ebsite www.jaypeebrothers.com, for detailed information on medicine books, visit our website www.jaypeebrothers.com



CLINICAL METHODS IN MEDICINE

CLINICAL SKILLS AND PRACTICES



SN Chugh
Eshan Gupta

SECOND EDITION

Contents

SECTION 1 *History Taking and Physical Examination*

Unit I: History Taking and Review of System

1. History Taking **3**
History Taking *3*
Review of Systems/Presenting Symptoms *11*

2. Analysis of Systemic Symptoms **19**
Analysis of Systemic Symptoms *19*
Gastrointestinal Symptoms *19*
Symptomatology Related to Liver and Gallbladder *24*
Cardiovascular Symptoms *25*
Respiratory Symptoms *28*
Symptoms Related to Blood Disorder *35*
Urinary Symptoms *37*
Neurological Symptoms *40*
Endocrinal Symptoms *44*
Symptoms Pertaining to Genital System *46*
Symptoms of Rheumatic Diseases *49*

Unit II: Physical Examination

3. General Physical Examination **51**
General Observations *51*

4. The Head, Scalp, Skin and Hair **62**
Head and Scalp *62*
The Skin *66*
The Nails *67*
The Hair *77*

5. The Eyes **83**
The Eyes *83*
Investigations for a Case with Eye Disorder *100*

6. The Mouth and the Pharynx **104**
The Mouth and the Pharynx *104*

7. The Ear, Nose, Sinuses and Throat **113**
The Ear *113*
Examination of the Ear *116*
Investigations for a Case with the Disease of Ear *120*
The Nose and Paranasal Sinuses *121*
Examination of the Nose and Nasal Sinuses *122*
Examination of the Throat *124*

8. The Neck **126**
The Neck *126*
Examination of Neck *126*
The Thyroid Gland *132*
Investigations of a Patient with Thyroid Disease *134*
The Trachea *134*
The Carotid Arteries and Jugular Veins *135*

9. The Breast and the Axillae **136**
The Breast and the Axillae *136*
Investigations for Breast Disease *143*

10. The Extremities **144**
Examination of Extremities *144*
The Hands and the Nails *144*

SECTION 2 *Systemic Examination and Appendices*

Unit III: Systemic Examination

11. The Cardiovascular System 161
- The Cardiovascular System *162*
- Examination of Cardiovascular System (CVS) *164*
- Investigations for a Case with Cardiovascular Disease *187*
- Peripheral Vascular System *196*
- Occlusive Arterial Disease *198*
- Investigations of Peripheral Vascular Disease *205*
- Venous System *206*
- Examination of Venous System *206*

12. The Respiratory System 211
- The Respiratory System *212*
- Examination of Chest *220*
- Investigation of a Patient with Respiratory Disease *238*

13. The Abdomen 245
- The Abdomen *246*
- Examination of the Groins and Back *273*
- The Anus, Rectum and Prostate *276*
- Investigations of Gastrointestinal System *278*
- Investigations of Hepatobiliary System *282*

14. The Urogenital System and Sexually Transmitted Diseases 293
- The Urinary System *294*
- The Genital System *295*
- Investigations of a Case with Renal Disease *302*
- Examination of Genitalia *313*

15. The Nervous System 324
- The Nervous System *325*

16. The Examination of Unconscious Patient 414
- Unconsciousness or Coma *415*

17. The Locomotor System 425
- The Locomotor System *426*
- Examination of Locomotor Disorders *431*
- Examination of Individual Joints *440*
- The Ankle and the Foot *461*
- Investigations for Rheumatological Disorders *464*

18. The Blood 469
- The Blood *470*
- Investigations for a Haematological Case *481*

19. The Psychiatric Assessment 488
- The Psychiatric Assessment *489*
- Case Histories *495*

20. The Endocrinal System 504
- The Endocrine System and Metabolism *505*
- Brief Synopsis of Few Common Endocrinal Disorders *519*

Unit IV: Appendices

Appendix I 529
- Sample Collection *529*
- Venipuncture *529*
- Microbial Tests *530*
- Serological Test *530*
- Chemical Analysis of the Urine *533*
- Semen Analysis *536*

Appendix II 537
- Centigrade and Fahrenheit Scale *537*
- SI Units *537*
- Normal Values (Reference Values) *538*

Index *547*

CHAPTER 3

General Physical Examination

GENERAL OBSERVATIONS

The general observation starts as soon as the patient enters the doctor's room. The physician/student tries to assess his/her general appearance which includes demeanour, personal cleanliness/hygiene and the nature and state of clothing. The things to be noted are given in the Box 1.

Box 1

Observations at a glance

- Note facial appearance, built, complexion, state of clothing
- Observe and define any abnormality of mental state, consciousness, gait, posture and movement
- Identify any abnormal sound or odour
- Assess the state of hydration, nutrition and oedema
- Observe any change in colour of skin and mucous membrane
- Measure the height and weight

1. **Facial appearance/expression.** Look at face for expression.

- Expressionless face is seen in parkinsonism.
- A startle look or staring look is seen in Grave's disease.
- Apathy or blunt expression is seen in depression.
- Agitation indicates hypomania.
- Toxic look with swinging temperature indicates septicaemia or toxaemia.

The typical gross facial appearances that pinpoint the diagnosis are given in the Table 3.1.

The recognition of looks of pain, fear, anxiety, anger and grief alert the physician to explore the possibility of underlying psychiatric disorder.

