"I Have A Tear Down There?": Implementing and Evaluating a Three-Dimensional Anatomical Education Resource in Post-partum Perineal Laceration Care

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Introduction

- Fifty-three to 79% of women will obtain some degree of laceration during vaginal delivery
- Many mothers feel underprepared to care for new physical health concerns that appear after discharge
- Time restraints of modern post-partum hospital stays and follow up appointments creates difficulty to provide quality education and address the mothers needs
- Women are unknowledgeable or hold inaccurate perceptions of basic female reproductive anatomy
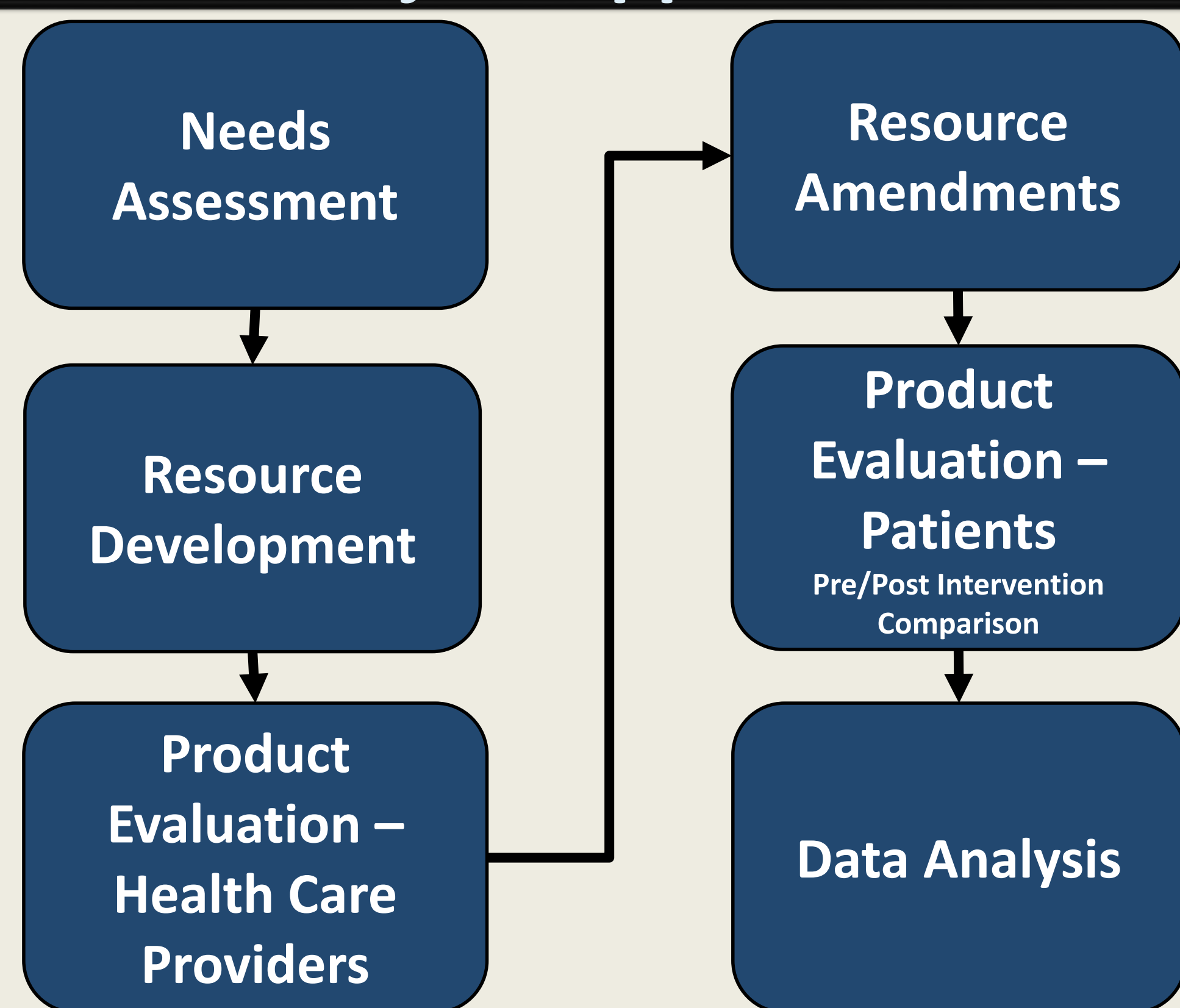- Perineal anatomy is complicated and difficult to conceptualize in 2D images (Figure 1)
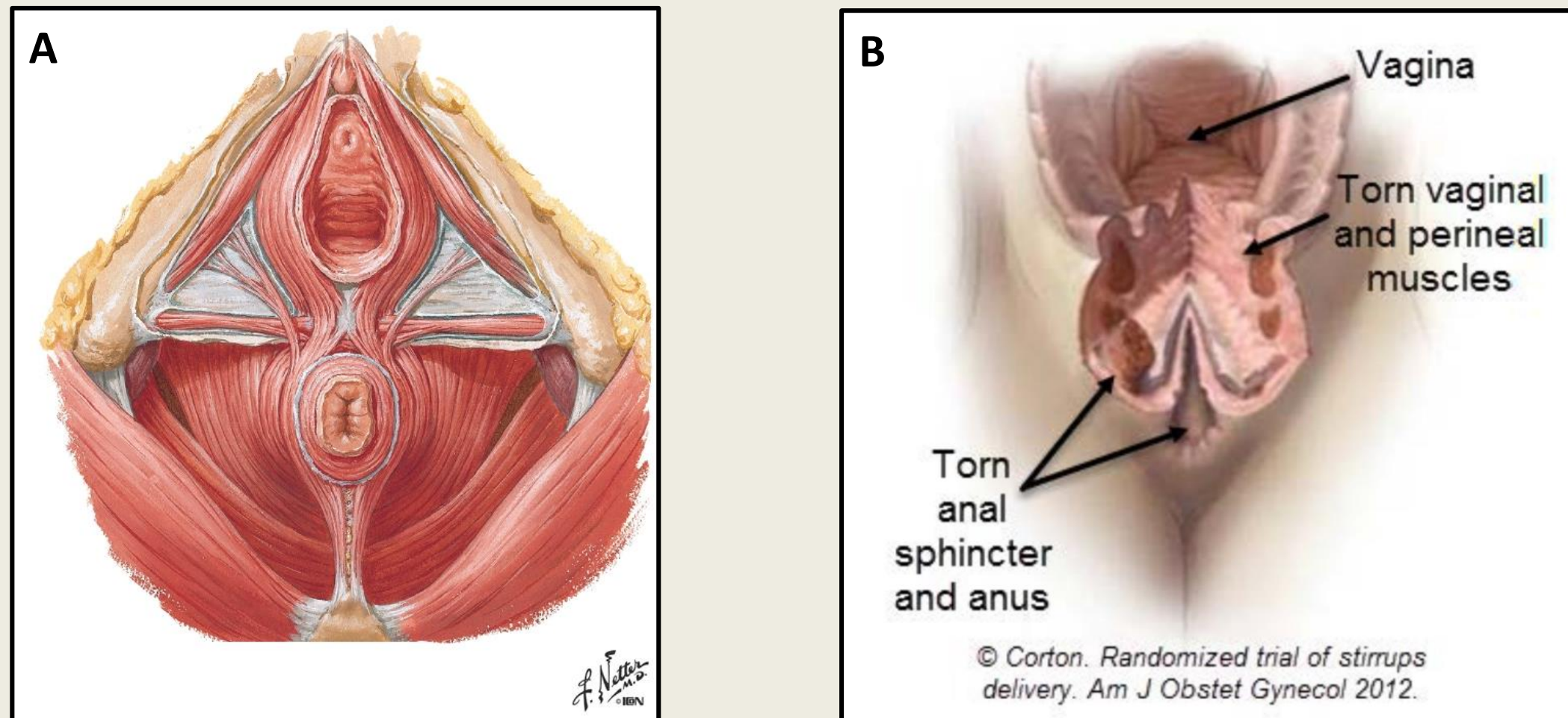
Figure 1. A) Anatomical illustration of the female perineum **B)** Diagram of a 4th degree laceration shown in a patient education printout

