

## Health assessment

### Introduction to health assessment:

#### Data collection:

The assessment phase of nursing process involves collecting data about the health status of the patient. The word data is plural of datum and means information, especially information organized for analysis or decision making. There are two types of data, *subjective* and *objective*.

*Subjective* data consist of information that is reported by the patient and family members in health history in response to direct questioning or in spontaneous statements. Subjective data are usually documented in the patient own words and include information such as previous experiences and sensations or emotions that only the patient can describe.

*Objective* data are those that other members of the health care team obtain through observation, physical examination, or diagnostic testing. Objective data can be seen or measured, e.g., heart rate, wound condition, and laboratory values. Sources of subjective data are the patient himself, the family and others.

#### Assessment interview and health history:

The health history is important step to identify the person's health strengths and problems to be followed by the physical examination.

#### External factors

*Ensure privacy.* Aim for geographic privacy like a private room. If it's not available, the psychological privacy afforded by curtained partitions may suffice as long as the person feels sure no one can overhear the conversation or interrupt.

*Refuse interruptions.* You need this time to concentrate and to establish rapport.

#### Physical environment

Set the room temperature at a comfortable level.

Provide sufficient lighting.

Reduce noise.

Remove distracting objects.

Maintain the distance between you and the patient at 4to5 feet(twice the arm length).

Arrange equal status seating. Both of you should be comfortably seated at eye level. Avoid sitting behind a desk or beside a table placed so that it looks like a barrier.

Avoid standing.

Introducing the interview:

Introduce yourself to the patient state your role and explain what you are going to do for him, always address the patient using his or her surname.

### **The health history**

**Identity (biographical data):** name, age, sex, nationality, religion, marital status, occupation, address, blood group and Rh, next of kin the nearest person to the patient, date of admission.

**Chief complaint and duration:** a brief statements (the patient own word) of the main problem that brought the patient to the hospital and the duration of the complaint.

**History of the present illness:** in which we describe the patient complaint from the beginning till the time of history taking. And it includes the followings:

Analysis of the chief complaint.

The related symptom review.

The reaction of the patient towards his illness.

Hospital admission.

Progression of the health status(discharge, further investigations, blood transfusion, surgical operation).

### **Review of systems**

Any system analyzed in the present illness should not be mentioned in reviewing of other systems.

**Central nervous system (CNS):** Headache, Dizziness, vertigo, tremor, parasthesia and pnumness, visual and hearing disturbances, fit, syncope.

**Cardiovascular system (cvs):** chest pain, dyspnoea, orthopnia, PND paroxysmal nocturnal dyspnoea, palpitation, leg edema, intermittent claudication.

**Respiratory system (RS):** chest pain, cough, sputum, haemoptysis, wheeze, dyspnoea.

**Gastrointestinal tract (GIT):** appetite, dysphagia, nausea, vomiting, jaundice, haematemesis, epigastric pain, heart burn, bowel habit, diarrhea, constipation, flatulence, lower GI bleeding.

**Genitourinary system (GUS):** loin pain, frequency, nocturia, urgency, dysuria, incontinence, poor stream, hesitancy, post voiding dribbling, strangury, retention of urine, polyuria, oliguria, haematuria.

**Musculoskeletal system:** bone pain, joint pain (arthralgia), joint stiffness, muscle pain (myalgia)

**Past medical history:**

Vaccination.

Childhood diseases (meas, mumps, diphtheria)

Adulthood diseases (DM diabetes mellitus, hypertension, sickle cell anaemia, ischaemic heart disease, bronchial asthma)

**The gynaecological history for female patient:**

**Menstrual history** (menarche, menstrual cycle regular or irregular, period, amount of blood or the severity, dysmenorrhoea, intermenstrual bleeding)

**Conception history:** we mention the type and duration

**Family history:**

Is the parent alive or dead and what is the cause of death (disease like IHD)

Any family history of chronic illnesses.

