Auscultation of HCM

- *Left ventricular outflow tract (LVOT) obstruction*
    - Harsh systolic ejection murmur best heard at left sternal border
    - Does <u>not</u> radiate to carotid a. (vs. valvular aortic valve stenosis [AS])
    - Effects of maneuvers are different from valvular AS (see below)
- *Mitral valve regurgitation*
    - Caused by systolic anterior movement (SAM) of mitral valve
    - Holosystolic murmur best heard at apex
    - Murmur of MR caused by HCM acts differently than other MR murmurs
        - Increase in preload and afterload <u>increases</u> typical MR murmur
        - Increase in preload and afterload <u>decreases</u> HCM type of MR murmur

Maneuvers

- LVOT obstruction creates a **dynamic gradient** due to the drag of mitral valve during SAM.
- Maneuvers that that **decrease LV volume** will **increase gradient** and therefore <u>increase the intensity</u> of the murmur. Conversely, an **increase of LV volume** will <u>decrease the intensity</u> of the murmur.
- **↑ murmur**
    - *↑ contractility*
        1. Post-premature ventricular contraction beat (*Brockenbrough response*)
        2. Dopamine: Positive inotropic effect
        3. Digoxin: Positive inotropic effect
    - *↓ preload*
        1. Straining phase of Valsalva: This maneuver produces a positive intrathoracic pressure → venous return ↓ → LVEDV ↓
        2. Standing: Blood pools in the capillary bed due to gravity → venous return ↓
        3. Nitroglycerin: Venodilation → venous capacitance ↑ → venous return ↓
    - *↓ afterload*
        1. Amyl nitrite: Vasodilation of arterioles → Systemic vascular resistance ↓
- **↓ murmur**
    - *↓ contractility*
        1. β-blockers: Negative inotropic effect
        2. Verapamil (CCB): Negative inotropic effect
        3. Disopyramide (Class I antiarrhythmic): Negative inotropic effect
    - *↑ preload*
        1. Passive leg rising: Venous return ↑
        2. Pregnancy: Expansion of blood volume
    - *↑ afterload*
        1. Squatting (also ↑ preload): Reverse of standing
        2. Handgrip: Compression of the arteries of the arm