

The techniques of some specific tests in physical examination

Visual Fields:

Confrontation testing:

Stand or sit 3 feet in front of and at eye level with the patient. Ask patient to look with both eyes at your-eyes. (You can ask the patient to close one eye while you close the other eye of yourself and test each eye individually).

Put your hands out on both sides approximately 50 cm apart and approximately 30 cm above eye level. Extend your index finger. Your fingers should now be in the patient's upper temporal fields on both sides. Ask the patient to indicate which index finger you move-right, left or both.

Repeat with hands approximately 30cm below eye level.

If you find a defect, try to establish boundries. Test one eye at a time.

Vestibular Function:

Caloric test (normally performed in a test laboratory):

Patient is lying down with head on a pillow at 30 degree, so the lateral semicircular canal in vertical. Instill cool water (30°) into one ear over 40 second (up to 120 ml). Ask the patient to look straight ahead and watch the eyes. Repeat in the other ear, and then each ear with warm water (44 degree).

Normal response:

- ▲ Cold water-nystagmus fast-phase away from stimulated ear.
- ▲ Warm water-nystagmus fast phase toward stimulated ear.

Hallpike's test: (used in patients with positional vertigo).

Sit the patient on a flat bed so that when he lies down his head will not be supported. Turn the head to one side and ask the patient to look to that side. The patient then lies back quickly till he is flat with his neck extended with his head supported by the examiner. Watch for nystagmus in the direction of gaze. Note if this is associated with

a delay, whether it fatigues when the test is repeated and if the patient feels vertigo. Repeat for the other side.

Weber test: (For lateralization)

Place the base of the lightly vibrating tuning fork firmly on top of the patient's head or on the midforehead. Normally the sound is heard in the midline or equally in both ears. In unilateral conductive hearing loss, sound is heard in the impaired ear. In unilateral sensorineural hearing loss, sound is heard in the good ear.

Rinne test: (compare air conduction (AC) and bone conduction (BC))

Place the base of a lightly vibrating tuning fork on the mastoid bone, behind the ear and level with the canal. When the patient can no longer hear the sound, quickly place the fork close to the ear canal an ascertain whether the sound can be heard again.

Normally: $AC > BC$. In conductive hearing loss: $BC = AC$ or $BC > AC$. In sensorineural hearing loss: $AC > BC$

Transillumination of Sinuses

To transilluminate the maxillary sinuses, place the light source lateral to the nose, just beneath the medial aspect of the eye. Look through the patient's open mouth for illumination of the hard palate. To transilluminate the frontal sinuses, place the light source against the

medial aspect of each supraorbital rim. Look for a dim red glow as light is transmitted just above the eyebrow.

Thyroid Gland

- Inspection

A normal thyroid is barely visible. Observe any upward motion of thyroid with swallowing.

- Palpation

1. Anterior approach with sitting face to face: By flexing the patient's neck or turning the chin slightly to the right, relax sternocleidomastoid muscle on that side. Displace the larynx to

the left by left hand, and during swallowing, palpate the left displaced thyroid lobe between the right thumb and the left sternocleidomastoid muscle. The right lobe is evaluated by displacing the larynx to the right and reversing the hand positions.

2. Posterior approach with standing behind the patient: Place two hands around the patient's neck, which is slightly extended, use the left hand to push the trachea to the right, as the patient swallow, feel for the thyroid gland against the right sternocleidomastoid muscle with right hand and against the left sternocleidomastoid muscle with left hand.

Cervical Rib

Palpate the radial pulse. Move the arm through its range of motion. Obliteration of the pulse by this maneuver is suggestive of a cervical rib.

Assessment of Chest Expansion

Place your thumbs along each costal margin, your hands along the lateral rib cage. As you position your hands, slide them medially a bit to raise loose skin folds between your thumbs. Ask the patient to inhale deeply. Observe how far your thumbs diverge as the thorax expands, and feel for the extent and symmetry of respiratory movement.

Assessment of Tactile Fremitus

Compare both sides of the chest, place the ulnar side of the right hand against the patient's chest wall and ask the patient to say "ninety-nine". Fremitus is usually decreased or absent over the precordium.

The liver

Percussion

The upper border of the liver is percussed in the right midclavicular line.

Starting in the midchest. As the chest is percussed downward, the resonant note of the chest becomes dull as the liver is reached. As percussion continues still further, this dull note becomes tympanic.

