

# Protocol

## Apex beat and heart sounds

### Methods

#### Apex beat

1. With lateral illumination, observe at first the chest wall under the left mamilla and look at whether the impact of the heart apex is visible. If so, palpate the pulse on the radial artery at the same time and consider the time relation of both events. Perform the observation also during a voluntary stop of breathing in inspiratory and in expiratory position and note the difference.
2. If the apex beat is not visible, place your palm on this chest area and follow the apex beat during palpation of the radial pulse at normal respiration and at respiration stopped in inspiratory and expiratory position.
3. The same examination is performed in supine position and in a mild forward bend and the differences noted.
4. The spot of the apex beat may be more precisely located by palpation with two fingers.

#### Heart sounds

The stethoscope should be firmly pressed against the skin and not moved during the auscultation so that no disturbing noise arises.

1. A stethoscope is placed on the naked chest of the examined person at locations of optimal audibility of the particular heart sounds
  - **A:** Aortic valve: 2nd intercostal space parasternally on the right
  - **P:** Pulmonary valve: 2nd intercostal space parasternally on the left
  - **M:** Mitral valve: in the region of the apex beat
  - **T:** Tricuspid valve: 5th intercostal space parasternally on the right or on the left or above the distal sternum
2. Later listen wherever it is necessary. Important areas are Erb's point (3rd intercostal space parasternally on the left), the area above the carotid arteries, in the left axilar line, etc.
3. Notice the character of the heart sounds, i.e. the intensity and the duration of particular sounds and the intervals between them which allows you to discern, in a normal rhythm, the first and the second sound (a simultaneous palpation of arterial pulse may be helpful).
4. Perform the examination in standing and supine position. During respiratory stop (in inspiratory and expiratory position) and in slow, deep breathing note the fluctuation of the heart rate, synchronous with respiration (respiratory arrhythmia).
5. After the examination at rest, the subject performs a series of ten fast squats. Immediately after this exercise, in supine position, follow changes of the frequency and the character of heart sounds.

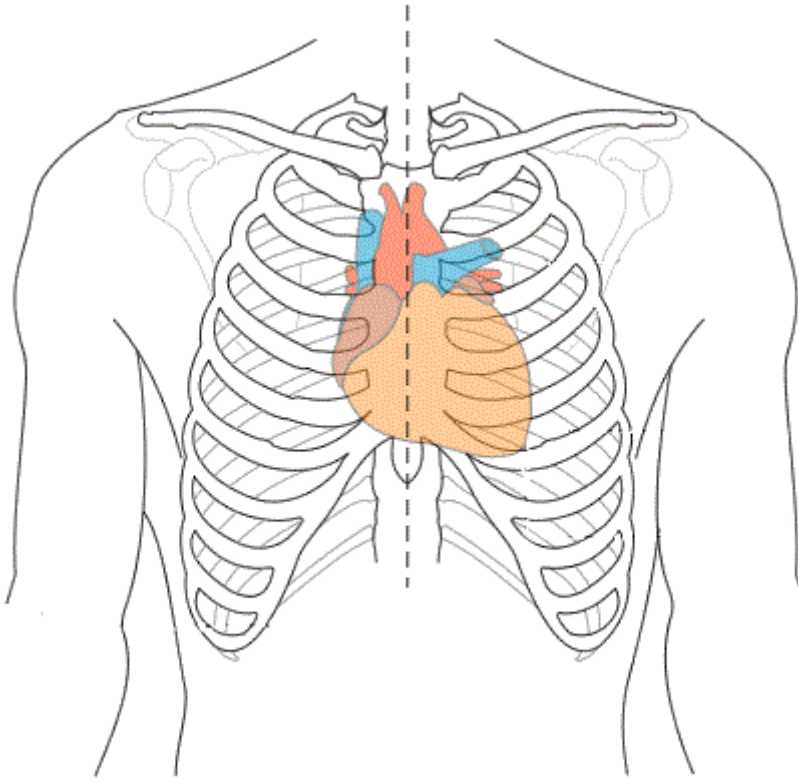
Name:

Numer:

Study group:

## Results

Mark the places on the thorax where sounds of particular valves are audible at best.



Did you observe heart beat visually or by palpation?

.....

Did the quality of the heart beat change during breathing?

.....

Which position was the best for observing heart beat?

.....

How did the heart sounds change during deep breathing?

.....

How did the heart sounds change after physical activity?

.....