— The Revolutionary Training System for Phaco and Other Ophthalmic Surgeries —

It's not the time we train ourselves with porcine or human eyes!!

"KITARO" Surgical Training System

Step 2

KITARO WetLab

Realistic simulation kit to replace porcine eyes

Step 1 KITARO DryLab

A starter kit for beginners

Used to learn basic instrumentation in phaco surgery such as CCC and nucleus dividing at a desk of medical office or home.

Step 2 KITARO WetLab

Realistic simulation kit to replace porcine eyes

Used to master basic phaco surgery by surgical simulation resembling human eyes using a phaco machine and microscope.

Step 3 KITARO ComplexLab

Skill up kit for intermediate surgeons

Used to practice complex cases in cataract suegery.

Invented by **Junsuke Akura**

Clinical Professor of Tottori University
Chairman of Association for Ophthalmic Cooperation in Asia

Co-Invented by **Kiran Pokharel**

Frontier Vision Co., Ltd.

What is "KITARO" Surgical Training System?

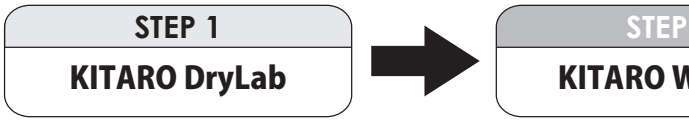
"KITARO" is a revolutionary training system for teaching and learning basic phaco surgery and complex cataract surgeries.

"KITARO" is the surgical practice eye kit which has been developed with many innovative technologies (14 PAT and 25 PAT. P. technologies) for teaching and practicing basic phaco surgery and complex cataract cases.

The KITARO surgical training system consists of three types of training kits; "KITARO DryLab" and "KITARO WetLab" for practicing phaco surgery and the recently developed "KITARO Complex Lab" for placticing complex cases in cataract surgery.

Phaco surgery involves a combination of instrument manipulation with hands and machine operation by foot switch. For beginners, it is very complicated to perform these two operations with hands and machine at the same time in wet lab. We believe that the most effective method to master phaco surgery for beginners is to first learn instrument manipulation with KITARO DryLab at a desk in the medical office or home, second to learn practical techniques using machines with KITARO

"KITARO" Surgica



A starter kit for beginners

Used to learn basic instrumentation in phaco surgery such as CCC and nucleus dividing at a desk of medical office or home.

Realistic simulation kit to

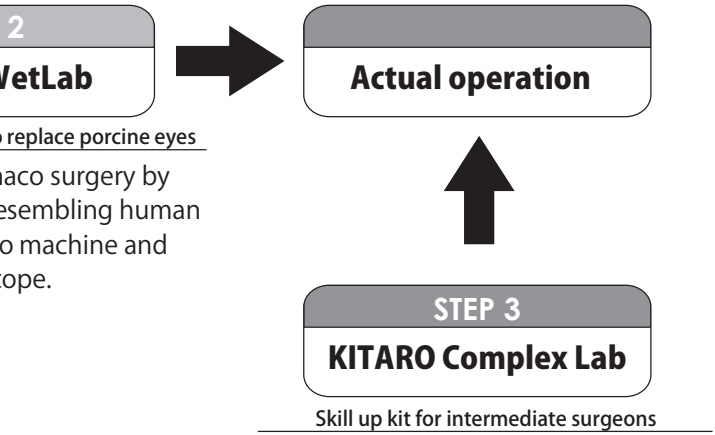
Used to master ph surgical simulation re eyes using a phac microsc

WetLab in wet lab or operation room, and then perform actual surgeries.

Meanwhile, "KITARO Complex Lab" has been developed for intermediate ophthalmologists to improve their surgical skills for complex cases in cataract surgery. KITARO Complex Lab consists, of two kits; "Lab 1 kit" for practicing ruptured zonules management, IOL transscleral fixation, and small pupil management; and "Lab 2 kit" for practicing manual ECCE and posterior capsule tear management.