**Social history**

Member /room ratio

Smoking (cigarette number per day and the duration of smoking)

Alcohol intake

Domestic or animals

Water supply and sewage disposal

History of travel

**Drug history:**

Any drug or food allergy

Any chronically used drugs

### **Functional health patterns**

Functional assessment measures a person's self care ability in the areas of physical health, activities of daily living, such as bathing, dressing, toileting, and eating, instrumental activities of daily living, which are those needed for independent living, such as housekeeping, shopping, and cooking, nutritional status, social relationships and resources, self concept and coping, and home environment. These questions provide data on the life style and type of living environment to which the person accustomed.

### **Health perception**

How do you define health? How do you view your situation now? What are concerns? What do you think will happen in the future? What are your health goals? What do you expect from us as a nurse, physicians, and other health care providers?

## **The physical examination**

Perform the physical examination in a warm and well lit environment. The examination couch or bed should be of adjustable height, with a step or stool to allow patients to get up easily.

Sensitively, but adequately, expose the areas of the body to be examined and cover the rest of the patient with a blanket or sheet.

Tactfully ask relatives to leave the room before the physical examination. Sometimes it is appropriate for one to remain if the patient is very apprehensive, or if the patient requests it. Parent should always be present when you examine small children. For any intimate examination you should have a chaperone to prevent misunderstandings and provide support and encouragement for the patient.

## **The equipment you will need to carry out a full examination as follows:**

Stethoscope

Pen-torch

Measuring tape

Sphygmomanometer

Tendon hammer

Tuning fork

Cotton wool

Wooden spatula

Magnifying glass

Disposable gloves, lubricant jelly

## **General examination**

It includes general inspection, examination of the exposed parts of the body (head, neck, hands and feet) and examination of the vitals (Bp, pulse rate, respiratory rate and the body temperature)

## **General inspection:**

**Age**

**Built**

**Position in bed**

**Expression** (patient looking e.g., looks well or ill looking)

**Jaundice** (yellowish discoloration of the skin and mucous membranes)

we examine the upper sclera, base of the tongue and we need day light for proper examination.

**Pallor:** we examine the mucous membrane of the oral cavity, conjunctiva, face, palmar creases.

**Cyanosis:** bluish discoloration of the skin and mucous membranes we have central and peripheral cyanosis

For central cyanosis we examine the tongue and the lips for peripheral cyanosis we examine nail bed.

**Clubbing of fingers** is seen in cases of cyanotic heart diseases, fibrosing alveolitis and ca bronchus.

**Oedema:** to elicit the presence of leg oedema we have to press over the shin of the tibia 10 cm above the medial malleolus 30 -60 second by the thumb.

**Cervical lymphadenopathy:** we have the upper circle, lower circle and the longitudinal group of lymph nodes.

**The upper circle:** is the submental, submandibular, periauricular, post auricular and occipital group.

**The lower circle:** is the supraclavicular nodes

**The longitudinal group** jugulodigastric nodes, upper deep cervical, juguloomohyoid nodes along the sternocleidomastoid.

**Examination of the head and neck:**

**Skin:** searching for any scar, swellings and pigmentation

**Hair:** normal hair distribution and the presence of hair loss.

**Orifices:** eyes, ears, nose searching for any abnormal deformity and discharge .

**The oral cavity:** If any deviation, fissuring, angular stomatitis, examine the teeth, gum, tongue, soft palate, uvula and tonsils.

**Examination of the neck:**

It includes the examination of the followings:

Thyroid examination

Cervical lymph nodes

Neck veins

Carotid pulsation

**Examination of the hands and feet:**

Skin: discoloration, cyanosis, pallor, jaundice

Nail: clubbing, discoloration, koilonychia

Muscle wasting

Oedema in case of feet exam

Note: any cannula, urine catheter, nasogastric tube should be mentioned in the general exam, in addition to that we have to mention the state of hydration.

**Vital signs**

**Pulse:** we mention the rate, rhythm, volume, state of the blood vessel wall

**Temperature:**

Oral temperature 36.8-37.2 c<sup>0</sup>

Rectal temperature is the core temperature which is 0.5 c<sup>0</sup> more than the oral temperature while the axillary is 0.5c<sup>0</sup> less than the oral temperature.

