

# Pediatric Physical Examination Benchmarks

## General Approach

The approach to examining children is flexible. You must establish rapport with the child and the parent before starting the exam. In general, children between the ages of 8 months and 4 years require the most flexible approach. Ideally, you will perform the most “invasive” part of the examination (e.g. the head and neck examination) last.

### ***Do***

Use an age appropriate approach to the examination

- Newborn: Place the newborn on the examination table. Conduct a general assessment by observing the child and then listen to the heart and lungs; once those are accomplished proceed with the remainder of the exam
- Infant/Toddler: You may examine the child in the caregivers lap. Begin slowly with a non-threatening part of the examination, perhaps the hands. Then move to the heart and lung exam. End with the Head and neck examination, focusing on the ears and throat last.
- Older child/adolescent: The sequence of the examination mirrors that of the adult. Pay particular attention to modesty and whether parents will remain in the room.

Assess the child’s growth

- Complete a growth chart accurately plotting height, weight and head circumference on the CDC Growth charts of the United States

Assess the child’s development

- Use a comment developmental screening instrument such as the Denver II or Ages and Stages questionnaire.

### ***Know***

- Be alert to the possibility of a problem when the head circumference is at one extreme or the other
- Sequential measurements of growth are sensitive measures of overall health.
- Alteration in the rate of growth “crossing percentiles” should alert you to possible underlying problems.
- Developmental delays are “red flags” for neurodevelopmental disorders.

The maneuvers you use in the adult physical examination are also used when examining children. The contents of the curriculum and appendices include the basic maneuvers that are unique to pediatric patients or are more challenging to perform in this population. It is expected that you will be able to correctly execute the basic physical examination maneuvers commonly used for all patients.

## **The Newborn Examination**

You should be able to conduct a complete examination of all organ systems in all newborns using an age appropriate approach. Specific maneuvers that are a part of the neonatal examination include:

### **Fontanel assessment:**

#### ***Do***

- Palpate the anterior fontanel, assessing size and firmness
- Palpate the posterior fontanel (many not be able to feel this)

#### ***Know***

- The posterior fontanel usually closes by 6 weeks of age. The anterior fontanel closes by 18 months in most infants.
- Changes in intracranial pressure or hydration status are reflected in changes of the palpable tension of the fontanel (increased with increased intracranial pressure, decreased with dehydration).
- Fontanel size varies tremendously; persistent delays in closure or unusually large size of fontanels (particularly the posterior fontanel) may indicate pathologic bone growth delay.

### **Eye Exam:**

#### ***Do***

- Assess whether the red reflex is present
- Test corneal light reflex

#### ***Know***

- Presence of a red reflex bilaterally suggests absence of cataracts or intraocular pathology.
- Asymmetric corneal light reflex is a sign of strabismus, an imbalance of ocular muscle tone. If this is not corrected early it can lead to blindness

### **Hip Exam:**

#### ***Do***

- Assess the neonate for congenital hip dysplasia by performing:
  1. Barlow Maneuver
  2. Ortolani test

#### ***Know***

- The infant may have a congenitally dislocated or subluxable hip if:
  - You feel or hear a click during either adduction or abduction
  - There is spasm or discomfort of the adductor muscles of the femur

### **Newborn reflexes:**

#### ***Do***

- As part of your newborn exam, elicit the following primitive reflexes.
  - Asymmetric Tonic Neck Reflex (Fencer's position)
  - Moro Reflex (startle response)
  - Palmar grasp
  - Plantar grasp

#### ***Know***

- Reflexes should be symmetric. Asymmetry suggests weakness in a particular muscle group
- Primitive reflexes disappear as the infant matures, persistence of these reflexes is a signal of underlying neurological dysfunction.

## **Skin exam**

### **Do**

- Inspect the all of the skin of the infant (including diaper area)
- Describe (size, shape, color, distribution) of any rashes
- Note any areas lacking skin

### **Know**

- Benign lesions that parents may have questions about include:
  - Small angiomas present on the eye lids, nape of the neck, forehead
  - Milia: small white spots on the skin, particularly on the nose and cheeks
  - Erythema toxicum: yellowish/white pustules on an erythematous base that occur singly or in groups.
- Concerning changes include large angiomas lesions, vesicles, pustules or areas lacking skin
- Midline abnormalities (dimple, hair tuft, moles) on the back may indicate an underlying abnormality in the bones/nervous system.

