<tr>
<td>- Hard to console</td>
<td>- Neurological - autism, FAS, CP,</td>
<td>- Information re: behavior validation of concerns</td>
</tr>
<tr>
<td>- Sleeping problems</td>
<td>hydrocephalus</td>
<td>- Anticipatory guidance</td>
</tr>
<tr>
<td>- ↓ cuddly</td>
<td>- Surgical abdomen - intussuption,</td>
<td>- Possible referrals:</td>
</tr>
<tr>
<td>- colic</td>
<td>volvulus</td>
<td>parent support</td>
</tr>
<tr>
<td></td>
<td>- Pulmonary - pneumonia, FB, asthma</td>
<td>parenting classes/resources</td>
</tr>
<tr>
<td></td>
<td>- Trauma - shaken baby syndrome</td>
<td>family counseling</td>
</tr>
<tr>
<td></td>
<td>- Diet - breast fed, formula, milk intolerance</td>
<td>OT for child</td>
</tr>
<tr>
<td>- Unusual response to sensory stimuli (slow process, pain)</td>
<td>- R/O visual or auditory deficit</td>
<td>- As above then: further evaluation of development possible referrals:</td>
</tr>
<tr>
<td></td>
<td>- Neurological - autism, CP</td>
<td>OT/PT early intervention</td>
</tr>
<tr>
<td></td>
<td>- Diet</td>
<td></td>
</tr>
<tr>
<td>- Attention (↓d)</td>
<td>- Neurological - autism, MR, sensory deficits</td>
<td>- Possible referrals:</td>
</tr>
<tr>
<td>- ↓ activity level</td>
<td>- Hearing</td>
<td>ophthalmology</td>
</tr>
<tr>
<td></td>
<td>- Vision</td>
<td>audiology</td>
</tr>
<tr>
<td></td>
<td>- Psychological - depressions</td>
<td>counseling</td>
</tr>
<tr>
<td></td>
<td>- Toxins</td>
<td>early intervention</td>
</tr>
<tr>
<td>&quot;Too easy&quot; or &quot;too difficult&quot;</td>
<td>- Neurological</td>
<td>- Referrals: family counseling</td>
</tr>
<tr>
<td></td>
<td>- Psychological - environmental family</td>
<td></td>
</tr>
<tr>
<td>- Motor delays</td>
<td>- Neurological - CP, Muscular Dystrophy</td>
<td>- Extensive review of history (has the child been chronically ill?)</td>
</tr>
<tr>
<td></td>
<td>- Developmental - prematurity</td>
<td>- Review psychosocial history (child's environment, child neglect or abuse?)</td>
</tr>
<tr>
<td></td>
<td>- Dysmorphological</td>
<td>- Comprehensive developmental evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Early intervention services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- PT/OT</td>
</tr>
</tbody>
</table>