Pyrexia is oral temperature more than 38.5c<sup>0</sup>.

gHyperpyrexia is oral temperature more than 40c<sup>0</sup>.

**Indication for rectal/axillary temperature:**

- Children
- Mentally retarded patient
- Comatose patient
- Trauma to the mouth
- Shortly after drinking hot or cold drinks
- Mouth breathers in case of NG tube or blockage nose.

**Respiratory rate: 16-20 cycle /min.**

Blood pressure: normal range 60-90 mmHg for diastolic Bp

100-140 mmHg for systolic Bp

## Abdominal examination

In order to do abdominal examination we have to take the permission from the patient and we put the patient in supine position and we expose the patient gently from the nipple to the mid thigh, because some of abdominal organs lies below the rib cage e.g., liver, spleen. And the external genitalia are part of the abdomen.

### Inspection

#### 1- From the foot of the bed:

We mention the symmetry and shape of the abdomen

Asymmetry may be caused by organomegally like hepatomegally or splenomegally or because of the presence of an abdominal mass like large ovarian cyst or large hernia.

**The shape of the abdomen may be one of the followings:-**

Flat which is the normal shape

Scaphoid e.g., like in cachexia

Distended as in the 6fs:

Fat= obesity

Fluid= ascitis

Flatus=intestinal obstruction

Faeces= faecal impaction

Fetus= pregnancy

Fibroid and other pelvic tumours

2-sequanting or kneeling from the side of the bed (to the patient's right hand):

We kneel for about one minute searching for the following signs:-

Epigastric pulsation

Visible peristalsis

Movement of the abdomen with respiration

Any visible mass

#### **Epigastric pulsations: -**

It is normally seen in thin individuals and we have to examine or inspect the abdomen for one minute whiles the patient holding his breathing. It



is abnormally seen in cases of RVH right ventricular hypertrophy, aortic aneurysm and when there is a mass overlying the stomach or the oorta.

Visible peristalsis

Usually the peristalsis seen when there is pyloric obstruction and gastric outlet obstruction and we should inspect the abdomen for about 2minutes.

### **Movement with respiration:-**

The abdomen is normally moves with respiration and it is not moving in case of peritonitis and becomes more obvious in case of emphysema.

### **3-inspection from the side of the bed:-**

Always we stand to the right side of the abdomen and we look to the followings: - skin, umbilicus and the hernia orifices

**Skin:** - we look for scars, discolorations, visible distended veins hair distribution

**Umbilicus:** - we look for the site, shape and abnormal discharge.

**Site:** - normally the umbilicus located midway between the xiphisternum and the pubic symphysis (centrally located umbilicus). Shifted umbilicus either upwards as in cases of pelvic tumours and downwards shift as in ascitis and upper abdominal tumours. Shape the umbilicus either flat(normal) , everted (umbilical hernia, abdominal distention) or inverted.

Abnormal discharge:

We have to mention the amount, colour and the types of the

### **Discharge as follows:**

Faeces as in vetilointestinal duct in infants.

Urine as in patent urachus in elderly with bladder outlet obstruction.

Blood as in adenoma.

Pus in cases of infection.

## Other physical signs

**Cough impulse**:- while we look on the sites of the hernia orifices and the scars we ask the patient to cough in order to see whether the patient has an expansile cough impulse or not.

**Succussion splash**:- it is a sign elicited after moving the patient from his lower chest or from the pelvis and you place your ear near the patient's abdomen to hear a gurgling sound provided the patient is fasting for about 4 hours before doing the test, because it is normally seen shortly after drinking plenty of fluids and it is abnormally seen in cases of gastric outlet obstruction.

## Palpation:

### Technique

- a. The hand placed horizontal with wrist and parallel to the patient  
We use the palmar aspect of the fingers for superficial palpation and the tips of the fingers for the deep palpation, the hand should be warm.

2 -the approach we start palpating away from the site of pain which we know from the history or by asking the patient.

