

Still Living in 3-D?

The Art and Science of Prenatal Diagnosis

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We are used to believing in a three-dimensional world—we see things as having a height, a width, and a depth. Many science fiction writers have posed the question, Wonder what would it be like to live in the fourth dimension? Einstein once commented that although we seem to believe in 3-D, we already live in a 4-D world, the fourth dimension is time. Living in 4-D really just means being able to see changes in the other three dimensions—seeing how things move and change over time.

All ultrasound machines are capable of showing a fetus in two dimensions (without the dimension of depth) to establish that the pregnancy is viable, estimate the pregnancy's due date, and evaluate the fetal anatomy. 3-D ultrasound is useful in certain situations to improve the evaluation and is a feature found on only newer high-tech machines. It is really exciting that prenatal ultrasound machines now come in 4-D as well. By use of sophisticated ultrasound technology, we now can see real-time 3-D movement of a baby in the womb. Amazingly, we also can measure parts of a baby's anatomy to the fraction of a millimeter. Color flow Doppler ultrasound, similar to the color Doppler radar the weather forecaster uses to tell us where it's raining on the nightly news, can show us patterns of blood flow.

3-D and 4-D ultrasound is not necessary to evaluate the majority of pregnancies, and is not a perfect tool. There are limitations to the types of medical conditions we can visualize. For example, mental retardation is not diagnosable with ultrasound because it is not a physical thing we can see. The science of prenatal ultrasound diagnosis is advancing quickly. Yet with all of our sophistication, with all of this expensive machinery, the art of prenatal ultrasound diagnosis hinges on being able to interpret what we see. For doctors and other health care professionals, the real art is explaining to their patients the benefits of what these ultrasound images show as well as the limitations of the technology.

In some pregnancies, things do not go as planned. Sometimes a serious birth defect shows up on ultrasound. This usually comes as quite a shock for parents as their plans for a perfect baby are forever changed. For instance, ultrasound may show that the fetus has heart problems which will require surgery and may be life-threatening. The art of prenatal diagnosis for the medical professional includes being able to break this type of bad news to a patient in a manner that is realistic, yet sensitive to the dramatic change that the patient's life has just taken. Many genetic counselors, physicians, and nurses are quite skilled in communicating this information. Normal parent reactions include shock, then grief and anger, and perhaps finally acceptance of their situation. It is also important to remember that although prenatal ultrasound sometimes uncovers medical problems, most pregnancies have happy outcomes.

GeneCare Medical Genetics Center, in Chapel Hill, offers prenatal ultrasound and genetic counseling to couples at risk for having a baby with birth defects or genetic conditions. For more information please call (919) 942-0021 or 1-800-277-4363 or visit our web site: www.genecare.com.

Image courtesy of The Fetal Medicine Foundation.



Ultrasound image of fetal profile