2. **Complexion:** Note whether patient has dark or fair complexion. Abnormalities of complexion may be noticed by the friends, relatives and even by the patient. The colour of the skin or face depends on the variation in haemoglobin, melanin and to a lesser extent on carotene. The unusual skin colours are described in the Chapter 4.
3. **State of clothing and personal hygiene:** Just inspection of clothing gives information about the personality and state of mind.

- Patients with dementia are shabbily dressed and may have faecal soiling of underwear.
- Excessive clothing may reflect the cold intolerance of hypothyroidism, or to hide the skin rash/disease or needle marks.

4. **Mental state/consciousness:** Is the patient conscious and co-operative?
   Patient's conscious level should be observed. Examination of unconscious patient is described separately (Read Chapter 16). Note whether patient is co-operative and answer your questions or noncooperative and avoids or overlook your questions. Other higher mental functions are discussed in the examination of nervous system.
5. **Posture, gait and abnormal movements:** The posture of the patient may give valuable information. Severely ill patients are not comfortable in bed and adopt uncomfortable attitudes/postures.

Patients of congestive heart failure or cor pulmonale may sit up on the bed with legs hanging down the bed due to orthopnoea (Fig. 3.2). Patients with asthma are dyspnoeic at rest. Patients with abdominal colic are restless and toss in the bed in agony.

Patients with neurological disorders produce characteristic posture, for example, neck retraction is seen in meningitis. Abnormalities of gait, posture and abnormal movements are either due to a neurological disorder or locomotor disorder, hence, are discussed in respective sections (Read Chapter 17).

6. **Sounds/voice/speech:** Normal speech is produced by coordination of the tongue, lips, palate, nose and voice box in the larynx. The speech disturbances are discussed under the examination of nervous system. However, some non-neurological causes may produce disturbance in speech such as cleft palate, nasal obstruction, loose

JAYPEE BROTHERS

TABLE 3.1 Face as a clue to diagnosis

Rounded moon-faces with red cheeks indicate Cushing's syndrome (Fig. 3.1A).



FIGURE 3.1A Moon-facies in Cushing's syndrome

Large facies, elongated protruding jaw, coarse facial appearance, thick lips, elongated head, short stubby finger and stout built indicate acromegaly (Fig. 3.1B).



FIGURE 3.1B Acromegaly

Dull puffy facies with non-pitting periorbital oedema. The hair on the eye brows are dry, coarse and loss of hair on outer third of eye brows indicate myxoedema (Fig. 3.1C).



FIGURE 3.1C Myxoedema

Periorbital oedema with puffy eyelids in the morning (on getting up) making the eyes to look slit-like indicate renal oedema due to nephritic or nephrotic syndrome (Fig. 3.1D).



FIGURE 3.1D Nephrotic syndrome

Bilateral asymptomatic parotid glands enlargement indicates mumps, if acute, painful and tender (Fig. 3.1E).



FIGURE 3.1E Bilateral parotids enlargement

A mask-like face with decreased facial mobility, infrequent blinking and vacant look indicate Parkinsonism (Fig. 3.1F).



FIGURE 3.1F Mask like face of Parkinsonism

Disfigured scar red face due to superficial facial burns (Fig. 3.1G).



FIGURE 3.1G Disfigured charred face following burns

There is small, flat face, upward slanting eyes, small nose with depressed bridge and protruded furrowed tongue with idiotic look. There was an accessory breast on right side, simian crease in hand with short stubby finger, short 5th metacarpal, clinodactyly and wide gap in 1st and 2nd toes with prominent longitudinal crease. Features are suggestive of Down's syndrome (Fig. 3.1H).



FIGURE 3.1H Mongolism in Down's syndrome

JAYPEE BROTHERS

Box 2

Common causes of round/moon like face

- Cushing syndrom
- Pseudocushing syndrome (alcoholism)
- Myxoedema
- Angioneurotic oedema
- Nephritic/nephrotic syndrome



FIGURE 3.2 COPD with cor pulmonale. A patient of COPD with acute exacerbation and cor pulmonale adopts a typical posture to relieve breathlessness and oedema. The patient is sitting along the edge of the hospital bed with legs handing and arms supported on the cardiac table, so as to reduce increased work cost of breathing as well as venous return from the legs

denture and dryness of mouth. Hoarseness of voice may be due to local cause (laryngitis) or a neurological disorder. The low-pitched, slow deliberate speech which sounds thick is characteristic of myxoedema due to myxomatous deposition in voice box.

Some other sounds may help in the diagnosis. Wheezing, rattling or stridor help in differentiation of dyspnoea. Sounds during coughing may be characteristic of some disorders such as *whooping cough* is suggestive of pertussis, *brassy cough* indicate bronchial obstruction (adenoma), *barking cough* suggest tracheobronchitis. A *cry* may be heard during an epileptic fit.

Audible noises of cardiovascular and alimentary systems are discussed in appropriate sections. Abnormalities of speech are discussed in examination of nervous system.

7. **Smell/odour:** *Normal smell* or odour from the body is due to sweat. *Pungent smell* may be due to excessive sweating and poor personal hygiene. *Malodour* (odour of dirty and soiled clothing and smell of dried-out urine) occurs in elderly or physically disabled/bed ridden patients or those with dementia. The *offensive/faecal* smell from the body occurs in gastrocolic fistula. Some characteristic odours that help in the diagnosis are given in the Box 3.

Halitosis means malodorous breath which often goes unrecognised by the patient but is offensive to others. It occurs due to a variety of reasons/causes given in the Box 3.

