

AbstractID: 9140 Title: Automated US QC with phantoms - A comparison with electronic transducer testing

Purpose: To compare the ability of automated quality control software to detect flaws in ultrasound transducers as compared with an electronic transducer testing system. **Method and Materials:** A standard tissue-mimicking quality control phantom was used to acquire images with an ultrasound system that has defective transducer elements. A program written specifically to evaluate image quality parameters was used to evaluate the resultant images. The automated QC program was compared against a commercially available system that evaluates the transducer while it is detached from the rest of the ultrasound scanner. Variables evaluated include image uniformity, sensitivity (depth of penetration) and spatial/contrast resolution. **Results:** The automated QC software was able to detect the transducer flaws that existed on the given transducer. This was also detected by the electronic transducer test system. The results from the latter depict transducer elements that are not operating properly, either due to delamination of the piezoelectric element from the acoustic coupling layer, contact failure, or grounding of the line in the cable. The automatic QC program is not able to detect this level of detail, however, the results from image analysis are more relevant to overall system performance. **Conclusions:** The ability of an automated QC program to detect transducer flaws has been evaluated. The automated QC program is not able to provide details of the transducer failure to direct repairs, however, it is able to detect subtle changes in transducer/ultrasound scanner performance in total. Therefore, the use of such a system will provide the physicist/engineer with objective imaging performance measurements. Comparisons of cost and ease of use will be included in the summary of this work and the reliability of each system to improve the quality of ultrasound studies will be discussed.