

The cardiovascular system

Cardiovascular system consist of:

1-heart.

2-blood vessel.

consists of two main structural units, **the heart and the blood vessels**, which are jointly concerned in maintaining the circulation of the blood and there by ensuring normal **exchange of oxygen, carbon dioxide, electrolytes, fluid nutrients and waste products between the blood and the body tissues.**

Circulation of blood:

1-pulmonaric blood circulation.

2-systemic blood circulation.

Regional Anatomy:

In all species of domestic animals the chest is flattened laterally, usually to a more marked degree in the lower two-thirds. The heart, suspended at its base by the great vessels which traverse the mediastinum,

In cattle, the degree of cardiac asymmetry is slightly greater than in the horse. The base of the heart in this species extends from opposite the third to about the sixth rib. The apex, which is median in position and about 2 cm from the diaphragm, is opposite the articulation of the sixth costal cartilage with the sternum.

Type of valve. Four valve I the heart;

1-Bicaspid valve: between left atrium and ventricle.



2-Aortic valve: اتصال البطين الايسر بالشريان الابهر

3-Tricaspid valve: between right atrium and ventricle.



4-pulmonary valve: اتصال بطين ايمن وشريان رئوي

blood circulation

*superior vena cava: bring blood from upper part of body.(above diaphragm).

*inferior vena cava: bring blood from lower part of body.(down to diaphragm)as kidney, intestine, urinary bladder, liver, spleen...etc.

The blood enter the right atrium then the tricuspid valve open and blood reach right ventricle then pulmonary valve open and the blood reach the lung by pulmonary arteries(non oxygenated) then the blood oxygenated in the lung and enter to the left atrium by pulmonary veins then bicuspid valve open and blood reach left ventricle then Aortic valve open and deliver the blood to all part of the body.

Examination of the heart:

1)Physical examination:

A-inspection. B-palpation. C-Ascultation. D-Percussion: dull sound.

2)Enzymes: C.K. LDH. Troponine(specific):

3)Catheterization. 4)X -ray. 5)Echo. 6)phonograph

The valve heard in right and left region of the heart

1-pulmonary valve: هو بالجهاز اليميني لكن اسمعه بالجهاز اليسار

3rd inter costal space.

2-Aortic valve: 4th inter costal space.

3-Bicuspid valve: 5th inter costal space.

بالجهاز اليميني يفحص فقط

in right region

Tricuspid valve in 3rd inter costal space.

Physical Examination of the Heart

Inspection

the heart on the chest wall can be readily observed.

A significant increase in the size of the heart will enlarge the area of contact caused by hypertrophy. Displacement of the heart may be associated with an increased

decreased, area of contact with the chest wall, so that the pulsation may be exaggerated or completely absent.

Palpation

It is performed by placing the palm of the hand over the cardiac area on each side in turn. The tip of one finger can be employed to determine the exact site of the cardiac impulse (apical impulse) which is regularly palpable

The point of maximum impact is increased in area and displaced posteriorly in cardiac hypertrophy or dilatation associated with insufficiency or an).

Percussion

performed at the same time as that of the lungs. In any situation it is advisable, initially, to percuss from the more resonant towards the dull sounding areas.

area extending from the fourth to the sixth intercostal space, approximately a finger's breadth above the sternum. On the **right side** the area of cardiac dullness extends from the fourth to the fifth intercostal space

An increase in the area of cardiac dullness occurs in enlargement of the heart (cardiac hypertrophy or dilatation), in distension of the pericardial sac with fluid (pericarditis, hydro-pericardium, haemopericardium

Reduction in the size of the area of cardiac dullness occurs in overdistension of the lungs (emphysema)

A pain reaction during percussion of the cardiac area suggests the presence of acute pericarditis

Auscultation

The cycle of cardiac activity is divisible into two phases, **systole and diastole**, 'lub-dupp'***systole: contraction of ventricle(lub)**.

