



## Professional Ultrasound Services

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### Doppler Fundamentals

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1. The Doppler shift is best defined as a:
  - a. Change in velocity
  - b. Change in frequency
  - c. Conversion of sound energy into audible energy
  - d. Change in direction
2. Which of the following factors is not essential to produce an acoustic Doppler shift?
  - a. A sound beam
  - b. Moving matter
  - c. An ear
  - d. A change in velocity
3. A positive Doppler shift indicates that movement is:
  - a. Toward the sound source
  - b. A higher velocity
  - c. Away from the sound source
  - d. A lower velocity
4. The primary source of acoustic Doppler information in medical ultrasound imaging is:
  - a. Leukocytes
  - b. Plasma
  - c. Erythrocytes
  - d. Fibrin deposits
5. Which of the following factors does not affect scattered ultrasound intensity?
  - a. Size of scatterer
  - b. Number of scatterers present
  - c. Velocity of scatterer
  - d. Frequency of sound source
6. Which of the following formulae describes the Doppler shift?
  - a.  $F_d = F_0 - F_r$
  - b.  $F_d = F_r - F_0$
  - c.  $F_d = V_r - V_0$
  - d.  $F_d = V_0 - V_r$
7. The study of blood flow is called:
  - a. Doppler ultrasound
  - b. Spectral analysis
  - c. Hemokinetics
  - d. Hemodynamics
8. If the pitch of a moving ambulance siren increases as it moves relative to a listening pedestrian, the ambulance is moving:
  - a. Too fast
  - b. Toward the pedestrian
  - c. At different speeds
  - d. Away from the pedestrian

9. The primary type of acoustic information used to produce Doppler displays in medical imaging is:
- Scattered energy
  - Reflected energy
  - Refracted energy
  - Transmitted energy
10. If an ultrasound transducer detects a 3.0MHz echo returning from the body but it emitted a 3.5MHz beam, the Doppler shift is:
- 0.5MHz
  - +0.5MHz
  - 3.0Mhz
  - +3.0MHz