

Chapter 162

Doppler Ultrasonography



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What is the Doppler effect?	Objects moving toward a detector reflect sound at higher frequencies. Conversely, objects moving away from a detector reflect sound at lower frequencies [1].
What is frequency shift?	Doppler US measures the frequency shift or the change in sound wave frequency as it reflects off a moving object [1].
What is color Doppler US?	Color Doppler US assigns a color spectrum to blood flowing toward and away from the US transducer. It can assess flow direction and velocity, though velocity measurements are more qualitative [1, 2].
What is spectral Doppler US?	Spectral Doppler US is used to quantify blood flow velocity [2].
How does spectral Doppler US work?	Spectral Doppler US evaluates the intensity of the frequency shift of sound waves at a specific region of interest as a function of time. The intensity is used to calculate flow velocity [2].

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What is power Doppler US?	Power Doppler uses the amplitude of Doppler signal to detect flow. Unlike color Doppler, it ignores blood flow direction and velocity [1].
What is the benefit of power Doppler US?	Higher sensitivity for blood flow [2]

References

1. Hertzberg BS, Middleton WD. Ultrasound: the requisites. 3rd ed. Philadelphia: Elsevier; 2016.
2. Bushberg JT, Seibert JA, Leidholdt EM Jr, Boone JM. The essential physics of medical imaging. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2012.