1. Simulation surgery is preferable to relying solely on MRI or CT scans, which aren’t as instructive since they are viewed in 2D on a flat screen.

2. The use of 3D-printed models for surgical training is also preferable to training on cadavers, which present problems with respect to availability and cost.

3. Cadavers also often lack the appropriate pathology, so they provide more of a lesson in anatomy than a representation of a surgical patient.

Related Article: A dress rehearsal for surgery

At least one clinical study and a plethora of anecdotal evidence suggests that accurate surgical models can be extremely useful in cutting surgery times and educating new doctors. And, with 3D printing, these models can be made to reflect a patient’s anatomy exactly.

Physical models of complex bony structures can be used for surgical skills training. Both design and validation of 3D printed complex bone models with internal anatomic fidelity are key factors for detailed surgical training and rehearsal.

Current non-3D models focus on surface rendering but suffer from a lack of internal accuracy due to limitations in the manufacturing process. We describe a technique for generating internally accurate rapid-prototyped anatomical models with solid and hollow structures from clinical and microCT data using a 3D printer.

In a face validation experiment, otolaryngology residents drilled a cadaveric bone and its corresponding printed model. The printed bone models were deemed highly realistic representations across all measured parameters and the educational value of the models was strongly appreciated. Our 3D models in any facility, symbolizes that institutions’ commitment to excellence. Your health care institution will also be recognized as being in the forefront of their industry.

In this issue, we discuss doctors spending decades trying to perfect their crafts. They don’t exactly get dress rehearsals when it comes to performing complex surgeries on one-of-a-kind patients, but our 3D printing capabilities changes all that.

The first step in a surgical simulation is the creation of a model that incorporates hard and soft structures in a 3D model.

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