If no pain we start from anywhere to finish our palpation at the umbilicus. And always we look to the patient's face during palpation.

3-if the patient fails to relax his abdomen we do the followings:

a-ask the patient to breathe from his mouth.

B-flex the knee joint/

C-place the palm of the left hand over the lower part of the sternum with gradual pressure till we lean on the patient

Steps:

The superficial palpation and deep palpation for any tenderness, state of the abdomen and any palpable mass

Organomegally.

Physical signs

**Rigidity**: - is a continuous abdominal contraction.

**Gaurdening**:- muscular contraction on palpation of an area of tenderness.

**Rebound tenderness:** - sudden withdrawal of manual pressure leads to snap which exacerbate underlying inflamed organs and the patient will feel pain.

**Pointing test:** - ask the patient to point to site of maximum tenderness.

**Percussion:**- we put our hand flat over the abdomen and we tap the middle finger of the placed hand by the middle finger of the other hand usually the abdomen give tympanic percussion sound, unless we have fluid or organomegally which give dull percussion sound.

**Auscultation:-**

We search for bowel sound and vascular bruit:

Techniques we put the stethoscope for about 2 minute at the right iliac fossa and we hear the peristaltic sound which is noisy gurgling sounds due to the fluid and gases. Absence of the bowel sound is seen in cases of paralytic ileus and exaggerated in cases of mal absorption, mechanical bowel obstruction.

For vascular bruit we put the stethoscope at the following areas:-

Epigastric region

Over the liver

In both loin

Both iliac fosae

## **Examination of abdominal organs:-**

**Liver:** - in liver examination we need to do palpation, percussion and auscultation.

**Palpation:** palpation of the liver start from right iliac fossa downward to the right hypochondrium. Ask the patient to take deep breathing and dip your fingers tip into the abdomen with each inspiration as the liver is pushed by the movement of the diaphragm.

**Percussion:** we start the percussion from above at the second intercostals space until the percussion note change from resonant( which is the percussion of the lung) to dull percussion note( the percussion of the liver.

Then we start percussion from the right iliac fossa (bowel percussion note) to the dull percussion note of the liver.

We measure the liver span that is normally between 10-12 cm.

Normally the upper limit of the liver is at 5<sup>th</sup> intercostals space, and the lower edge of the liver is just palpable below the costal margin.

**Auscultation:** is important in case of hepatoma (vascular tumour) in which we hear bruit.

## **Examination of the spleen:**

The spleen is the largest lymphoid organs, lies under the diaphragm on the left side of the abdomen. It may be summarized by, 1,3,5,7,9,11, that is it measures 1x3x5 inches (2.5x7.5x12.5 cm), weighs 7ounces (200 g) and lies beneath the 9<sup>th</sup> to 11<sup>th</sup> ribs.

**Palpation:** we start palpating from the right iliac fossa towards the left hypochondrium meanwhile we ask the patient to take deep breathing from his mouth and we look to the patient face for any tenderness. The spleen needs to be enlarge 1.5 times to be palpated i.e., the spleen may be enlarged but still impalpable.

**Percussion:** - if we don't find palpable spleen we do percussion.

## **Auscultation:-**

Using the bell of the stethoscope we put it just below the xiphoid process to hear the venous hum.

**Kidney:** the kidneys examined by different methods of palpation.

**Bimanual examination:** by this way of palpation we put the left hand posteriorly on the renal angle or the costo -vertebral angle which lies between the lower border of the 12 rib and the lateral boarder of the sacrospinalis muscle.

The right hand placed on the flank and we approximate both hands while the patient is breathing

**Renal ballottement:-** in this way of examination each kidney examined from its side( the right from the right side and the left from the left side) we place the right hand as a watching hand over the right flank while the left hand is the displacing hand is placed over the renal angle. We displace the enlarged kidney by the displacing hand to be felt by the watching hand.

