

Basics of Ultrasound.

Ultrasound is the name given to high frequency sound waves, over 20,000 cycles per second (20kHz). These waves inaudible to humans, can be transmitted in beams and are used to scan the tissues of human body.

Ultrasound pulses of the type produced by the medical scanners are of frequency from 2 to 10MHz.

Piezoelectric transducers generate ultrasound waves, which is capable of changing signals in to mechanical (Ultrasound) waves.

Common Glossary used by ultrasonologists:-

Acoustic beam-	The beam of ultrasound waves (energy) provided by the transducer (Probe).
Acoustic enhancement -	The increased echogenicity (Echo brightness - White colour on USG) of tissues that lie behind a structure that causes little or no attenuation of ultrasound waves, such as fluid filled cysts. The opposite of acoustic enhancement is <i>acoustic shadowing</i> .
Acoustic shadowing -	The decreased echogenicity of tissues (black colour on USG) that lie behind a structure that causes marked attenuation of the ultrasound waves.
Anechoic (Anechogenic)-	Without echoes: echofree. For example normal urine, bile and transudate pleural effusion are anechogenic i.e. they have no internal echoes. (Appearance is completely black on Ultrasound machine).
Coupling Agent-	A liquid or gel used to fill gap between the skin and the ultrasound transducer, so that there is no intervening air to interfere with ultrasound transmission.
Hyperechogenic-	(Hyperechoic) Describes tissue that create brighter echoes than adjacent tissues. e.g. bone, perirenal fat, wall of gall bladder and cirrhotic liver (compared with normal liver) and air bronchogram in pneumonic consolidation.
Hypoechoogenic-	(Hypoechoic) Describes tissue that create dimmer echoes than adjacent tissues e.g. lymph nodes, some tumours and fluid.