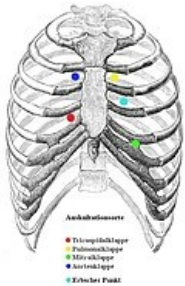


Examination of the heart by listening

We perform **auscultation of the heart** with the help of a stethoscope in the listening areas of individual flaps, as needed, the propagation of sound can be monitored (eg in the left axillary line, between the scapulae). We examine in three positions - lying on his back, lying on his left side and sitting, the patient is undressed in half. Listening is preceded by palpation - finding the place of the heartbeat, possible vortices in the listening places. We examine during normal breathing and during apnea breaks to eliminate respiratory murmurs ("inhale, exhale, do not breathe").

Flap listening area



Listening areas

The listening areas differ from the anatomical projections of the valves on the chest wall.

- aortic valve (dark blue) - 2nd intercostal space parasternally on the right
- pulmonary valve (yellow) - 2nd intercostal space parasternally left
- tricuspid valve (red) - at the left margin and above the lower sternum
- mitral valve (green) - the area of the heart tip
- Erb's point (light blue) - 3rd intercostal space parasternally to the left

Auscultation finding

Sounds are divided according to their origin into **cardiac** and **extracardiac** (origin in the pericardium, large vessels). Heart sounds are divided into **sounds** (up to 0.1 s) and **murmurs** (up to 1 s).

Echoes are divided according to the mechanism of origin into:

- **closing** - I. (systolic), II. (diastolic)
- **filling** - III., IV.
- **additional sounds** - opening (narrowed venous orifice), ejection (cranks, arterial orifice)

I. and II. echoes are always heard, other sounds are located either between I. and II. echoes - systolic phenomena, or II. and I. echoes - diastolic phenomena.

Heart sounds

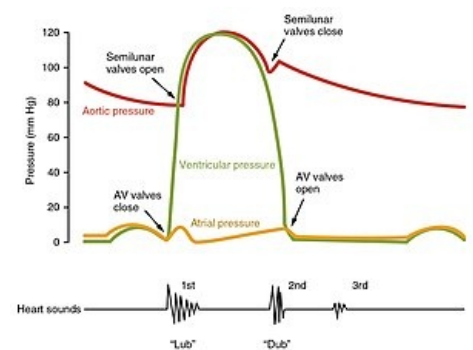
I. (systolic) sound

- formed by vibrations during contraction of the left ventricle, closure of the cervical and opening of the crescentic valves
- best heard in the area of the heart tip, is darker and longer than the second sound and is followed by a systolic pause
- **amplification** - caused by the contraction rate of the left ventricle at the moving tips of the flap; "modified" echo in mitral stenosis, hyperkinetic circulation, short PQ
- **weakness** - left ventricular failure, long PQ, mitral valve calcification, obesity
- **cleft** - delay of the tricuspid component, better audible in inspiration; blockade of Tawar's arms, tricuspid stenosis

II. (diastolic) sound

- it is formed by closing the crescent-shaped flaps
- audible at the heart (2nd and 3rd intercostal space), clear and short, followed by a diastolic pause
- consists of two components - closing aortic (A 2) and closing pulmonary (P 2), are formed by delayed closure of the pulmonary valve compared to the aortic by 0.02 s, this physiological cleft increases in inspiration to 0.04 s
- **fixed cleft** - does not depend on respiration; caused by a decrease in pulmonary resistance, slower activation of the right ventricle (BPTR)
- **paradoxical cleft** - delay of the aortic component; delayed left ventricular activation (BLTR), aortic regurgitation, prolongation of mechanical systole (hypertension, outflow tract block)
- **component enhancement** - A 2 in systemic hypertension, P 2 in pulmonary hypertension, pulmonary embolization - II. sounds more audible on the left, is audible even in the area of the tip, where it is not normally
- **component weakening** - when the flap is immobile

III. (protodiastolic) sound



The course of the heart cycle and heart sounds

- formed in the phase of rapid filling of the ventricles and their rapid expansion - depends on the wall thickness, more often in dilated cardiomyopathy and is not common in severe hypertrophy
- diastolic, 0.15 s after II. echo
- **physiologically** in healthy young individuals
- **pathologically** - in left ventricular failure due to high left atrial filling pressure (not always audible), non-failing mitral regurgitation; dark, better audible expiratory, on the left side, after a workout (induce tachycardia) - presents itself as **protodiastolic gallop**.

