Lecture: Best Measure Response to Aortic Valve Disease: Gradients, areas and others
Fausto Pinto, MD (Yun Zhang, MD PhD in Asia Broadcast)
**Quantification of Valvular Gradients**

Peak AS Gradient (mmHg)

\[ \Delta p = 4v^2 \]

**Continuity Equation to Assess Valve Area**

\[ A_1 \times V_1 = A_2 \times V_2 \]

Ross, Braunwald Circulation 1960;18:297

**Bernoulli Equation**

\[ p_2 - p_1 = \frac{1}{2} \rho \left( V_2^2 - V_1^2 \right) + \rho_1 \frac{dV}{dt} ds + R(V) \]

\[ p_2 - p_1 = 4V^2 \]

**Continuity Principle**

**Assessment of Aortic Valve Area**

**AoV Area Continuity Equation**

\[ A_{AV} \cdot \overline{V}_{AV} = A_{LVOT} \cdot \overline{V}_{LVOT} \]

\[ A_{AV} = 0.785 \times (D)^2 \cdot \frac{\overline{V}_{LVOT}}{\overline{V}_{AV}} \]
Doppler Quantification

**Stenosis**

- Use clinical judgement
- Take your time ... and your best pictures
- Use TEE if bad window
- If still in doubt: Use other methods (cath)