"KITARO Complex Lab" allows you to practice various complex cataract cases not only in an operation room or wet lab room with a surgical microscope but also at the desk at home with a cheap desk top magnifying glass or naked eyes.

l Training System



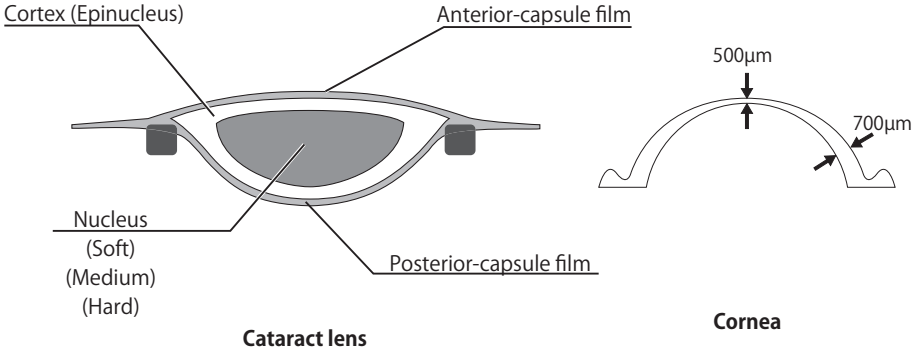
What is KITARO WetLab?

KITARO WetLab is a miracle phaco surgery simulator replacing porcine wet lab.

- KITARO WetLab is a tool designed to simulate phacoemulsification using a phaco machine under a microscope in an operation room or practice room, very similarly on the human eye.

  KITARO WetLab provides advantages over porcine wet lab in terms of (1) simple preparation (setting the artificial cataract lens only), (2) hygienic environment (free from virus infection and rot), (3) high quality (useful for practice of CCC and nuclear segmentation which is difficult with porcine eyes), and (4) cost effectiveness (simple preparation results in saving time and manpower costs).
- KITARO WetLab is an all-in-one surgical simulator kit having almost everything you need, including the eyeball part which generates eyeball movement during instrumentation, a mask equiped with eyelids as those of a soft as human, mock instruments such as a hook and forceps and a irrigation and drainage system, all of which require no complicated preparation.

The features of KITARO WetLab include a high-quality cataract lens and cornea.



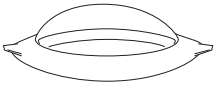
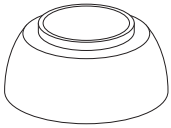
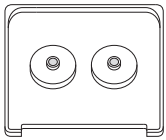
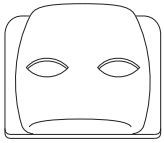
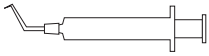
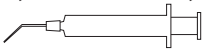
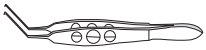
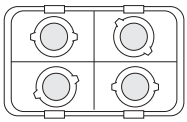
The cataract lens of KITARO consists of the nucleus, cortex, anterior-capsule film, and posterior capsule film and enables practice of almost all steps in phacoemulsification such as CCC, hydroprocedures, all nuclear segmentation techniques, emulsification and aspiration of nuclear fragments, cortex (epinucleus) removal, and IOL insertion. There are 3 types of nuclei varying in hardness (soft, medium and hard).

The cornea of KITARO is 500 μm thick at the central part and 700 μm thick at the periphery, generating resistance as when an instrument is inserted and manipulated in the human eye. It also allows practice of corneal self-sealing incision, suture, AK (LRI), and so on.

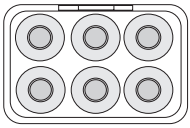
Components of the Kit and Optional Items

Components of the Kit

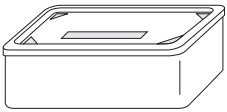
Note: A 6-piece pack of the cataract lenses should be purchased separately. The drainage box must also be purchased, or substitute prepared.

Eyeball Part	① Cornea-iris part for WetLab (This is fixed to the sclera part in the kit)  ② Sclera part 
Base Plate & Mask	③ Base plate (with iron balls and sponges)  ④ Mask 
Mock Instruments	⑤ Cystotome with syringe  ⑥ Nucleus manipulating hooks (2 types) Spatula hook  Phaco chopper ⑦ Hydro needle with syringe  ⑧ Sclera fixation forceps  ⑨ Anterior-capsule forceps 
Irrigation Bag	⑩ Irrigation bag (using tap water) 
Consumables	⑪ 4-piece pack of cornea-iris parts 

Components sold separately

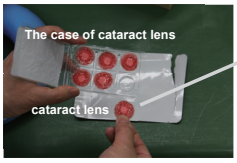
Disposabe	Pack of 6 cataract lenses: 1) Soft nucleus pack (6 soft nuclei) 2) Medium nucleus pack (6 medium nuclei) 3) Hard nucleus pack (4 hard nuclei) 4) Mixed nucleus pack (3 soft nuclei and 3 medium nuclei  Case of 6 cataract lense (This is vinyl wrapped and in analminum pack)

