

— The Revolutionary Training System for phaco Surgery and others —

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



Step 1 KITARO DryLab

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

Step 3 KITARO MultiLab

Multi performance kit for general surgeons

Used to practice difficult cases in phaco surgery and surgical techniques in various field.

Invented by Junsuke Akura

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

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What is "KITARO" Surgical Training System?

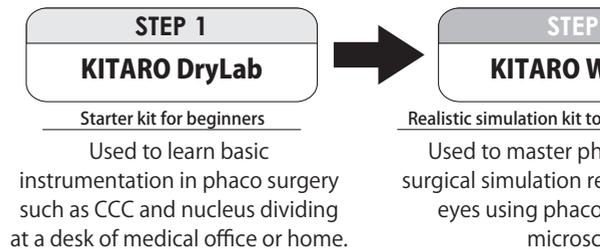
■ **"KITARO" is a revolutionary education and training system for mastering phaco surgery and another surgeries.**

"KITARO" is the surgical practice eyes kit which is developed by many innovative technologies (15 PAT technologies and 25 PAT. P. technologies) for teaching and practicing phaco surgery and other surgeries.

The KITARO surgical training system consists of three type of training kits, these are "KITARO DryLab", "KITARO WetLab", for learning phaco surgery, and recently developed "KITARO Multiple Lab" for learning difficult cases in phaco surgery and surgical techniques in various field.

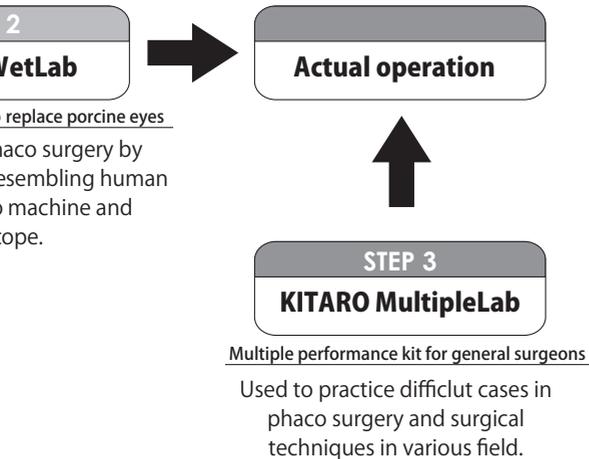
Phaco surgery involves a combination of instrument manipulation with hand and machine operation by foot switch. For beginners, it is very complicated to perform these two operation with hand and foot at the same time in wet lab. We believe that the most effective method to master phaco surgery for beginners is to first learn instrument manipulation with KITARO DryLab, and second to learn machine operation with KITARO WetLab. Then an actual operation can be performed.

"KITARO" Surgical



On the other hand, "KITARO Multiple Lab" has developed for general surgeons to practice difficult cases in phaco surgery such as small pupil, lens luxation, and to practice new techniques such as IOL scleral fixation, ECCE (standard, no-sutured), glaucoma surgery (Trabeculectomy, Trabeculotomy), corneal transplantation and phakic IOL implantation. "KITARO Multiple Lab" can be practiced not only at wet lab room with machine but also at the desk at home without machine.

Wet Lab Training System



What is KITARO DryLab ?

■ “KITARO DryLab” is an epoch-making tool to repeatedly practice basic techniques in phaco surgery at the desk.

The KITARO DryLab is a tool developed for the purpose of learning the basic techniques in phacoemulsification and consists of 14 patented technologies. With the KITARO, trainers can teach the basic surgical techniques to beginners, and beginners can practice them repeatedly at a desk in an office or at home, without using phaco machine and operation microscope.



■ Techniques you can learn with KITARO DryLab and how to use effectively

Techniques to learn with KITARO DryLab

1. CCC
2. Nuclear Segmentation
3. Foldable IOL Insertion
4. Wound Construction

Phaco surgery involves a combination of instrument manipulation with hands and machine operation with a foot switch. KITARO DryLab is a tool for practicing the basic instrument manipulation with hands. With KITARO DryLab, you can learn the upper 4 techniques.

Usage Roles of KITARO DryLab

1. Self-learning tool for novice surgeons
2. Teaching tool for trainers to train novice surgeons
3. Training tool for university students or doctors-in-training
4. Practicing tool for general surgeons for upskilling

KITARO has 4 usages according to the man (woman) and the purpose to use.

