

# Project Design Specification

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## *Problem Statement:*

To train clinicians to perform transnasal endoscopy of the larynx, a model with realistic and anatomically correct structures of the nasal passages and larynx must be developed. Currently, training is conducted on human subjects in the form of volunteers and/or patients.

## *Client Requirements:*

- Anatomically correct model of nasal passages and larynx
- Materials should have a compliance similar to living tissue
- Costs less than \$3000
- Force against a turbinate is painful, touching the larynx causes choking, touching the tongue base causes gagging. Feedback to the user would be helpful if contact with these structures is made.

## **1. Physical and Operational Characteristics**

a. *Performance requirements:* Needs to accurately simulate environment and obstacles involved in transnasal endoscopy. Simulate a real face as best as possible.

b. *Safety:* The model must contain non-toxic materials. The materials included may not damage the endoscope.

c. *Accuracy and Reliability:* The model must be anatomically correct for training purposes. The model should be durable.

d. *Life in Service:* 5 years

e. *Shelf Life:* No specific requirements by client, but to be determined by materials used.

f. *Operating Environment:* Office / classroom (non-sterile).

g. *Ergonomics:* Should be small enough to place on a table or desktop.

h. *Size:* Accurate in terms of anatomy.

i. *Weight:* 25 pounds so it's light enough for one person to move by hand.

j. *Materials:* Non-toxic materials.

k. *Aesthetics, Appearance, and Finish*: The outer surface should look like a face. The inner structures should be the same color and shape as the living structures.

## **2. Production Characteristics**

a. *Quantity*: One.

b. *Target Product Cost*: Less than \$3000.

## **3. Miscellaneous**

a. *Standards and Specifications*: Model should comply with anthropometric data.

b. *Customer*: Voice pathologists and other medical professionals working with transnasal endoscopy and its training.

c. *Patient-related concerns*: Any material allergies such as latex need to be taken into concern. The scope needs to be cleaned after use with the model since it is not sterile.

d. *Competition*: Existing commercial larynx models and human subjects (volunteers and/or patients).