Optional

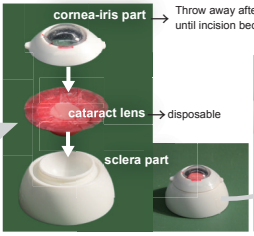
Drainage system	Drainage box  (Two skidless sheets are included) or Drainage tray (Three skidless sheets are included)

Simple Instruction for Use

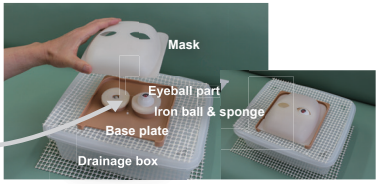
Setting up KITARO



Take the case of 6 cataract lenses from the aluminum pack, and take one cataract lens from it.



Put the cataract lens in the hollow of the sclera part. Set the cornea-iris part firmly onto the sclera part.

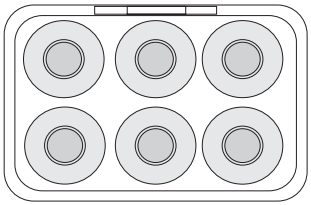


Lay the nonslip mats under and on the drainage box. Place the base plate of KITARO on it, set the eye ball part on the sponge and iron ball of right eye (left eye is deep-set), and cover it with the mask.

Cataract lens (disposable)

The cataract lenses are disposable. Accoding to nuclear hardness, these are 4 kinds of pack; Soft nucleus pack consists of 6 soft nuclei (Emery grade 1~2), Medium nucleus pack consists of 6 medium nuclei (Emery grade 2~3), Hard nucleus pack consists of 4 hard nuclei (Emery grade 3~4). Mixed nucleus pack consists of 3 soft and 3 medium nuclei. These 6 cataract lenses are in the case and kept in the alminum pack.

The cataract lenses are NOT included in the KITARO WetLab Kit. They need to be purchased separately when purchasing the KITARO WetLab Kit.



Case of 6 cataract lenses
(This is kept in the alminum pack)

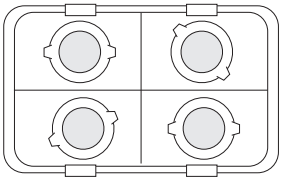
〈**Storage condition of cataract lenses**〉

If the cataract lenses in the alminum pack is not opened and is stored at room temperature (10℃ to 30℃), the quality will be stable for about 6 months. If they are stored at 5℃ to 10℃ in the refrigerator, the quality will be stable for more periods. Please note that the quality will rapidly deteriorate under high temperature (above 40C°) or in the freezer (below 0C°). Once you open the pack, you must close the case, keep it in the alminum pack, seal it tightly. And sure you use them up within two weeks.

Cornea-iris part (consumable item)

The cornea-iris parts are consumable items and you can throw them away after making an incision each time or use the same incision a few dozen times until they are worn-out (ithe incision becomes enlarged).

The KITARO WetLab kit has a pack of 4 cornea-iris parts. After you use them up, you need to purchase the additional pack.



Pack of 4 cornea-iris parts

Irrigation & Drainage system

The irrigation bag is included in the kit, but the drainage box and the dranage tray are not. Please purchase the drainage box or drainage tray, otherwise prepare an alternative by yourself.

