

# Examination of the cardiovascular system



**ASSIGN  
BUSTER**

The child should be undressed appropriately to the waist. In the older child, the examination easily performed with the patient sitting over the edge of the bed or even on a chair. Preferably, examine the younger child on the parent's lap. Removing a toddler from his parents is less likely to yield good clinical signs and more likely to yield a screaming child. For examination of femoral pulses, the child should be in the supine position.

Warm your hands by rubbing them against each other.

## **STEPS OF THE TASK**

You should use the middle three fingers of your dominant hand to palpate the pulses against the underlying bone. The finger tips are used for palpation as they have maximum sensitivity.

While palpating, the artery is stabilized by the proximal and distal fingers and the thrust of the pulse is felt by the middle finger. Partial occlusion of the artery by the distal finger improves the thrust of the pulse wave on the middle finger.

Palpate all the pulses listed below first on the right and then on the left side. Always compare the respective pulses on both sides except the carotids. In case of carotids, palpating both sides can induce cerebral ischemia and can cause the patient to faint.

Carotid (don't palpate both sides simultaneously) – Palpated at the level of thyroid cartilage along the medial border of the sternomastoid muscle either with finger tips or thumb (left thumb for the right side and vice versa)

Brachial – Palpated with the elbow flexed along the medial aspect of the lower end of the arm

Radial – felt at the lower end of the radius on the anterior aspect of the wrist, medial to the styloid process with the patient's forearm slightly pronated and wrist semiflexed

Femoral (DO NOT FORGET FEMORALS) – felt in the middle of the groin with the leg slightly flexed and abducted and foot externally rotated.

Dorsalis pedis – can be felt on the dorsum of the foot lateral to the extensor hallucis tendon in the middle third of the foot

Posterior tibial – felt posterior to the medial malleolus and anterior to the Achilles tendon.

For assessing the pulse rate, use brachial pulse in an infant or toddler and radial pulse in older children

While counting the pulse rate, count for 15 seconds and multiply by 4. But tell the examiner that ideally, you would like to count for one minute.

However, if the pulse is irregular, then count for one full minute and also count the heart rate by auscultation.

Rhythm – while looking for the rhythm, one looks for the gap between the pulse waves and comment on their regularity.

Volume

This is a highly subjective sign. It describes the thrust (expansion) of the pulse wave and reflects the pulse pressure.

If high volume, always check for collapsing nature. (Hold the right forearm of the patient by your hand in such a way as the radial artery is under the head of the metacarpals of our hand. Lift the patient's entire upper limb vertically by 90°, and feel for the sudden and exaggerated rise and fall of the pulsations of radial artery.)

Character – This describes the form of the wave and various types are decided by the rise, peak and waning of the wave. It is best appreciated in carotids.

Radio femoral delay (femoral pulse appears following a time delay after radial – suggests coarctation of aorta)

## **POST- TASK**

Make sure you don't leave the child exposed.

Thank the child/ parent for co operation if no further examination is planned

## **VIGNETTE**

Characteristics of pulse should be described as follows

Rate

Rhythm

Volume

Character

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## Symmetry

Radio-femoral delay

## Rate

Comment on rate as normal, tachycardia or bradycardia based on age specific heart. In general, for children over 3 years of age pulse rate > 100 beats per minute is tachycardia and pulse rate < 50 beats per minute is bradycardia

Tachycardia has poor specificity and always make sure child is not anxious/febrile before attributing significance

Bradycardia in a child is usually point to underlying pathology once exercise (athletes), drug intake (Digoxin, beta blockers) is ruled out.

## Rhythm

Reported as regular, Regularly irregular and Irregularly irregular

Regular – there is a normal variation of heart rate on breathing – sinus arrhythmia. It is present in most children.

Regularly Irregular: abnormal beats occur at regular intervals – pulsus bigeminus, coupled extrasystoles (digoxin toxicity), Wenckebach

## Phenomenon

Irregularly Irregular – no specific gaps between the waves – Extrasystoles are common in normal children and disappear with exercise. Atrial fibrillation is another common condition which causes an irregularly irregular pulse.

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Comment on the pulse deficit i. e. the difference between heart rate and pulse rate

Volume

High volume – anemia, carbon dioxide retention or thyrotoxicosis

Low volume pulse is seen in low cardiac output states.

Character

Slow rising and plateau (pulsus parvus et tardus) – severe aortic stenosis

Collapsing pulse e. g. aortic incompetence

Pulsus Paradoxus- pulse is weaker or disappears on inspiration e. g.