**Renal angle test:** while the patient in sitting position we tap the renal angle shortly if seeking for tenderness.

**Gall bladder:-**the gallbladder is a pear shaped organ located below the liver at the right upper quadrant.

**Palpation:-** the gallbladder is normally impalpable in normal circumstances but it become palpable due to different causes like in acute cholecystitis, Mucocele, ca head pancreas and ca gallbladder.

**Murphy's sign( sign of acute cholecystitis)**

We put the left is placed on the costal margin so that the thumb lies over the fundus of the gallbladder then we ask the patient to take deep breath and the sign is positive when the patient catch his breath because of pain.

**Urinary bladder:-**

The urinary bladder examined by palpation and percussion:

**Palpation:-**We use the ulnar side of the hand from umbilical level downward.

**Percussion:-**full bladder gives a percussion note.

**Examination for free fluid (ascites) in the abdomen:-**

Ascites can be examined by two methods shifting dullness and transmitted thrill.

**Shifting dullness:** - is used when the amount of the fluid is small (500ml)

We start percussion from the midline at the level of the umbilicus till we reach a point of dullness. We fix our hand at that site, then we ask the patient to move slightly to the opposite side and we should wait for about 30-60 sec (to give time for fluid to re accumulate) then percuss backward we will see change in the percussion note from tympanic to dull percussion note so we call it **shifting dullness**.

**Transmitted thrill:**-is used when the amount of the fluid is large more than 1000 ml.

We place one hand on one side of the abdomen and we tap the abdomen by the other hand on the opposite side so we can feel the transmitted thrill on the other side like a mechanical wave.

In order to finish the abdominal examination we have to examine:-

- The external genitalia.
- Per rectal examination.
- Examination of the inguinal lymph nodes.
- Examination of the back.
- Examination of the supraclavicular lymph nodes.

## **Examination of the heart:**

### **Inspection of the pericardium:**

We have to inspect the pericardium for the presence of any scars like midline sternotomy scar from open heart surgery like valve replacement or valvoplasty. Look for the presence of any pericardial pulsation.

### **Palpation:**

We put the whole palm of the hand on the pericardium to feel the apex beat. (Which is the most lateral and lowest point at which the cardiac impulse can be felt that's normally at the left 5<sup>th</sup> intercostals space).

Palpation for palpable murmur (thrill).

### **Auscultation:**

We auscultate the heart for the following sounds:

1-S1 or the first heart sound (it comes from the closure of the mitral and tricuspid valves), (lup)

2-S2 or the second heart sound (it comes from the closure of the aortic and pulmonary valves), (dup)

3-murmurs: is a musical sound due to turbulent blood flow through a valve.

We start the auscultation by put the stethoscope at the apex, tricuspid area( 4<sup>th</sup> left ics), pulmonary area(second left ics) and finally at the aortic area(second right ics). Then we ask the patient to turn himself to the left side then we put the stethoscope at the apex, then we ask him to sit and we put the stethoscope at the third left intercostals space.

## **Examination of the respiratory system**

### **Inspection of the chest:-**

- a- Chest deformities:- we inspect the chest of the patient while the patient lying at 45 degree with exposure of the head, neck and the whole chest. Burrell chest (increase the anteroposterior diameter) due to long standing chronic obstructive airway disease COPD.
- b- visible mass or masses especially in the supraclavicular fossa.
- c- abnormal muscle movement (using the accessory muscles)
- d- muscle wasting due to weight loss.
- e- looking for any scar from previous thoracic surgery.
- f- the mode of respiration (thoracic or abdominal).

### **Palpation:-**

- We palpate the chest wall looking for the following abnormalities:-
- 1- Chest wall tenderness which may result from a fractured rib.
  - 2- Palpation of any mass.
  - 3- Surgical emphysema. (Result from the presence of subcutaneous air)
  - 4- the vocal fremitus :- we do this test by applying the palm of the right hand flat on the anterior chest wall and we ask the patient to say one one or 44 in Arabic language and we test three levels upper, middle and lower and we compare between the left and right side of the chest wall. Vocal fremitus increase in case of consolidation, collapse, tumour and lung fibrosis
  - 5- chest expansion: - we put both thumbs at the level of the xiphisternum and we make a skin fold in between and the other fingers spreads laterally then we ask the patient to take deep breath
  - 6- we check the position of the trachea.