8. **Built/physique:** Note whether height and weight are according to his/her chronological age. Is he/she tall or short, thin or muscular, asthenic or hypoasthenic? Are there any obvious deformities? Measure the height and body proportions if patient is too tall for his/her age.
9. **Measurement of height and weight:** Measurement of height and weight is important for their immediate value and for future reference. Measurements such as span, sitting height and pubis to ground height are made only where a more precise evaluation of growth and development is required especially in infants and young children (pre-pubertal). The significance of height is given in the Box 4 while causes of disorders of height are given in the Table 3.2. The normal height is equal to arm span (one fingertip to another finger-tip of outstretched arms) and twice the lower body segment (pubis to heel). For disurbance of these body proportions, read, "Bed side medicine without tears by Prof. SN Chugh".

Changes in weight: Change in weight results from changes in body tissues or body fluid. Weight gain occurs when caloric intake exceeds caloric expenditure over a prolonged period of time or may be due to an abnormal accumulation of body fluids (oedema, ascites, etc.).

Take the weight by a weighing machine adjusted at O. Weight should be measured with clothing (*pajama* and *kurta*, and *salwar* and *kameez*), wherever necessary body mass index (BMI) may be calculated.

Box 3

Abnormal smell from breath

• Malodorous breath (*Halitosis*)	Bronchiectasis, lung abscess, oral sepsis (stomatitis, gingivitis), extensive caries, atrophic rhinitis, smoking and idiopathic
• A fishy odour (fetor hepaticus)	Hepatic failure
• Ammonical or urinary smell	Uraemia/azotaemia
• A sweet or fruity odour	Diabetic or starvation ketoacidosis

JAYPEE BROTHERS

Box 4

Analysis of height

- Assess any abnormality in stature
- Measure height on vertical scale with rigid adjustable arm piece with patient standing erect without shoes

Increased	*Decreased*
• Gigantism (Fig. 3.3) • Hypogonadotrophic hypogonadism (Kallmann's syndrome, Laurence-Moon-Biedl syndrome • Chromosomal abnormalities, e.g. Klinefelter's syndrome • Marfan's syndrome	• **Hereditary,** e.g. constitutionally short • **Genetics**, e.g. Down's syndrome, Turner's syndrome and achondroplasia (Fig. 3.6) • **Nutritional**, e.g. protein energy malnutrition, rickets, intra-uterine growth retardation • **Systemic disease**, e.g. CRF, Steatorrhoea • **Endocrinal**, e.g. hypothyroidism (cretinism, juvenile), hypopituitarism, craniopharyngioma • **GI tract**, e.g. malabsorption (coeliac disease Crohn's disease, cystic fibrosis) • **Cardiorespiratory**, e.g. congenital heart disease, suppurative lung disease • **Locomotor**, e.g. severe scoliosis

TABLE 3.2 Measurement of height in various disorders

Measurement of body proportions	*Disease*	*Other associated features*
Total height, upper and lower segments of body increased.	Gigantism (↑GH) (Fig. 3.3)	Coarse facial features, thick lips, prognathism, sturdy body.
Eunuchoidism (the sitting height from top of head to pubic symphysis is less than half of total height during standing (top of head to floor).	• Kallmann's syndrome (hypogonadotrophic hypogonadism) • Klinefelter's syndrome (47 XXY).	Anosmia or parosmia. Gynaecomastia, small testes, loss of axillary and pubic hair, talkativeness.
• **Arm span** (the span of extended arms) will exceed the standing height or will be twice or more of sitting height.	• Marfan syndrome (Fig. 3.4).	Long slender fingers (arachnoidactyly), webbing of fingers, high arched palate, ectopia lentis (slit lamp examination), dilatation of ascending aorta, positive thumb protrusion sign.
Short stature. The actual height is less than the expected height according to his/her age and weight. The built is stocky and short in achondroplasia (Fig. 3.6).	It may be hereditary (selective failure of GH) or genetic or chromosomal disorders (Turner's syndrome (45X0), chronic renal failure, coeliac disease (Fig. 3.5).	Features of associated or underlying condition will be present. In Turner's syndrome, there is low hair-line and webbing of the neck in the girls. Features of renal failure or malabsorption may be present. Endocrinal disorders may have their characteristic manifestation, e.g. cretinism, juvenile hypothyroidism and panhypopituitarism.

Obesity is a clinical condition in which there is excessive amount of body fat. In an adult of 70 kg male, the total body water accounts for 60–65% (45 kg) of weight while fat accounts for 10 kg of weight. In clinical practice, the body weight is considered indirectly the measurement of fat in a normal hydrated patient. The causes and consequences of obesity are given in Table 3.3.

The Framingham study demonstrated that 20% excess over desirable weight should be considered as obesity as this weight imparts a health risk. A National Institute of Health Consensus Panel on obesity agreed with this definition, which is now widely accepted.

An alternative method of estimating obesity and undernutrition is ***body mass index (BMI)*** and ***waist-hip ratio***.

