

KERATO

Suturing Task



Suturing is a fundamental skill in ophthalmic surgery. However, it is a common weakness among aspiring surgeons due to the lack of operative experience and suitable training models. This skill is absent in virtual reality tools, and animal models are not accurate or repeatable.

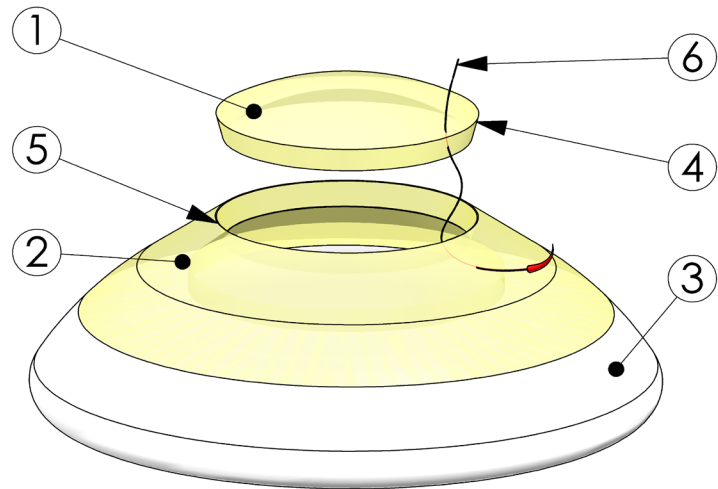
By presenting the main challenges of a penetrating keratoplasty (PKP) scenario, the **KERATO** task allows users to learn, train and perfect the skills required to perform precise suturing under a microscope.

The **KERATO** task consists in suturing a corneal graft to a host limbus using real surgical instruments. The user will need to properly handle forceps, needle holder, scissors and 10-0 suture to complete the task.

With practice the user will gain confidence, reduce time to completion, improve suture radiality and spacing, maintain even and safe distance to tissue edge and gain better feel for suture tension during knot creation.