Dr. Cate M. 1992
<table>
<thead>
<tr>
<th>Presenting Concerns (acute vs. chronic)</th>
<th>Possible Medical/Organic Causes</th>
<th>Response to Concern When Organic Causes Ruled Out/Parent Perceptions + Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Muscle tone problems</td>
<td>-Neurological - CP, myopathy, neuropathy, hydrocephalus, CNS or spinal cord tumor -Infectious - meningitis -Toxins - lead</td>
<td>-Comprehensive developmental evaluation -Early intervention -PT/OT</td>
</tr>
<tr>
<td>stiffness or floppiness</td>
<td></td>
<td></td>
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<tr>
<td>difficulty with head control</td>
<td></td>
<td></td>
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<tr>
<td>poor balance</td>
<td></td>
<td></td>
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<tr>
<td>poor coordination/awkward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Asymmetry of movement</td>
<td>-Neurological - hemiplegia, neuropathy -Orthopaedic - fracture, joint pain -Infectious - septic joint, osteomyelitis</td>
<td>-PT/OT evaluation -Developmental evaluation</td>
</tr>
<tr>
<td>-Toe walking</td>
<td>-Neurological - CP, muscular dystrophy -Orthopaedic - leg length discrepancy, structural abnormality, pain -Rheumatological - joint pain, swelling</td>
<td>-PT/OT evaluation</td>
</tr>
<tr>
<td>-Difficulty with eye-hand coordination</td>
<td>-Neurological - Vision</td>
<td>-PT/OT evaluation</td>
</tr>
<tr>
<td>-Difficulty with self-help skills</td>
<td>-Developmental - Neurological - Vision -Orthopaedic - structural abnormality resulting in J’d range of motion</td>
<td>-Comprehensive developmental evaluation -PT/OT</td>
</tr>
<tr>
<td>-Feeding difficulties (sucking, chewing, choking)</td>
<td>-Neurological - CP -ENT - structural abnormalities -Gastrointestinal - reflux, dysphagia -Pulmonary - aspiration, asthma infection -Dental - abnormalities, caries</td>
<td>-PT/OT -Speech therapy</td>
</tr>
<tr>
<td>-Excessive drooling</td>
<td>-Neurological - ENT - structural abnormality, enlarged tonsils, foreign body -Dental - caries, infections</td>
<td>-Speech therapy -PT/OT</td>
</tr>
<tr>
<td>-Picky eater</td>
<td>-Developmental - is it appropriate for developmental age? -Nutrition</td>
<td>-Anticipatory guidance</td>
</tr>
<tr>
<td>-Sloppy eater</td>
<td>-Neurological - Dental -ENT</td>
<td>-Speech therapy evaluation -OT evaluation</td>
</tr>
<tr>
<td>-Speech difficulties - not talking, hard to understand</td>
<td>-Neurological -Developmental - other areas -Audiological</td>
<td>-Audiological evaluation -Developmental testing -Speech therapy</td>
</tr>
</tbody>
</table>
Medical Risk Factors for Developmental Problems

The following is a list of risk factors associated with an increased risk of later developmental problems. Many children with a history that includes one or more of these risk factors will, fortunately, go on to develop normally.

Prenatal Risks

1. Hereditary Disorders
   a. inborn errors of metabolism (ex.: Tay Sachs, PKU)
   b. single gene abnormalities (ex.: tuberous sclerosis, neurofibromatosis)
   c. chromosomal aberrations (ex.: fragile X, translocations)
   d. polygenic familial syndromes or traits
2. Chromosomal changes including trisomy (ex.: Down Syndrome)
3. Multiple congenital anomalies, brain anomalies
4. Intrauterine infections (ex.: CMV, syphilis)
5. Teratogens, drugs, alcohol
6. Placental insufficiency
7. Fetal malnutrition

Perinatal Risks

1. Asphyxia, hypoxia
2. Prematurity
3. Infection
4. Metabolic (ex.: hypoglycemia, hyperbilirubinemia, hyperosmolarity)
5. Birth trauma
6. Intraventricular/periventricular hemorrhage

Postnatal Risks

1. Infections (ex.: meningitis, otitis media, pulmonary)
2. Trauma (ex.: motor vehicle accidents, bicycle accidents, child abuse)
3. Asphyxia (ex.: near drowning)
4. Poisoning
EFFICIENT ADAPTIVE RESPONSE
Integration of multiple sensory input
Attention (or selective attention)
Discrimination
Orientation to stimulus
Freedom and control of movement
Ability to achieve, change and maintain state of arousal
Purposive system (spark, curiosity, desire, persistence)
Internal self regulatory functions

Predispositions (temperament, culture, physiological status, genetics, styles)

Basic biological drives (Combine processes into an integrated system, Strive for equilibrium and, Fulfill developmental cycle)

