

Project Design Specifications

#24- Life-like Anatomical Simulation of Inguinal Hernia Anatomy

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Client: Dr. Jon Gould

Advisor: Professor Thomas Yen

Function:

Dr. Gould has requested a life-like anatomical simulation of inguinal hernia anatomy that can be used to train medical students and residents in anatomy, for laparoscopic surgical simulation, and for open hernia surgery simulation.

Client Requirements:

- Life- like internal and external appearance
- Interactive learning model
- Male model
- Life- size
- Materials realistically replicate anatomy
- Indirect and direct hernia
- Open and laparoscopic surgery

Design Requirements:

1) Physical and Operational Characteristics

a) *Performance requirements*

- i. Interactive model.

b) *Safety*

- i. No negative biological effects.

c) *Accuracy and Reliability*

- i. Must accurately portray inguinal hernia and surrounding anatomy

d) *Life in Service*

- i. Daily use for 5- 10 years
- e) *Shelf Life*
 - i. 15-20 years
- f) *Operating Environment*
 - i. In contact with surgical tools and hands.
 - ii. Must operate from 15° to 30° C
- g) *Ergonomics*
 - i. Easily maintained.
- h) *Size*
 - i. Dimensions of an average male from lower abdomen to upper thigh
 - ii. 14 x 10 x 10 in.
- i) *Weight*
 - i. 15lbs- 30lbs
- j) *Materials*
 - i. No latex
 - ii. Silicone
- k) *Aesthetics*
 - i. Must naturally portray hernia and anatomy

2) Production Characteristics

- a) *Quantity*
 - i. One model.
- b) *Target Product Cost*
 - i. \$500- \$1,000

3) Miscellaneous

- a) *Standards and Specifications*
 - i. FDA approval is required if placed in the market
- b) *Customer*
 - i. Medical schools
 - ii. Hospitals

c) *Patient-related concerns*

- i. Not applicable.

d) *Competition*

- i. Inguinal Hernia Model (Patent number 5,908,302)
- ii. SimuLab Product number HTM- 30
- iii. American 3B Scientific Inguinal Hernia Model