

# HISTORY AND PHYSICAL EXAMINATION FOR THE PEDIATRIC PATIENT

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## Learning Objectives:

- Identify important aspects of the medical history of pediatric patients.
- Explain the significance of findings from the pediatric medical history.
- Describe techniques used in physical examination of the pediatric patient.
- Explain the significance of findings from the pediatric physical examination.
- Describe techniques used in neurologic examination of pediatric patients.
- Explain the significance of findings from the neurologic examination.

## Pediatric History

## Information Sources

- Parent, loco-parentis
- Patient
- Medical record
- Transport personnel

## Information Source

- Status of informant
  - △ Cognition- reliability of information
  - △ Emotions- accuracy of information
  - △ Culture- viewpoints of disease
  - △ Education level
    - ▶ communication, language skill
    - ▶ comprehension of questions, answers

## General Information

- Name
- Age, birth date
- Gender
- Race, ethnicity
- Referral source

### **Chief Complaint**

- What concerns you?
- Why did you bring him/her here?

### **History of Present Illness**

- The child was   ?   until   ?   days ago
- Events leading up to admission
  - △ Signs
  - △ Symptoms
  - △ Treatments- medications

### **Prenatal/maternal history**

- Maternal health
  - △ medications?
  - △ intrauterine infections?
    - congenital heart disease
    - neurologic disease
  - △ drug dependency?
  - △ occupational exposure?
  - △ amniocenteses
    - suspected anomalies?
    - suspected hereditary disease?

### **Birth history**

- Birth weight
- Gestational duration- prematurity?
- C-section- why?
- Forceps
  - △ head, cervical spinal trauma
  - △ cerebral palsy
  - △ epilepsy

### **Neonatal history**

- Apgar
  - △ immediate neonatal health
  - △ does not predict future health, development
- Birth appearance
- Apneic episodes
  - △ depressed automaticity
  - △ upper airway obstruction?

### **Neonatal history**

- Intensive care
  - △ why?
  - △ how long?
  - △ reflects serious illness with sequelae
- Jaundice
  - △ Hemolytic dx; e.g., Rh incompatibility
  - △ liver disease

### **Neonatal history**

- Congenital anomalies
  - △ type?
  - △ associated with other anomalies?

### **Neonatal history**

- **Congenital anomalies**
  - △ airways
    - ▶ TE fistula
    - ▶ choanal atresia
  - △ gastrointestinal
    - ▶ esophageal atresia
    - ▶ omphalocele, gastroschisis
  - △ congenital heart dx

### **Neonatal history**

- **Special procedures**
  - △ types
    - ▶ EEG
    - ▶ cardiography
    - ▶ line placement
    - ▶ chest tubes
  - △ why?
  - △ suspected conditions?

### **Feeding History**

- **breast or bottle fed?**
- **feeding difficulties- cough, vomiting?**
  - △ GI dx
  - △ cardiac dx
  - △ airway, pulmonary dx
- **hypoxemia may present choice between breathing and eating**

### **Developmental History**

- **Growth rate**
- **Ages for:**
  - △ holding head up
  - △ walking
  - △ talking- cognitive development
- **Delayed development- failure to thrive**
  - △ chronic disease
  - △ neglect

### **Behavioral History**

- **Affective disorders**
  - △ organic brain syndrome
  - △ psychiatric illness
  - △ medication effects
  - △ substance abuse
- **Sleep patterns**
  - △ asthma?
  - △ obstructive sleep apnea?