Palpation

- The bimanual technique

The posterior hand is placed between the 12th rib and the iliac crest and the anterior hand firmly inward and upward in the RUQ and instruct the patient to take a deep breath and hold it.

- The hooking technique

The examiner stands near the patient's head and places both hands together below the right costal margin and the area of dullness. The examiner press inward and upward and hooks around the liver edge while the patient inhales deeply.

- Rule out hepatic tenderness

Hepatic tenderness is elicited by placing the palm of the left hand over the right upper quadrant and gently hitting it with ulnar surface of the fist of the right hand.

The Spleen

Percussion

With the patient breathing normally, in the supine position, percuss in the lowest intercostal space in the left anterior axillary line. Normal percussion yields either a resonant or tympanic note. A positive test of splenomegaly is diagnosed when the percussion note is dull.

Palpation

First, have the patient slip his left forearm under the small of his back, this position will tend to thrust the spleen upward. Second, roll the patient on his right side with the right leg straight and the left knee flexed. The tips of the palpating fingers should be placed 1-2 cm below the costal margin.

The Kidney

Palpation

Stand at the patient's right side and place the left hand behind the patient's right flank, between the costal margin and the iliac crest.

The right hand is placed just below the costal margin with the tips of the fingers pointing to the examiner's left. Very deep palpation may reveal the lower pole of the right kidney as it descends during inspiration. The lower pole may be felt as a smooth, rounded mass. The same procedure is used for the left kidney as you stand on the patient's left side.

Rule Out Renal Tenderness

The patient should be seated and the examiner should make a fist and gently hit the area overlying the costovertebral angle on each side

The Bladder

The bladder normally cannot be examined unless it is distended above the symphysis pubis. On palpation the dome of the distended bladder feels smooth and round. Check for tenderness. Use percussion to check for dullness.

The Aorta

Press firmly deep in the upper abdomen, slightly to the left of the midline, and identify the aortic pulsations.

Rectal Examination

May be performed with the patient lying on his back, lying on the left side or standing, bent over the examination table. The examiner lubricates the right gloved index finger. The left hand spreads the patient's buttocks, and the patient is instructed to take a deep breath, the examiner's right index finger is gently placed on the anal verge. The sphincter tone should be assessed.

Test for Cholecystitis

Murphy's sign:

Hook your left thumb or the fingers of your right hand under the costal margin at the point where the lateral border of the rectus muscle intersects with the costal margin. Ask the patient to take a deep breath. Watch the patient's breathing and note the degree of

tenderness. A sharp increase in tenderness with a sudden stop in inspiratory effort constitutes a positive Murphy's sign of acute cholecystitis.

Tests for Ascites

Shifting Dullness:

After mapping the borders of tympany and dullness, ask the patient to turn onto one side. Percuss and mark the borders again. In a person without ascites, the borders between tympany and dullness usually stay relatively constant. In ascites, dullness shifts to the more dependent side, while tympany shifts to the top.

Puddle sign:

Ask the patient to assume the knee-chest position for several minutes to allow any fluid to pool by gravity. Percuss the umbilical area for dullness to determine the presence of fluid.

Fluid wave:

Ask an assistant to press the edges of both hands firmly down the midline of the abdomen. While you tap one flank sharply with your fingertips, feel on the opposite flank for an impulse transmitted through the fluid. Unfortunately, this sign is often negative until ascites is obvious, and it is sometimes positive in people without ascites. An easily palpable impulse suggests ascites.

Identifying an organ or a mass in an ascitic abdomen

Ballottement:

For identifying an organ or a mass in an ascitic abdomen straighten and stiffen the fingers of one hand together, place them on the abdominal surface, and make a brief jabbing movement directly toward the anticipated structure, this quick movement often displaces the fluid so that your fingertips can briefly touch the surface of the structure through the abdominal wall.

Tests for Appendicitis

Rovsing's sign (to assessing possible appendicitis):

Press deeply and evenly in the left lower quadrant. Then quickly withdraw your fingers. Pain in the right lower quadrant during left sided pressure is a positive Rovsing's sign and suggests appendicitis.

Psoas sign:

Place your hand just above the patient's right knee and ask the patient to raise that thigh against your hand. Alternatively, ask the patient to turn onto the left side. Then extend the patient's right leg at the hip.

