

Heart Sounds

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Heart Sounds

- **Seems old fashioned**
 - Still important
 - Basic
 - Underestimated
 - Training
 - Clinical setting



Heart Sounds

- **Question:**
 - What is the diagnosis?



Heart Sounds

- **Questions:**
 - What are normal heart sounds
 - S1 – what?
 - S2 – what?
 - How do you know what is S1?
 - Which are the characteristics of heart sounds?



Heart Sounds

- **S1**
 - Beginning of systole
 - Closure of AV valves + tensing of chordae tendinae
- **S2**
 - End of systole
 - Closure Ao & Pulm valve



Heart Sounds

- **Heart sounds – characteristics**
 - Location
 - Intensity
 - Duration
 - Pitch
 - Quality
 - Timing



Heart Sounds

- **Location**
 - Anatomic area where heart sound best heard
- **Intensity**
 - I Lowest intensity, difficult to hear even by expert listeners
 - II Low intensity, but usually audible by all listeners
 - III Medium intensity, easy to hear even by inexperienced listeners, but without a palpable thrill
 - IV Medium intensity with a palpable thrill
 - V Loud intensity with a palpable thrill.
Audible even with the stethoscope placed on the chest with the edge of the diaphragm
 - VI Loudest intensity with a palpable thrill.
Audible even with the stethoscope raised above the chest.



Heart Sounds

- **Duration**
 - Length of time of sound heard
 - Click, snap or murmur
- **Pitch**
 - Frequency
 - High – diaphragma of stethoscope
 - Low – bell of stethoscope



Heart Sounds

- **Quality**
 - Combination of its frequencies
 - Sharp, dull, booming, snapping, blowing
- **Timing**
 - Systole or diastole
 - Includes S1 or S2 – yes or no



Heart Sounds

- **S1**
 - Two components – M1 + T1
 - Best heard at apex with diaphragma
 - Can be enhanced by sympathetic stimulation (exercise)
 - Split: LBBB



Heart Sounds

- **S2**
 - Two components: A2 + P2
 - A2 slightly ahead
 - A2 is louder
 - Best heard with diaphragma
 - Best heard Left parasternal over pulmonic area
 - Split during inspiration



Heart Sounds

- **Extra sounds**
 - S3
 - Diastolic filling sound
 - Low frequency – best heard with bell
 - Can be intensified by increasing SV (leg lift)
 - Always pathological in age > 40 yr
 - Related to “forced dilation of ventricle”
and to non-compliant ventricle <<SLOSH’-ing-in>>



Heart Sounds

- **Extra sounds**
 - S4
 - Late filling of ventricle due to atrial contraction
 - Can be heard in stiff ventricles
 - But also in athletes hypertrophic ventricles
 - <<a-STIFF'-wall>>



Heart Sounds

- **Murmurs**
 - Crescendo
 - Decrescendo
 - Crescendo-decrescendo
 - Plateau shaped



Heart Sounds

- **Systolic murmurs** - *Can be innocent*
 - **Ventricular outflow obstruction**
 - Midsystolic murmur
 - Ends before S2
 - Longer murmur with more severe stenosis
 - **Regurgitation murmurs**
 - Early, late or holosystolic



Heart Sounds

- **Diastolic murmurs**
 - Aortic regurgitation
 - Blowing characteristic
 - Enhanced in sitting patient, lean forward
 - Mitral stenosis
 - Starts with opening snap <<toc-tata-rrrrrou>>
 - Tricuspid stenosis



Heart Sounds

- Continuous murmurs
 - Patent ductus arteriosus

- Pericardial friction rub