© Corton. Randomized trial of stirrups delivery. Am J Obstet Gynecol 2012.

Aim 1: Create and implement an interactive three-dimensional (3D) anatomy-based resource into post-partum care for perineal laceration patients.

Aim 2: Assess the usability of the resource amongst healthcare provider's and evaluate the efficacy of the resource to increase patient knowledge and confidence and decrease patient anxiety.

Project Approach

Needs Assessment → Resource Amendments

Resource Development

Product Evaluation – Health Care Providers

Resource Amendments → Product Evaluation – Patients (Pre/Post Intervention Comparison)

Product Evaluation – Patients → Data Analysis

Methods and Materials

- **Model Acquisition**: 3D models were obtained from Touch of Life Technologies (Aurora, CO).
- **Population**: Health care providers at Denver Health OBGYN departments (Labor and Delivery, Post-partum recovery, OB Screening, Women's Health Clinic) and perineal laceration patients
- **Resource Evaluation**
  - ✓ **Health care providers:** survey on resource need, usability, value, accuracy
  - ✓ **Patients:** pre/post intervention surveys on anxiety, perineal knowledge, confidence in self care
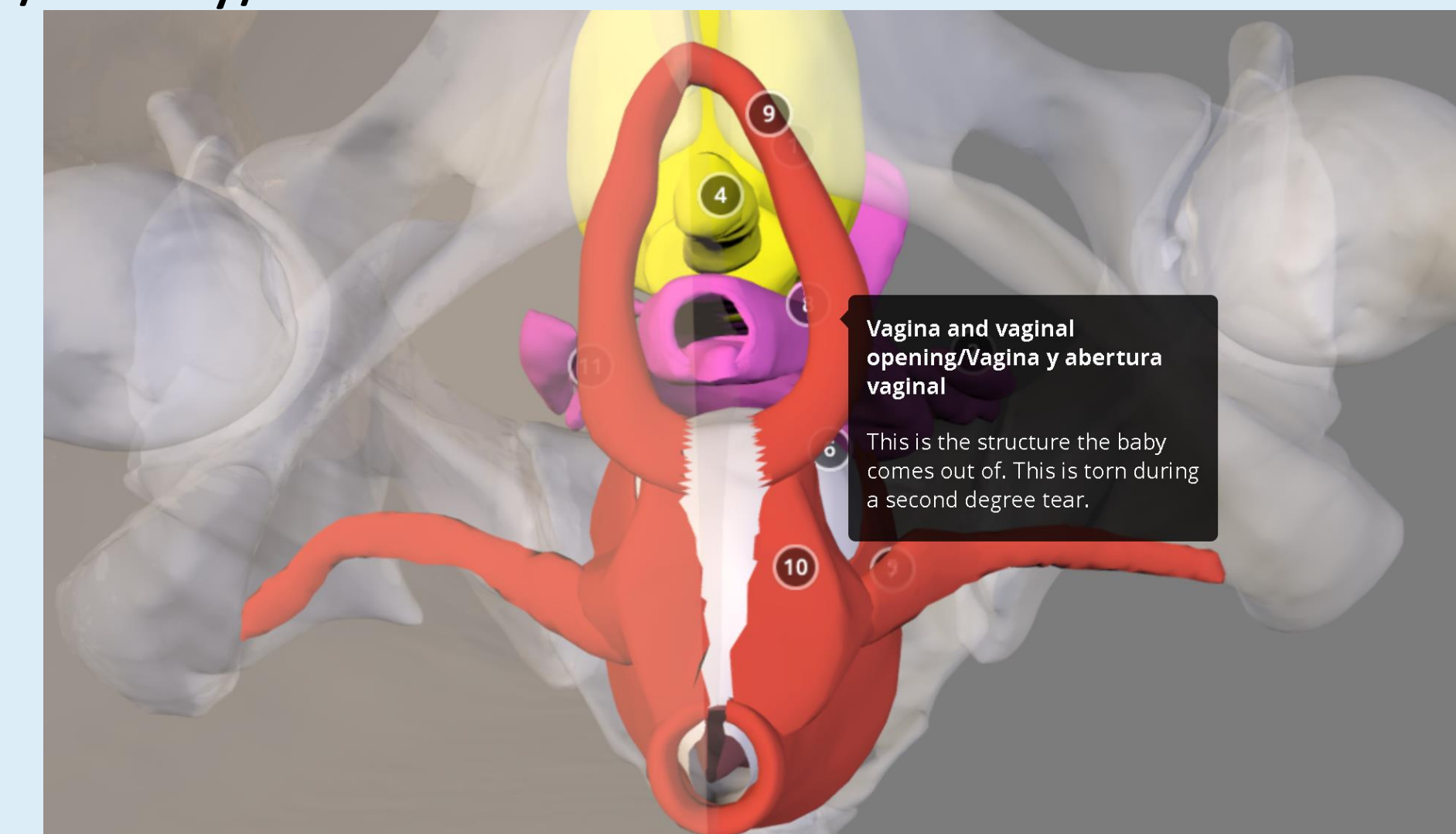- **Analysis:** Two-tailed t-test