Cutaneous hyperesthesia:

At a series of points down the abdominal wall, gently pick up a fold of skin between your thumb and index finger, without pinching it. Localized pain in all or part of the RUQ, may accompany appendicitis.

Obturator muscle test:

Ask the patient to lie supine and flex the right leg at the hip and knee to 90 degree. Hold the leg just above the knee, grasp the ankle, and rotate the leg laterally and medially (this sign is positive in ruptured appendix or a pelvic abscess).

To assessing peritoneal inflammation

Rebound tenderness:

Press your fingers in firmly and slowly, and then quickly withdraw them. Watch and listen to the patient for signs of pain. Ask the patient (1) to compare which hurt more, the pressing or the letting go, and (2) to show, you exactly where it hurt. Pain induced or increased by quick withdrawal constitutes rebound tenderness. It results from the rapid movement of an inflamed peritoneum.

Inguinal hernia

Inspect the area of the inguinal canal, when he is standing and bearing down. Then insert your examining finger (depending on the size of the patient) into the lower part of the scrotum and carry it upward along the vas deferens into the inguinal canal. Ask the patient to cough. The hernia is described as *indirect* if the viscus lies within the canal or may also even pass into the scrotum. (Be sure to examine both sides thoroughly). If the viscus is felt medial to the external canal, it probably represents a *direct* inguinal hernia.

Peripheral Veins

Jugular venous pressure:

Raise the head of the bed to about 30°. Turn the patient's head slightly a way from the side you are inspecting. Look for pulsations in the suprasternal notch, between the attachments of the sternomastoid muscle on the sternum and clavicle, or just posterior to the sternomastoid. Extend a long rectangular object or card horizontally from the highest point of pulsation and a centimeter ruler vertically from the sternal angle, making an exact right angle. This vertical distance in cm, above the sternal angle where the horizontal object crosses the ruler, is the JVP.

Hepatojugular Reflex:

Use your hand to apply firm and sustained pressure to the liver in the RUQ while the patient is instructed to breath regularly. Observe the neck for an elevation in JVP followed by an abrupt fall in JVP as the hand pressure is released. The JVP quickly equilibrates after removal of the pressure.

Thrombosis

Humans sign:

Flex the patient's knee slightly with one hand and, with the other, dorsiflex the foot. (Complaint of calf pain is positive sign)

Peripheral Arteries

Auscultate and palpate carotid pulse:

The patient should be lying down with the head of the bed still elevated to about 30°. When feeling, for the carotid artery, first inspect the neck for carotid pulsations. Then place the diaphragm of the stethoscope over the carotid artery. The patient's head should be slightly elevated on a pillow and turned slightly away from the carotid artery being elevated. Normally, either nothing or transmitted heart sounds are heard. Place, your left index and middle fingers (or left thumb) on the right carotid artery in the lower third of the neck. Press posteriorly, and feel for pulsations.

Assess variations in amplitude from beat to beat or with respiration and repeat on the opposite side.

- Avoid compressing both sides at the same time.
- Avoid compressing the carotid sinus higher up in the neck.

Palpate the Radial pulse:

Grasp both of the patient's wrists and palpate the pulses with the index, middle, and fourth fingers. Count the pulse for 15 seconds and multiply by 4 and a full minute if the pulse is irregular.

Palpate the Brachial pulse:

Two manners is used:

- a. Use the index and middle fingers or thumb of your opposite hand. Cup your hand under the patient's elbow and feel for the pulse just medial to the biceps tendon. The patient's arm should rest with the elbow extended, palm up. With your free hand, you may need to flex the elbow to a varying degree to get optimal muscular relaxation.
- b. You should standing in front of the patient and your left hand hold patient's right arm, and your right hand hold the patient's left arm. The brachial artery can be felt medially just under the belly or tendon of the biceps muscle. Once the brachial pulsation is felt with the thumbs, you should apply progressive pressure to it until the maximal systolic force is felt.

Palpate and auscultate the Abdominal Arorta:

The patient should be supine. The examination is performed by palpating deeply, but gently, into the midabdomen.

The presence of a mass with laterally expansive pulsation suggests an abdominal aortic aneurysm.

- For rule out abdominal bruits you should place the diaphragm of the stethoscope in the midline of the abdomen about 2 inches above the umbilicus and listen carefully.
- Abdominal bruits that are present only during systole are frequently of little clinical value, because they are found in normal individuals as well as patients with essential hypertension.
- The presence of a systolic-diastolic abdominal bruit, however should raise the suspicion of renovascular hypertension.