Oetter & StevensDominguez, 1991, Training Unit, UAP/UNM
<table>
<thead>
<tr>
<th>Age Range</th>
<th>Behavior</th>
<th>Developmental Risks: What Can Go Wrong</th>
<th>Assoc. Conditions</th>
<th>Possible Therapy Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to 2 months</td>
<td>Regulation and interest in world Can terminate interaction Shows response to mother's voice Mutual eye gaze Differentiated cry Efficient sucking Primitive reflexes</td>
<td>Lack of self-regulation No mutual eye gaze Lack of response to voice Strange cry/much crying Difficult consoling/poor sootheability Resists cuddling Problems with suck/seat</td>
<td>Prematurity Syndromes (Down, Cri du Chat, etc.) Poor vision/poor ocular motor control Poor head control Poor hearing Poor sensory processing</td>
<td>Focus on caregivers' reading and responding to early cues</td>
</tr>
<tr>
<td>2 - 4 months</td>
<td>Preferential response to smiles Cooing and gooing Repeats pleasant behavior Can start and stop interactions Tracks objects</td>
<td>Lack of clear cues/lack of affect Lack of sense of preference Minimal vocalization Inability to calm self Doesn’t start and stop Interactions</td>
<td>As above Intubation/gastrostomy Respiratory distress Deficits in sensory/motor integration Developmental delay Failure to thrive Abuse and neglect</td>
<td>Continue above Health and motor development for facilitating stronger signalling cues</td>
</tr>
<tr>
<td>4 - 8 months</td>
<td>Through generalized movements, indicates desire for repetition of activity Reaches toward or moves toward desired object Turns to mother's voice Laugh triggered by touch Babbling/vocal play (increased variety of sounds-influenced by body posture) Variety of facial, gestural expressions Interests/exploration of objects</td>
<td>Minimal/uncoordinated movement Not achieving motor milestones Baby avoids or doesn't respond to touch Lack of limited sound play Minimal expression of emotion Decreased exploration</td>
<td>As above Begin diagnosing specific motor disorders Parents begin to suspect a problem Otitis media</td>
<td>As above Caregiver begins to follow child's lead Module nonverbal expressions and vocalizations (reduce or intensity)</td>
</tr>
<tr>
<td>8 - 12 months</td>
<td>Specific means to achieve goals Variety of actions on objects/exploration Joint attention Comprehension of &quot;no&quot; and familiar words Intentional communication for variety of purposes Beginning adult-like intonation Imitates new sounds that are similar to those already produced Turn-taking routines (verbal/nonverbal) Some imitation of familiar facial expression</td>
<td>Limited exploration of toys Limited intentional communication/law purposes for communication Lack of interest in people or objects Decrease in sound production/imitation of new sounds Noted lack of affect</td>
<td>As above Deafness Blindness Specific communication impairment Questions of possible autistic-like behavior might arise</td>
<td>As above Caregiver follows child's lead Turn-taking routines Verbally code child's intentions Use of simple familiar language (imitation/ expansion) Simple oral activities Positioning for play and vocal interaction</td>
</tr>
<tr>
<td>Age Range</td>
<td>Behavior</td>
<td>Developmental Risks: What Can Go Wrong</td>
<td>Assoc. Conditions</td>
<td>Possible Therapy Approaches</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
</tbody>
</table>
| 12 - 17 months | Refine and integrate 8-12 month activities  
Directed protests/tantrums  
Points to desired object  
Starts to use words to communicate/increase of communicative functions  
Jargoning  
May show preference for words that have certain sounds  
Functional use of objects  
Initiates routines  
More sophisticated use of objects to get attention and interact | (Continue issues of 8-12 months)  
Frequent intense, lengthy tantrums  
(escalation of tantrums)  
Overly compliant as compared to others in the culture  
Failure to follow directions/failure to understand names  
Different quality of interactions | Same as above | Same as above |
| 17 - 24 months | Symbolic behavior (play and language)  
Marked increase of vocabulary  
Stability of vocabulary  
Expression of semantic relationships  
Responds to speech with speech Conventionalized forms of behavior to refer  
Use of alternative strategies to achieve goals  
Comprehension of words when referent not present  
Child can get most messages across  
Speech simplification strategies (i.e., final consonant deletion, syllable reduction, consonant cluster reduction, prevocalic voicing, consonant harmony)  
Substantial increase in imitation of facial expression | Refining oral motor skills  
Can't get message across  
Unintelligible to parents  
Easily frustrated in communicative attempts  
Use of unusual or overly frequent use of speech simplification strategies (i.e., deletion of initial consonants, vowel distortion, glottal replacement, backing)  
Inconsistency in articulatory production  
Limited vocabulary  
Slow speed in learning vocabulary  
Not using a variety of semantic relationships  
Doesn't follow directions  
Extreme "shyness" | Specific language disorder  
Dyspraxia  
Motor speech disorder  
Speech sound disorder/phonological process disorder | Can continue earlier strategies  
More structured activities designed to meet goals (in context of play); create opportunity to use targeted language and speech sounds  
Specific language teaching strategies (imitation, expansion, parallel, talk, waiting, modeling)  
Need direct involvement of speech pathologist  
Possibility of joint treatment |
<table>
<thead>
<tr>
<th>Age Range</th>
<th>Behavior</th>
<th>Developmental Risks: What Can Go Wrong</th>
<th>Assoc. Conditions</th>
<th>Possible Therapy Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 3 years</td>
<td>Beginning reference to past and immediate future. Development of play events that are of less frequent experiences or in which child was not an active participant. Development of play sequences increasing sentence length. Asks and answers what, where, who...doing questions. Use of morphological markers and auxiliary verbs. Adult speech can inhibit child’s action. Beginning associative play.</td>
<td>Doesn’t play like other children. Doesn’t interact with other children. Maintains “baby-talk”. Doesn’t understand questions. Unintelligible.</td>
<td>Same as above. Autistic/autistic-like.</td>
<td>Same as above.</td>
</tr>
</tbody>
</table>