ToLTech

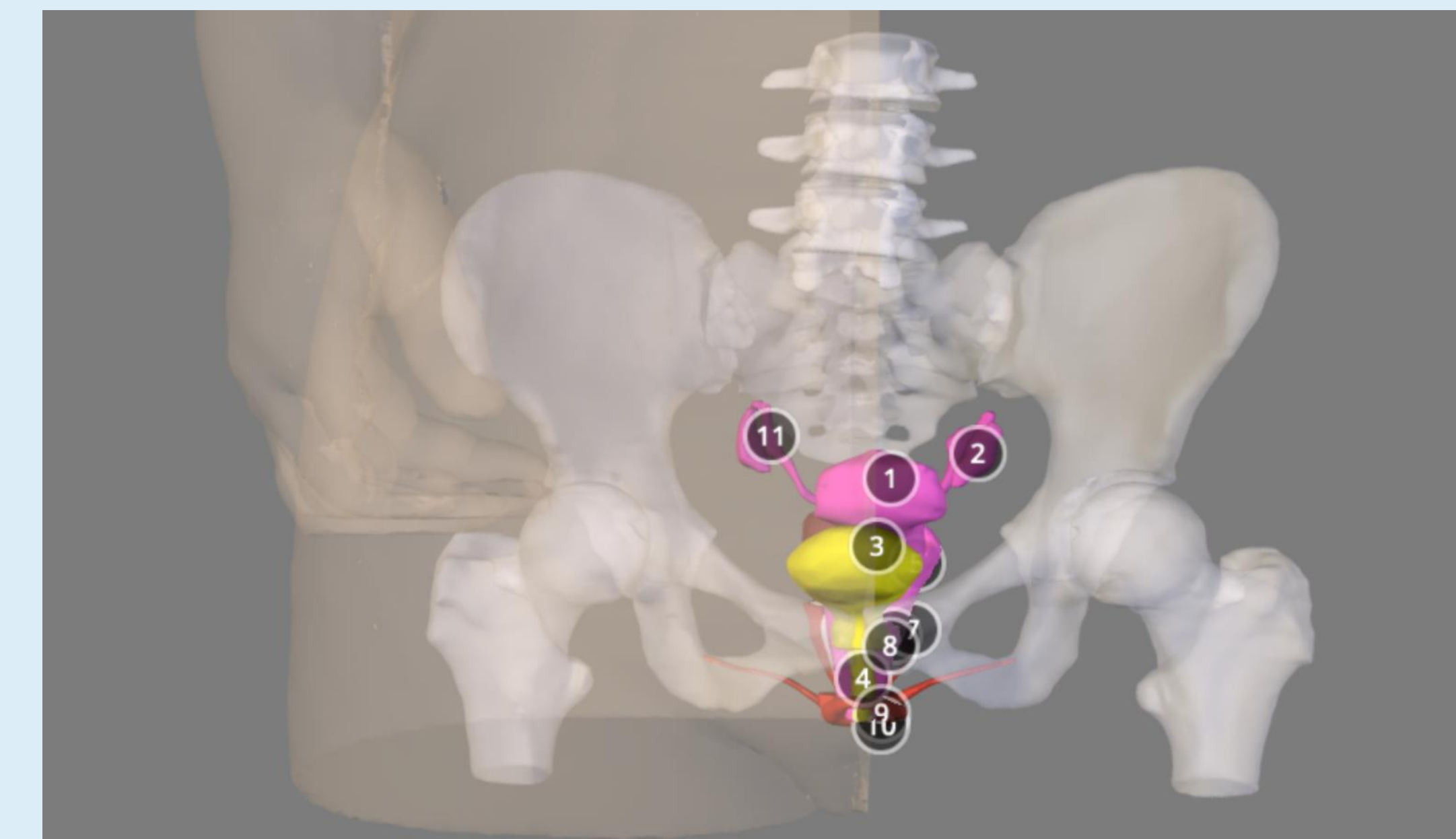### Maya and Mudbox: smooth and color application
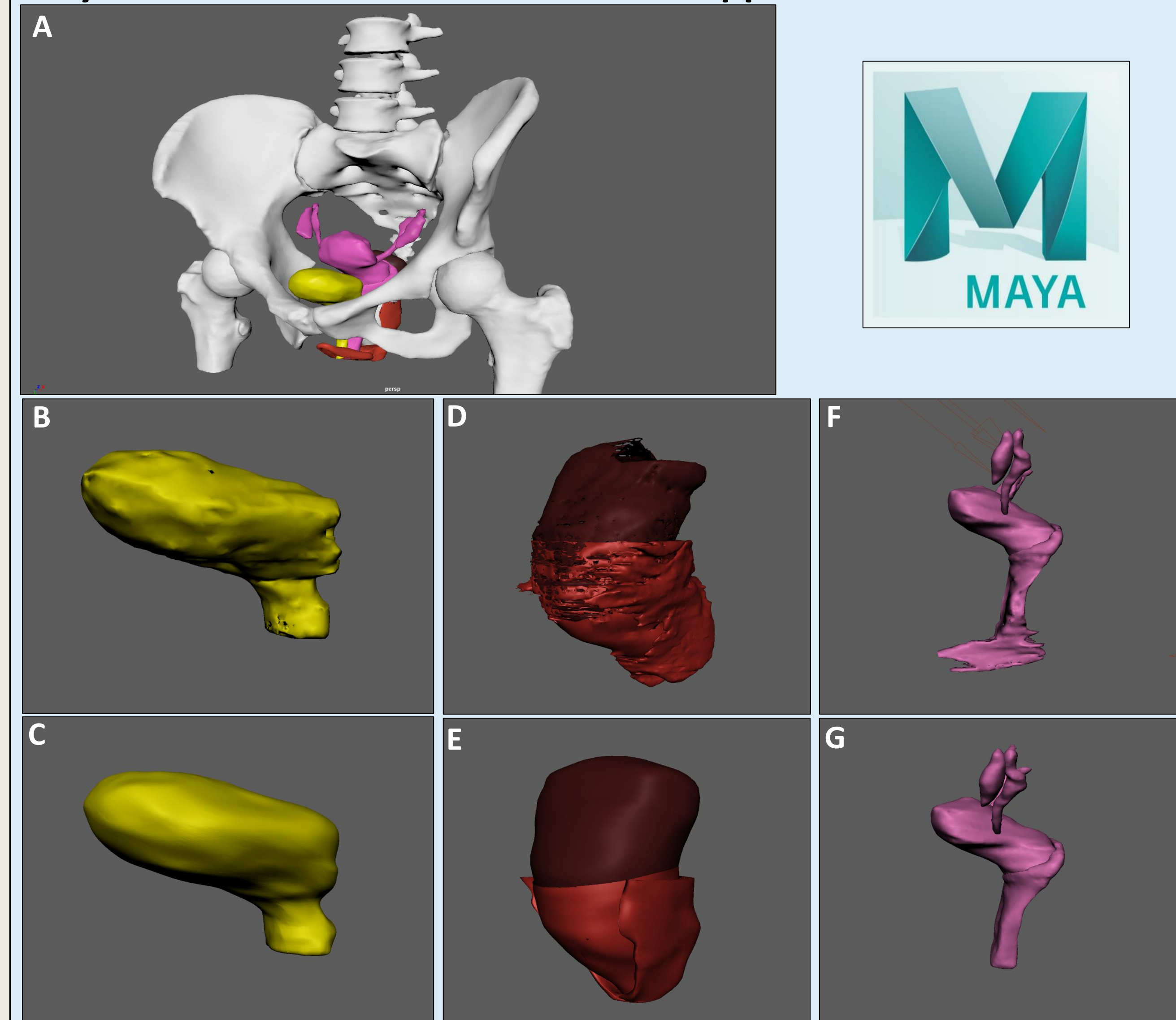
MAYA

