An Interactive Learning Experience: Revalidation of Clinical Skills for AT Professionals & AT Educators

Cardiac Auscultation

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Disclosure Slide

- No conflicts of interest
- No relevant financial relationships
Learning Objectives

• At the end of the session, the participant will be able to:

  • Demonstrate site proficiency for cardiac auscultation
  • Identify normal heart sounds
  • Recognize basic heart murmurs
Anatomy of the Heart: 4 Chambers and 4 Valves

- Superior vena cava
- Pulmonary vein
- Pulmonary artery
- Mitral valve
- Aortic valve
- Inferior vena cava
- Tricuspid valve
- RA
- LA
- RV
- LV
- Aorta
Blood Flow in the Heart

- Superior Vena Cava
- Aorta
- Pulmonary Artery
- Pulmonary Vein
- Left Atrium
- Mitral Valve
- Aortic Valve
- Right Atrium
- Pulmonary Valve
- Tricuspid Valve
- Right Ventricle
- Left Ventricle
- Inferior Vena Cava
- Pericardium

Base

Apex
S1 and S2

Cardiac Auscultation

Basic Heart Sounds:

**S1 (First heart sound)**
- "Lubb"
- Tricuspid & Mitral Valves Close
- Beginning of Systole
- Closure of AV Valves
- Beginning of ventricular systole
- Loudest at the apex and lower left sternal border
- Longer than S2
- Carotid pulse

**S2 (Second heart sound)**
- "Dubb"
- Aortic & Pulmonic Valves Close
- End of Systole/Beginning of Diastole
- Closure of SL Valves
- End of ventricular systole
- Loudest at the base of the heart
5 Sites for Auscultation
“APT. M 2245”
“All Patients Eat & Take Medicine”
Heart Murmurs

A: Normal
B: Aortic stenosis
C: Mitral regurgitation
D: Aortic regurgitation
E: Mitral stenosis
F: Patent ductus arteriosus
HEART MURMURS

AORTIC AREA
- Systolic murmur
  - Aortic stenosis
  - Flow murmur (e.g., physiologic murmur)
  - Aortic valve sclerosis

ERB POINT
- Diastolic murmur
  - Aortic regurgitation (valvular)
  - Pulmonic regurgitation
- Systolic murmur
  - Hypertrophic cardiomyopathy

PULMONIC AREA
- Systolic ejection murmur
  - Pulmonic stenosis
  - Atrial septal defect
  - Flow murmur

TRICUSPID AREA
- Holosystolic murmur
  - Tricuspid regurgitation
  - Ventricular septal defect
- Diastolic murmur
  - Tricuspid stenosis

MITRAL AREA
- Holosystolic murmur
  - Mitral regurgitation
- Systolic murmur
  - Mitral valve prolapse
- Diastolic murmur
  - Mitral stenosis
Hypertrophic Obstructive Cardiomyopathy
Heart Murmur

Checklist

- Occurs during systole
- Crescendo-decrescendo murmur
- Heard best → left lower sternal border
- Radiates → aortic/mitral areas

- Increase intensity: reductions in afterload and venous return
  (standing, Valsalva manoeuvre, dehydration)

- Decrease intensity: elevations in afterload and venous return
  (squatting, leg elevation, handgrip)
References

- Barrett, Michael J. MD; Ayub, Bilal MD; Martinez, Matthew W. MD. Cardiac Auscultation in Sports Medicine - Strategies to Improve Clinical Care, Current Sports Medicine Reports 11(2):p 78-84, March/April 2012.

- Barrett, Michael J.; Mackie, Andrew S.; Finley, John P. Cardiac Auscultation in the Modern Era. Cardiology in Review, Volume 25, Number 5, September/October 2017, pp. 205-210(6)

