

Heart Sounds

The opening of valves is a slow developing process and doesn't produce any noise, while the closure of valves is a sudden process causing the surrounding fluid to vibrate producing noise. The closure of atrioventricular valves causes the first heart sound (S_1) whereas the closure of semi-lunar valves causes the second heart sound (S_2).

First Heart Sound (S_1) (Lubb)

It is due to closure of AV valves.

It is low pitch with frequency of 30-80/sec

It is a loud sound

Duration $\rightarrow 0.1 - 0.17$ sec.

Best heard over Mitral area (Left 5th intercostal space internal to mid clavicuar line)

Tricuspid area (Left 5th intercostal space near sternal border)

Second Heart Sound (S_2) (Dupb)

It is due to closure of semi-lunar valves ~~and mitral~~

It is a sharp sound with high pitch & frequency of 150-200/sec. Its duration is 0.1-0.14 sec.

Heart best over Pulmonary area (Left 2nd intercostal space just outside sternum)

Aortic area (Right 2nd intercostal space outside the sternum)

Heart murmurs, adventitious sounds and gallop rhythm S_3 and S_4 are other sounds.

Heart murmurs are generated by turbulent flow of blood.

Eg - In stenosis

S_3 and S_4 can occur in normal person

The gallop associated with early diastolic filling is S_3 gallop.

Pathological S_3 may be heard in left ventricular systolic dysfunction

S_4 is late diastolic sound associated with atrial contraction.

Pathological condition in which S_4 can be heard is uncontrolled hypertension.

second heart sound (S2)

Breath Sounds

Normal Breath sounds

flow
① Vesicular → Soft, low pitched breezy but faint sound
Longer on inspiration than on expiration (3:1)
Heard best over most of chest i.e. peripheral lung field.

② Bronchial → Loud, hollow, tubular high pitch sound.
Heard equally during Inspiration and Expiration with a pause in between.
Heard over mainstem bronchi (trachea)

③ Bronchovesicular → High pitched sound. Equal on Inspiration and expiration without a pause.
Heard best over superior to clavicle and suprascapular, parasternal, interscapular region.



Abnormal sounds

* Sound transmission changes due to underlying pathology

Absent (No sound) of any of 3 types → Eg: Bronchial sound absent in ~~peripheral~~ lung tissue when it becomes airless.

Diminished → ↓ sound (vesicular or bronchial or bronchovesicular)

* Adventitious sounds

① Crackles (Rales) → Discontinuous low pitch sounds
(Rubbing hair / velcro popping)
(fine crackles coarse crackles)

- Primarily heard during inspiration
- Indication of secretion moving in airways
- closed airways rapidly opening.

② Rhonchi → Low pitch continuous sounds
Heard during inspiration or expiration
It is due to obstructive process in larger
more central airways.

③ Wheeze → Continuous high pitch sound.
(Hissing / whistling type)
Primarily occur during expiration.
Indication of bronchospasm

However inspiratory wheeze may be present
when air moves through secretions.

Extrapulmonary sounds

Friction Rub → Rubbing or leathering sound
occurs both during inspiration and expiration.

It occurs due to visceral pleura rubbing
against parietal pleura.

Pain is usually associated. Sign of pleural pathology.