Figure 2. A) Complete view of models in Maya (Autodesk, San Rafael, CA) **B)** Original model of the bladder **C)** Recreated bladder model **D)** Original model of anal sphincter complex **E)** Recreated anal sphincter complex **F)** Original model of the vaginal canal **G)** Recreated vaginal canal
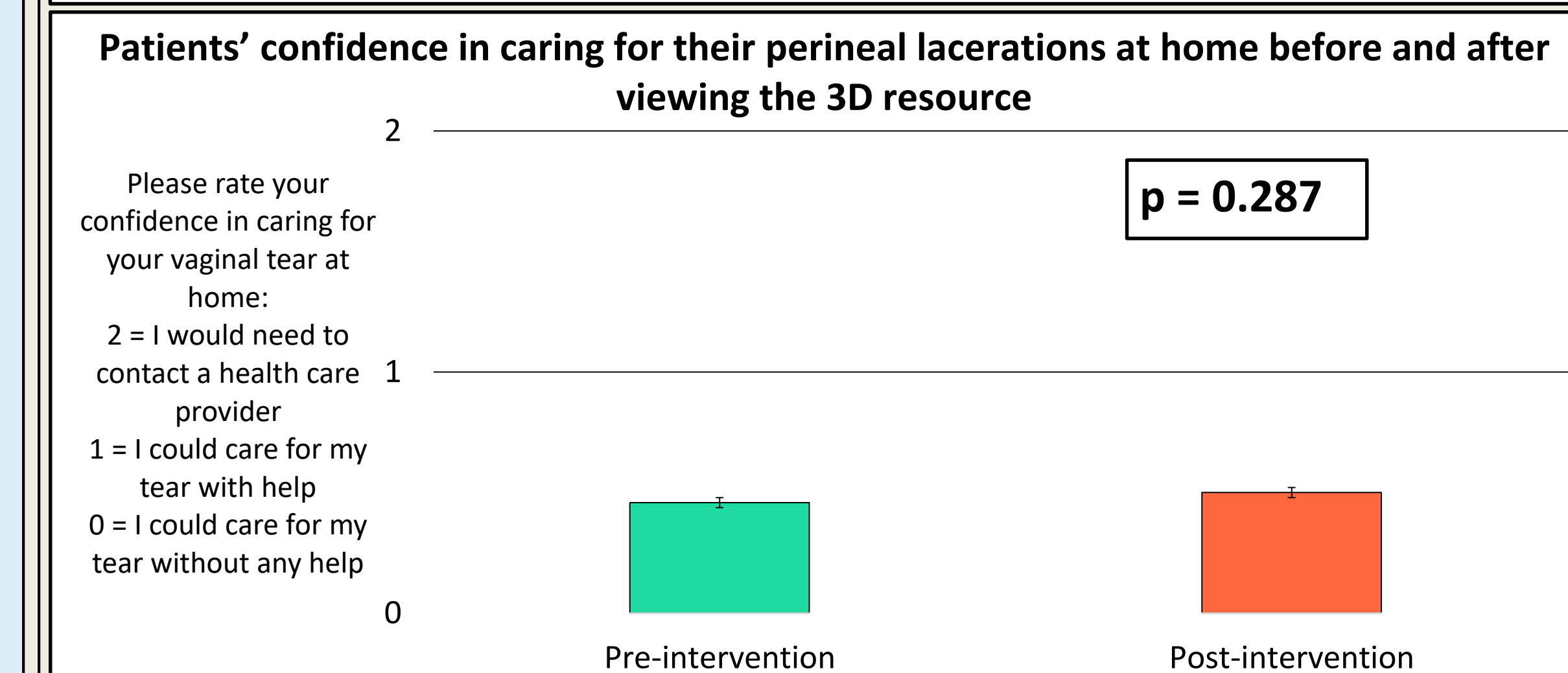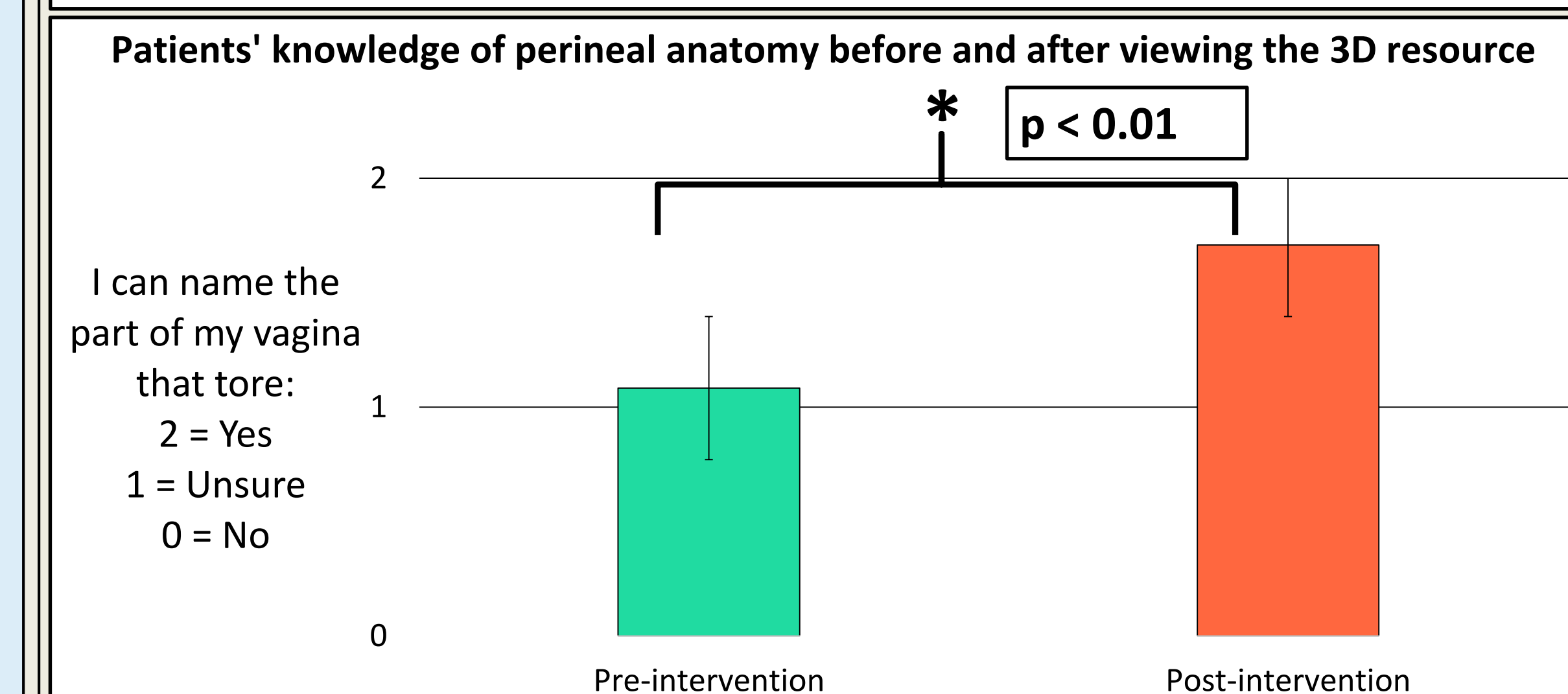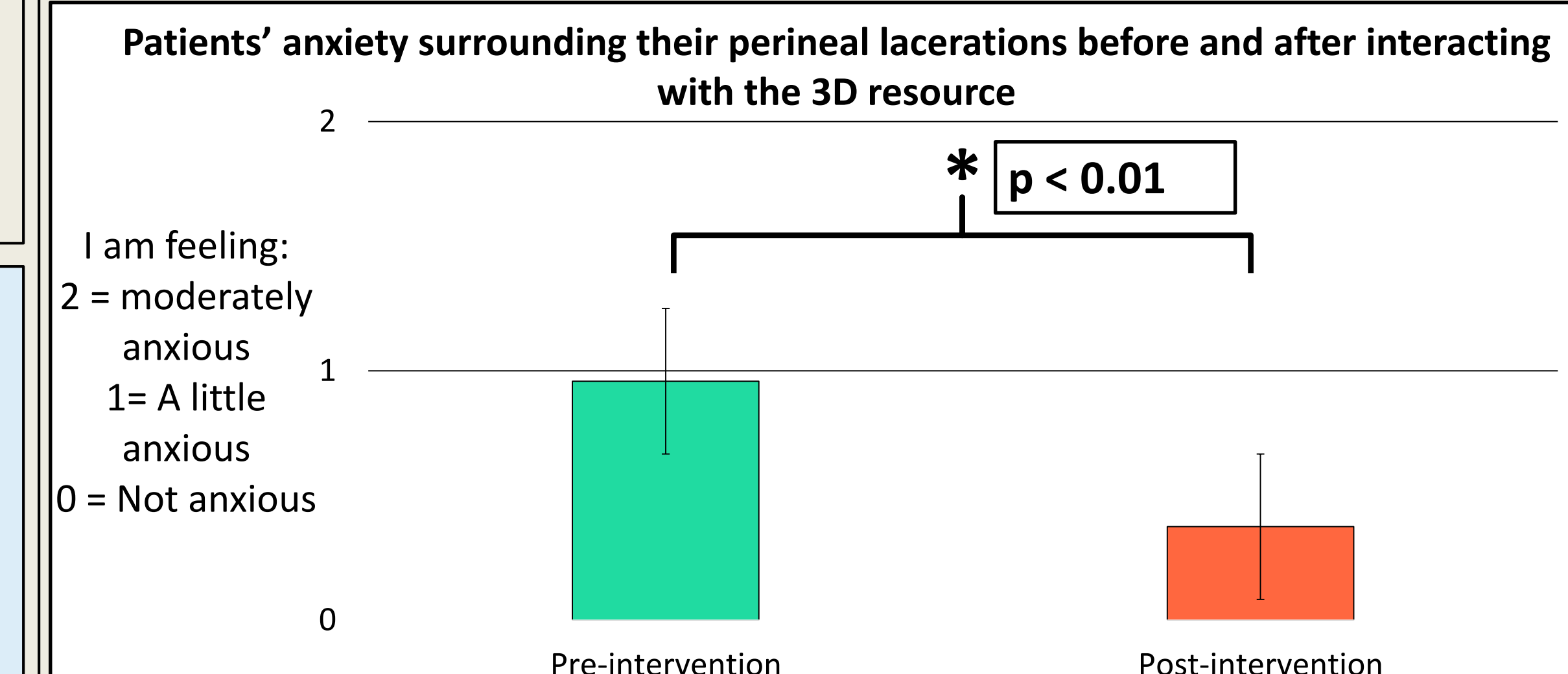
Sketchfab: annotations and host interface
Link: https://skfb.ly/6wDSK