JAYPEE BROTHERS



FIGURE 3.3 Gigantism: Note the height (8 feet 2 inches). The hands and feet are large. The built is stout



FIGURE 3.4 Marfan's syndrome: Note the tall stature. The height of patient is 6′ and 1.5″. Arm span 6′ and 6″; upper segment: lower segment is 0.75



FIGURE 3.5 Dwarfism: The child has coeliac disease



FIGURE 3.6 Achondroplasia: An active mentally sound dwarf male with well-developed sexual features. He has full-fledged family

Other parameters of obesity determination include *skin fold thickness measurement*, *body fat scan*, *dual energy X-rays*, *CT scan* and *MRI*. Now a days, body fat percentage may be a better measure of weight-related diseases than BMI.

$$\text{BMI} = \frac{\text{Body weight (kg)}}{\text{Height (metre)}^2} = \text{kg/m}^2$$

Waist-hip ratio: It is determined in the erect position by measuring the abdominal girth at the level equidistant

TABLE 3.3 Causes and consequences of obesity

Causes	*Consequences*
• **Primary** – Psychological – Socioeconomic reasons – Hereditary (genetic predisposition) – Physical inactivity – Drug induced, e.g. steroids, insulin, oral contraceptives, phenothiazines. • **Secondary** – *Endocrinal* - *Physiological*, e.g. puberty, pregnancy, menopause. - Pathological, e.g. thrombosis hypothyroidism, Cushing's syndrome, Frohlich's syndrome, Laurence-Moon-Biedl syndrome, Prader-Willi syndrome	• **Metabolic** – Type 2 DM – Impaired glucose tolerance (IGT) – Gallstones – Hyperuricaemia (gout) • **Mechanical** – Osteoporosis – Hernias (abdominal, – Varicose veins and diaphragmatic) • **Respiratory** – Pickwickian syndrome – Sleep-apnoea syndrome • **Cardiovascular** – Atherosclerosis and IHD – Hypertension • **Neurological** – Stroke – Accident-prone • **Gastrointestinal** – Hiatus hernia

JAYPEE BROTHERS

Box 5

Facts and figures about abdominal obesity

Waist circumference indicating abdominal obesity

- Men > 90 cm (as opposed to 102 cm according to international guidelines
- Women > 80 cm (as opposed to 88 cm as per international guidelines)

Facts

- Experts say 6–8 crore Indians will benefit from the new guidelines
- Absolute mortality due to chronic heart diseases in India will increase to 2.03 million/year by 2010. It will reach 2.58 million by 2020
- The number of patients with diabetes in India (presently 41 million) is expected to increase by 170% in the next 20 years
- Figures indicate that every second person in Delhi is obese. Nearly 25% of the adolescents suffer from metabolic syndrome

between costal margins and iliac crest and at the level of greater trochanter. It indicates abdominal obesity—an ingredient of metabolic syndrome [waist circumference ≥ 102 cm (> 90 cm in Indian) in men and ≥ 88 cm (≥ 80 cm in Indian)] in women indicates abdominal obesity (Box 5).

Depending on the percentage of weight reduction and BMI, the malnutrition is graded as **mild**, **moderate** and **severe** (see the Box 6). The two common types of protein-energy malnutrition are compared in the Table 3.4.

Weight loss: Weight loss is an important symptom that has many causes and explanations. Patients with weight loss present with history of loosening of clothes, belt, bra, undergarments and also complain of fatigue and weakness.

In normal persons, weight is stable over long periods because food intake is matched with energy expenditure by neural activity in the hypothalamus. Because the system is usually effective, hence weight loss brings the patient to the physician.

Weight loss may be "physiological" due to dieting, exercise, starvation or the decreased nutritional intake which accompanies old age.

It is difficult to define weight loss in clear terms. In general, a reduction of 5% of body weight or 5 Kg is considered significant if lost over a period of 6 months.

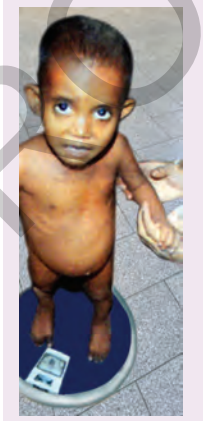
Weight loss with poor food intake is due to psychiatric illness (anorexia nervosa), chronic infections, cardiac, pulmonary or renal failure or malignancy. On the other hand, weight loss with relatively high food intake suggests hyperthyroidism, diabetes mellitus, malabsorption or binge eating (bulimia).

Box 6

Obesity and BMI (Kg/m²)		
	WHO criteria	*Indian criteria*
Normal	18–25	18–23
Overweight	< 30 (26–29)	≤ 25
Obesity	> 30 (30–39) (Fig. 3.7)	< 25
Morbid obesity	> 40	≥ 32.5
Undernutrition and BMI		
Severity or grade	*Body weight reduction 95% of international standard*	*BMI reduction (Kg/m²)*
Mild	From 90% to 81%	From 20 to 18
Moderate	80% to 71%	18 to 16
Severe	< 70%	< 16

Note: Nutritional intervention will be needed if BMI is less than 18 or if weight loss during an illness is greater than 10%.

FORCES draft report on state of children in India



- Malnourished children under 3 years has increased from 15.5% to 19.1%
- Children aged 6–35 months who are anaemic has increased from 74.2% to 79.2%
- India has 47% underweight children as compared to 29% in sub-saharan Africa

TABLE 3.4 Comparison of two common types of protein energy malnutrition (PEM)

Parameter	*Kwashiorkor*	*Marasmus (Fig. 3.8)*
• Growth retardation	Mild to moderate	Severe
• Deficit in weight for height	Mild	Marked
• Body weight as % of international standard	60–80	<60
• Oedema	Present	Absent
• Wasting, skin and hair changes	Skin and hair changes present	Wasting is marked
• Serum albumin	Low	Normal
• Physical state	Child is miserable	Child is alert

Symptoms associated with weight loss often pinpoint the cause as does a good psychological history. Poverty, old age, social isolation, physical disability, emotional or mental

JAYPEE BROTHERS



FIGURE 3.7 Indian scenario of metabolic syndrome/obesity (facts and figures)

- Overweight if the BMI (Body Mass Index) is 23 kg/m^2 or more. The international standard is 25 kg/m^2
- Obese if the BMI is 25 kg/m^2 or more as opposed to 30 kg/m^2 as international standard
- An Indian needs drug therapy for obesity if BMI is 25 kg/m^2
- An Indian qualifies for bariatric surgery for obesity if the BMI is 32.5 kg/m^2 as opposed to 35 kg/m^2 for international patients



FIGURE 3.8 Marasmus—protein energy malnutrition (PEM)

impairment, lack of teeth or ill-fitting dentures, alcoholism and drug abuse increase the chances of malnutrition and weight loss.

