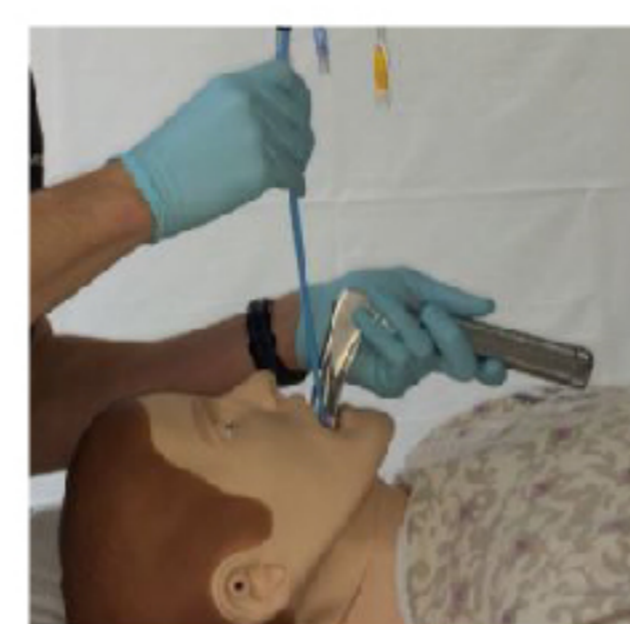
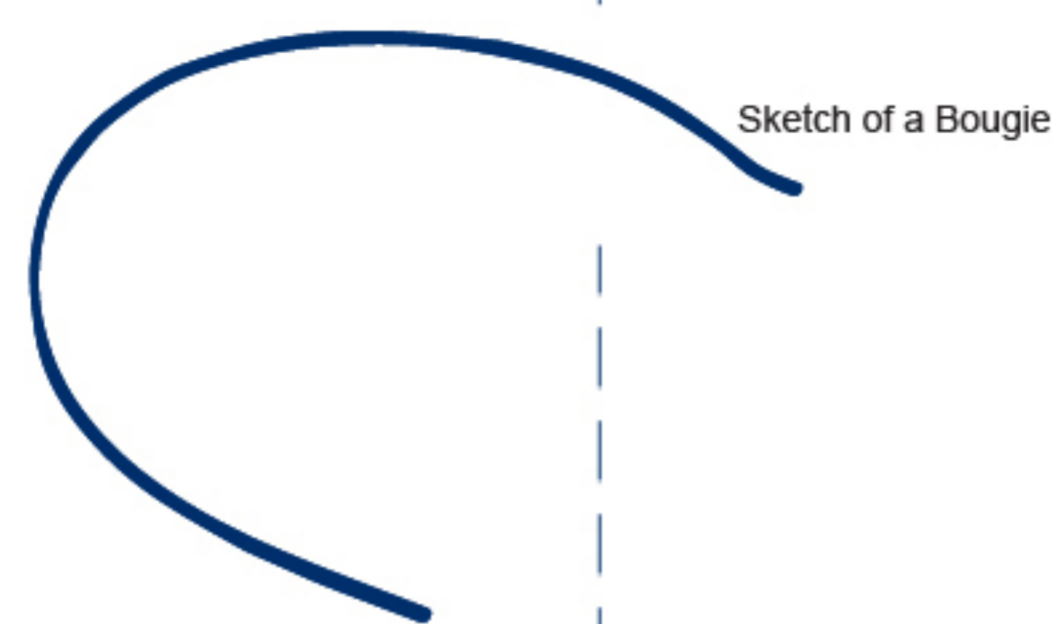
