NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
School of Materials Science and Engineering
College of Engineering

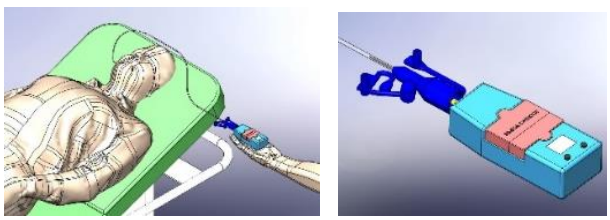
Automated Retractable System for Rapid and Convenient Nasogastric Tube Placement Testing

TECHNOLOGY OVERVIEW

This technology features an extendable-retractable sensor, controlled by an external hand-held device, that can move seamlessly within nasogastric tubes. Said device can be connected to a nasogastric tube for easy sensor insertion once the sensor cartridge has been attached.

By exploiting on conductivity differences between the stomach and lungs (validated in animal studies), this technology is able to rapidly distinguish between placement in the stomach vs the lungs and output easily as audio and visual signals to indicate correct or incorrect placement respectively.

Through this approach, it is envisioned that nasogastric tube placement can be done more effectively and rapidly and in turn, greatly reduce the load on the healthcare system.



3D rendering of technology application and proposed design of hand-held device (top)

Current sensor prototype (top) in existing nasogastric tubes

FEATURES & SPECIFICATIONS

- An extendable-retractable-reusable sensor
- Hand-held device with in-tube movement-controlled sensor and placement status display
- Highly stable readings
- Minimal contact time in human body with negligible by-products
- Commercial nasogastric tube compatible
- Portable and highly mobile in healthcare facility

MARKET TRENDS & OPPORTUNITIES

- Dysphagia, characterized by difficulty in swallowing, is a common medical condition amongst the elderly. The global prevalence rate ranges from 2-20% and locally, an estimated 58,000-174,000 individuals over the age of 65 are living with dysphagia. In most dysphagia cases, nasogastric tubes (NGTs) are used to aid feeding.

- The global NGT market reached US$321.54 million in 2020 and is projected to reach US$621.19 million by 2028, with a CAGR of 7.0% from 2020-2028. This growth is driven by an increase in the aged population, estimated to be 900 million from 2015 to 2 billion in 2050. The rise in chronic diseases such as cardiovascular disorders, cancers and preterm births are projected to further fuel the growth of this market.

POTENTIAL APPLICATIONS

- Surgical
- Medical