Weight loss occurring as an isolated symptom is seldom associated with serious organic disease.

Nutritional Status

Assessment of nutritional state of a patient is an important part of clinical examination because nutritional depletion may eventually result in malnutrition which has its functional consequences such as reduced immune response, muscle weakness, oedema, confusion or neuropathy etc. It is easy to detect gross malnutrition but lesser degree may be difficult to detect especially when oedema is present.

Parameters of assessment are:

- **Dietary history:** In the history one should ask about the diet the patient has been taking. Is he/she taking diet regularly or has omitted any major meal? Is the appetite good? Is there any difficulty in eating? Ask about history of diarrhoea, vomiting or steatorrhoea. Is patient alcoholic or drug addict? Is there any history of psychiatric or neurological illness that interferes with his/her food intake? Has the patient lost weight recently? Does the patient avoid certain food stuffs for any reason?
  Significance of Dietary History
  - In *anorexia-bulimia*, a disorder usually affecting young women, there are cyclic changes in appetite and food intake.
  - Patients having dysphagia or other gastrointestinal disorders or cirrhosis may develop malnutrition.
  - Patients with gluten sensitivity will avoid wheat products and in lactase deficiency will avoid milk because they have been advised to do so.
  - A strict vegetarian diet or vegan diet may lead to vitamin B_{12} deficiency.
  - Purdah muslims ladies are more prone to get vitamin D deficiency.
  - Low fibre diet is associated with constipation and gall stones.
- **Clinical assessment:** Wasting or thinness of muscles, oedema, pallor, weakness, loss of skin elasticity, and other signs of nutrients and vitamins deficiency are pointers towards poor nutrition or malnutrition. The primary illness may obscure or confuse signs of malnutrition.
- **Anthropometry:** Measurement of body weight, measurement of subcutaneous fat and muscles by *mid-arm* circumference with a tape or measurement of *skin-fold* thickness by special calipers (Harpenden or Hotain calipers) are used for nutritional assessment in hospitalised patient. Serial measurements are essential.

  The reference standards of mid-arm circumference are given in the Table 3.5.

  Skin fold thickness (Fig. 3.9): The measurement of triceps skin fold thickness midway between acromian and olecranon is the preferred site. The measurement is

JAYPEE BROTHERS

TABLE 3.5 Mid-arm circumference in mm

	Men percentile			Women percentile		
Age	*50th*	*10th*	*5th*	*50th*	*10th*	*5th*
19–24	308	272	262	265	230	221
25–34	319	282	271	277	240	233
35–44	326	287	278	290	251	241
45–54	322	281	267	299	256	242
55–64	317	273	258	302	254	243
>65	307	263	248	299	252	240

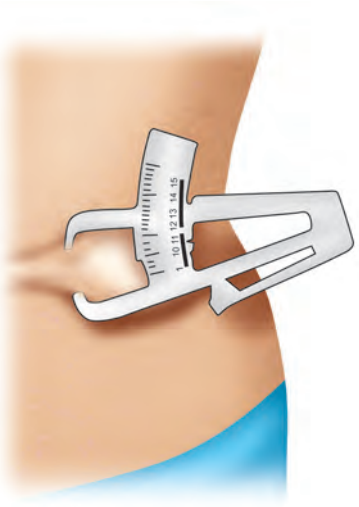


FIGURE 3.9 Skin fold thickness measurement

TABLE 3.6 Skin fold thickness measurement (mm)

	Standard	*80%*	*60%*
Adult male	12.5	10.0	7.5
Adult female	16.5	13.0	10.0
Nutritional status	Normal	Moderate	Poor

Note: The 80% and 60% ranges are associated with moderate and severe nutritional depletion.

done in vertical plane with arms hanging by the side in relaxed position. Normal values and 80% and 60% values indicating moderate and poor nutrition are depicted in the Table 3.6. Among Asians 20–20% body fat is normal for women and 17% for men.

- **Biochemical assessment:** Biochemical tests are done in hospitalised patients to assess the nutritional status and micronutrients deficiencies. The various tests are:
  - ***Blood protein.*** Estimation of serum proteins is sensitive parameter to detect undernutrition and to monitor nutritional repletion.
  - ***Serum albumin*** (half-life 14 days) is the most useful predictor.
  - ***Serum transferrin, retinol binding protein***, etc.

State of Hydration

In an adult of 70 kg, the body fluid is 45 litres (60–65% of the body weight) out of which two-thirds (30L) is intracellular; of the remainder, two-third is interstitial (10L) and rest 5L constitutes the circulating blood volume.

Parameters of Assessment

The state of hydration is assessed by:

- **Skin elasticity:** It is demonstrated by pinching up a fold of skin and then released. It remains as a ridge and subsides slowly if skin elasticity is lost otherwise it returns immediately to its normal position. Loss of elasticity is not true index of hydration as it is lost in old age and due to loss of collagen in the skin.
- **Intraocular tension:** Low tension indicates dehydration. In dehydration, the eyeballs are soft and shunken (Fig. 3.10).
- **Recording of BP:** Low blood pressure and postural drop in BP indicates dehydration and is a useful index of intravascular volume depletion due to diarrhoea, vomiting, excessive sweating and polyuria.