Constrictive pericarditis, tamponade, status asthmaticus

Jerky pulse – normal volume, rapidly rising and ill sustained.-suggestive of hypertrophic obstructive cardiomyopathy

Pulsus bisferiens – two peaks felt during systole, seen in the presence of moderate aortic stenosis and severe aortic regurgitation

Pulsus alternans – Pulse wave with alternate small and large waves – seen in severe left ventricular failure and arrhythmias

Symmetry

Unequal or absent pulses may be suggestive of previous surgery e. g.

Blalock-Taussig shunt, repaired coarctation, cervical rib or absent radial pulse

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## **OSCE CHECKLIST**

### **PRIOR TO THE TASK**

- Hand washing or using alcohol rub
- Asks the name and age of the child, if already not told by the examiner
- Explains the purpose of his/ her visit and what he/ she is going to do
- Positions the patient appropriately

### **TASK**

- Uses the middle three fingers of the dominant hand to palpate the pulses
- Palpates all the pulses first on one side and then on the other side
- Compares pulses bilaterally
- Does not palpate the carotids simultaneously
- Counts the pulse rate at least for 15 seconds
- If pulse is irregular, then counts for one full minute and also counts heart rate
- Looks for Radio femoral delay
- While describing the pulse, comments on rate, rhythm, character, volume, symmetry and radio-femoral delay

### **POST- TASK**

- Makes sure that the child is not left exposed
- Thanks the child / parent for co operation

## **Task: MANUAL Measurement of blood pressure**

### **PRIOR TO THE TASK**

Mercury sphygmomanometer should be used as aneroid sphygmomanometer loses accuracy on repeated usage.

Choose the appropriate size cuff – the cuff bladder should cover at least 2/3 of the length of the arm and 3/4 of the circumference . Cuff size should always be documented.

Make sure that the child is calm and not crying or agitated

Child can be either seated or in the supine position

Any clothing over the arm should be removed

### **THE TASK**

The convention is to measure BP in the right arm in a calm but awake subject. If conditions differ from this they should be documented with the reading.

The elbow should be supported and flexed and should be at the level of the heart.

The cuff is wrapped around the upper arm with the bladder centered over the middle of the arm.

Approximate estimation of the systolic blood pressure is done initially by inflating the cuff fully and then deflating slowly and smoothly while palpating the radial pulse. Systolic blood pressure is noted at the point when the radial pulse returns.

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Following this, the blood pressure is recorded by auscultatory method which is the more accurate measure. The diaphragm of the stethoscope is placed over the brachial artery along the medial aspect of the lower end of the arm below the edge of the cuff. The cuff should be inflated to 30 mm above the palpatory systolic blood pressure and then deflated slowly and smoothly at the rate of 2-3 mmHg per second. Systolic blood pressure is recorded at the point when clear, repetitive tapping sounds are just heard. Diastolic blood pressure is recorded when the sounds disappear.

In some children, instead of disappearing, the sounds muffle first before disappearing. In this case, the value at which the sounds muffle should be recorded as the diastolic pressure if the difference between the point of muffling and disappearance of the sounds is greater than 10 mmHg.

## **POST- TASK**

Make sure you do not leave the child exposed.

Thank the child/ parent for co operation if no further examination is planned

While interpreting the readings, the state of the child should be taken into account. Values should be compared to normal values with reference to the age/height and sex of child.

## **VIGNETTE**

In infants, instead of radial, brachial pulse should be palpated. Sometimes, auscultation can be difficult in infants in which case systolic pressure by palpation should be documented.

If measuring a lower limb pressure, the same cuff can be applied to the lower leg and a foot pulse palpated.

It is advisable to measure the blood pressure in both upper and lower limbs. When coarctation is suspected, it is imperative that blood pressure is recorded in both arms and one leg. The same should be done in cases of hypertension and in those who have had shunt surgeries as in Blalock Shunt.

While recording blood pressure in the lower limb, a larger appropriate size cuff should be used and auscultation is done over the popliteal artery.

The sounds which are heard while auscultating are called as Korotkoff's sounds and has five phases. Phase 1 is the first heard clear, tapping sound, phase 2 is intermittent murmur like sound, phase 3 is the loud tapping sound, phase 4 is the muffling of sounds and phase 5 is disappearance of the sounds.

Occasionally, the sound might disappear after the Korotkoff sound phase 1 before reappearing later. This 'auscultatory gap' can lead to either underestimation of the systolic blood pressure (if prior estimation of blood pressure by palpation is not done) or overestimation of diastolic blood pressure if the auscultation is not continued till the end.