IV. (presystolic) sound

- arises during ventricular contraction by atrial contractions at the end of diastole
- **physiologically** - young individuals with strong atrial contraction
- **pathologically** - in decreased left ventricular compliance with good atrial contraction - it is not a sign of heart failure, it cannot be in atrial fibrillation ; is in hypertension , coronary heart disease
- may form **atrial gallop**, at heart rate above 100 / min may III. and IV. echo merge - **summation gallop** or create a four-stroke rhythm

Adventitious sounds

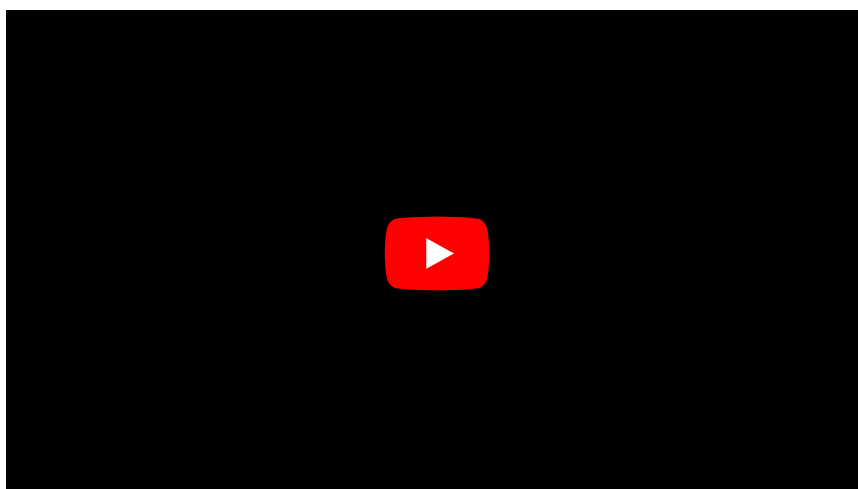
They do not occur in normal valves, only in pathologically altered ones. Audible as a high frequency click.

- **Opening clicks** in mitral stenosis (opening snap) - early diastole indicates increased pressure in the left atrium, the closer II. echoes, the more severe the stenosis, best heard above the base and parasternally to the left
- **ejection crank** in aortic stenosis - early systolic, characteristic of congenital valvular stenosis
- **systolic click** at mitral valve prolapse - late systolic.

Heart murmurs

{{You can find more information on the page- Heart murmurs}}

Heart examination



References

Related articles

- Physical exam
- Basic symptoms of heart disease
- Heart murmurs

External links

- Heart sounds and murmurs - Audio recordings (TECHmED) (<https://www.techmed.sk/auskultacia-srdca-ozvy-se-lesty/>)

Related literature

- CHROBÁK, Ladislav, et al. *Propedeutika vnitřního lékařství*. 2. edition. Praha : GRADA Publishing, 2007. 243 pp. ISBN 978-80-247-1309-0.
- ŠPINAR, Jindřich – LUDKA, Ondřej, et al. *Propedeutika a vyšetřovací metody vnitřních nemocí*. 2. edition. Praha : Grada, 2013. ISBN 9788024743561.

- ŠTEJFA, Miloš. *Kardiologie*. 3. edition. Praha : Grada, 2007. 722 pp. ISBN 978-80-247-1385-4.
- ws:Vyšetření srdce poslechem