# Transcanal endoscopic ear surgery INSTRUMENT USER-FEEDBACK STUDY

STUDY ID #\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Demographic information

1. Please indicate your training status (circle one):

Resident Fellow Staff

1. Number of years in surgical practice or PGY training level: \_\_\_\_\_\_\_\_\_\_
2. Your age: \_\_\_\_\_\_\_\_\_\_
3. Are you right or left handed (circle one): Left Right
4. What is your surgical glove size: \_\_\_\_\_\_\_\_\_\_
5. Total number of endoscopic cases performed as primary or assistant surgeon:

0-10 10-50 50-100 > 100

1. Percentage of cases performed totally endoscopically:

0% Up to 50% 50%-90% > 90%

# Instrument Assessment

1. Please rate the following aspects of the instrument design:

1= Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrument Form** | **1** | **2** | **3** | **4** | **5** |
| The instrument is an appropriate weight |  |  |  |  |  |
| The instrument handle is an appropriate size |  |  |  |  |  |
| The instrument wrist is an appropriate size |  |  |  |  |  |

***Comments regarding handle design:*** *(If you disagree with any of the statements please explain. If you have any additional insights on the shape, look or feel of the instrument, please elaborate)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rate the following aspects of the instrument operation in terms of its intuitiveness. Consider how these features would translate to performing surgery on a live patient in an operating room:

1= Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrument Operation – Mental Effort** | **1** | **2** | **3** | **4** | **5** |
| Understanding how the instrument works is intuitive |  |  |  |  |  |
| The effort necessary to perform tasks using the instrument is minimal |  |  |  |  |  |
| Bending the tip of the instrument requires minimal effort |  |  |  |  |  |
| The bend/curvature of the tip is useful to reach target structures |  |  |  |  |  |
| Dissecting tissue without bending the wrist was not difficult |  |  |  |  |  |
| Dissecting tissue while bending the wrist was not difficult |  |  |  |  |  |
| The forces applied by the instrument on the tissue were appropriate |  |  |  |  |  |

***Comments regarding handle design:*** *(If you disagree with any of the statements please explain)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rate the following aspects of the instrument in terms of its range-of-motion, precision and stability. Consider how these features would translate to performing surgery on a live patient in an operating room:

1= Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrument Operation – Performance and Safety** | **1** | **2** | **3** | **4** | **5** |
| The instrument performed as expected |  |  |  |  |  |
| The instrument tip moved accurately |  |  |  |  |  |
| The instrument was responsive |  |  |  |  |  |
| The instrument tip moved smoothly |  |  |  |  |  |
| The instrument did not block the field-of-view of the endoscope |  |  |  |  |  |

***Comments regarding instrument safety and performance:*** *(Please let us know of any features that would make this instrument safer to use or have better performance)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rate the following aspects of the instrument in terms of functionality:

1= Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrument Operation - Functionality** | **1** | **2** | **3** | **4** | **5** |
| The instrument can reach all the spaces in the field-of-view necessary to perform the task. |  |  |  |  |  |
| The instrument could be used to control bleeding. |  |  |  |  |  |
| The instrument can be used to move and position a graft into the intended place. |  |  |  |  |  |
| The instrument can be used to dissect and remove cholesteatoma. |  |  |  |  |  |
| The instrument with the laser fibre can be used to direct laser energy in the desirable direction. |  |  |  |  |  |

***Comments regarding instrument functionality:*** *(If you disagree with any of the statements please explain)*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Comments regarding instrument tip length:*** *(Please indicate which instrument tip length you preferred for specific tasks)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rate the following aspects of the instrument in terms of usability:

1= Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrument Operation - Comfort** | **1** | **2** | **3** | **4** | **5** |
| The instrument is comfortable in my hand |  |  |  |  |  |
| The force required to operate the instrument was appropriate |  |  |  |  |  |
| Operating the instrument will NOT likely cause hand fatigue |  |  |  |  |  |

***Comments regarding instrument comfort:*** *(If you disagree with any of the statements please explain)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Instrument Testing:

Please perform the following tasks using a 3D printed ear model, endoscope and suction setup.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Task:** | **Result** | | | | | | **Comments** |
|  | **A** | **B** | **C** | **D** | **E** | **F** |  |
| **Reach:** Instrument tip reached all regions of interest within the 3D model. |  |  |  |  |  |  |  |
| **Dissection:** Instrument tip was able to dissect the targets within the 3D model. |  |  |  |  |  |  |  |
| **Suction:** Instrument tip was able to suction the targets within the 3D model. |  |  |  |  |  |  |  |
| **Laser:** Instrument tip with laser fiber was successfully directed in the appropriate areas within the 3D model.\* |  |  |  |  |  |  |  |

\*Note: the laser will not be used; the fiber will be inserted through the instrument without delivering laser energy.

***Comments regarding instrument testing:*** *(do you have any suggestions to optimize instrument design?)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Please rate the following aspects of the 3D printed ear models:

1= Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **3D Printed Ear Model** | **1** | **2** | **3** | **4** | **5** |
| The 3D printed ear model is accurate |  |  |  |  |  |
| The regions of interest were located in the correct spot |  |  |  |  |  |
| The regions of interest were easy to locate with the endoscope |  |  |  |  |  |

***Comments regarding 3D printed ear models:*** *(do you think they are realistic?)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_