### **Percussion:-**

- Anteriorly we percuss on the clavicle directly by the middle finger of the right hand in the midclavicular point. Then we percuss the intercostals spaces. Laterally we percuss from the 4<sup>th</sup> -7<sup>th</sup> ICS
- Posteriorly we percuss and compare both apices , above and below the spine of the scapula then between the scapulae and vertebral column downward.



## **Grades of percussion**

1-Hyperresonance-pneumothorax.

2-Resonance-normal.

3-Dullness-consolidation, mass and lung collapse.

4-Stony dullness-pleural effusion.

## **Auscultation:-**

We use the diaphragm in three positions:-

Anterior at the midclavicular line.

lateral at the mid axillary line.

Posterior.

We hear the breath sounds, type of breath sounds and the other abnormal sounds

The normal breath sound is vesicular breath sound and we have to know whether the breath sound is diminish In one or more than one area of the chest wall and we have to mention such area of diminishing breath sound clearly.

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## **Examination of a lump**

In order to examine any lump in the body we have to do the following steps:-

1-local examination (inspection, palpation, special physical signs, percussion, auscultation)

2-Regional examination (regional lymph nodes and local tissues like arteries, nerves, bone and joint)

### **Local examination:**

#### **1-inspection (4s)**

Site

Size

Shape (spherical, pear, irregular)

State of overlying skin (pigmentation, dilated or visible vein, oedema, signs of inflammation and the presence of scar)

#### **2-Palpation:**

Tenderness (tender or not tender)

Surface (smooth, nodular or irregular)

Edge (well defines or not well defines)

Consistency (soft, firm, hard or stony hard)

Temperature

Attachment to skin and underlying tissues

#### **3-Special physical signs:**

a. fluctuation,

b. transillumination

The mass will glow following application of a torch light in a dark room

c. slipping test

d. emptying

- e. reducibility
- f. indentation
- g. pulsation

#### **4-auscultation:**

- 1-systolic bruit as in vascular lump
- 2-bowel sound if the lump containing bowel

#### **5-percussion: -**

A lump containing bowel will give tympanic percussion note

#### **2-Regional examination:**

For any mass we found we have to examine the draining lymph nodes according to the anatomical sit of the mass and the draining lymph nodes enlarge secondary to inflammatory and malignant masses. Then we have to check the local tissues likes the arteries, veins and bone and joint.

## Breast examination

### Surgical anatomy:-

The protuberant part of human breast is generally described as overlying the second to the sixth ribs and extending from the lateral border of the sternum to the anterior axillary line.

The lobule is the basic structural unit of the mammary gland. The number and size of the lobules vary enormously: they are most numerous in young women. From 10 to over 100 lobules empty via ductules into a lactiferous duct, of which there are 15-20.

The areola contains involuntary muscle arranged in concentric rings as well as radially in subcutaneous tissue. The areolar epithelium contains numerous sweat glands and sebaceous glands, the sebaceous glands enlarge during pregnancy and serve to lubricate the nipple during lactation (Montgomery's tubercles).

The nipple is covered by thick skin with corrugations. Near its apex lie the orifices of the lactiferous ducts. The nipple contains smooth muscle fibers arranged concentrically and longitudinally which help in the nipple erection.

The lymphatics of the breast drain predominantly into the axillary and internal mammary lymph nodes. The axillary lymph nodes receive approximately 85% of the drainage.

The breast supply by the internal mammary and intercostal arteries

### **Examination of the breast:**

We examine the breast by inspection, palpation, examination of the axillary lymph nodes and we examine the arm.

Exposure: we expose the patient down to the waist.

Position: the patient has to sit upright in the bed.

