Innovations in Endoscopic Ear Instrumentation in Toronto

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Disclosures

• Patent application filed by SickKids

• Funding Sources:
  • Department of Otolaryngology – Head & Neck Surgery, SickKids Hospital
  • Proof of Principle Grant, SickKids Hospital
  • Harry Barberian Scholarship Award, Department of Otolaryngology – Head & Neck Surgery, University of Toronto
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Bipolar Robotic Neurosurgical Tool (BRNT) for the dVRK

Hamlyn Surgical Robot Challenge
June 25/2017

Rami Seab, Alex Gordon, Peter Frances, Kevin Ai Xin Jun Luo, Ashley Deonaran, Luke MacLean, Saba Sebastian, Arashin Swarup, Thomas Looi, and Dr. James Drake
What do we need in a new tool?

• You told us!

Needs Analysis Survey from 2nd World Congress of EES

New instrumentation to:
1. **Reach** structures visualized by the endoscope
2. **Dissect** cholesteatoma
3. **Suction-enabled**
Reaching Problem

Thomassin Dissector, curved

Ear Canal

Target

Thomassin Dissector, double curved
SFT Characteristics

Steerable tip = reaching structures
Steerable Flexible Tip (SFT) Instrument
Anatomical Validation Study

Reaching Experiment
Validation Studies

Handle Ergonomics
Ease of Use
Tip Functionality
Validation Study – Results I
Validation Studies – Results II

Instrument Characteristics Scored as “Good ≥4.5”

- Tip Size: Performed as Expected, Accurate Tip Movement, Comfortable Grip, Intuitive Operation, Block Field of View

- Bar chart showing scores for each characteristic.
Instrument Characteristics Scored as “Less Favourable <4”

- Handle Size
- Force to Operate
- Potential Hand Fatigue
- Effort Required for Tip Bending
Thank You!