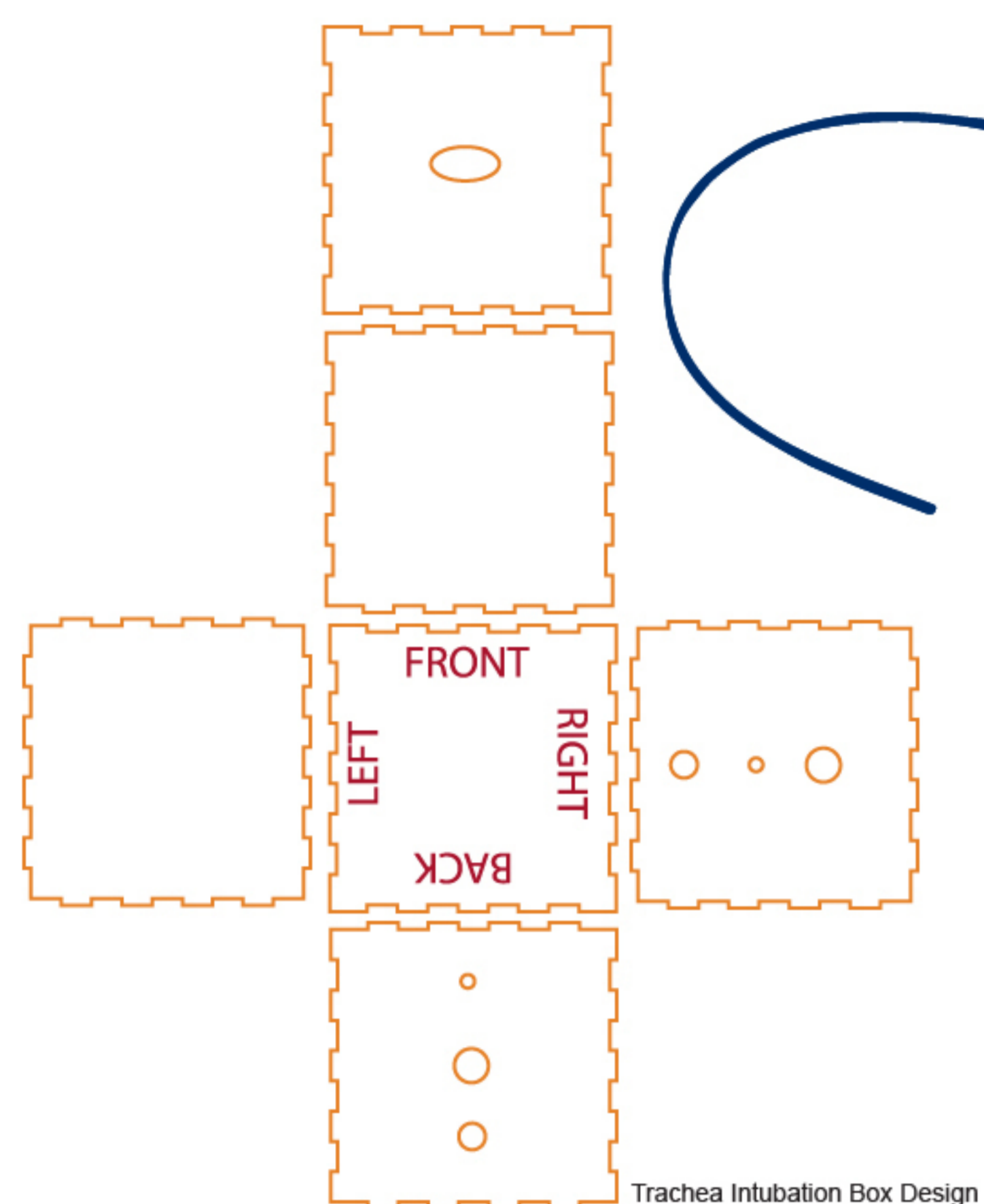