### **Immunization History**

- **Types, dates**
- **Reasons for failure to immunize**
  - △ age of child (too young)
  - △ immigration
  - △ religion
  - △ fear of adverse consequences; such as autism
- **Failure to immunize increases risks for: diphtheria, polio, tetanus, etc.**

### History of Past Illness

- General health
- Childhood diseases
- Allergies
- Recurrent pulmonary infections
  - ▲ aspiration- often goes undetected
  - ▲ cystic fibrosis
  - ▲ congenital heart disease
  - ▲ congenital lung anomaly
  - ▲ immunocompromise- CIDS, AIDS

### History of Past Illness

- Recurrent upper airway infections- obstructive apnea
- Wheezing
  - ▲ asthma
  - ▲ bronchiolitis
  - ▲ airway anomaly
  - ▲ aspiration
- Surgeries
- Hospitalizations
- Injuries

### Family History

- Common familial diseases
  - ▲ asthma
  - ▲ diabetes
  - ▲ cystic fibrosis
  - ▲ muscular dystrophy
  - ▲ coagulation disorders

### Social History

- Family unit?
- Habitat?
  - ▲ sanitation
  - ▲ communicable dx
  - ▲ pets
- Habits?
- Recreation?

### Review of Systems

- Head- eyes, ears, mouth
- Throat, neck
- Chest- lungs, heart, breasts
- Gastrointestinal- appetite, diarrhea
- Genitourinary- dysuria, frequency
- Extremities
- Neurologic- headaches, fainting
- Skin- rashes, itching
- Psychiatric- moods, tension

**Physical Examination**

### General Approach

- Establish rapport
- Uncomfortable procedures last
- Painful areas examined last
- Encourage, praise during exam
- Stop and observe from door, if possible
- Obvious conditions
  - ▲ trisomy 21
  - ▲ FLK (funny looking kid)

### General Appearance

- Color
  - ▲ pale- anemic
  - ▲ cyanosis- hypoxia
  - ▲ jaundice- liver, hemolytic dx
  - ▲ bright red- HbCO

### General Appearance

- Posture
- Alertness, comfort level
- Odors
  - ▲ infections
  - ▲ diabetes
  - ▲ toxins
  - ▲ hygiene

### General Appearance

- Skin
  - ▲ rashes- infection, allergy
  - ▲ ecchymoses
    - ▶ trauma
    - ▶ abuse
    - ▶ coagulopathy

### Head

- Expression
- Facies- anomalies
  - ▲ micrognathia (e.g., Pierre-Robin)- airway obstruction
  - ▲ macroglossia (e.g. trisomy 21)- airway obstruction
- Nasal flaring- reduces airway resistance

### Neck

- Lymphadenopathy- painful on palpation
- Supraclavicular retractions- elevated work of breathing
- Tracheal position- shift==>
  - ▲ pneumothorax- away from affected side
  - ▲ atelectasis- toward affected side

### Measurements

- Heart rate
  - ▲ newborn = 100-180
  - ▲ 10 YO = 50-90
- Respiratory rate
  - ▲ newborn = 45-60
  - ▲ 10 YO = 20

### Measurements

- Blood pressure- comparatively low, up to 2 YO
  - ▲ newborn = 40-60/20-36
  - ▲ 1 YO = 66-126/41-91
- Compare pulses, pressure of upper and lower extremities
  - ▲ unequal ==> coarctation of aorta

### Measurements

- Height, weight
  - ▲ for drug dosages
  - ▲ for ventilator adjustments
  - ▲ for predicted normal physiologic values

### Chest

- Observation
  - ▲ ventilation pattern
  - ▲ retractions
  - ▲ surgical scars
  - ▲ deformities
- Palpation
  - ▲ fremitus- voice transmission
  - ▲ symmetry of ventilation

### Chest

- Percussion
  - ▲ dullness ==> consolidation, effusion
  - ▲ resonance, tympany ==> air
- Auscultation
  - ▲ warm the diaphragm
  - ▲ listen over trachea
  - ▲ sounds transmitted readily across small chest
  - ▲ uncuffed tubes==> air leak with positive pressure ventilation

### Heart

- Precordial pulsation, bulge-ventricular hypertrophy
- Exam for:
  - ▲ rate
  - ▲ rhythm
  - ▲ murmurs ==> abnormal blood flow

