CREATION AND APPLICATION OF INTERACTIVE COMPUTER-BASED 3D MODULES FOR THE TEACHING OF ANATOMY

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BACKGROUND INFORMATION: 3D image processing techniques, initially developed for use in the production of animated films and special effects, provide tools for high resolution and interactive manipulation of medical images. 3D medical imaging may be used to create interactive virtual anatomy teaching modules to augment understanding of complex anatomical relationships.

METHOD: With the support of an Academy of Medical Educators Curricular Innovations grant, three 3D interactive anatomy-teaching modules were created. These modules are focused on: basic abdominal anatomy, cardiac anatomy and the anatomy of the liver and biliary system. They combine life-like 3D volume rendered images and movies, created from patient CT scans, with text and self-guided interactivity in a Flash-based template. The modules can be viewed on lab workstations, personal computers and used by instructors in a classroom setting.

EVALUATION: An educational research project assessed the value of interactive 3D vs. a conventional 2D atlas-type approach to the teaching of liver and biliary anatomy. 1st and 4th year medical student subjects felt more engaged and satisfied with the 3D module than those viewing the 2D module. This was true for those with good as well as those with poor cognitive 3D skills on an initial test. The 3D group scored higher on exam questions that required an understanding of 3D anatomy, although the differences were not statistically significant. This work is being submitted for publication in the medical education literature.

DISSEMINATION: These modules have been used in lectures to 1st and 2nd year medical students as an aid to teaching radiology anatomy correlations. They have been available to 4th year radiology elective students. Plans to deploy the modules online are proceeding.

REFLECTIVE CRITIQUE: The educational research projects described above included questionnaires assessing student satisfaction and encouraging feedback and suggestions, which have been incorporated in subsequent modules, including a virtual dissection module currently under construction.