Designing/Building a Low-Fidelity Simulation In Collaboration with Weill Cornell's Emergency Department



Goals/Objective:

The gum bougie is used for navigating anatomically difficult airways and assisting in endotracheal intubation. Our goal was to create a low-fidelity task trainer to teach novice airway practitioners microskills (tip guidance, shaping, rotational maneuvering) necessary for effectively using an airway gum bougie.

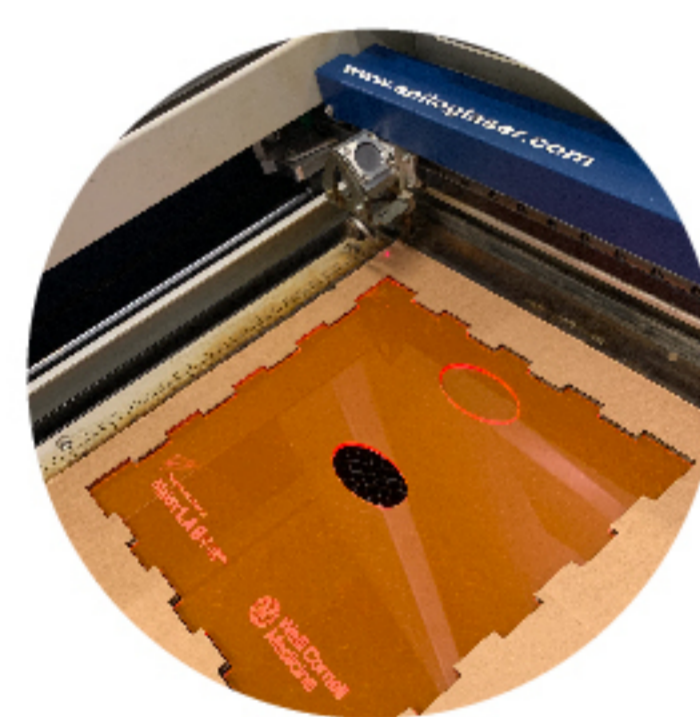
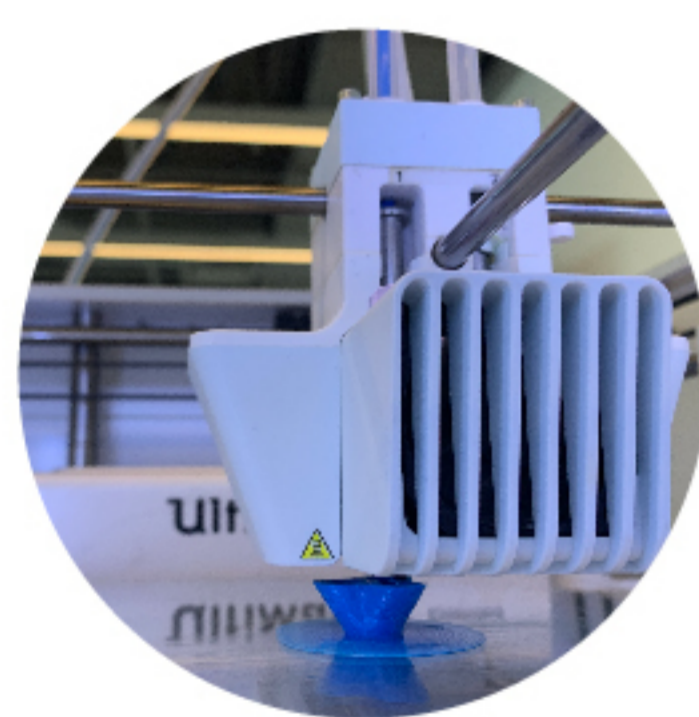
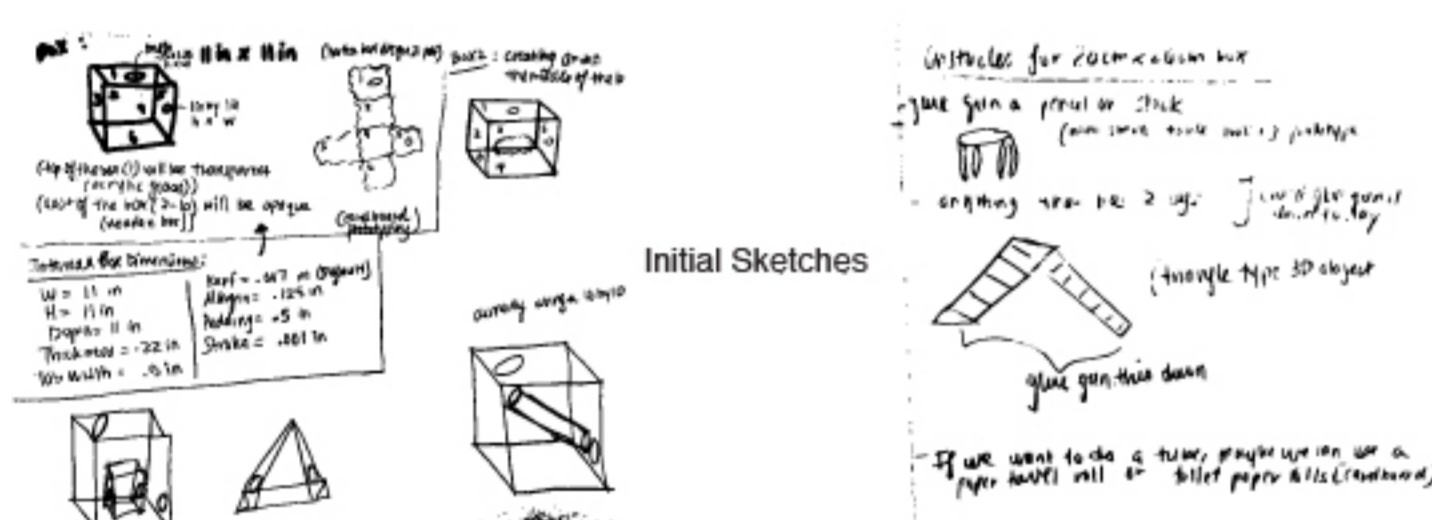
Background/Relevance:

