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Handbook for History Taking and Clinical Examination in Children

ML Kulkarni

JAYP

Contents

CHAPTER 4

General Physical Examination of Children

GENERAL REMARK

1. Age
2. Sex
3. Built (height) and nourishment (weight)
4. General appearance
   a. *Sickness*:
      - Facial expression
   b. *Toxicity*:
      - Febrile
      - Pallor
      - Coated tongue
      - Sunken eyes
   c. *Shock*:
      - Altered consciousness
      - Tachycardia
      - Hypotension
      - Cold and clammy peripherals
   d. *Respiratory distress*:
      - Nasal flare
      - Tachypnea
      - Retraction of chest
      - Sounds (strider, wheezing, hoarseness, muffled sounds)
      - Type of cough—croupy, wheeze
   e. *Dehydration*:
      - Depressed anterior fontanelle
      - Sunken eyes
      - Loss of skin turgor
      - Signs of shock
   f. *Altered level of consciousness*:
      - Confused
      - Disoriented
      - Drowsy
      - Stupor
      - Semicoma, coma
   g. *Increased intracranial pressure*:
      - Bulging anterior fontanelle

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- Altered consciousness
- High-pitched cry
- Unconsolable
- Altered vitals

h. *Pain*:
- Irritable, anxious
- Splinting
- Rigid posture
- Facial expression

i. *Posture/abnormal movements*:
- Decerebrate
- Decorticate
- Opisthotonus
- Emprosthotonus
- Inability to move limbs
- Tremor
- Chorea
- Athetosis, hemiballismus
- Spasms
- Fits
- Tics

j. Pallor/Cyanosis

VITAL SIGNS

a. Pulse — Normal rate at different age

Pulse rate at rest		
Age	***Range***	***Average***
Newborn	70–190/min	125/min
1–11 months	80–160/min	120/min
2 years	80–130/min	110/min
4 years	80–120/min	100/min
6 years	75–115/min	100/min
8 years	70–110/min	90/min
10 years	70–110/min	90/min

b. Respiratory Rate/type — Normal rate and type at different age

Respiratory rates in relation to age	
Age	***Respiratory rate***
Newborn	40–60/min
Infants	Up to 30/min
1–4 years	24–26/min
4–8 years	20–22/min
>8 years	18–20/min

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c. Blood Pressure — Method, normal cuff size,
Normal values at different age

Normal values of blood pressure with respect to age		
Age	*Systolic pressure (mm Hg)*	*Diastolic pressure (mm Hg)*
Birth (12 hour, <1000 g)	39–59	16–36
Birth (12 hour, 3 kg)	50–70	25–45
Neonate (96 hour)	60–90	20–60
Infant (6 months)	87–105	53–65
Toddler (2 years)	95–105	53–66
School age (7 years)	97–112	57–71
Adolescent (15 years)	112–128	66–80

d. Temperature — Method, type of temperature

ANTHROPOMETRY

a. *Weight*:

Proper Recording Scales (Beam, Salter, Spring and Electronic)					
IAP grading	*Weight for age*	*Plot NCHS/ WHO chart*	*Plot Agarwal chart*	*Plot on road to health chart*	*Welcome grading*

b. *Height*:

Proper Recording (Infantometer, Standing Height)		
Height for age	*Plot NCHS/WHO chart*	*Plot Agarwal chart*

c. *Head circumference:*

Proper Recording		
Plots NCHS/WHO chart	*Plot Agarwal chart*	*Plot SD Chart*

d. *Chest circumference*:
Proper Recording: Compare with head circumference

e. *Midarm circumference:*
Proper Recording: Interpretation
(Normal – Borderline PEM – Severe PEM)
>13.5 cm 12.5–13.5 cm <12.5 cm
Anthropometric Indices: Kanawati, McLaren, Rao's
Dugdale's Indices.

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Genetic Anthropometry:
- Upper segment/Lower segment
- Interpupillary distance
- Intercanthal distance
- Outer canthal distance
- Philtrum length
- Mouth width
- Ear length
- Ear breadth
- Hand length
- Finger length
- Foot length
- Testis Volume
- Penile length

Age-independent Anthropometric Indicators (Below 5 years)

These indicators do not require consideration of the age. The labile tissues such as subcutaneous fat and muscle are more reduced in malnutrition than the static tissues like skeleton. Hence, the ratio between the labile and static tissues can be calculated and compared with the normal.

