# Doppler Ultrasonography Encyclopedia Article

## Doppler Ultrasonography

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# Doppler Ultrasonography

Doppler ultrasonography is a noninvasive, non-x ray, painless diagnostic procedure that can detect the direction, velocity, and turbulence of blood flow. It is frequently used to detect problems with heart valves or to measure blood flow through the arteries. For instance, disrupted or obstructed blood flow through the neck arteries may indicate that a person is at risk of having a stroke. Doppler ultrasonography is also useful for assessing blood flow in the abdomen or legs and viewing the heart to detect and monitor disease. The newest addition to Doppler ultrasound technology is the use of color, which shows the direction and rate of blood flow more clearly.

Doppler ultrasonography makes use of two different, but complementary, principles. The **ultrasound** principle is this: when a high-frequency sound is produced and aimed at a target, the sound will bounce off the target and be detected back at its origin. The Doppler principle is simply that sound pitch increases as the source moves toward the listener and decreases as it moves away.

Medical science utilizes these two principles in the following way. A transducer (sometimes called a probe) sends a series of short sound pulses into the body and pauses between each pulse to listen for the returning sounds. The machine then determines the direction and depth of each returning sound and converts this into a point of light on a television monitor. Thousands of these pulses are computed and displayed every second to produce a detailed image of the object being studied.

During a Doppler ultrasonography procedure, a technician applies special gel to the skin over the area being studied in order to slide the transducer smoothly. He or she will then move the transducer over the skin at various angles to produce different views of the target area for the physician.