Sketchfab

Vagina and vaginal opening/Vagina y abertura vaginal
This is the structure the baby comes out of. This is torn during a second degree tear.

Figure 3. Example of an annotation in the Sketchfab host interface.

Figure 4. Final resource hosted in Sketchfab.

Health Care Providers

Population: 31 health care providers

Q1: The resource is needed for patient education.

- It is essential: 16
- It is useful, but not essential: 15
- It is not useful

Number of Healthcare Providers

Q3. How often would you use the resource in clinic to help explain perineal lacerations to patients?

- Always: 15
- Most of the time: 10
- Rarely: 2
- Never: 1

Number of Healthcare Providers

Q6: How likely are you to recommend the resource to another healthcare provider in the future?

- Very likely: 15
- Likely: 9
- Neither likely nor unlikely: 6
- Unlikely: 1
- Very Unlikely
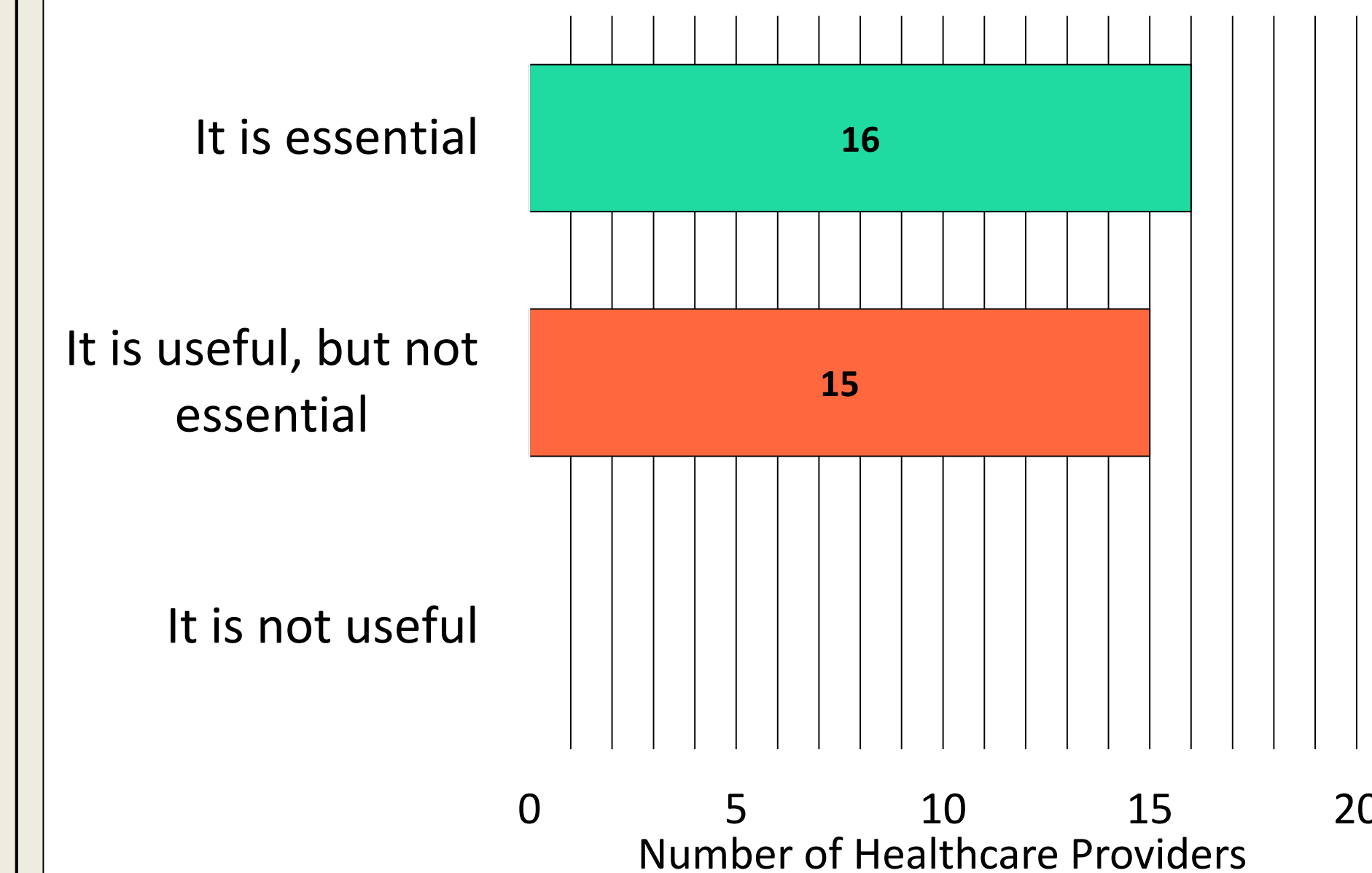
Number of Healthcare Providers

