Purpose:Magnetic Resonance Imaging is a challenging area of Medical Physics. Concepts presented in didactic lectures can be reinforced if hands-on laboratory procedures can be simultaneously performed by students. This can be accomplished on a clinical scanner if access is unlimited. However, the constraints of scanner availability usually preclude students from experimenting with different procedures. Further, it is not feasible to allow students to experiment extensively with clinical systems since scanner performance cannot be compromised.

Methods: To address the need for hands-on training as well as the limited availability of MR scanners, we have integrated a desktop Earth's field MRI system to reinforce concepts in NMR and MRI and a video presentation of a comprehensive MR Quality Control procedure performed by a MR physicist. The desktop Earth's Field MRI system (TerraNova) allows students to learn NMR and MRI fundamentals. The video records a MR QC procedure and takes students through the different steps to perform the comprehensive QC exam for ABR. In addition, the video highlights procedural errors and simulates conditions that result in commonly encountered artifacts. The video and MR images are provided to students so that they can independently analyze the images. The sequence of presentation was as follows: didactic lecture (prior semester), desktop experiments, video of MRQC culminating with the actual clinical rotation.

Results: A one hour lecture and 4 hour lab was developed with the desktop model and students successfully completed the lab in groups of two. Video and image analysis were completed individually by each student prior to the clinical lab rotation. Surveys conducted at each step confirmed the additional learning value of the desktop model and the video.

Conclusions: In addition to enhancing the learning of MRI, the novel approach also resulted in an improved efficiency of the MR clinical rotation.

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