

Ultrasound Machine

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Abstract— This is a summary of the ultrasound machine in general. It provides backgrounds to its beginnings and where it is heading in the near future. The ultrasound remains one of the leading biomedical devices used in hospitals and looks to continue its dominance in the medical field.

I. INTRODUCTION

AN ultrasound is a procedure that uses high frequency sound waves to view internal organs and produce images of the human body. The procedure is noninvasive, which means it does not penetrate the skin or body openings. By not penetrating the skin, it is relating to the probe not the sound waves, which do indeed penetrate the skin. The procedure is also diagnostic. This means that it is used to determine what disease or condition is present in the person. The sound waves are what help the image be viewed. The faster the waves the clearer the picture, but the depth in which it penetrates the body is less. The lower the waves the deeper they will penetrate, but they will not be as clear. The reasons people get ultrasounds vary greatly. One woman may have an ultrasound of her womb because she is pregnant and another man may have one because of stomach pain that turned out to be ulcers. When there is an issue relating the inside of the body an ultrasound may be used. The procedure can be performed on any part of the body. Yet, the ultrasound itself does not reflect a clear image from bone. So for bone related issues, alternative techniques are preferred to determine what is wrong.

II. METHODS

An ultrasound machine consists of a transducer, monitor, keyboard and printer. The transducer passes over the area being examined, emits and receives sound waves, and the echoes are constructed into a picture of what is below the skin onto the monitor. The keyboard and printer are not used in the actual procedure but are used to enter information into the system and to print hard copies of the images seen on the monitor.



III. HISTORY

The Ultrasound technology was originally developed as sonar to track submarines during World War I. It was later converted into the use of medical imaging and was first medically used in the 1950s. The original scanners were massive and would produce a still image like a picture. While the doctors could read the images things have become much easier today. The modern scanners produce moving picture which are much easier to interpret for the doctors. Currently the newer and modern ultrasound machines are much smaller than when they were first used. They are now portable and can be moved, even though they are still quite large. New technology allows them to produce not only moving images but 3D images. This is very interesting especially when looking at a fetus in the womb of a mother. It gives a quite detailing view of what the baby looks like.

IV. DISCUSSION

The ultrasound machine is limited to the viewing of the issue. It cannot fix a problem that it finds. Also, there are still many cancers not visible on ultrasound machines. It does not reflect clearly from bone or air so it cannot be used to help in cases involving the bones or lungs. The future of the ultrasound machine looks very promising. Engineers are working hard to design and build handheld machines. They are not projected to be ready for another twenty to thirty years but are being worked on at this very moment. The biggest issue is how to fit so much information into such a small device. Doctors are excited at the thought however. The machines could be brought to the patients in emergencies and certain cases instead of the patient always needing to go to the doctors.

REFERENCES

- [1] <http://www.ultrasoundschoolsinfo.com/ultrasound-technology-how-it-works/>
- [2] <http://ehealthmd.com/content/what-ultrasound>
- [3] http://www.medindia.net/patients/patientinfo/ultrasound_uses.htm
- [4] <http://portableultrasoundmachines.net/the-risks-limitations-and-benefits-of-ultrasound-testing/314/>
- [5] <http://www.sdms.org/members/news/NewsWave/NW-December-2008.pdf>
- [6] <http://www.nlm.nih.gov/medlineplus/ency/article/003336.htm>
- [7] <http://www.ncbi.nlm.nih.gov/pubmed/20097500>