

Healthcare to Go

In the last sixty years, countless inventions have revolutionized our world. One innovation that has had an impact both within the United States and in the global community is the hand carried ultrasound machine. Making a lasting impact on the world and global health, the development of hand carried ultrasound, by transforming the technology into a more usable form, expanded the reach of a technology that had previously been inaccessible to large parts of the world and increased its applications in portions of the world where it had already been adopted. Hand carried ultrasound is a miniaturization of conventional ultrasound, a diagnostic technology which is used throughout healthcare and plays a large role in improving world health. Because of its portability, ruggedness and relative lower cost, hand carried ultrasound allows that very useful technology to be brought to impoverished communities in the harshest and least accessible regions.

The first portable ultrasound machine was developed in Bothell in 1999 by Jacques Souquet, PhD, chief technology officer at Advanced Technology Laboratories (ATL) and later a board member of SonoSite, which spun off ATL after the creation of the product, to take control of the product. To date, SonoSite has sold over 60,000 units worldwide in more than 100 countries. While they are by no means the sole provider of these systems, they are the market leader and their volumes can be used to estimate the magnitude of the worldwide market for hand carried ultrasound. Funded by a Department of Defense DARPA grant, the hand carried ultrasound machine was originally made according to military specifications, giving it its ruggedness. DARPA grants are designed to develop technology that the military needs but

civilians can utilize. The durability, which was not something that was thought that the civilians would find useful, became enormously useful. As a result of its origins and robustness, the portable ultrasound machine has improved healthcare especially in rural areas.

Diagnostic ultrasound is used in gynecology, heart conditions and disease, breast and prostate cancer diagnosis, obstetrics, musculoskeletal trouble, and anesthesia. It is non-invasive, fast, and easy. In many cases an ultrasound diagnosis could be the difference between a fast recovery and a slow and painful one. It can prevent harmful issues from arising during illness or pregnancy. For example, in developing nations such as Mali many women deliver their babies at home, skilled personnel delivering only twenty-five out of every one hundred babies. As a result if there are complications with the birth, the baby and the mother may die or suffer serious health problems. However, an ultrasound scan at a critical point during pregnancy can allow doctors to predict if complications may arise during birth and refer the patient to a hospital. With portable ultrasound, this scan is much easier, because instead of asking all pregnant women to make a long walk into the nearest medical center, the doctor can bring the scan to them, reducing the interruption to daily life. Through the facilitation of early detection of difficulties in pregnancy and illness, hand carried ultrasound has had a major impact on the reduction of neonatal and maternal mortality rates.

Due to its lightweight and portable design, each machine weighing only about six pounds, hand carried ultrasound can be brought to even the most secluded environments. They are equipped to deal with harsh environments, such as the freezing cold of high plateaus or the dusty heat of a desert. Immobile ultrasound machines are exactly that, immobile. It would be nearly impossible to get one to a rural village in the Plateau of Tibet, or in the African

savanna. However, a portable ultrasound that packs up to the size of a laptop computer can be packed in a backpack and taken almost anywhere. They also operate on battery so they do not need a reliable source of power to function. This has increased the accuracy of diagnosis in rural areas. Where in the past, a doctor had to rely on anecdotal evidence because the patient was either unable or unwilling to come to the nearest ultrasound station for a scan, now the doctor can pack up his equipment and take the scan to the patient. Due to its portability and durability, portable ultrasound has had a great impact in bringing the benefits of ultrasound to people all over the world, improving global health, and removing geographic barriers to accurate healthcare.

Portable ultrasound is much more cost-effective than a machine that is stationary. A doctor may work from five different offices. Buying portable ultrasound means that he only needs to invest in one machine rather than five. With a higher cost-effective portable ultrasound system, the doctor can lower his prices and still be able to cover his costs. The most deaths every year in poor countries are from childbirth or pregnancy, and other diseases that could be cured by simple medical care. First, however, the doctor needs to determine the cause of the disease. If the patient is very poor, they may not be able to afford the cost of the diagnostic scan. Because of its cost-efficiency, portable ultrasound can bring point-of-care diagnostics to patients who would not be able to afford it otherwise and in doing so, has left a large mark on improving global health.

Ultrasound is used every day in diagnosis from sports injuries to determining the age, sex, and health of a developing fetus. It provides doctors with a detailed, safe, and fast image of the inside of a patient's body so that the doctor can decide what the problem is and the best

treatment, putting the patient as fast as possible on the road to recovery. With the invention of hand carried ultrasound in 1999 by Jacques Souquet, the benefits of ultrasound became more accessible to impoverished patients in remote locations. Since its inception, hand carried ultrasound has spread beyond the Puget Sound region and left a mark on our community and beyond the United States by removing financial and geographical boundaries to good healthcare.

Bibliography

Dilulio, Renee. "Portable Ultrasound: Small Modality, Big Impact." *Imaging Economics*. Allied Media, 3 July 2006. Web. 23 Mar. 2011.

<http://www.imagingeconomics.com/issues/articles/2006-07_03.asp>.

Haring, Andrew, and Anne Bugge. *Sound Caring*. N.p., 2010. Web. 23 Mar. 2011.

<http://www.soundcaring.com/?page_id=20>.

"Sound Medicine: Understanding Ultrasound and its Benefits." *Society of Diagnostic Medical Sonography*. Society of Diagnostic Medical Sonography, 1999. Web. 23 Mar. 2011.

<<http://www.sdms.org/public/soundmedicine.asp>>.

"Ultrasound." *GE Healthcare*. N.p., 2011. Web. 23 Mar. 2011.

<<https://www2.gehealthcare.com/portal/site/usen/menuitem.f76842a5b0610162d6354a1074c84130/?vgnnextoid=dd3ba52fcea2d110VgnVCM100000258c1403RCRD>>.

Vansickle, Carole. "About Portable Ultrasounds." *eHow Health*. eHow, 1999. Web. 23 Mar.

2011. <http://www.ehow.com/about_4658768_portable-ultrasounds.html?ref=fuel>.

World-Leader and Specialist of Mountable and Hand-Carried Ultrasound. N.p., 2009. Web. 23

Mar. 2011. <<http://www.sonosite.com/>>.