AbstractID: 1767 Title: Lesion Signal-to-Noise Ratio Characteristics of Two Modern Ultrasound Systems

Studies were presented at the 2003 AAPM meeting characterizing the effect of various ultrasound scan parameters on the depth of visualization (DOV) of spherical simulated lesions. These studies indicated that few of the tested scan parameters had a significant effect on the DOV on the evaluated scanner (GE LOGIQ 700). New measurements obtained using an Acuson Sequoia scanner agree with some of the previous results but also indicate some differences in the performance of the two scanners. Changes in gain, dynamic range, edge enhancement and frame averaging (within reasonable ranges) had no significant effect on the DOV for either scanner. Measurements made using an 8 MHz central frequency showed differences between the GE 739L and Acuson 8L5 transducers in the plots of lesion signal-to-noise ratio (LSNR) as a function of depth. The LSNR values for the GE scanner demonstrate a well-defined peak at approximately 30cm depth and an LSNR value of greater than 8.0 over a depth range of 25-45mm. The Acuson data showed a nearly constant LSNR value of 8.0 up to a depth of 30mm, beyond which the LSNR values decreased. For the Acuson system, the LSNR values generally increased with increasing central frequency from 5-7 MHz, but decreased at 8 MHz for depths greater than 35mm. LSNR values for the GE system generally decreased with increasing central frequency from 7-9 MHz at depths greater than 30mm. Additional results will be presented for higher frequency transducers on both systems.