

## Public Abstract

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Department:Mechanical & Aerospace Engineering

Degree:MS

Title:The Design and Implementation of an Endoscopic Enabled Mouth Gag

The purpose of this project was to design and produce a working prototype of a device that could be used in upper airway Otolaryngology surgeries to increase nasopharynx visualization. The nasopharynx is the anatomical region of the airway that is behind the nose and above the palate, and therefore very difficult for surgeons to access and properly visualize. Traditional methods include the blind removal of diseased tissue or the use of a small, hand-supported, dental-style mirror for visualization during tissue removal with a cutting tool. The blind method is severely limiting for the surgeon. The use of the mirror has advantages over the blind method, but has a restricted field of view and limits the surgeon's ability to visualize the procedure as well. The proposed endoscopic enabled mouth gag (EEMG) device attaches to the traditional mouth gag and allows for the fixation of a rigid endoscope that can be positioned as needed and locked into place. The improved field of view of the endoscope over the mirror allows for superior visualization for the surgeon. The device was designed using Solidworks, produced using Polyjet 3D printing technology, and tested in conjunction with a Crowe-Davis mouth gag, rigid endoscope and anatomical mannequin for functionality and ease of use.