Sources: Cohen & Donnellon, 1987; Dunst, 1980; Greenspan & Greenspan, 1985; Khan & Lewis, 1986; Patterson & Westby, in press; Schlefelbusch, 1980; Westby, in press.

Westby & Laurel, 1992, Training Unit, UAP/UNM.
Diagnosis

Prognosis

Interpretation

Anticipatory Guidance

Support
Medical Risk Factors for Developmental Problems

The following is a list of risk factors associated with an increased risk of later developmental problems. Many children with a history that includes one or more of these risk factors will, fortunately, go on to develop normally.

Prenatal Risks

1. Hereditary Disorders
   a. inborn errors of metabolism (ex.: Tay Sachs, PKU)
   b. single gene abnormalities (ex.: tuberous sclerosis, neurofibromatosis)
   c. chromosomal aberrations (ex.: fragile X, translocations)
   d. polygenic familial syndromes or traits

2. Chromosomal changes including trisomy (ex.: Down Syndrome)

3. Multiple congenital anomalies, brain anomalies

4. Intrauterine infections (ex.: CMV, syphilis)

5. Teratogens, drugs, alcohol

6. Placental insufficiency

7. Fetal malnutrition

Perinatal Risks

1. Asphyxia, hypoxia

2. Prematurity

3. Infection

4. Metabolic (ex.: hypoglycemia, hyperbilirubinemia, hyperosmolarity)

5. Birth trauma

6. Intraventricular/periventricular hemorrhage

Postnatal Risks

1. Infections (ex.: meningitis, otitis media, pulmonary)

2. Trauma (ex.: motor vehicle accidents, bicycle accidents, child abuse)

3. Asphyxia (ex.: near drowning)

4. Poisoning

Dr. Cate McClain, 1992; UAP/UNM

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Medical Evaluation

A. Perinatal History

B. Medical History

C. Family History

D. Developmental History

E. Physical Examination
   1. General appearance and behavior
   2. Growth parameters
   3. General physical examination
   4. Dysmorphology examination
   5. Neurologic examination
   6. Vision and hearing screening
BOYS BIRTH TO 36 MONTHS
LENGTH FOR AGE & WEIGHT FOR AGE

NAME
RECORD#
BOYS: 2 TO 18 YEARS

STATURE FOR AGE &
WEIGHT FOR AGE

NAME ____________________________

RECORD # ________________________

Department of Health, Education, and Welfare, Public Health Service,
Health Resources Administration, National Center for Health Statistics, and Center for Disease Control

Head Circumference

BOYS

39
Figure 7-9. Head circumferences. (From Nellhaus, G. Pediatrics, 41:106, 1968. University of Colorado Medical Center Printing Services.)