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Editors

Cardiovascular Hemodynamics

An Introductory Guide

Second Edition

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speed of ultrasound in the medium (c). Rearrangement of the equation allows one to determine the velocity of the red blood cells. *Top right:* The Bernoulli equation enables one to determine the pressure gradient across a stenosis, in this case, a stenotic aortic valve. Flow accelerates just before and at the level of the stenosis. The velocity proximal to the stenosis is V_1 , and the velocity distal to the stenosis is V_2 . Based on certain assumptions (see text), the Bernoulli equation can be simplified to $P_1 - P_2 = \Delta P = 4(V_2)^2$. In this case, the peak gradient is 64 mmHg based on the peak velocity across the aortic valve (V_2) of 4 m/s. Reprinted with permission, Cleveland Clinic Center for Medical Art & Photography © 2011. 156

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resistance, VTI velocity time integral, LVOT left ventricular outflow tract, D diameter, LA left atrial pressure, SBP systolic blood pressure, V_{MR} peak mitral regurgitation velocity, PCWP pulmonary capillary wedge pressure, LVEDP left ventricular end-diastolic pressure, DBP diastolic blood pressure, V_{EDAI} end-diastolic aortic insufficiency velocity, SVR systemic vascular resistance, Q_p pulmonary flow, Q_s systemic flow. (Reprinted with permission, Cleveland Clinic Center for Medical Art & Photography © 2011) 177

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