### **Inspection**

Size

Symmetry

Visible lump or ulcer

Visible scars

Visible or dilated vein

Skin tethering

Skin redness

Areola (degree of pigmentation, cracking, fissuring and swelling)

Nipple (level, direction, discharge, discoloration and retraction)

### **Palpation**

We have to examine the normal breast before the affected breast in order to know the texture of the breast, and then we examine the other breast in systematic way quadrant by quadrant, the areola and nipple searching for any mass or tenderness.

### **Examination of the axillary lymph nodes:**

The right axilla examined by the right hand and the left by the left searching for any palpable lymph node and we have to know the texture of the involved node.

### **Examination of the arm:**

We examine the arm for the followings:

Swelling of the arm or edema

Arterial and venous abnormalities

Neurological abnormalities

## **Peripheral vascular assessment**

The assessment of peripheral vascular integrity (arterial supply , venous return and lymphatic drainage) should start with history and physical examination and investigations.

We have to take careful history about the symptoms of vascular impairment as follows:

1-intermittent claudication.

2-Rest limb pain.

3-colour changes.

4-limb swellings.

5- parasthesia and numbness.

6- ulcerations.

7 -loss of function.

8- history of cardiovascular problems like hypertension, ischaemic heart disease, heart failure or diabetes mellitus etc.

### **intermittent claudication.**

This is a phenomenon of (a) pain in the leg(especially in the calf but sometimes in the thigh or buttock or instep) increasing steadily until the patient is forced to stop; (b) relief of that pain by rest. Should he resume his journey on foot, this sequence is repeated, and he is forced to halt at exactly the same distance(claudication distance) as before.

### **Rest limb pain.**

It is pain that its felt in a limb at rest and it is more grave and severe than intermittent claudication and gangrene is never far away. Usually the pain is felt in the foot and is worse at night when the foot becomes warm beneath the blanket which increase the oxygen requirements so the patient will hang his leg or legs out of the side of the bed.

### **Physical examination:**

We start the physical examination by doing the general examination as usual and then we do exam the involved limb in details as follows:

Inspection:

1-Colour of the skin:- pale, cyanosis, pigmentations or black.

2- Any deformity, ulceration and swelling.

- 3- Loss of hair and shyness
- 4- We look for wasting of the affected limb.
- 5- We look at the pressure area and between the digits for any Thickening of the skin, discolorations ulcerations, fissuring, blistering, necrosis and gangrene.

### **Palpation:-**

**Temperature:** the affected limb is colder than the normal limb.

**Tenderness** and any signs of infection.

**Pulses:**

#### **1-Femoral pulse:**

Is felt below the inguinal ligament midway between the anterior superior iliac spine and the symphysis pubis.

#### **2-Popliteal pulse:**

- 1- While the leg is straight your fingers over the Popliteal fossa so they meet each other at the midline and the thumbs at the patella or the two tibial tuberosities.
- 2- While the patient in prone position we flex the knee and palpate the Popliteal fossa.
- 3- The crossed leg test for Popliteal pulsation this test is unnecessary if one or more foot pulses are present, it is performed with the patient seated and legs are crossed each other oscillatory movement of the foot occurs synchronously with the patient pulse, meanwhile we try to distract the patient attention from the leg by taking a history.

#### **3-Dorsalis pedis artery:-**

The patients toes are grasped lightly in the left hand so as to steady the foot, we fell the artery between the first and second metatarsal bone (in the groove) in between them at the proximal end of it just lateral to the tendon of extensor hallucis longus.

It is absent in 10% of the population.

#### **4-Posterior tibial pulse:-**

Midway between the back of medial malleolus and medial border of the Achilles tendon.

### **5-Anterior tibial pulse**

Midway between the two malleoli just above the level of the ankle joint.

### **6-Radial pulse**

Above and medial to the styloid process lateral to the tendon of flexor carpi radialis.

### **7-Ulnar pulse**

Proximal to the pisiform bone lateral to the tendon of flexor carpi ulnaris.

### **8-Brachial pulse**

Just medial to the tendon of biceps.

### **9-Axillary pulse**

Is felt at the apex of the axilla.

### **10-Carotid pulse**

Medial to lateral border of sternomastoid at the level of thyroid cartilage(Adams apple).