1. *The bangle test*:
   - This is done by slipping a bangle with an inner diameter of 4 cm up the forearm.
   - If it crosses the elbow, the child is malnourished.
   - It is a simple test, but is less sensitive as the elbow circumference represents the thickness of the bone.
2. *The Shakir's tape*:
   - This is a plastic tape with colored zones, green, yellow and red representing more than 13.5 cm, 12.5–13.5 cm and less than 12.5 cm respectively to measure midarm circumference (MAC).
3. *The Quac stick*:
   - It is the short name for Quacker Arm Circumference Stick.
   - It is a rod with two sets of markings, one indicating the height and the other, the midarm circumference (MAC) for the corresponding height.
   - The arm circumference is measured and the stick is placed behind the standing child.
   - If the height is more than the expected height for the measured arm circumference, the child is considered malnourished.
4. *The modified Quac stick*:
   - This utilizes a rod that is colored green, yellow and red that represent normal nutritional status, borderline and severe malnutrition respectively.
   - The upper zone is red.

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5. *Nabarro's thinness chart*:
   - A graphic chart that represents the expected weight for height has been prepared by save the children fund.
   - In the severely malnourished child, the head touches the upper red zone when the child is made to stand against the column on the chart for the recorded weight of the child.
6. *The MAC to head circumference (MH) ratio (Kanawati)*:
   A ratio of:
   - 0.28–0.314 indicates mild malnutrition
   - 0.25–0.279—moderate malnutrition
   - And less than 0.249—severe malnutrition.
7. *The head circumference to chest circumference ratio*:
   - A ratio of more than one is normal and less than one indicates malnutrition in children above 9 months of age.
8. *The midarm circumference to height ratio*:
   A ratio of:
   - Less than 0.29 indicates severe malnutrition
   - 0.32–0.33 indicates normal nutrition.
9. *Rao and Singh index: weight/height^2 ratio*:
   The ratio of:
   - Above 0.0015 is normal
   - 0.0013–0.0015 indicates moderate malnutrition
   - Less than 0.0013 indicates severe malnutrition.
10. *Ponderal index: weight/height^3 ratio*:
    This ratio of:
    - Above 2.5 is normal
    - 2–2.5 indicates symmetric IUGR
    - Less than 2 indicates asymmetric IUGR (malnourished).
11. *Dughadale's index: weight in kgs/(height in cms)$^{1.6}$ ratio*:
    A ratio of:
    - Above 0.79 indicates normal nutrition
    - Below 0.79 indicates malnutrition
12. *Body mass index and Quetelet index*:
    - BMI is expressed as weight in kg/height^2 expressed in meter.
    - It is a very good index of body's reserve or loss of fat.
    - The extent of wasting, tendency for obesity and obesity can be assessed using reference curves.
    - In adults, BMI 18.5–25 is considered normal.
    - Recent studies suggest that less than 15 may be considered as moderate malnutrition and <13 as severe underweight (UW) in growing children.
    - In adults, BMI >25 indicates overweight (OW) and >30 indicates obesity (OB). The corresponding figures in growing children are 22 and 25, respectively.

$$\textit{Quetelet index} = \frac{\text{Weight (kg)}}{\text{Height}^2\ \text{(cm)}} \times 100$$

Normal is >0.15

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$$\textit{Body mass index (BMI)} = \frac{\text{Weight (kg)}}{\text{Height}^2\ \text{(m)}}$$

UW = BMI <5th centile, OW = BMI >85th centile, OB = BMI >95th centile

13. *Midarm muscle circumference (MAC)*:
    - This is calculated by the following formula.

Midarm muscle circumference = MAC – (3.14 × SFT) cm.