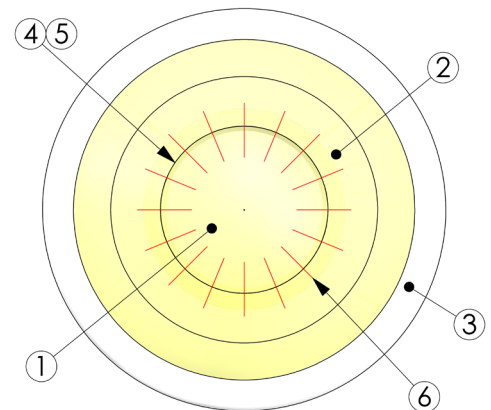
Pat. Pending

- 1 - CORNEA
- 2 - LIMBUS
- 3 - SCLERA
- 4 - GRAFT EDGE
- 5 - RECIPIENT EDGE
- 6 - SUTURE



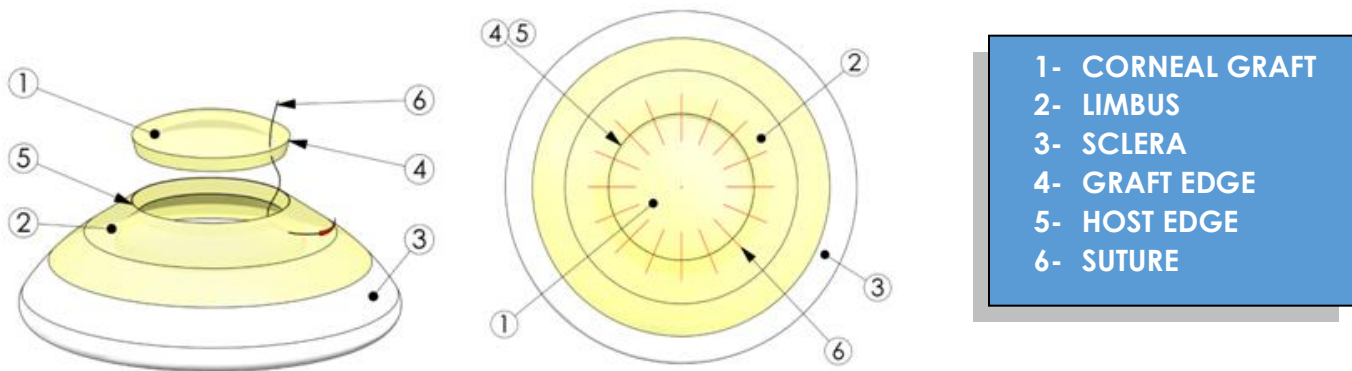
FEATURES AND BENEFITS

- Accurate tissue proportions
- Realistic tissue feel
- Repeatable and available
- Encourages awareness of tissue hydration
- Practice microsuturing techniques (continous/interrupted)
- Improve confidence and decrease fatigue
- Improve time to completion (Decrease OR time)
- Self asses execution by checking for:
 - Suture radially
 - Safe and even distance to tissue edge
 - Knot tension
 - Even spacing between sutures



Watch an instructional video: www.youtube.com/user/BionikoDesign

By presenting the main challenges of a penetrating keratoplasty (PKP) scenario, the **KERATO** task trainer allows users to learn, train and perfect the skills required to perform precise suturing under a microscope; a fundamental skill in ophthalmic surgery.



The **KERATO** models come in boxes of 5 disposable units (5 corneal grafts, 5 host eyes). The **KERATO** task consists in suturing a donor **cornea** (1) to a host **limbus** (2) using real instruments and **suture** (6). The PKP scenario is ideal for suture training because it requires the user to pass and tie sutures in all directions.

Do not use dry. Lubricate with water. Do not use BSS.
Soak CORNEAL GRAFT for aprox 5 minutes in luke warm water (aprox 95F) immediately before use.

You will need: **KERATO** (box of 5); **ORBIT**, water dropper and surgical instruments: needle holder, scissors, tying forceps (flat), 0.12 corneal forceps (with teeth).

1. Soak- Immerse the donor cornea for at least 5 minutes in water. (**Note:** cornea looks "milky" when properly hydrated).
2. Load- Insert the host eye **sclera** into the **ORBIT** (compatible with **BASIC-ORBIT** and **FLEX-ORBIT**). Be careful not to damage delicate structures when inserting the models. Always press on the sclera.
3. Refer to your **ORBIT** and accessories instructions for use.
4. Lubricate- Use a dropper with water to lubricate the limbus before starting.

NOTE: Lubricate with water frequently throughout the task to maintain hydration and realistic feel.

5. Suture- Attach the donor corneal graft to the host eye limbus at evenly spaced points. Tension and location of the sutures should be as uniform as possible to minimize distortion of the cornea.

NOTE: The model encourages awareness of tissue hydration and works best with frequent lubrication.

6. Assess- Evaluate the task by reviewing the following parameters:
 - **Suture execution parameters:** These may include radiality, distance to donor edge, distance to host edge, intra-stromal vs penetrating, tension and spacing.
 - **Instrumentation:** These may include number of sutures breaks, number of needles bent, length of suture used.
 - **Time to completion:** Although in real surgery situations quality is more important than speed, at a basic skill training level, time to completion is a good indicator of a learning curve. As familiarity with steps and confidence with the technique increases, a decrease in time to completion is expected.
7. Remove model-If using an **ORBIT**, insert a closed instrument behind the model and leverage it out of the socket. If using the posterior segment or any other accessory, please refer to its instructions for use.

NOTE: Lift the suction release tab to remove ORBIT from surface. DO NOT PULL ON THE ORBIT!

NOTE: Models are best used with the aid of an experienced surgeon/instructor and the use of an operating microscope (OPMI).

Instructions for care

Follow these recommendations to maximize the life of your models:

- Store in a **cool, dry and dark** place (a drawer will be fine). Extended exposure to some indoor lights or sunlight (UV) may affect material properties. Prolonged exposure to humidity or high temperatures may adversely affect material properties.
- Do not place **heavy objects** on top of the model's box. Prolonged compression may deform the models.

FAQ

- **Q:**Do I need to lubricate both the corneal grafts and host eyes of the **KERATO** Task?

A:The donor cornea needs to be pre-soaked for at least 5 minutes in water. Use a dropper to lubricate the donor cornea as well as the host limbus frequently throughout the task. This will make the suturing feel more realistic.

- **Q:**Can I reuse the model?

A:The **KERATO** task is meant to be single-use. Sutures can be cut to re-use, however the limbus and corneal button edge will be weak where previous sutures were made. Any new sutures should be made in a different location from the previous ones.