In atrial fibrillation, phase 4 of Korotkoff sound should be used for recording diastolic blood pressure.

Pulsus paradoxus is best appreciated while recording blood pressure by auscultation and is identified by recording the value at which the tapping sounds are heard only during expiration and the value at which the sounds

are heard both during inspiration and expiration. When the difference between the two values is greater than 10 mmHg, pulsus paradoxus is said to be present.

Pulse pressure is the difference between systolic blood pressure and diastolic blood pressure. A weak pulse is associated with narrow pulse pressure and is seen in cardiac failure, shock, aortic stenosis and constrictive pericarditis.

Pulse pressure is wide in aortic regurgitation, hyperthyroidism, anemia and febrile states.

## **OSCE CHECKLIST**

### **PRIOR TO THE TASK**

Washes hands or uses alcohol rub

Explains the purpose of his/ her visit and what he/ she is going to do

Positions the patient appropriately

Chooses mercury sphygmomanometer

Chooses the appropriate size cuff

Removes any clothing over the arm

### **TASK**

Supports the elbow and keeps it at the level of the heart.

Wraps the cuff around upper arm with the bladder centered over the middle of arm

Estimates systolic blood pressure by palpatory method

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Uses brachial pulse in infants for palpatory method

Estimates systolic blood pressure by auscultatory method

Uses diaphragm of the stethoscope for auscultation

## **POST- TASK**

Makes sure that the child is not left exposed

Thanks the child / parent for co operation

Records blood pressure as estimated by palpatory and auscultatory method including the site and the position of the child

Interprets the blood pressure

## **Task: Evaluation of jugular venous pulse**

### **PRIOR TO THE TASK**

The room should be adequately lit for the assessment of jugular venous pulse

The patient should be in semi-reclining position with the trunk at 45°, to the bed.

The head and the back should be well supported with a pillow under the head.

The head should be positioned in the midline

### **THE TASK**

Stand on the right side of the patient and assess the jugular venous pulse.

The torch should be shined from the left in an oblique direction and the jugular pulsation is observed

Jugular venous pulse is located just lateral to the clavicular head of the sternomastoid muscle.

Pulsations of the jugular veins should be differentiated from the carotid pulsations as discussed below.

The jugular venous pressure is assessed by measuring the vertical distance between the top of the jugular venous pulsations and the sternal angle (angle of Louis). In cases where the top of the jugular pulsations is not visible at 45°, increasing the reclining angle up to 90° can make the top of the pulsations obvious. The assessment is done when the child is breathing quietly

Look for hepato-jugular reflex. This performed by exerting firm and sustained pressure on the right upper quadrant of the abdomen and looking for an elevation in the jugular venous pressure by 2-3 cm.

## **POST- TASK**

Make sure you do not leave the child exposed.

Thank the child/ parent for co operation if no further examination is planned

## **VIGNETTE**

Assessment of jugular venous pressure is rarely important in the younger child. It is also difficult to obtain an accurate reading because of the short neck in children

It can be generally measured easily if the child is greater than 10 years

## **Jugular Venous Pulsation**

### **Carotid Pulsation**

Pulse lateral to sternomastoid

Pulse medial to sternomastoid

Better seen

Better felt

Multiple waves seen

Single wave

Abdominal pressure makes the pulsations prominent

Abdominal pressure has no effect

Valsalva maneuver makes the pulsations prominent

Valsalva maneuver has no effect

Can be obliterated with pressure

Cannot be obliterated with pressure

The right jugular vein is in a straight line with the right atrium and is more likely to show the pressure effects than the left jugular vein which has more tortuous course and is more likely to kinked. This can lead to false elevation of the jugular pressure.

In patients with highly elevated JVP, the pulsation may be seen only below the angle of jaw. In such cases, increasing the reclining angle to 60°, or more makes the pulsations more obvious.

Turning the head slightly towards the contralateral side can make the pulsations prominent, if the pulsations are not obvious.

JVP consists of a, c and v waves and x and y descent. 'a' wave is due to right atrial contraction, 'c' wave is due to bulging of the tricuspid valve and 'v' wave is due to atrial filing. 'x' descent is due to atrial relaxation and 'y' descent results from ventricular filling and tricuspid valve opening.

The sternal angle (angle of Louis) is taken as the reference point as it roughly corresponds to the middle of the right atrium.

