

# Effects of Ultrasound

The term "ultrasound" applies to all sound waves with a frequency above the audible range of normal human hearing, about 20 kHz. The frequencies used in diagnostic ultrasound are typically between 2 and 18 MHz. Waves of this high frequency can cause some damage to the human body, and perhaps even more to the unborn fetal body.

## Fetal effects

The effects of Ultrasound technology have been proven to have many effects on the fetal bodies. In Australia a study conducted on 1400 pregnant women showed that women who had 5 monthly ultrasound tests, as compared to women who only had one throughout the entire pregnancy, gave birth lower weight babies over all. Another conclusion from this study showed that the babies that were exposed to ultrasound were mostly left handed. Other research published by the Canadian Medical Association's Journal showed that in a study of 72 children with delayed speech disorder, more than 70% of the children were exposed to frequent ultrasounds during pregnancy. A final study from Switzerland showed that mice who were exposed to extreme amounts of ultrasound during pregnancy birth mice that acted abnormally. These mice were also not as explorative as the control group for the experiment. Finally once the mice matured they had difficulty learning patterns, it took them more repetitions of simple tasks to learn that the task was always rewarded.

## Adult effects

Fetuses are not the only ones effected by the possibly damaging effects of ultrasound. One of the most well known effects of ultrasound is that as Ultrasound waves pass through a tissue they tend to heat it up. The tissue can easily be warmed to 40 degrees Celsius. Although in vivo the heat is usually easily carried away by blood circulation or simply dissipated into surrounding tissues. this regiment can be applied in a technique called Ultrasound therapy where this heat is used to stimulate repair to damaged internal tissues. Another well known effect of Ultrasound are cavitations. Cavitations are small bubbles of gas that are released upon exposure to extreme negative pressure. These bubbles can cause cells or even tissues to rupture. This effect is used in a form of non-invasive liposuction, in which adipocytes are burst using ultrasound waves. Although Ultrasound cannot be heard by humans, at high decibels it can still cause direct damage to human ears. Ultrasound in excess of 120 decibels may cause Hearing damage. Exposure to 155 decibels causes heat levels that are harmful to the body. 180 decibels may even cause death.

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### Bibliography

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