Then you should place diaphragm of the stethoscope in about 2 inches above the umbilicus and 1-2 inches laterally to the right and to the left of midposition for rule out renal bruit.

Palpate the femoral pulse:

The patient should be lying on the back. Press deeply, below the inguinal ligament and about midway between the anterior superior iliac spine and symphysis pubis. The use of two hands, one top of the other, may facilitate this examination, especially in obese patients.

Palpate the popliteal pulse:

The patient's knee should be somewhat flexed, and the leg relaxed. Place the fingertips of both hands so that they just meet in the midline behind the knee and press then deeply into the popliteal fossa.

Palpate the dorsalis pedis pulse:

Feel the dorsum of the foot (not the ankle) just lateral to the extensor tendon of the great toe. If you cannot feel a pulse, explore the dorsum of the foot more laterally.

Palpate the posterior tibial pulse:

Curve your fingers behind and slightly below the medial malleolus of the ankle. (This pulse may be hard to feel in a fat or edematous ankle). The description of the amplitude of the pulse is most important.

Arterial supply

Allen test:

This test is useful to assure the patency of the ulnar and radial artery before sampling. While the patient make a tight fist, compress both radial and ulnar arteries firmly between your thumbs and fingers. Next ask the patient to open the hand. Release your pressure over the

ulnar artery, and then releasing the radial artery while still compressing the ulnar. Pallor of the palm during compression of one artery indicates occlusion of the other.

Mapping varicose veins:

With the patient standing, place your palpating fingers gently on a vein and, with your other hand below it, compress the vein sharply, feel for a pressure wave transmitted to the fingers of your upper hand. A palpable pressure wave indicates that the two parts of the vein are connected.

Competency of venous valves:

With the patient supine, elevate one leg to about 90 to empty it of venous blood. Next, occlude the great saphenous vein in the upper thigh by manual compression. Ask the patient to stand, while you keep the vein occluded, watch for venous filling in the leg. (Normally the vein fills from below, taking about 35 seconds). After the patient has stood for 20 seconds release the compression and look for any sudden additional venous filling. (Normally there is none)

Muscle tone

Ask the patient to relax. Flex and extend the patient's fingers, wrist and elbow, ankle and knee . There is normally a small, continuous

resistance to passive movement. Observe for decreased (flaccid) or increased (rigid spastic) tone.

Muscle strength

Test strength by having the patient move against your resistance.

Always compare one side to the other.

- Grading:

0/5. No muscle movement.

1/5. Visible muscle fasciculation, but no movement at the joint.

2/5. Movement at the joint, but not against gravity.

3/5. Movement against gravity, but not against resistance.

4/5. Movement against resistance, but less than normal.

5/5. Normal power.

Coordination and gait

Rapid alternating movement:

The ability to perform rapid alternating movements is called diadochokinesia. The patient can be asked to pronate and supinate one hand on the other hand rapidly, or have the patient to touch the thumb to each finger as quickly as possible.

Point to point movements:

- Ask the patient to touch your index finger and his/her nose

alternately several times. Move your finger about as the patient performs this task.

- Hold your finger still so that the patient can touch it with one arm and finger outstretched. Ask the patient to move their arm and return to your finger with their eye closed.

- Ask the patient to place one heel on the opposite knee and run it down the shin to the big toe. Repeat with the patient's eye closed.

Romberg test: (Romberg test is performed after examining the gait).

Be prepared to catch the patient if they are unstable. Ask the patient to stand with the feet together and eyes closed for 5-10 seconds without support. The test is said to be positive if the patient becomes unstable.

Test the superficial reflexes

Abdominal

Use a blunt object such as key or tongue blade. Stroke the abdomen lightly on each side in an inward direction above the umbilicus and below it. Note the contraction of abdominal and deviation of the umbilicus towards the stimulus.

Test for pyramidal tract disease

Plantar response or Babinski's sign (L₅, S₂):

Explain to the patient that you are going to stroke the bottom part of his foot. Gently draw a blunt object up a lateral border of the foot and across the foot pad. Normally, there is plantar flexion of the big toe. In the presence of pyramidal tract disease, there is dorsiflexion of the big toe.