### **11-Superficial temporal pulse**

Just anterior to the ear.

### **Auscultation**

**1-listen for bruit.**

**2-Measure the BP on both arms.**

Also we have to measure the limb circumference and we compare with other limb.

Then we assess the limb movement and we test the nerve supply to both lower and upper limbs.



## **Assessment of the musculoskeletal system**

The musculoskeletal system or the locomotor system composed of bone, skeletal muscles and joints in addition to intact nerve supply.

The human body possess 650 skeletal muscle that are under voluntary control. We have three types of joints fibrous joints between the bones of the skull, cartilaginous joint between the vertebrae and the synovial joints in the upper and lower limbs.

The bones are of two types the compact bone and the sponge bone. The compact bone forming the shaft of the bone while the sponge bone forming the bones heads.

The assessment of the musculoskeletal system stars by the history, physical examination and followed by the investigations.

### **Symptoms:-**

Bone pain

Bone swellings.

Deformity or deformities of upper limb, lower limb or spine deformity.

Joint pain( arthralgia).

Joint swelling.

Joint stiffness or limitation of movements.

Muscle pain(myalgia).

Backache.

### **Past medical and surgical history:-**

We have to ask about RA rheumatoid arthritis, OA osteoarthritis, previous trauma or fracture, SCD, malignancy,

### **Family history:-**

We ask about family history of same problems, SCD, RA, osteoporosis or gout

### **Social history:-**

There are a lot of social habit may affect the bone density leading to decrease in the bone density the so called osteoporosis like smoking, alcoholism, lack of exercise and decrease in the sun exposure.

### **Drug history:-**

We have drugs like corticosteroids which also cause osteoporosis so we have to ask about it, in addition to the lack of calcium rich diet like the dairy product, red meat and high intake of caffeine rich beverages that play a major role in the occurrence of osteoporosis.

**Physical examination:-**

We have to do general examination followed by local examination of the involve site.(hand , feet, back, lower or upper limb, ..etc)

We have to inspect the patient after proper exposure and we observe his, her gate for any limping or difficulties on walking and posture.

Inspect joints, muscles, and extremities for size, symmetry, and color.  
Palpate joints, muscles, and extremities for tenderness, edema, heat, nodules, or crepitus.

Test muscles strength and ROM (range of movement) of joints.

Compare bilateral findings of joints and muscles.

perform special tests.

### **The assessment of the nervous system:**

the nervous system compose of the brain, spinal cord, and the peripheral nerves.

We start the assessment of the nervous system by taking history and physical examination followed by specific investigation.

### **The important symptoms we have to ask about as follows:**

Headache.

Loss of consciousness.

Vertigo.

Blurring of vision.

Tinnitus.

Convulsion.

Parasthesia and numbness.

Paralysis

Past history:

We have to ask about history of stroke, and history of head injury.

Family history:

Family history of CVA cerebro- vascular accident, epilepsy, and brain tumour.

### **Collecting objective data:**

Mental status.

Cranial nerves.

Motor and cerebellar system.

Sensory system.

Refluxes.

### **Mental status and level of consciousness:**

Observe level of consciousness

Observe posture and body movement

observe dress,grooming, and hygiene

observe facial expression

observe speech

observe mood, feelings, and expressions

observe thought processes and perceptions

### **-cranial nerves**

1-olfactory

2-optic

3-oculomotor, 4-trochlear, and 6- abducent

5-trigeminal

7-facial

8-vestibulocochlear

9-glossopharyngeal and 10 vagus

11-accessory

12-hypoglossus

### **sensory system**

light touch, pain, and temperature sensation

vibratory sensation

sensitivity to position

tactile discrimination

### **reflexes**

#### **deep tendon reflexes**

biceps reflex

brachioradialis reflex

triceps reflex

patellar reflex

Achilles reflex

Ankle clonus

#### **Superficial reflexes**

Planter reflex

Abdominal reflex

Cremasteric reflex in males

#### **Tests for meningeal irritation**

Brudzinkis sign

Kernig sign

