CARDIOVASCULAR EXAMINATION

PART THREE Auscultation of the heart

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There is no consensus on what constitutes the correct routine in auscultation of the heart (Cox and Roper, 2005) so the key principles of the procedure will be described in detail.

Normal heart sounds, related physiology and use of the stethoscope will also be discussed. Next week, abnormal heart sounds will be outlined.

Auscultation of the heart is undertaken to establish whether the heart sounds are normal and if there are any additional sounds (Scott and MacInnes, 2006). It is a skill that requires detailed knowledge, practice and experience to ensure competency at distinguishing what is normal and abnormal.

The priority is to master the recognition of normal heart sounds; then it will be possible to identify abnormal heart sounds (Cox and Roper, 2005).

NORMAL HEART SOUNDS

The heart sounds are usually described as ‘lub-dup’. The first heart sound (‘lub’), which is often referred to as S1, is due to closure of the mitral and tricuspid valves and is best heard at the apex. It corresponds to the beginning of ventricular systole (Waugh and Grant, 2006). Sometimes splitting of the first heart sound occurs, which is normal.

The second heart sound (‘dup’) – often referred to as S2 – is slightly higher pitched. It is due to the closure of the aortic and pulmonary valves and is best heard in the second/third intercostal space, at the left sternal edge. It corresponds to the end of ventricular systole and the beginning of atrial systole. Splitting of the second heart sound can occur upon inspiration.

After S2 there is a short gap before the heart sounds of the next cardiac cycle; this is ventricular diastole and signifies the time when the ventricles are filling with blood (Scott and MacInnes, 2006).

USING A STETHOSCOPE

The stethoscope was introduced into medicine 200 years ago. Originally it was a wooden cylinder with a hole drilled from one end to the other. The modern stethoscope has two earpieces, which are connected by tubing to a chest device usually consisting of a bell and a diaphragm. The earpieces should be angled forwards, that is in the same direction as the practitioner’s external auditory meati (Epstein et al, 2003).

The functions of the stethoscope are to:

- Transmit sounds from the patient’s chest;
- Exclude extraneous noise;


Selectively emphasise sounds of certain frequencies, allowing the practitioner to concentrate on them (Epstein et al, 2003).

The stethoscope should be correctly used, as the diaphragm and bell amplify different sounds (Scott and Maclinnes, 2006). The diaphragm (Fig 1) is used to detect high-pitched sounds, for example S1, S2 and some murmurs, and should be pressed firmly against the skin. The bell (Fig 2) is used to detect low-pitched sounds such as the mitral stenosis murmur. It should be placed very lightly against the precordium otherwise it will, effectively, be a diaphragm (Scott and Maclinnes, 2006; Cox and Roper, 2005).

STANDARD SITES FOR AUSCULTATION

According to Scott and Maclinnes (2006) and Cox and Roper (2005), the standard sites for auscultation of the heart are (Fig 3):

- Mitral area – left fifth intercostal space, mid-clavicular line. This is where the mitral valve sounds are best auscultated;
- Tricuspid area – left fourth intercostal space, just lateral to the sternum. This is where the tricuspid valve sounds are best auscultated;
- Pulmonary area – left second intercostal space, just lateral to the sternum. This is the area where sounds from the pulmonary valve are best auscultated;
- Aortic area – right second intercostal space, just lateral to the sternum. This is where the aortic valve sounds are best auscultated.

THE PROCEDURE

Recommendations for auscultation of the heart vary. The following procedure is based on Cox and Roper (2005):

- Explain the procedure to the patient;
- While ensuring privacy and maintaining dignity, expose the patient’s chest;
- Position the patient supine at an angle of 45 degrees;
- Ensure the room is quiet;
- Ask the patient to breathe in and breathe out normally;
- Using the diaphragm, auscultate over the mitral area (Fig 4);
- Identify the S1 and S2 sounds. To assist identification of these heart sounds, it may be necessary to palpate the carotid pulse at the same time as this will coincide with the first heart sound (Ford et al, 2005) (Fig 5);
- Ask the patient to roll slightly into a left lateral position and, using the bell, auscultate over the mitral area (Fig 6). This is the best position and method to auscultate the low-pitched mid-diastolic murmur of mitral stenosis.

REFERENCES


PROFESSIONAL RESPONSIBILITIES

This procedure should be undertaken only after approved training, supervised practice and competency assessment, and carried out in accordance with local policies and protocols.