Haptic Simulators in Veterinary Education

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Haptic technology allows people to interact with computer generated environments through their sense of touch and feel 3D virtual objects. The technology has been used to develop a range of simulators for teaching veterinary palpation-based skills. The aim was to provide more effective training for procedures that are particularly difficult to learn and teach using traditional methods.

A simulator has been developed for teaching bovine rectal palpation: the Haptic Cow. A student palpates the virtual reproductive tract while an instructor follows the hand movements and provides directions. A computer-guided version has also been developed for students to use on their own. The student's hand is moved along the path of an expert's examination by the haptic device and each step is accompanied by audio instructions.

The Haptic Cow can also be used to run a virtual farm visit, a role playing exercise. The instructor acts as the 'farmer' and the student is the 'vet'. The 'vet' is presented with a fertility case, must extract a history from the 'farmer', palpate the simulation, make a diagnosis and discuss treatment options.

Haptic simulations have also been developed for procedures in other species. An equine colic simulation is used to teach a systematic examination of a normal abdomen, the diagnosis of impactions, displacements of the large intestine and dilated small intestine. Further developments include:

- A simulator for learning core skills (the building blocks of a range of procedures)
- A system to guide students in the use of safe and effective force
- Simulations for small animal palpation e.g. canine prostate and feline abdomen
- Simulations of minor procedures including epidural injections and feeling pulses.

Haptic simulators provide students with safe, effective and accessible learning environments in which to develop skills before examining real animals. Additionally, the instructor can have a more effective input into the learning process of procedures that are particularly challenging to teach using traditional methods.