

Haptic Simulators as an adjunct to Anatomy Teaching

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Introduction

We have extended the use of haptic simulations by investigating the applications earlier in the curriculum in anatomy teaching. During the large animal practicals in the preclinical anatomy course, students dissect sheep and horses but not cows, due to various restrictions on access to material. Therefore, the Haptic Cow is being used to enable students to learn about topographical anatomy and to experience the 'feel' of a variety of organs and structures.

During the pilot study in 2009, nearly 200 hundred students used the simulators over a 2 day period. Feedback was gathered via an online questionnaire and the findings were presented at AMEE 2009 in Malaga. This work has been published in Anatomical Sciences Education ([Kinnison et al, 2009](#)).

Creating a Library of Feel

In order to assist students in remembering how organs and structures feel, a 'library of feel' is being developed. This is a collation of the haptic effects already developed for the existing simulators with some new ones. The aim is to provide a comprehensive haptic library across species, tissue types and structures. Using the simulation, students will be able to compare the feel of: a cow's uterus with its rumen or bladder; the skin of one species with another; muscle with fat; a lymph node with a cyst or abscess; etc. . The 'Library of Feel' also allows experts to prototype simulations rapidly and was used at the [Haptics Workshop](#) held at the RVC for clinicians and simulator designers. One of clinical experts managed to "create pitting oedema – which felt quite realistic!"

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Dissection Skills

A simulation is being developed to capture aspects of an expert's technique when performing a dissection and the recording will be played-back to students. The aim is that this will enable students to experience, and learn from, the expert's technique. This will be a mixed-reality simulator, with a virtual model of the skin and collocated graphics using a semi-transparent mirror so that the skin and scalpel appear superimposed on underlying structures e.g. a toy dog.

Virtual Surgery