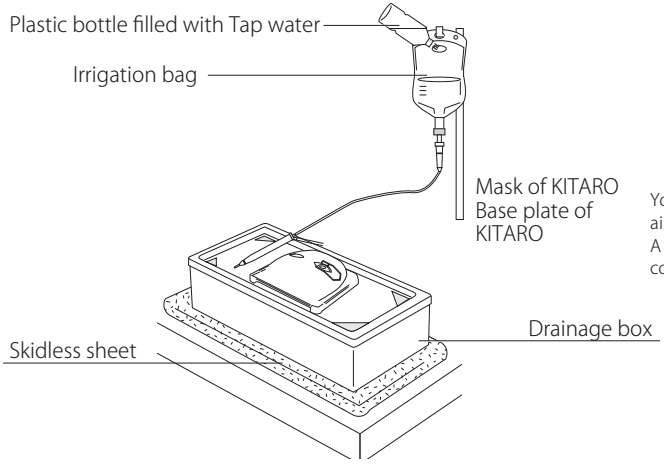
Irrigation bag and Irrigation fluid

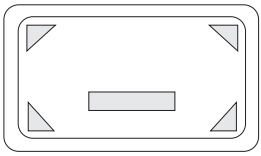
The irrigation bag is an empty 1300-ml saline bag with a hole in the upper part. Please prepare the 2000-ml plastic bottle filled with tap water and pour tap water from a plastic bottle through the hole into the irrigation bag and connect the irrigation line to the phaco machine. If 1000ml of tap water mixed with 1-2ml of dish washing liquid is used as irrigation fluid, obstruction of aspiration line with nuclear flagments is prevented and cornea can be kept clear.

Drainage box (option)

The drainage box(option) is a container with holes for the water to drain. Water is drained from these holes and is collected in the drainage box.

Please lay the skidless sheets under and on it and place the KITARO on it. When you cannot use drainage box due to the relation of the height of desk and/or chair, please use the drainage tray. Then please lay a skidless sheet under the tray.Prepare 2 of the skidless sheet into 4-fold and place them on top of each other. Then lay them on the bottom of the tray and place the KITARO on top of it.





Holes on the drainage box lid

You can make the drainage box with an airtight container by making the holes. A 5-L container having a lid with the convex circumference is suitable.

Irrigation & Drainage system

Practice Methods

Materials needed for preparation

1) Phaco machine and operating microscope
2) Contents of KITARO WetLab kit, Persoal instruments
3) Pack of 6 cataract lenses, Knives, Viscoelastic
4) Tap water in a plastic bottle (Mixed with small volume of dish soap preferred), Drainage box or some other drainage system

Settings and practice procedures

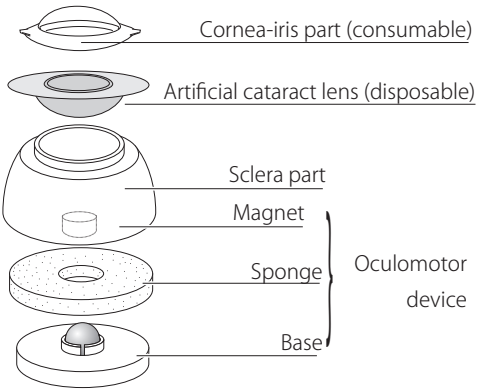
① Settings of the phaco machine

U/S power, vaccume pressure and aspiration rate are set as high as that for the human eye. The setting of 30~40%, 120~200mmHg, 22~25ml/min for soft nucleus, 50~60%, 200~300mmHg, 25~30ml/min for medium nucleus, 70~90%, 400~500mmHg, 28~30ml/min for hard nucleus are recommended.

If the aspiration flow rate is higher than 30ml/min, the air comes into the anterior chamber more easily. The bottle should be around 50cm (if bottle height is placed higher, the water will spout from the incision and the cloth will become wet).

② Settings of the KITARO WetLab

1) - Pour tap water from a plastic bottle (It is recommended to mix 1~2ml of dish washing liquid to 1000nl of water) through the hole into the irrigation bag included in the KITARO WetLab Kit.
   - Connect it with the irrigation line of the phaco machine.



2) - Prepair on the drainage box or any other drainage system, lay skidless sheets under and on it, and place the KITARO on it.
3) - Take one cataract lens from the pack of 6 cataract lenses and set it in the hollow of the sclera part.
   - Take one cornea-iris part from the pack of 4 corneal-iris parts and set it in the

sclera part.

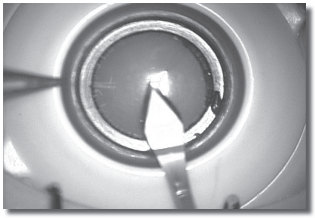
- Place it on the oculomotor device of the base plate and cover it with the mask (Right eye is normal-setting and left eye is deep-setting).

③ Practice procedures

1) Wound construction

Make an incision in the cornea slightly above the red line of plastic part. This incision location is good for smooth insertion of U/S sleeve (the red line is a mark for the incision site when you use a same cornea repeatedly).

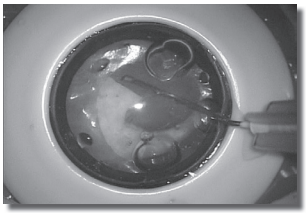
The sclera part of KITARO is hard plastic, therefore only one or two plane corneal incision can be made in KITARO.