Chaddock's sign:

Stimulate on lateral aspect of foot. When the big toe dorsiflexes, pyramidal tract disease is suggested.

Oppenheim's sign:

Run down the medial aspect of the tibia with thumb and index finger. Dorsiflexion of the big toe indicates pyramidal tract disease.

Hoffmann's sign:

The patient's hand is relaxed and pronated, and the examiner grasp the terminal phalanx of the middle finger between the index finger and thumb. With a sharp jerk, the phalanx is passively flexed and suddenly released. A positive response consists of adduction and flexion of the thumb as well as flexion of the other fingers.

Sensory

Vibration:

Use a low pitched tuning fork (128 Hertz). Strike the tuning fork and place it on the sternum or chin to ensure that the patient understand what vibration means. Ask the patient to close his eyes.

Place the stem of the fork over the distal interphalangeal joint of the patient's index fingers and big toes. Ask if he can feel the vibration. Check with a non-vibrating tuning fork first to ensure, that the patient reporting the correct stimulus.

Position sense or proprioception:

Grasp the patient's big toe and hold it away from the other toes to avoid friction. Show the patient "up" and "down". Ask the patient to close eyes. Grasp only the sides of the digit. It is routine to test the terminal phalanx on each hand and toes. Ask the patient to identify the direction you move the toe. If position sense is impaired move proximally to test the ankle joint. Test the fingers in a similar fashion. If indicated problem, move proximally to the metacarpophalangeal joints, wrists, and elbows.

Meningeal irritation

Neck stiffness:

Note: not to be performed if there could be cervical instability. Eg: following trauma or in patients with rheumatoid arthritis. The patient should be lying flat. Place your hands behind the patient's head. Gently rotate the head. Moving the head as if the patient was indicating "no". Feel the stiffness. Gently lift the head off the bed, feel the tone in the neck. Watch the legs for hip and knee flexion.

Hip and knee flexion in response to neck flexion=Brudzinski's sign. This indicates meningeal irritation.

Kernig's sign:

The patient is lying flat on the bed. Flex the leg at the hip with the knee flexed. Then try to extend the knee. Repeat on the other side. If the knee straightens without difficulty, the test is normal. Resistance to knee straightening=Kernig's sign

Carpal tunnel syndrome

Tinel's test:

Percussion of a nerve at putative site of compression (usually using a tendon hammer). It is positive when paraesthesia are produced in the distribution of the nerve concerned. Commonly performed to test for median nerve compression at the wrist.

Phalen test:

Hold the patients wrists in acute flexion for 60 seconds. Alternatively, ask the patient to press the backs of both hands together to form right angles. If numbness and tingling develop over the distribution of the median nerve (e.g., the palmar surface of the thumb, and the index, middle, and part of the ring fingers), the sign is positive, suggesting carpal tunnel syndrome.

Lhermitte's phenomenon

Forward flexion of the neck produces an electric shock feeling. Usually running down the back. The patient may complain of this spontaneously or you can test for it by flexing the neck. Occasionally patients have the same feeling on extension, indicates cervical pathology - usually demyelination. Occasionally occurs with cervical spondylitic myelopathy or cervical tumours.

Low back pain

Straight leg raising:

With the patient lying flat on the bed, lift the leg, holding the heel. Note angle attained and any difference between the two sides. (Normal > 90°, less in older patients).

Note: Increased pain in the affected leg when the opposite leg is raised strongly confirms radicular pain and constitutes a positive crossed straight leg-raising sign.

Sitting knee extension test:

The patient sits off the side of the bed and flexes the neck, placing the chin on the chest. The examiner fixes the thigh on the bed with one hand while the other hand extends leg. If sciatica is present, pain is reproduced as the leg is extended.

Asterixis

Ask the patient to stop traffic by holding both arms forward, with hands cocked up and fingers spread. Watch for 1 to 2 minutes, coaxing the patient as necessary to maintain this position. Sudden, brief, non rhythmic flexion of the hands and fingers indicates Asterixis, that identifies a metabolic encephalopathy.

Winging of the scapula

When the shoulder muscles seem weak or atrophic, look for winging. Ask the patient to extend both arms and push against your hand or against a wall. Observe the scapula. Normally they lie close to the thorax. In winging, the medial border of the scapula just backward. It suggests weakness of the serratus anterior muscle or injury to the long thoracic nerve.