

Utilizing 3D Printing to Optimize Mock Code Training in Simulation

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For medical professionals, there is a great desire to keep their skill sets sharp and available when an emergency strikes. They hone their skills through research, hands-on application and the experience of simulated events such as mock codes. The right equipment makes applying those skills in a controlled environment extremely beneficial, especially when engaged in a highly realistic simulation. One of those skills is the insertion of an Intraosseous (IO) needle into the tibia or humerus. Simulation models are available, but many are expensive and can wear out quickly, which makes the tactile experience less realistic.



3D printing materials at the National SimLab in Orlando

Members of the James A. Haley VA simulation faculty visited the National SimLab in Orlando to review the facility's 3D Modeling Department. The equipment was fantastic, although out of budget. Determined to find a good fit, the team researched several production processes and settled on a filament, or deposition printer.

The team chose a filament style printer for its low cost (\$230 for the printer, \$25 for a 1 kg roll filament), print size (up to a 1' cube) and self-contained process (no other equipment or special ventilation needed).

The filament used in production is polylactic acid (PLA) plastic, which is cornstarch-based and biodegradable. Using the included software and free designs available online, the team was able to manufacture a Tibial IO simulation model with a replaceable drill-through plate for less than \$1 worth of material.

The simulation equipment is extremely beneficial and will accommodate a 20 ml syringe so that a nurse or physician can practice both aspiration and injection. The replaceable plate has a similar strength and feel of bone, which can be printed for less than 25 cents of material. The main body of the model can be used indefinitely. With their new printer, the team will be able to produce as many models as they need so that nurses and physicians are able to practice their skills without concern for wearing out equipment.

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