



# Promoting Excellence In Ultrasound

## **Policies and Statements**

# **A2**

## **Statement On Doppler Ultrasound**

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#### Statement On Doppler Ultrasound

*September 1998, Revised February 2000, Reaffirmed July 2008*

Doppler techniques are used over a broad range of applications from adult cardio-vascular to fetal examinations. Higher outputs are usually required to image poorly reflecting structures lying deep in the body, such as in the measurement of flow in deep vessels in the large patient. Other applications can be performed effectively using considerably lower outputs, such as in fetal/embryonic (transvaginal) examinations where attenuation by overlying tissue is low. Care and vigilance should be exercised to ensure that the examinations are performed with the minimum level of acoustic output necessary to obtain the required diagnostic information.

In modern equipment the highest intensity usually occurs with pulsed Doppler mode ultrasound. However, there is a large overlap in the ranges of intensities that are available for use in "Colour Flow (velocity) Imaging", "Power (amplitude) Doppler" and "Pulsed (spectral) Doppler".

In pulsed Doppler the beam is focussed onto a small volume and kept stationary so that the same tissues are insonated throughout the examination thereby maximising the heating. Data from studies with animals show that pulsed Doppler ultrasound can produce significant thermal effects, particularly near bone.

Nonthermal effects can result in capillary bleeding in gas-containing structures such as the lungs and intestine. The embryo and fetus do not normally contain gas.

#### **RECOMMENDATION**

Care should be exercised to ensure that the examinations are performed prudently using as low as reasonably achievable (ALARA) acoustic output and dwell time.

Users should take notice of exposure information provided by the manufacturer and minimise exposures to tissue structures containing bone and/or gas.



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