

3D Printing Airway Trainers: BME 400

Dates: 10/26/25 - 11/1/25

Client: Kristopher Schroeder, MD

Advisor: Dr. Paul Campagnola

Team:

Matt Sheridan (Communicator)

Dan Altschuler (Team Leader)

Cody Kryzer (BPAG)

Lance Johnson (BSAC)

Elleana Thom (BWIG)

Problem Statement

Airway management is an integral part of keeping a patient stable in many medical environments. While training medical practitioners with simple airway trainers has improved patient outcomes, this has not had the same effect on patients with abnormal airways. The use of 3D printing from existing patient imaging to create realistic and individualized airway manikins would assist medical professionals, allowing them to practice airway management skills on lifelike models.

Brief Status Update

The team has now made a silicone mold of a generic airway using the Decent Simulator model, and will be using this to create a full prototype. We will be attending show and tell this week in order to gather more ideas for our prototyping. We are going to use a lamp neck as the neck of the manikin to allow for modularity, and will also be giving room for adjustment on the jaw of the manikin.

Weekly Goals and Accomplishments

- Team
 - Completed outreach activity outline and did testing on the main outreach activity
 - Made a silicone airway using the Decent Simulator mold that we printed
- Matt Sheridan
 - Did segmentation of MRI and a negative of the MRI to see if we can make a mold of our own airway to fill with silicone
 - Tested outreach activity with team
- Dan Altschuler
 - Collected the print from Decent Sim and ordered silicone
 - Completed the preliminary report
- Cody Kryzer
 - Researched silicone for mold
- Lance Johnson
 - Tested outreach activity with the team
- Elle Thom
 - Finalized decision on outreach and tested it

- Met with the team to make a silicone mold of the airway

Upcoming Goals

- Team
 - Make negative scans and convert them into 3D printable files to test the viability of printing a negative to pour a mold into
 - Put together the full head/neck and airway with modularity.
 - Do the outreach activity as a team
- Matt Sheridan
 - Do the segmentation and send it to Lance
 - Start putting together the full airway
- Dan Altschuler
 - Continue work on the manikin design
 - Build a prototype to show Dr. Schroeder
- Cody Kryzer
 - Segment scans
 - Work on making an adjustable manikin
- Lance Johnson
 - Continue working on the manikin and building neck adjustment mechanism
 - Convert the segmented scan to a 3D-printable file and print using elastic resin
- Elle Thom
 - Building the prototype
 - Meet with Professor Puccinelli to review the outreach activity
 - Research ways to create the manikin shell