## **Infant/Toddler Examination**

You should be able to conduct a complete examination of all organ systems in all infants/toddlers using an age appropriate approach. Specific maneuvers that are a part of the infant/toddler examination include:

### **Ear examination**

#### **Do**

- Ask about hearing concerns
- Inspect the ears
  - Pay particular attention to the shape and position of the ears
- Palpate the tragus and posterior auricular area
- Otoscopic exam including insufflation

#### **Know**

- Any delay in language acquisition or loss of language milestones should prompt a referral for formal hearing testing
- Tenderness to palpation of the tragus is indicative of otitis externa
- The most common reason for an immobile tympanic membrane with pneumatic otoscopy is a poor seal between the otoscope and ear canal
- You must assess the movement of the tympanic membrane to determine if a patient has otitis media
- Changes in the appearance of the tympanic membrane highly suggestive of acute infection include: bulging or purulent material visualized behind the tympanic membrane

### **Mouth examination**

#### **Do**

- Inspect the teeth
- Inspect gums, mucosal surfaces and posterior pharynx

#### **Know**

- The numbering system for primary teeth is different than the system used in adults
- Dental caries is the most common chronic illness in the United States. More than 1/2 of children within the U.S. have dental caries. *Streptococcus mutans* is associated with the development of dental caries.
- Using a tongue blade in this population is challenging. Inserting it along the side of the mouth and then gagging the child will allow for an unobstructed view of the posterior pharynx in most children.
- The diagnosis of streptococcal pharyngitis is a laboratory, not clinical diagnosis.

## **Musculoskeletal Examination**

### ***Do***

- Observe the child closely; noting in particular range of motion and limb use
- Inspect the joints for redness or swelling
- Palpate methodically and in a systematic manner the involved area and all other areas that influence the involved area.
  - Note muscles, bony prominences, other important landmarks, and joints of the involved body part.
  - Be observant for pain or warmth
- Assess Active and Passive Range of motion for each major joint.
- Assess the strength major muscle groups of the upper and lower extremities
  - Be able to test pelvic girdle strength

### ***Know***

- Much of your assessment will be derived from observation
- Common normal variants seen in this age group include:
  - Child's feet turn in:
    - Internal Femoral Torsion (femoral anteversion)-femurs are internally rotated & patella are rotated inward. Rotate legs so patellas point straight forward and feet then also point straight ahead
    - Internal Tibial Torsion- patellas point directly ahead and feet turn in
  - Genu Varum (bowlegs) and Genu Valgum (Knock knees): are physiologic in majority of children, Genu varum usually corrects by 2 years old and genu valgum by 4 years of age. If it persists, must rule out pathology
  - Flat feet: normal in children < 2-3 years old. Check to insure good mobility of feet and reassure parents

## **Older child/Adolescent Examination**

You should be able to conduct a complete examination of all organ systems in all adolescents using an age appropriate approach. The physical examination in an older child/adolescent is very similar to that done in adults. Pay particular attention to patient modesty. Specific maneuvers that are a part of the older child/adolescent examination include:

### **Tanner staging**

#### ***Do***

- Assess Tanner staging for both male and female patients
  - Female: Breast and pubic hair
  - Male: genitalia and pubic hair

#### ***Know***

- Pubertal changes typically occur between the ages of 8 and 14 in girls and 9 and 16 in boys. Occurrence of pubertal changes outside these ranges should be evaluated.

## **Musculoskeletal exam**

### **Do**

- Be able to perform a basic musculoskeletal examination (see ICMI benchmarks)

In addition:

- Assess pelvic girdle strength
- Back examination
  - Inspect the back for spinal dimples & midline abnormalities such as a tuft of hair, midline nevi or central dimple (this should be done through out childhood)
  - Assess symmetry of the back/spine:
    - Shoulders should be at the same level, as should posterior superior iliac crest
    - Have the child bend forward at the waist keeping knees straight and allowing arms to hang freely; ribs/thorax should be symmetric.

### **Know**

- Gower's sign occurs when a child is unable to rise from a sitting to standing position without assistance. This sign indicates proximal muscle weakness
- Midline abnormalities may indicate an underlying spinal cord or vertebral abnormality
- Scoliosis occurs is common in children and screening is a part of the adolescent or older child examination
- Excessive thoracic kyphosis that persists when the child lies down is pathologic

## **Suggested Readings:**

Goldbloom, R B. Pediatric Clinical Skills, 3<sup>rd</sup> edition. 2003 Elsevier Science (USA) Philadelphia.

*This is a gold mine of tips and techniques for the pediatric history and physical. Excellent pictures and explanations are included in each chapter.*

Bickley, LS and PG Szylagyi. Bates' Guide to Physical Examination and History Taking, 8<sup>th</sup> edition. 2003. Lippincott Williams & Wilkins, Philadelphia.

*This textbook provides an excellent basic introduction to the pediatric history and physical.*

Zitelli, BJ and H. W. Davis. Atlas of Pediatric Physical Diagnosis, 4th Edition. 2002 Elsevier Science, Philadelphia.

*This book is an outstanding reference for physical diagnosticians in pediatrics. It provides both normal and abnormal findings and is subdivided by subspecialty with an emphasis on diagnoses that have significant findings on physical exam.*