The rate, or velocity, of blood flow varies inversely with the total cross-sectional area of the blood vessels. As the total cross-sectional area of the vessels increases, the velocity of flow decreases.

Often expressed in cm/s. This value is inversely related to the total cross-sectional area of the blood vessel and also differs per cross-section, because in normal condition the blood flow has laminar characteristics. For this reason the blood flow velocity is the fastest in the middle of the vessel and slowest at the vessel wall. In most cases the mean velocity is used.

There are many ways to measure blood flow velocity, like videocapillary microscoping with frame-to-frame analysis, or laser Doppler anemometry.

Blood velocities in arteries are higher during systole than during diastole. One parameter to quantify this difference is the pulsatility index (PI), which is equal to the difference between the peak systolic velocity and the minimum diastolic velocity divided by the mean velocity during the cardiac cycle. This value decreases with distance from the heart.

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