Annually, the Weill-Cornell Emergency Department hosts an airway course for trainees involved in airway management. This course breaks down skills and approaches to airway management including the use of the gum bougie in anatomically difficult intubations. Typically, videos or high-fidelity simulations are used to teach bougie use, however, the individual microskills required to utilize this tool are not teased out with these conventional education techniques. We sought to create a task trainer to address this gap in bougie education.



Results:

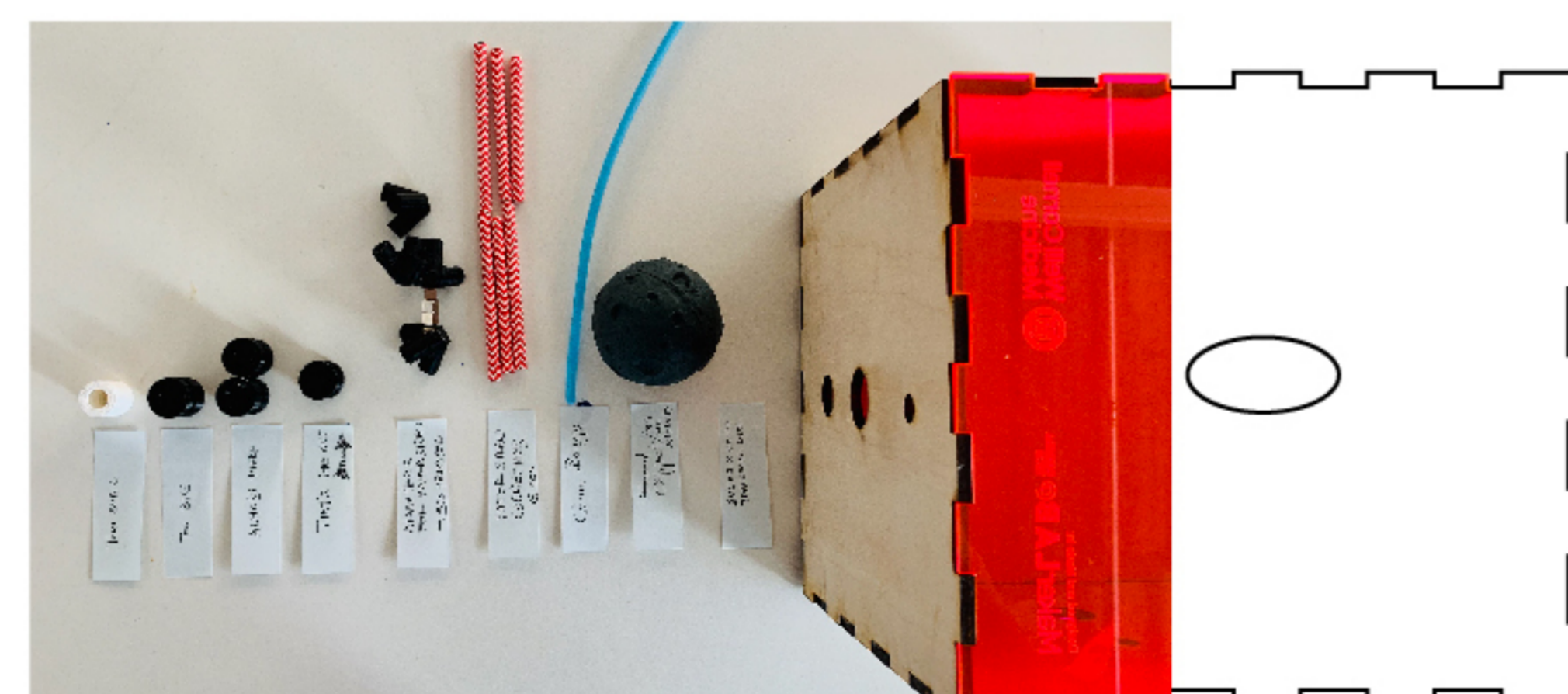
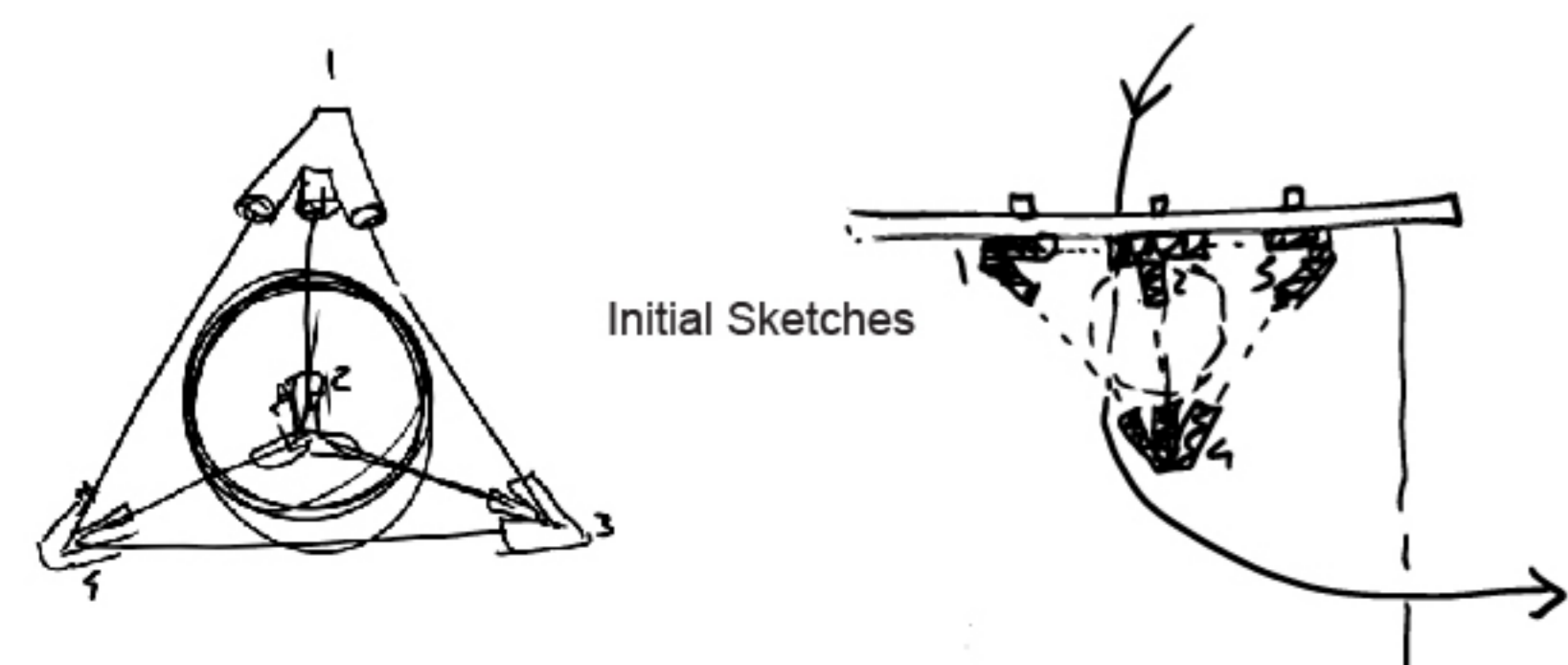
Novices appreciated the stepwise approach to learning the tactile skills required for using the bougie in real life situations. More advanced airway practitioners found the higher levels of difficulty appropriate for fine tuning their tactile skills. The use of the MakerLAB is efficient in filling in the gaps of medical education thus providing support with hands-on learning and enforcing skills through use rather than mere visualization.



Design/Methods:

In collaboration with Cornell Tech's MakerLAB and Weill-Cornell Medical School and Emergency Department, a Bougie Microskill Box was designed to allow learners hands-on practice in the microskills required to utilize the bougie. Keeping the bougie as a constant parameter, different sizes of cardboard and wooden boxes were created to find efficient ways to develop training maneuvers through a playful and meaningful setup.

Rapid prototyping tools like laser cutter and FDM 3D printer allowed quick ideation for the modular design. The box was first prototyped using a laser cut cardboard template design of 10cm x 10cm x 10cm for tolerance and testing. Adobe Illustrator was used to create a vector file ready for laser cutting.



Conclusion/Next Steps:

The development of the Bougie Microskill Box was well received and appreciated by the learners. Informal feedback was obtained and design improvements are planned to improve ease of use and transport. We expect to continue such collaboration between Cornell Tech and Weill Cornell where we can use the MakerLAB as an incubator to design/build an array of such learning tools.