Patient Results

Final population: 24 patients; median age of 29 [IQR 31, 21.25] and parity 1 [IQR 3, 1]
Patient anxiety significantly decreased while knowledge in perineal anatomy significantly increased after viewing the resource. Confidence in ability to care for lacerations did not significantly change.
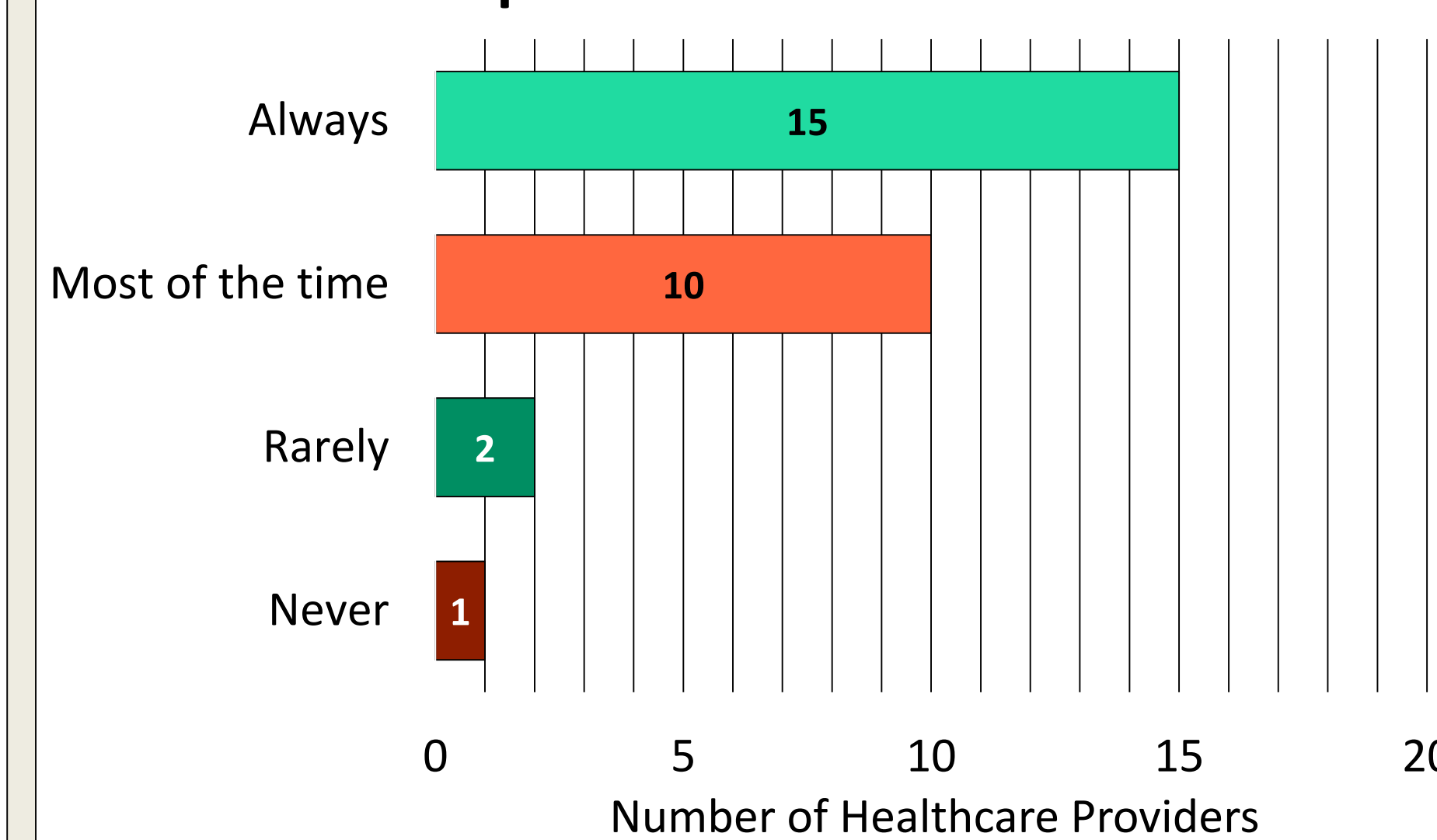
Patients' anxiety surrounding their perineal lacerations before and after interacting with the 3D resource

I am feeling:
2 = moderately anxious
1= A little anxious
0 = Not anxious

* $p < 0.01$

Pre-intervention / Post-intervention

Patients' knowledge of perineal anatomy before and after viewing the 3D resource

I can name the part of my vagina that tore:
2 = Yes
1 = Unsure
0 = No

* $p < 0.01$

Pre-intervention / Post-intervention

Patients' confidence in caring for their perineal lacerations at home before and after viewing the 3D resource

Please rate your confidence in caring for your vaginal tear at home:
2 = I would need to contact a health care provider
1 = I could care for my tear with help
0 = I could care for my tear without any help

$p = 0.287$

Pre-intervention / Post-intervention

Conclusion

- The resource decreased patient anxiety while increasing patient knowledge, and had no impact on patient confidence in caring for tears after hospital discharge
- The resource could be a valuable education tool for healthcare providers to use at bedside during post-partum recovery
- Further data collection will investigate other obstetric complications mothers find most intimidating
- Future iterations of the resource will include other common obstetric complications
- In addition to patients, this resource could be used to provide immediate education to healthcare providers in clinics

Acknowledgements