FIGURE 3.10 A dehydrated patient. Note: the sunken cheeks and eyeballs with dry tongue. Her systolic BP was < 90 mmHg. The skin was dry, wrinkled with loss of elasticity

JAYPEE BROTHERS

Box 7

Causes of dehydration

I. Gastrointestinal loss
- Diarrhoea
- Vomiting
- Gastroenteritis (food poisoning)

II. Cutaneous loss
- Burns
- Perspiration

III. Renal loss
- Diabetes mellitus
- Diabetes insipidus
- Diuretics

IV. Internal sequestration
- Acute pancreatitis
- Acute intestinal obstruction
- Ascites

- **Dry tongue and mouth:** A dry tongue and mouth may indicate dehydration but are commonly seen in smokers and mouth-breathers, hence, these signs may be deceptive.
- **Measurement of weight:** A recent loss of weight may be a sign of dehydration if previous weight is known.
- **Haemoconcentration:** Rise in haemoglobin, PCV and plasma osmolality provide evidence of severity of dehydration. The serial readings will indicate the replacement of effective fluid volume.
- **Jugular venous pulse and pressure (JVP):** The jugular venous pressure is low in volume depletion, hence veins are collapsed and not visible.

The causes of dehydration are given in the Box 7.

Vitals

Look for vitals, i.e. pulse, BP, temperature and respiration.

The pulse: Count the pulse for at least 15 seconds if the rhythm and heart rate appear to be normal, multiply the reading by 4 to get the pulse rate or heart rate in beats/min (bpm). If the rate is too slow or too fast, then count the pulse for full one minute. The pulse should be analysed for **rate, rhythm, character, volume** and **presence or absence of radio-femoral delay**. When the rhythm is irregular, the heart rate should be evaluated by cardiac auscultation to know the pulse deficit. The **pulse deficit** (difference between heart rate and pulse rate) is because of nonconduction of weak cardiac beats to peripheral pulse.

Heart rate <60/min is called ***bradycardia*** and more than 100/min is called ***tachycardia***. The causes of decreased and increased heart rate are given in the Box 8.
The rate of pulse varies from 60 to 90 bpm during activity in a normal healthy individual.

Blood pressure: Blood pressure is measured using a Sphygmomanometer cuff wrapped around the upper arm. The method of measurement, a checklist for measurement are discussed in CVS examination. It is important to use the correct size of the cuff. The length of inflatable bladder of the cuff should be 30–35 cm and width should be 12.5 cm (12–14 cm) for an average adult.

Box 8

Causes of change in heart rate

Bradycardia	*Tachycardia*
• Physiological, e.g. vagotonic individuals, athlete, during sleep and induced by carotid sinus compression. • Hypothyroidism • Hypothermia	• Physiological, e.g. anxiety, excessive use of tea, coffee, exercise, smoking etc. • Hyperthyroidism • Arrhythmia
• Obstructive jaundice • Sick sinus syndrome	• Acute pulmonary emoblism • CHF, hypertension
• Hyperkalaemia/ hypermagnesaemia	• Drug-induced, e.g. adrenaline, thyroid medications, necotine or alcohol, atropine, caffeine, amylnitrate, nifedipine
• Drugs, e.g. b-blockers, calcium channel blockers • Second and third degree (complete) AV blocks • Raised intracranial pressure • Poisoning, e.g. organo-phosphorous, aluminium phosphide, scorpion sting bite.	• Congenital heart disease, valvular heart disease, thyrotoxic heart disease • Phaeochromocytoma (catecholamine excess)

Blood pressure should be taken in both the arms at least once. Normally there may be difference of <10 mmHg in both the arms. Subsequent readings should be repeated on the arm with high pressure difference.

An internationally recognised JNC VIII classification which defines the normal and abnormal blood pressure is depicted in Box 9.

Respiration: Count the respiratory rate for a full half minute and multiply it by 2 to get respiratory rate per minute. This should be counted when patient's attention is diverted elsewhere for example count the respiratory rate when you are counting the pulse rate. Tachypnoea implies respiratory rate more than normal. The causes are given in the Box 10.

Normal respiratory rate in adults is 14–18 breaths/min.

Temperature: The warmth of the skin felt with back of the hand over covered body part (neck, chest, abdomen) provides a good indication of fever, but the skin of a patient with a

JAYPEE BROTHERS

Box 9

JNC VIII Classification of hypertension

Category	*Systolic (mmHg)*	*Diastolic (mmHg)*
Normal	<120	<80
Prehypertension (previous term used in JNC VI as high normal replaced)	120–139	80–89
HYPERTENSION		
Stage 1	140–159	90–99
Stage 2	≥ 160	≥ 100
JNC VIII has not changed the definitions of JNC VII. They have addressed treatment goals mainly.		

Box 10

Causes of tachypnoea

- Physiological, e.g. strenuous exercise, anxiety, nervousness
- Fever
- Hypoxia due to pulmonary disease
- CHF (congestive heart failure)
- Pleuritis, pneumothorax
- Cerebral disturbance/hypoxia
- Metabolic acidosis
- Hysterical hyperventilation

normal temperature may feel cold and an apparently normal temperature does not exclude hypothermia.

