Cardiac Murmur: Evaluation and Participation
TPC 2016
Diastolic Murmurs

- Almost always indicate structural heart disease
- Refer for further evaluation
- Hold from high intensity activity until evaluation is complete
- Asymptomatic athletes who have been participating at low/moderate intense exercise can probably safely continue during work up
  - Expert opinion
Now that that is out of the way!

- **Systolic murmurs**
  - Common findings in asymptomatic children and adults
    - Up to 80% of children
    - 50-60% of adults
  - How common and how significant vary greatly based on who is being looked at
    - Infants
    - Children
    - Adolescents
    - Adults
    - Symptomatic or Asymptomatic

- This talk will focus on children and young adults
  - Structural disease more common in infants and adults
    - Still relatively uncommon
  - This is the group that will present for screening
How are we finding them?

- AHA/PPE cardiac recommendations
  - 12 points of examination
  - 4/12 point on examination are auscultation

- Less common
  - Athlete with presenting with symptoms
Just so we are clear

Murmur Basics

- Murmur Grading
- Grade 1 = very faint
- Grade 2 – quite
  - Heard rite away
- Grade 3 = moderately loud
- Grade 4 = loud
- Grade 5 = heard with stethoscope partly off chest
- Grade 6 = heard without stethoscope
How come you never listen to me?!

- Murmurs can be hard!
  - Often disagreement among “experts”
- Family physicians/internists
  - Recognize < 50% of abnormal murmurs
- Residents worse
  - < 20%
  - Those with formal training no better but more confident

- Skill can improve
  - 90 workshop on murmurs
  - 47% correct identification pre workshop
  - 77% post workshop
  - Skills maintained for up to 12 months
What is that sound?

- Innocent
  - Changes with breathing and position (except valsalva)
  - Short
  - No associated clicks or gallops
  - Does not radiate
  - Quite – Grade 1 or 2
  - Low pitch
Figure. Major systolic and diastolic murmurs.

### Major Systolic Murmurs

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Location</th>
<th>Associated CV Findings</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic Stenosis</td>
<td>$S_1$ Aortic area diagonal to apical area</td>
<td>$S_2$ radiates to carotids decreased carotid pulses (slow upstroke) PMI laterally displaced</td>
<td>Cresendo, decresendo</td>
<td></td>
</tr>
<tr>
<td>Mitral Regurgitation</td>
<td>$S_1$ Apical area to lower left sternal border</td>
<td>$S_2$ radiates to axilla</td>
<td>Holosystolic</td>
<td></td>
</tr>
<tr>
<td>Mitral Valve Prolapse</td>
<td>$S_1$ Apical area to lower left sternal border</td>
<td>$S_2$ radiates to axilla</td>
<td>Late systolic</td>
<td></td>
</tr>
<tr>
<td>Hypertrophic Cardiomyopathy with obstruction</td>
<td>$S_1$ Lower left sternal border</td>
<td>$S_2$ Radiates to carotids PMI laterally displaced $S_4$ Quick carotid upstroke, fast drop off</td>
<td>Increase with Valsalva in lying position and standing</td>
<td></td>
</tr>
</tbody>
</table>

### Major Diastolic Murmurs

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</thead>
<tbody>
<tr>
<td>Aortic Regurgitation</td>
<td>$S_1$ Aortic area, right sternal border</td>
<td>$S_2$ Soft $S_1$ High pitched blow after $S_2$</td>
<td>Heard best sitting with the patient leaning forward and holding breath out</td>
<td></td>
</tr>
<tr>
<td>PDA</td>
<td>$S_1$ Apical area</td>
<td>$S_2$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Red flags

- Murmur increases with Valsalva
- Holosytolic
- Loud 3 or >
- Harsh

- Associated symptoms = ?
  - Shortness of breath
  - Chest pain
  - Syncope during exercise
Evaluation

- Screening
  - Consider cardiology referral prior to ordering other studies as you may be able to avoid
    - Based on your personal skill
    - Based on relationship/access to cardiology
  - ECG?
    - Not usually helpful in diagnosis
  - ECHO
Evaluation
Do symptoms matter?

- Unclear if symptoms + innocent murmur should change work up
- Use history and clinical examine to help guide
- Red flags
  - Syncope with exercise
  - FH of sudden death

- Symptomatic
  - Consider referral
  - If no early access consider ECG and ECHO
  - Use updated ECG criteria
  - Seattle Criteria
  - BMJ learning module for free
End of Story

- Diastolic = Bad
- Systolic very common
- Use characteristics to help with innocent versus pathologic
- Know the red flags
- Remember we don’t listen well!
  - Experts disagree
  - Know limitation
  - Work to improve
- Use cardiology help
- Remember that causes of sudden death may not present with murmurs
  - I.e. syncope with exercise concerning regardless
Selected References

- Evaluation and Management of Heart Murmurs in Children. Frank JE, Jacobe KM. Am Fam Phys Oct;84;793-800