



# clinic Tips

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## REVISED AIUM GUIDELINES ISSUED FOR OBSTETRIC ULTRASOUND DISCOURAGE DOPPLER USE

The American Institute of Ultrasound in Medicine (AIUM), has promoted the safe and effective use of ultrasound in clinical medicine for more than 50 years, setting the standard for sonography. AIUM developed the "AIUM Practice Guideline for the Performance of Obstetric Ultrasound Examinations." Due to the changing world of medical practice and technology, AIUM recently revised these guidelines, in collaboration with the American College of Radiology (ACR), the American College of Obstetricians and Gynecologists (ACOG), and the Society of Radiologists in Ultrasound (SRU). **Those who perform ultrasounds are wise to listen when AIUM speaks**, as these guidelines are the standard of care and practice in the event of litigation.

In 1998, NIFLA first developed the Institute in Limited Obstetric Ultrasound, based upon the AIUM Guidelines and guidelines published by the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) for training of nurses in limited ultrasound.

The new 2013 AIUM Guidelines can be downloaded at [www.aium.org](http://www.aium.org). Pregnancy Medical Clinics (PMCs) are urged to go to the AIUM website and print off the AIUM Guidelines as a reference.

The revised guidelines address the use of ultrasound Doppler. NIFLA has also addressed the issue of using ultrasound Doppler in previous issues of *Clinic Tips* (See July 2004, August 2004 and March 2011), and continues to receive phone and e-mail queries as to whether it should be used. Doppler use is appealing because it allows the baby's heart beat to be heard during the ultrasound procedure. Since it can be a moving and emotional experience to hear the amplified heartbeat, it is very tempting to encourage use of Doppler. However, harmful bioeffects can result from unnecessary exposure using Doppler ultrasound, which has an energy level seven times the level of ultrasound imaging. Ultrasound energy is converted to heat in the body, raising the body temperature of the unborn. The fetus is susceptible to

harm when there is an abnormal increase in body temperature. The most critical time of development is during the first ten weeks LMP, when organs (i.e. heart, renal system, central nervous system, eyes, ears, etc.) are forming (organogenesis). The central nervous system is thought to be particularly susceptible to temperature elevations, with the possibility of neural tube defects.<sup>1</sup>

**NIFLA's advice has been consistent; there is no medical indication to justify using audible Doppler when fetal cardiac activity is visible with sonography and measurable using M-mode.**

There have not been any controlled studies to determine if excess ultrasound is harmful to the unborn or the mother. However, there is always the possibility that future studies will determine harmful effects resulting from higher than necessary heat exposure to ultrasound energy. While a majority of studies have supported a Doppler safety profile, most were performed using machines (prior to 1993),

with a fraction of the output potential utilized currently.<sup>2</sup> The energy output potential of Doppler use is significantly higher than standard B-mode imaging because of the intensity it produces and the small focus (the heart) being examined.

**It is of special note that the latest AIUM Guidelines now use strong language to discourage the use of Doppler:**

1. Regarding first trimester ultrasound examinations, “When an embryo/fetus is detected, it should be measured and cardiac activity recorded by a 2-dimensional video clip or M-mode imaging. **Use of spectral Doppler imaging is discouraged.**”<sup>3</sup>

2. In regard to fetal safety, “Diagnostic ultrasound studies of the fetus are generally considered safe during pregnancy. This diagnostic procedure should be performed only when there is a valid medical indication, and the lowest possible ultrasonic exposure setting should be used to gain the necessary diagnostic information under the ALARA (as low as reasonably achievable) principle.”<sup>4</sup>

3. Further, regarding fetal safety, “In keeping with the ALARA principle, **M-mode imaging should be used instead of spectral Doppler imaging** to document embryonic/fetal heart rate.”<sup>5</sup> ALARA is a standard of practice in ultrasound scanning requiring that the lowest level of energy possible be used to achieve the result desired.

Since the AIUM Guidelines are the standard of care which would be looked at by a court in the event of any litigation, it is imperative that PMCs who desire to use Doppler carefully consider the most recent statements from AIUM on Doppler. It is our goal that mothers considering abortion be given all available information on their unborn child. However, the use of the Doppler by PMCs, though well-intentioned, violates the standard of medical practice regarding Doppler.

An interesting occurrence has surfaced during numerous trainings in limited OB ultrasound when women were asked what they liked best. Many stated they liked “hearing my baby’s heartbeat” even though Doppler was not used. They were referencing the visual

M-Mode used, which shows the frequency of the baby’s heartbeats when fetal cardiac activity is being measured. This visual gave the impression that they were hearing the heartbeat as well as seeing it. Such anecdotal data demonstrates that being able to visualize their unborn’s beating heart is indisputable evidence of the life of their child, and can be just as powerful as hearing it.

The ALARA principle remains the guiding principle for the standard of sonography use and must be upheld in order for PMCs to be seen as credible sources of medical services. Prenatal ultrasound always constitutes the practice of medicine, and should always be provided under the guidance of medical standards and the oversight of a licensed physician.

The patients whom God brings to our clinics deserve the best care and we would never want to find out years from now that the very life we were trying to protect has been harmed by over exposure to ultrasound energy (via Doppler) during the early stages of development.

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<sup>1</sup> Ibid.

<sup>2</sup> Houston, L, Odibo, A, Macones, G. (2009) The safety of obstetrical ultrasound: a review. *Prenat Diagn* 2009; 29: 1204–1212.

<sup>3</sup> American Institute of Ultrasound in Medicine. AIUM practice guideline for the performance of obstetric ultrasound examinations. *J Ultrasound Med* 2013; 32: 1083–1101. Retrieved July 21, 2013 from <http://aium.org/resources/guidelines/obstetric.pdf>

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

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