JVP is elevated in congestive cardiac failure, fluid overload, constrictive pericarditis, pericardial tamponade, tricuspid stenosis and tricuspid regurgitation.

Non-pulsatile elevation of JVP is seen in superior vena cava obstruction.

'a' wave are absent in atrial fibrillation.

Large 'a' waves: are caused either by hypertrophied right atrium in response to decreased right ventricular compliance as in pulmonary hypertension and pulmonary stenosis or contraction of atrium against resistance as in tricuspid stenosis.

Cannon 'a' waves are giant 'a' waves seen in early systole and is caused by contraction of the atrium against a closed tricuspid valve. It is usually seen in complete heart block and ectopics.

Large 'v' waves are seen in tricuspid insufficiency.

Sharp 'x' and Sharp 'y' descents are seen in constrictive pericarditis and restrictive cardiomyopathy.

## **OSCE CHECKLIST**

### **PRIOR TO THE TASK**

Washes hands or uses alcohol rub

Explains what he/ she is going to do

Makes sure that the room is adequately lit

Positions the patient in semi-reclining position with the trunk at 45°, to the bed

Supports the head with pillow to ensure relaxation of the neck

Positions the head in midline

### **TASK**

Stands on the right side of the patient and assesses the right jugular venous pulse.

Locates the jugular pulse correctly



If the jugular pulse is not obvious, then makes it obvious by turning the head slightly to the left and shines the torch from left obliquely if necessary

Measures the jugular venous pressure correctly

Looks for hepato-jugular reflex.

## **POST- TASK**

Makes sure that the child is not left exposed

Thanks the child / parent for co operation

Lists the differences between carotid pulse and jugular pulse

## **Task: general inspection of the body with reference to cardiovascular system**

### **PRIOR TO THE TASK**

Introduce yourself to the child and carer and ask for permission to examine

For inspection, the room should be well lit. Ensure that the lights are turned on and the windows are open

The child should be undressed appropriately to the waist.

In older child, the examination is easiest to perform while they sit over the edge of the bed or even on a chair

Examine the younger child on the parent's lap.

### **STEPS OF THE TASK**

LOOK – GENERAL

General well being – Well/ Ill looking child

Interest in the surroundings – Sick child will not be interested

Size of the child – thin & small, thin & tall, well nourished and tall, well nourished and short.

Degree of breathlessness – classify as none, mild or severe

Environment (Equipment) – oxygen mask, nasal cannula, intravenous catheter, pulse oximetry, feeding tube/ gastrostomy,

LOOK – SPECIFIC

Head – look at the size (microcephaly or macrocephaly) and shape (dolichocephaly)

Face – Normal or dysmorphic features, malar flush

Conjunctiva – pallor, jaundice (refer chapter on general examination)

Mouth – Using the pen torch, take a quick look in the mouth and look for the presence of age appropriate teeth, abnormal teeth and caries. Ask the child to stick their tongue “ outwards and upwards towards the nose” and examine the tongue for central cyanosis.

Hands and fingers – pallor; clubbing; polydactyly and syndactyly; Osler’s nodes; Janeway lesions; splinter haemorrhages. Examine both the hands quickly.

Difference in colour between limbs

## **POST- TASK**

Make sure that the child is not left exposed

Thank the child / parent for cooperation

## **VIGNETTE**

Always think whether the findings combine to form a recognizable clinical syndrome.

It is preferable to inspect the child in sunlight than in artificial light.

Children with chronic cardiac conditions are usually thin and small for age.

Breathlessness is classified as mild when the child has only chest recession, and there is no contraction of sternocleidomastoid or nasal flaring and severe when all three are present

Microcephaly can be associated with some of the intrauterine infections and genetic disorders like congenital rubella syndrome and Edward's syndrome

Dolichocephaly (increased antero-posterior diameter) is seen in ex-preterms

Syndromes with dysmorphic facial features

Downs syndrome – almond shaped eyes (due to epicanthal folds); Brushfield spots (light colored spots in the iris); small, flat nose; small mouth with a protruding tongue; small, low set ears; round faces; flat occiput

Turners syndrome – prominent, posteriorly rotated auricles with looped helices and attenuated tragus; infraorbital skin creases; mildly foreshortened mandible

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Williams syndrome – broad forehead; short nose with broad tip; full cheeks; wide mouth with full lips

Noonan's syndrome – downwards slanting eyes with arched eyebrows; epicanthal folds; broad forehead; nose with wide base and bulbous tip; pointed chin

Marfan's syndrome – long, thin face; deep-set eyes; down-slanting palpebral fissures; receding chin; dolichocephaly; malar hypoplasia; enophthalmos

DiGeorge syndrome – small ears; asymmetric facies; small mouth and chin

Malar flush – plum coloured malar eminences

Hutchinson (conical) incisor is seen in congenital syphilis (patent ductus arteriosus) and enamel hypoplasia in Ellis-van Creveld Syndrome (atrioventricular canal, ventricular septal defect, atrial septal defect, and patent ductus arteriosus).