One-plane incision using a keratome
(Incision should be made in the cornea slightly away from the plastic part.)

2) CCC construction

- Fill the anterior chamber with the viscoerastic.
- Make CCC.
- Remove the piece of the anterior-capsule film cut out by CCC using forceps. (It cannot be aspirated by the U/S tip.)



CCC using a cystotome
(Its tip should be a slightly ofture)

3) Hydroprocedures

- Perform hydroprocedures as on human eyes (however the current of water cannot be observed).

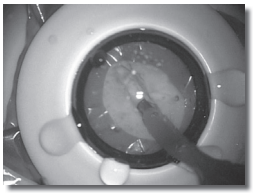
4) Insertion of a U/S tip with sleeve into an incision

Insert a U/S tip with sleeve to an incision horizontally (in a lying position) in a bevel-down state. If a beginner inserts a U/S tip with sleeve roughly in a upright position or the thickness of sleeve is poor, the sleeve may be twisted or may dvelop cracks on it. The twisted sleeve induces easy occurrence of air bubbles in

the anterior chamber. In such cases, the sleeve should be changed to a different one or a small amount of Vaseline should be applied to the sleeve for better sliding.

5) **Surface cortex aspiration**

Please expose the surface of the nucleus (yellow color is present) by removing the surface cortex inside CCC by ultrasound and aspiration before starting the nuclear dividing procedure (Note that many beginners make grooves in the cortex abruptly without surface cortex aspiration）.



Grooving

6) **Nucleus segmentation and phacoemulsification**

The soft nucleus of the cataract lens of KITARO is prone to breakage when it is handled with an instrument having a sharp tip. Therefore, it is recommended to use an instrument having a plane or thick tip.

When the nucleus is divided into two, sufficiently deep grooving is required. In the Phaco Chop technique, it is also required to insert a U/S tip deeply. Shallow grooving or insertion cannot successfully divide the soft nucleus. These properties are the same as the soft nucleus in the human eye.

Phaco Chop

With the medium nucleus, it is easier to perform segmentation. With the hard nucleus, it takes time to emulsify and aspirate.

7) **Cortex (epinucleus) aspiration**

The cortex of the soft nucleus can be aspirated with an I/A tip (it sometimes requires to crush with a hook), but it is not like peeling from the capsule in the human eye and it is aspirated as the isolated slightly harder cortex.

The cortex of the medium and hard nucleus cannot be aspirated with an I/A tip. It should be aspirated with a U/S tip as a hard cortex or epinucleus.

Matters that require attention

1) When CCC is performed using a new cystotome other than the one provided, make its tip slightly obtuse (greatly obtused tip causes slipperiness and loses its performance) by rubbing it against something hard because a sharp tip can easily cause puncture of the anterior capsule.
2) During phacoemulsification/aspiration of the medium or hard nucleus, the obstruction of aspiration line by nuclear fragments may occur (this is noticed because nucleus cannot be aspirated suddenly). Please release it by sucking them from an U/S handpiece or injecting air (or water) into aspiration tube forcilly with a large syringe.

   If you old 1~2ml of dish washing liquid to 1000ml of water and use as a irrigation fluid, obstruction will not occure and cornea can be kept clear.
3) While practicing, there are some cases that air comes into anterior chamber easily. Many cases are due to the tear or the weakness of the U/S sleeve, and/or the enlargement of corneal incision. In such cases, please change the U/S sleeve and/or cornea-iris part. Another reason may be due to the bad relation between the U/S tip and the sleeve. In such a case, please change the U/S tip to a thinner one, or change the U/S sleeve to a thicker (stronger) one..
4) Red fundus reflex cannot be seen like in the human eye in KITARO. In order to cover this disadvantage, the capsule, cortex, and nucleus are colored to gain better visibility of their tissues. Collapse of eyeball and iris prolapse cannot occur in KITARO.

【Developed, Manufactured, & Distributed by:】

Frontier Vision Co., Ltd.

Frontier Vision
for Ophthalmic Innovation & Education

4-7, Futami-cho, Nishinomiya,
Hyogo, 663-8111 Japan
TEL: +81 798 68 6555
FAX: +81 798 68 6556
E-mail: info@frontiervision.co.jp
URL: http://www.frontiervision.co.jp/