Abstract

Otologic disease accounts for an estimated 8 billion in health care costs annually in the United States. Training health professional charged with the surgical treatment of such disease requires 5 to 7 years of training at an annual cost of $76,000 each. Currently, this requires mock surgical procedures using cadaver material (temporal bones) and apprentice type training on real patients in the operating room. The expected application of this research is to provide an adjuvant environment to learning the surgical treatment of otologic disease. Our long term hypothesis is that simulation technologies can increase efficiency in training and raise proficiency of the practitioner in a safe and cost effective manner. For this specific project, our focused hypothesis is virtual environment for temporal bone dissection is equivalent to training with cadaveric temporal bone dissection in the anatomy laboratory.

The broad, long-term objectives of this work are to further develop and validate a robust, realistic virtual environment for temporal bone dissection. Specifically, this work will evaluate the efficacy of emerging simulation technologies compared to traditional methods of temporal bone dissection for training otologic surgeons. This work will extend the functional use of the system (as developed under a previous R21) through increased realism, the integration of new high and ultra high resolution multimodal image data sets, and through a multi-center national trial. In its current state, the system has met with overwhelming support from a number of academic institutions, which have currently committed to further collaborative development and validation studies.