Caries tooth may be a cause of infective endocarditis in congenital heart disease.

In preaxial polydactyly, the extra digit is on the radial (thumb) side while in postaxial polydactyly, it is on the ulnar (little finger) side of the hand.

Osler's nodes are painful, red, raised lesions found on the hands and feet and is seen in infective endocarditis

Janeway lesions are nontender, macular lesions, most commonly involving the palms and soles and seen in infective endocarditis.

Splinter hemorrhages appear as narrow, red to reddish-brown lines of blood that run vertically under nails. Splinter hemorrhage can be associated with infectious endocarditis, systemic lupus erythematosus, and trauma

## **OSCE CHECKLIST**

### **PRIOR TO THE TASK**

Washes hands or uses alcohol rub

Explains what he/ she is going to do and ask for permission to examine

Positions and exposes the child appropriately

Makes sure that the room is adequately lit

### **TASK**

Looks for the following general points

General well being

Interest in the surroundings

Size of the child

Degree of breathlessness

Environment (Equipment)

Looks for the following specific points

Head – size and shape

Face

Conjunctiva

Mouth

Hands and fingers

Difference in colour between limbs

## **POST- TASK**

Makes sure that the child is not left exposed

Thanks the child / parent for co operation

## **Task: INSPECTION OF THE CHEST**

### **PRIOR TO THE TASK**

Introduce yourself to the child and carer and ask for permission to examine

For inspection, the room should be well lit. Ensure that the lights are turned on and the windows are open

The child should be undressed appropriately to the waist.

In older child, the examination is easiest to perform while they sit over the edge of the bed or even on a chair

Examine the younger child on the parent's lap.

### **STEPS OF THE TASK**

Look tangentially from foot end of the bed in supine patients and from the sides in sitting patients.

Look for the following and comment

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Shape of the Chest – symmetrical or asymmetrical

Symmetry of chest expansion

Scars

Pulsations – Observe for apical impulse, parasternal, suprasternal, epigastric pulsations.

Spine for scoliosis

## **POST- TASK**

Make sure that the child is not left exposed

Thank the child / parent for cooperation

## **VIGNETTE**

Common asymmetrical chests

Pectus carinatum: also called pigeon chest, deformity of the chest characterized by protrusion of the sternum and ribs. It may occur as congenital abnormality or in association with genetic disorders such as Marfan's syndrome, Morquio syndrome, Noonan syndrome, Trisomy 18, Trisomy 21, homocystinuria, and osteogenesis imperfecta.

Pectus Excavatum: also called funnel chest, deformity of the anterior wall of the chest producing sunken appearance of the chest. It may occur in rickets, Marfan's syndrome and spinomuscular atrophy.

Harrison's sulcus: horizontal indentation of the chest wall at the lower margin of the thorax where the diaphragm attaches to the ribs. It may occur in conditions with increased pulmonary blood flow or chronic asthma.

Scars: lateral thoracotomy scar results from closure of patent ductus arteriosus, tracheoesophageal fistula repair and Blalock Taussig shunt.

Central sternotomy scar is seen after open heart surgery and lobectomy.

Children can have drainage scars in epigastrium, subclavian/axillary scars from pacemakers and scars following cardiac catheterization in the groin and neck.

Pulsations:

Apical impulse will be shifted peripherally due to cardiomegaly, collapse of left lung or fluid in the right pleural cavity

Parasternal pulsations can occur due to right ventricular enlargement or enlarged left atrium pushing the right ventricle.

The most common cause of suprasternal pulsations is dilated aorta due to aneurysm or markedly increased blood flow.

Epigastric pulsation may be seen in thin children, right ventricular hypertrophy and abdominal aneurysm.