HEAD-TO-FOOT EXAMINATION (REGIONAL)

a. *Head*:
- *Inspection*: Shape, scalp, symmetry.
- *Palpation*: Head circumference, anterior fontanelle sutures, swelling, tenderness, tachycerebrale.
- *Percussion*: Macewen's sign.
- *Auscultation*: Bruit.
- *Transillumination*: Conventional/Chun gun.

b. *Face*:

General	*Infections*	*Nutrition*
Sickness	Tetanus	Kwashiorkor
Shock	Mumps	Marasmus
Dehydration	Measles	Angular stomatitis
Toxicity	Roseola-infantum	Xerophthalmia
Mental retardation		
Respiratory—distress	Adenoid face	
Pallor/Cyanosis		

Renal	*Endocrinal*	*CNS*
Acute glomerulo-nephritis	Certinism	Myasthenia gravis
Nephrotic syndrome	Cushing's syndrome	7th Nerve palsy
	Steroid face	Myopathy
		Hydrocephalus
		Microcephaly

Genetic	*Hematology*
Down's syndrome	Thalassemia
Turner's syndrome	Chloroma
Sturge-Weber syndrome	
Pierre-Robin	
Whistling face syndrome	
Hallermann-Streiff syndrome	
Goldenhar syndrome	
Tuberous sclerosis	
Apert's syndrome	

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c. *Eyes*:
   - Visual acuity, setting.
   - Orbit, conjunctiva, sclera, eyelids, eyebrows.
   - Eye movement, pupil, papillary reflex.
   - Swelling, discharge, proptosis.
   - Fundus.

d. *Ears*:
   - Setting, pinna, external and middle ear.
   - Hearing.

e. *Nose*:
   - External nose, patency, discharge, flaring, polyps, sinus, turbinates.

f. *Throat and mouth*:
   - Dentition, Number, type (Deciduous/Permanent) Abnormal occlusion
   - Dental age
   - Lip, tongue, buccal and oral mucosa
   - Floor of mouth
   - Pharynx, tonsils, palate
   - Tongue movement, palate movement, gag reflex
   - Voice

g. *Neck*:
   - Mobility, neck rigidity (True, false)
   - Trachea, thyroid gland, swelling

h. *Chest*:
   - Shape, anteroposterior diameter, movement, retraction deformities, rickety rosary, Harrison's sulcus.

i. *Breast*:
   - Tanner stage in older children.
   - Mass, areola, nipple.

j. *Abdomen*:
   - Inspection, palpation, percussion, auscultation.

k. *Genitalia*:
   - *Male*: Penis, scrotum, urethra, descent of testis, hernia, hydrocel, torsion, urinary stream.
   - *Females*: Labia, discharge, injury.

l. Anus/Rectum

m. *CVS/lungs*: Inspection, palpation, percussion, auscultation.

n. *Musculoskeletal*: Gait, spine.

o. *Skin and hair/Nail*: Edema, rash, pigmentation, sweating, odor, clubbing.

p. Lymph node

q. *CNS*: Higher mental function, cranial nerves, motor system, sensory system, cerebellar signs, meningeal signs, automatic nervous system, deep reflexus, primitive reflexus, skull and spine.

r. *Developmental assessment*: 180° flip in infants.

s. Systemic examination

t. Case-oriented examination

u. Summary.

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Handbook for
History Taking and Clinical Examination in Children

Salient Features

- Provides step-by-step techniques that outline correct process of physical examination
- Describes vividly the art of taking history of the children
- Provides clearer insights into the skills of empathic listening
- Contains adequate tables, figures, and flow charts, so that the readers can memorize the important features to know the signs and symptoms of the pediatric patients
- Helpful for new students placed in clinical wards, who are just learning the skills and techniques of history taking and methods of performing clinical examinations
- Useful for medical students, nursing education, as well as related health professionals.

ML Kulkarni MD (Ped) FRCPCH (UK) FCPCC (Lon) FIMSA FAMS FIAP MAAP (USA) is Former Professor and Head, Department of Pediatrics, JJM Medical College, Davangere, Karnataka, India. He has a vast professional experience spanning over 38 years. He has received wide recognition and acclaim for his academic contributions. He is the recipient of the prestigious Dr BC Roy National Award of the Medical Council of India (MCI) as an eminent medical teacher (1994) and best teacher award of Rajiv Gandhi University of Health Sciences (RGUHS) in 2002. He is the author of several books and scientific papers. This book is his another adventure and desire towards the spread of medical knowledge.

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