## Extremities, Spine

- Spinal deformity- kyphosis, etc.
- Clubbing- chronic hypoxemia
  - △ congenital heart dx
  - △ chronic pulmonary dx

# Neurologic Assessment

## Pediatric Coma Scale

Activity	Infant's best response	Children's, adults best response	Score
Eye opening	Spontaneous	Spontaneous	4
	To speech	To speech	3
	To pain	To pain	2
	None	None	1
Verbal	Coo, babble	Oriented	5
	Irritable, cry	Confused	4
	Cries to pain	Inappropriate	3
	Moans to pain	Non-specific sounds	2
	None	None	1
Motor	Normal moves	Follow command	6
	Withdraw- touch	Localize pain	5
	Withdraw- pain	Withdraw- pain	4
	Abnormal flexion	Flexion- pain	3
	Abnormal extension	Extension- pain	2
	None	None	1

## Neurologic Assessment

- ▶ **Mental status**
  - ✓ attention
  - ✓ cognitive function
- ▶ **Motor function**
  - ✓ purposeful
  - ✓ posturing

## Neurologic Assessment

- ▶ **Decorticate posturing**
  - ✓ flexion of the arms,
  - ✓ clenched fists over chest
  - ✓ legs are straight out, pointed toe-in
- ▶ **Common Causes**
  - ✓ brain abscess
  - ✓ brain tumor
  - ✓ increased intracranial pressure
  - ✓ head injury

## Neurologic Assessment

- ▶ **Decerebrate posturing**
  - ✓ rigid extension of the arms- internal rotation
  - ✓ extension of the legs- internal rotation
  - ✓ downward pointing of the toes
  - ✓ backward arching of the head
- ▶ **Common Causes (brainstem injury)**
  - ✓ cerebral infarction (stroke)
  - ✓ intracranial hemorrhage
  - ✓ brain tumor

### **Neurologic Assessment**

- ▶ **Cranial nerves**
  - ✓ oculocephalic reflex- doll's eyes
  - ✓ oculovestibular reflex- ice water in ear
  - ✓ facial sensation- grimace to pin prick
  - ✓ gag reflex
- ▶ **Pupillary response- affected by medications, as well as pathology**
  - ✓ response to light
  - ✓ symmetry

### **Neurologic Assessment**

- ▶ **Ventilation patterns**
  - ✓ neurogenic hyperventilation- midbrain
  - ✓ Cheyne-Stokes ventilation- metabolic or lesion of both hemispheres
  - ✓ apneustic- midpons lesion
  - ✓ hypoventilation- intoxication

### **Summary and Review**

- ▶ **History specific to pediatric patients**
  - ✓ maternal history
  - ✓ prenatal history
  - ✓ birth history
  - ✓ neonatal history
  - ✓ feeding history
  - ✓ developmental history
  - ✓ behavioral history- sleep
  - ✓ immunizations

### **Summary and Review**

- ▶ **Physical examination specific to pediatrics**
  - ✓ use a gentle approach
  - ✓ signs of hypoxia often signify cardiac disease
  - ✓ presence of one anomaly suggest that other may be present

### **Summary and Review**

- ▶ **Physical examination specific to pediatrics**
  - ✓ pediatric vital signs differ from adults
  - ✓ compare upper & lower pulses
  - ✓ breath sounds are transmitted across small chests
  - ✓ check for heart murmurs

### **Summary and Review**

- ▶ **Neurologic examination specific to pediatrics**
  - ✓ pediatric coma scale
  - ✓ medications affect pupillary response
  - ✓ posturing may be decerebrate or decorticate- reflect level of injury

## **References**

- ▶ **Johnson KB. Oski's Essential Pediatrics. 1997 Lippincott, Williams & Wilkins, Baltimore. Chap. 1.**
- ▶ **Barnhart SL, Cervinske MP. Perinatal and Pediatric Respiratory Care 1995. WB Saunders, Philadelphia. Chap. 4.**