Fever or **pyrexia** refers to an elevated resting body temperature (>37.2° or > 99°F). The average oral temperature is usually quoted as 37.1°C (98.6°F). It may fluctuate considerably, i.e. in early morning, it may fall as low as 35.8°C (96°F) and in the evening it may rise to 37.2°C (99.0°F). *Rectal temperature* is higher than oral temperature by an average of 0.4 to 0.5°C (0.7 to 0.9°F) approximately. In contrast, the axillary temperature is lower than oral temperature by approximately 1°C, hence, is considered less accurate than other two measurements.

Choice of site for recording: Most patients prefer oral to rectal temperatures. Oral temperature recording is not recommended in an unconscious patient or restless/violent patients as recordings may be less accurate and thermometer is likely to be broken.

Method: For oral temperature you may choose either a glass or electronic thermometer. When using a glass thermometer, wash the mercury end of thermometer and then shake it down to 35°C (98°F) or below. Now insert it into the mouth under the tongue and ask the patient to close the mouth. Read the thermometer after 1 minute. This will tell the temperature of the patient.

Types of fever (Fig. 3.11): Fever may be *continuous*, *remittent* and *intermittent*. It is said to be continued (*continuous*) when it does not fluctuate >1°C (1.5°F) during 24 hours and at no time touches the normal. If fluctuations (swings) exceed 2°C, it is called *remittent* and when fever manifests only for several hours in a day, it is called *intermittent*. The intermittent fever may appear daily (*quotidian*), on alternate days (*tertian*) and on every third day (*quartan*). Now-a-days, in era of antibiotics and other effective drug therapy, these types of fever are infrequently seen.

Note: Transient rise in temperature may occur due to a recent hot drink or a bath and even after smoking. In such situations, it is best to defer the measurement for 10 to 15 minutes.

Conventionally it is called *low grade* (<101°F or 38°C), *moderate grade* (<103°F) and *high grade* (>103°F).

Hyperthermia/Hyperpyrexia: It refers to extreme elevation in temperature above 41°C (106°F). It could be due to heat stroke, heat exhaustion or malignant hyperpyrexia (an inherited abnormality).

Hypothermia: It refers to an abnormally low temperature below 35°C (95°F) rectally. Low-reading clinical rectal thermometers are available and should be used when hypothermia is suspected. Temperatures as low as 27°C are not uncommon and core body temperatures below 20°C have been recorded in patients who subsequently survived. The causes of hypothermia are tabulated—(Table 3.7).

TABLE 3.7 Causes of hypothermia

- **Excessive heat loss**
  - Prolonged environmental exposure at low temperature, e.g. accidental, iatrogenic, unconsciousness
  - Increased continuous blood loss (heat loss), e.g. burn, psoriasis, toxic epidermal necrolysis (TEN)
- **Inadequate heat production**
  - Inadequate metabolism, e.g. malnutrition, starvation, hypothyroidism, Addison's disease, hepatic failure, diabetic ketoacidosis and hypoglycaemia
  - Altered thermoregulation, e.g. sepsis, uraemia, head trauma, stroke, tumour, spinal cord injury and Shapiro's syndrome (episodic spontaneous hypothermia with hyperhidrosis)
  - Drug-induced, e.g. barbiturates, phenothiazines, opiates, lithium, benzodiazepines, alcohol