***diastole: relaxation(dupp).**

Heart rate higher than normal (Tachy cardia).

Heart rate lower than normal (Brady cardia).

Rhythm :Regular and Irrigular (Arrhythmia): _Fibrillation. Flutter.

Quality: _strong or _weak.

Adventitious Heart Sounds (Murmurs)

These may replace one or both heart sounds, or accompany them. that arise from inside the heart are classified as murmurs, and are caused by endocardial lesions such as valvular vegetations or adhesions, by valvular insufficiency and by abnormal orifices such as ventricular septal defect or patent ductus arteriosus. Cardiac murmurs caused by these conditions may be hissing, humming, whirring or even markedly vibrant in tone.

Endocardial murmurs occur during either systole or diastole.

1. **Systolic murmurs** indicate either stenosis of the semilunar valves or insufficiency of the atrioventricular valves.
2. **Diastolic murmurs** suggest the opposite—either stenosis of the atrio-ventricular valves or insufficiency of the semi-lunar valves

Pericardial Frictional Sounds

These sounds are caused by roughening of the pericardium and are not related to any particular phase of the cardiac cycle. In normal circumstances, movement of the heart within the peri-cardial sac produces no audible sound. When, however, two roughened, dry areas rub together,

a 'friction' sound is created. Such sounds, which simulate those associated with roughening of the pleural membranes, are not very loud and occur during the early stages of pericarditis

Mucous membrane_

pink: normal.

congested: fever.

bluish: toxication, hypoxia.

yellowish: jaundice.

***Capillary refill time:**

From gum, lower lip, vulva.

Press by finger : normal return color 0- 2 second

اضغط اذا رجع اللون نفسه بوقت اقل من ثانيتين يعني طبيعي.

***capillary in eye (sclera): veneole or arteriole.**

red Arteriole احمر يعني ارتفاع ضغط الدم

Bluish veneole اذا كان لونها ازرق وممتلئه يعني فشل القلب

Abnormal

A/Engorged (CHF) or empty(Shock anemia)

B/Non engorged(normal)

Jugular Pulse

1 /negative jugular pulse occurs during the early part of cardiac systole when the blood, being temporarily unable to enter the contracted right atrium, is dammed back in the jugular vein. This type of jugular pulse takes the form of distension of the proximal part of the jugular vein, **arising presystolically, i.e. before the heart contracts, and gradually**

extending from the lower part of the vein forwards. It is physiological, readily observed in lean animals and particularly common in cattle.

2. **Exaggerated** in tricuspid stenosis, heart block and exudative pericarditis.

3.Positive jugular pulse (true pulse waves) which run forward from the shoulder towards the angle of the jaw. These regurgitation waves are not only visible but are palpable as moderately strong impulses. **Positive jugular pulse** occurs in **tricuspid incompetence** because, during cardiac systole, the blood in the right ventricle is forced backwards through the incompletely closed valvular orifice into the right atrium and the jugular vein. In lactating cattle affected with tricuspid valve insufficiency, a positive pulse may be detected also in the subcutaneous abdominal (mammary) vein. This type of jugular pulse is systolic and coincides with the arterial pulse; it is pathognomonic of **tricuspid valve incompetence**. The existence of positive jugular pulse is indicated if, following the application of digital pressure to the vein in the region of the larynx, the engorgement disappears only after two or more cardiac cycles.

In lean animals, the pulsation of the underlying carotid artery, noted particularly at the entrance to the thorax, may be transmitted to the overlying tissues and thereby simulate a positive jugular pulse. This condition, which is termed 4. **false jugular pulse**, is not obliterated by compression of the jugular vein, whereas a true positive jugular pulse will disappear.

Cyanosis is bluish discoloration of the skin and mucous membranes .

A varying degree of cyanosis occurs in all forms of heart disease; it is most obvious in congenital heart defects and less so in acquired heart disease. In pulmonary disease, cyanosis is rarely very obvious because the circulation is impeded proportional to the degree of lung dysfunction.