

Project Design Specifications

#3- Reduced Diameter Nasogastric Tube with Guide Wire Support

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Client: Dr. Steven Yale

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Function:

Evacuation nasogastric tubes are used to remove fluid contents from the stomach in patients that have an obstructed gastrointestinal system. Our mission is to design an evacuation nasogastric tube that has a reduced outside diameter of 3mm. This will significantly decrease patient discomfort while improving the correct placement of the device, by increasing the stiffness of the device.

Client Requirements:

- Cost effective
- Reduces patient discomfort
- Reliable

Design Requirements

1. Physical and Operational Characteristics
 - a. Performance requirements
 - i. Allows for evacuation of fluid contents of stomach
 - ii. Does not degrade in acidic stomach environment
 - iii. Does not kink or bend during placement
 - b. Safety
 - i. Reduces patient discomfort with placement
 - ii. Contains no toxic materials
 - c. Accuracy and Reliability
 - i. Nasogastric tube must not degrade while in patient
 - ii. Must allow for accurate placement in stomach
 - d. Life in Service
 - i. 1-5 days
 - e. Shelf Life
 - i. 1-2 years
 - f. Operating Environment
 - i. Nasal Cavity, Esophagus, and Stomach
 - g. Ergonomics
 - i. Easy for nurse or doctor to correctly place in stomach
 - h. Size
 - i. External diameter: 3mm
 - ii. Length: 130cm
 - i. Materials
 - i. No latex
 - ii. Water impermeable
 - iii. Acid resistant
 - iv. Stiff

- j. Weight
 - i. Less than 1 kg
- 2. Production Characteristics
 - a. Quantity
 - i. One model
 - b. Target Production Cost
 - i. Under \$30
- 3. Miscellaneous
 - a. Standards and Specifications
 - i. Must be tested to ensure patient comfort and reliability
 - b. Customer
 - i. Hospitals
 - ii. Clinics
 - c. Patient-related Concerns
 - i. Discomfort
 - ii. Allergic reaction
 - d. Competition
 - i. Covidien
 - ii. Bard
 - iii. Dale
 - iv. Rusch