JAYPEE BROTHERS

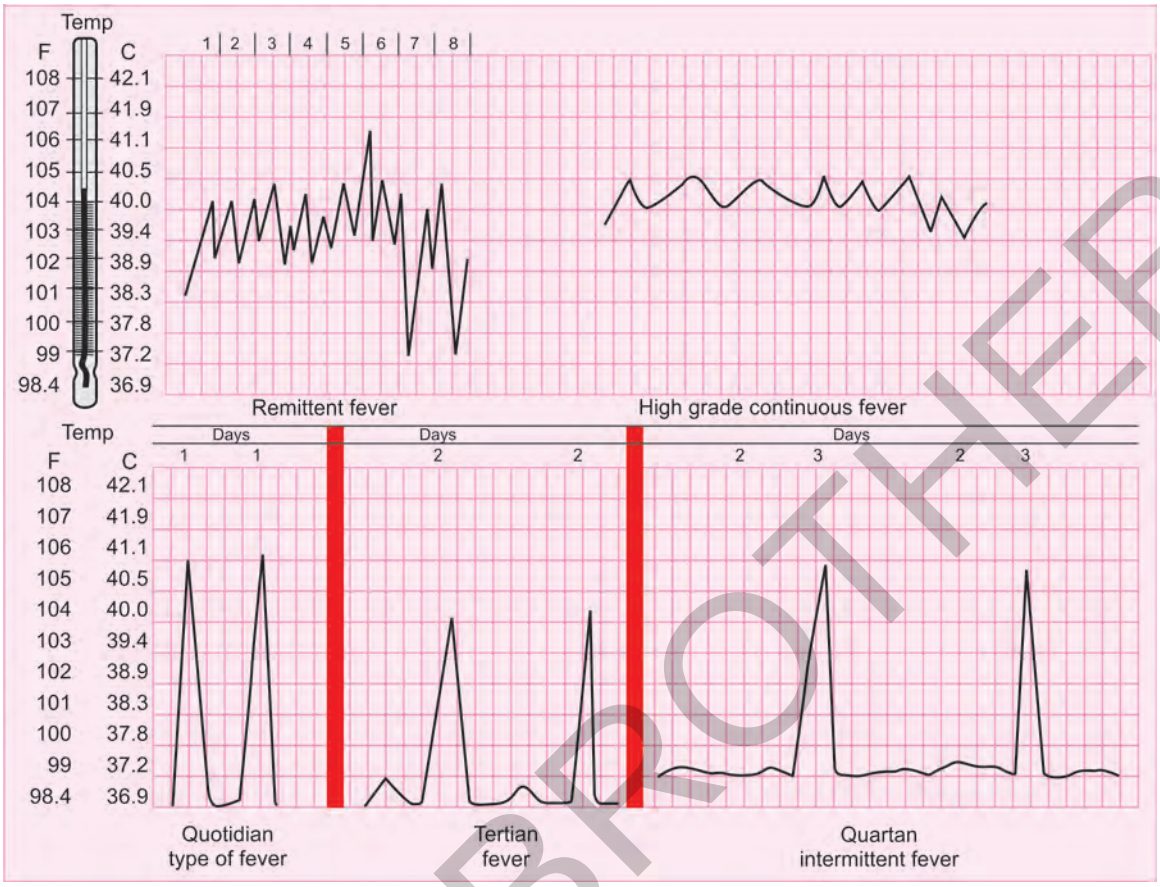


FIGURE 3.11 Types of fever

Compilation of Statement

After going through the general physical examination, one has to make statement as follows:

- Is patient conscious/semiconscious/unconscious?
- Is he/she cooperative or uncooperative?
- Is he/she lying or sitting comfortably or is patient uncomfortable?
- Comment about normal/abnormal physical appearance, built, complexion, personal hygiene.
- Comment about any abnormal sound/voice, abnormal smell/odour.
- Is patient well-nourished/poorly nourished?
- Is patient well hydrated/dehydrated?
- Is oedema present or absent?
- Vital signs, e.g. pulse, BP, temperature and respiration normal or abnormal.

Comment as follows

On general examination, the patient is fully conscious, cooperative and lying/sitting comfortably. He/she is having normal built, physical appearance and maintaining good personal hygiene. He/she is well nourished and well hydrated. There is no oedema. The pulse, BP, temperature and respiration are normal.

JAYPEE BROTHERS

or detailed information on medicine books, visit our website www.jaypeebrothers.com, for detailed information on medicine

CLINICAL METHODS IN MEDICINE

CLINICAL SKILLS AND PRACTICES

Salient Features

- The book is most informative and student-oriented in simple, easy, and understandable language
- Demonstrates most of the clinical signs with illustrations and symptoms are analysed and interpreted properly
- Observes the abnormalities during clinical examinations and their significances have been highlighted briefly in the boxes
- Details the presenting complaints, history, brief general physical examination and systemic examination in each chapter. The most of physical signs are demonstrated either with figure or photograph so that the students can remember what they have seen
- Discusses the simple bedside as well as advanced investigations related to the subject in details at the end of each chapter
- Enables the student to present the case before examiners with confidence because he/she is now well prepared to answer the questions on clinical examination. Efforts have been made to discuss specific clinical disorders related to the system so that students become well-versed with the theoretical and practical aspects of the case
- Diagrams/figures are self-explanatory
- Incorporates illustrations for spotting the diagnosis, therefore, if a student is given a similar case, he/she can make the spot diagnosis easily
- Useful for the students during their ward posting and practical examination, and definitely this book is a clinical boon to the students.



SN Chugh is a Senior Professor and Pro-Vice Chancellor in Pt BD Sharma University of Health Sciences, Rohtak, Haryana, India. He has a vast experience of teaching both undergraduate and postgraduate students. He has been an examiner for both MBBS and MD at his own institution and at other institutions of various Universities. He had brilliant undergraduate and postgraduate career. During his career as a teacher, he has been awarded many times for academic activities. He received *Searle Oration Award* from API in 1999, GS Sainani Gold Medal from Indian Academy of Clinical Medicine, *Bela Devi Oration Award* by West Delhi Physician Forum and Best Teacher 2013 by Indian Medical Association (IMA). He has received *Rashtriya Gaurav* and *Indira Gandhi Priyadarshini Award* by International Organisation.

He is the Member of National Academy of Medical Science (MNAMS), Founder Fellow of Indian Academy of Clinical Medicine (FIAMS) and Fellow of different societies such as Fellow of International College of Angiology, USA (FICA), Fellow of Indian College of Physician (FICP), Fellow of Indian Society of Cardiology (FISC), Fellow of International College of Nutrition (FICN) and Fellow of International Medical Science Academy (FIMSA). He has credit of delivering invited lectures in various conferences held in India and abroad. He has credit of publishing more than 100 papers in national and international journals of repute.

He has written chapters in prestigious textbooks such as *API Textbook of Medicine* and *Essentials of Toxicology* published by National Poisoning Centre, All India Institute of Medical Sciences (AIIMS), New Delhi, India. He has published himself about 14 books on medicine for medical and paramedical students. Apart from these books, *A Textbook of Electrocardiography* and *Bedside Medicine Without Tears* published by M/s Jaypee Brothers Medical Publishers, New Delhi, India are worth mentioning.

Eshan Gupta is pursuing DM (Cardiology) at Govind Ballabh Pant Hospital, New Delhi, India. He has excellent undergraduate and postgraduate career.

Available at all medical book stores
or buy directly from Jaypee Brothers through online shopping
at www.jaypeebrothers.com

JAYPEE BROTHERS
Medical Publishers (P) Ltd.
www.jaypeebrothers.com
Join us on facebook.com/jaypeebrothers

Shelving
Recommendation
MEDICINE

ISBN 978-93-5025-039-6
9 789350 250396