Scoliosis should be looked for in the standing and not in sitting position

## **OSCE CHECKLIST**

### **PRIOR TO THE TASK**

Washes hands or uses alcohol rub

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Explains what he/ she is going to do and ask for permission to examine

Positions and exposes the child appropriately

Makes sure that the room is adequately lit

## **TASK**

Looks tangentially from foot end of the bed in supine patients and from the sides in sitting patients

Looks for the following points and comments

Shape of the Chest

Symmetry of chest expansion

Scars

Apical impulse, parasternal, suprasternal, epigastric pulsations

Spine for scoliosis

## **POST- TASK**

Makes sure that the child is not left exposed

Thanks the child / parent for co operation

## **Task: PALPATION OF THE CHEST**

### **PRIOR TO THE TASK**

Introduce yourself to the child and carer and ask for permission to examine

The child should be undressed appropriately to the waist.

Position the older child so that they sit over the edge of the bed or lie down on the couch

Examine the younger child on the parent's lap.

Warm your hands for palpation

## **STEPS OF THE TASK**

Be gentle with palpation

Apical Impulse:

Place the palm of the whole hand flat over left chest wall to get a general impression of the point of maximal impulse.

Next, lay the ulnar border of the hand on the chest parallel to rib space where the impulse was felt and try to locate the apex.

Finally palpate with the fingertip of the index or middle finger to localize the apical impulse and define its character.

Use the left hand to palpate the carotid artery to time the apical impulse.

With the finger of the right hand still in place over the apex beat, palpate the manubriosternal joint (angle of Louis) which is present just below the suprasternal notch and is felt as a prominence with the left hand. It corresponds to the second intercostal space. Slide the index finger and count down the next few intercostal spaces until you locate the intercostals space that is level with the apex beat. Look at the position of the apex with reference to the midclavicular line.

If the apical impulse is not readily palpable in the supine position, ask the child to lie on their left side.

If the apex beat is not still palpable, try on the right side in case of dextrocardia.

Parasternal pulsation and heave:

With the fingertips, palpate over the left sternal edge to find the parasternal pulsations.

With the child lying in supine position, place a pencil lateral to the left sternal edge and look tangentially for lifting of the pencil.

Next, place the base of your hand just lateral to the left sternal edge and palpate for a parasternal heave.

If parasternal heave is present, try suppress it by exerting pressure with base of the hand.

Thrills are best felt with fingertips. Time the thrill with carotid or brachial pulse. Palpate the following areas.

Apex of the heart

3rd to 5th intercostal space along the left sternal border

Pulmonary area (left second intercostal space)

Aortic area (right second intercostal space)

Suprasternal area

Carotids

## **POST- TASK**

Make sure that the child is not left exposed

Thank the child / parent for cooperation

## **VIGNETTE**

Apical impulse is the farthest inferior and lateral maximal cardiac impulse on the chest wall. It results from the heart rotating, moving forwards and striking against the chest wall during systole. Apical impulse is normally felt in the 4th left intercostal space on the midclavicular line. It may be difficult to palpate in obese children and in pericardial effusion.

Displaced apex

Tension pneumothorax and pleural effusion (push apex away from the lesion)

Pulmonary fibrosis and collapse (pull towards the side of the lesion)

Left ventricular hypertrophy – apex is displaced down and out

Right ventricular hypertrophy – apex is displaced outwards

Skeletal abnormalities

Quality of apical impulse (normal apex lifts the palpating fingers briefly)

Sustained (increased amplitude and duration) – pressure overload (aortic stenosis)

Hyperdynamic or forceful (increased amplitude but not duration) – volume overload (mitral incompetence and aortic incompetence)

Tapping – palpable first heart sound of mitral stenosis

Parasternal pulsations

Palpable 2nd heart sound reflects pulmonary hypertension.

Parasternal heave is present in right ventricular hypertrophy or left atrial enlargement pushing the right ventricle.

There are three grades of parasternal heave

Grade I – heave identified by lifting of the pencil alone and not the heel of the hand

Grade II – easily identified, can be suppressed with pressure

Grade III – lifts the heel of the hand and cannot be suppressed with pressure

Thrill is a palpable murmur that felt like a purring cat. While describing the thrill, describe the site and phase of cardiac cycle. When thrill is present, the accompanying murmur is by definition at least 4/6 in intensity.

## **OSCE CHECKLIST**

### **PRIOR TO THE TASK**

Washes hands or uses alcohol rub

Explains what he/ she is going to do and ask for permission to examine

Positions and exposes the child appropriately

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Warms hands before

## **TASK**

Palpates gently

Apical Impulse

Places the palm flat over left chest wall to get a general impression

Keeps the ulnar border of the hand parallel to rib space

Palpates with the fingertip to locate the apical impulse

Palpates the carotid artery