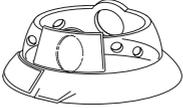
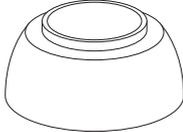
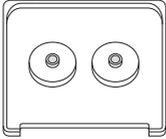
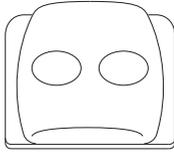
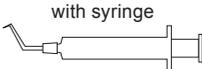
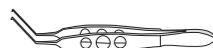
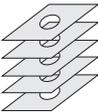
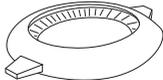
Trainers can teach the surgical techniques to novice surgeons step by step at the desk at hospital or medical office. Novice surgeons can repeatedly practice them at the desk at hospital or their own homes again and again, while implementing what is described in the textbook. It is extremely effective to get hands-on practice with KITARO rather than verbally teach or intellectually learn from books.

KITARO DryLab also allows students or doctors-in-training at university hospital or polyclinic to easily simulate phaco surgery. As a result, it may help to make them interested in ophthalmology and acquire surgeons.

KITARO DryLab is also useful for experienced surgeons to improve their surgical skills and practice new or uncommon surgical techniques and manipulation of new instruments.

Components of KITARO DryLab Kit

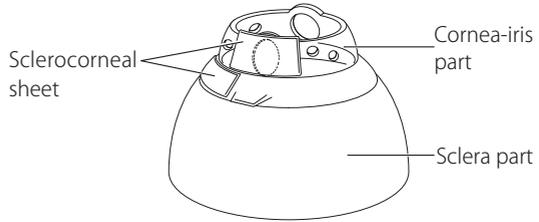
Contents of Kit

<p>Eyeball Part</p>	<p>① Cornea-iris part</p> 	<p>② Sclera part</p> 
<p>Base Plate & Mask</p>	<p>③ Base plate (with iron balls and sponges)</p> 	<p>④ Mask</p> 
<p>Artificial Nucleus</p>	<p>⑤ Segmented plastic nuclei (3 types)</p> 	<p>⑥ Yellow polymer-clay nuclei in posterior-capsule cups (3 pieces)</p> 
<p>Mock Instruments</p>	<p>⑦ U/S (I/A) handpieces (2 types)</p> <p>For segmented plastic nucleus</p>  <p>For polymer-clay nucleus</p>  <p>⑧ Nucleus manipulating hooks (3 types)</p> <p>Spatula hook</p>  <p>Chopper</p>  <p>Mr. Divider's hook</p> 	<p>⑨ Cystotome (21G needle) with syringe</p>  <p>⑩ Sclera fixation forceps</p>  <p>⑪ Anterior-capsule forceps</p> 
<p>Semi-consumables</p>	<p>⑫ CCC-processed anterior-capsule film (5 sheets)</p> 	<p>⑬ Storage case containing posterior-capsule cup filled with artificial cortex (wheat clay) (in "R") & spare clay (types of wheat and resin)</p> 
<p>Consumables & accessories</p>	<p>⑭ Viscoelastic substance</p>  <p>⑮ Anterior-capsule film (2.5m in total)</p> 	<p>⑯ Precut sclerocorneal sheet (30 pieces)</p>  <p>⑰ Sclerocorneal limbus (for attaching sclerocorneal sheet) (not a consumables)</p> 

■ Eyeball part ①②

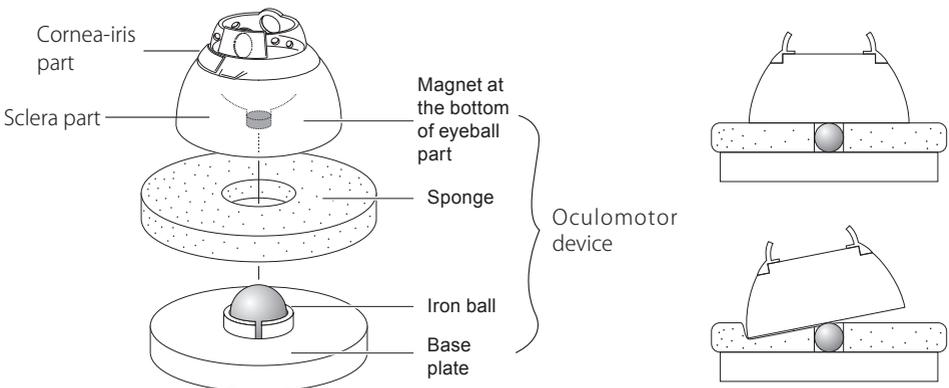
The eyeball part of KITARO DryLab consists of the cornea-iris part ① and sclera part ②. The cornea-iris part is fixed to the sclera part, and it is placed to the base plate and is covered with the mask.

The sclerocorneal sheet with wound has been patched to the oval opening of the cornea-iris part, from where the instruments and IOL are inserted. The sclerocorneal sheet has been patched also to the sclera (conjunctiva) part of the cornea-iris part, which is used for fixation of eye ball by holding with a forceps. If these sheets wear out, they will exchange with the sheets contained in the kit. The small holes in the cornea-iris part are used for the insertion of a cystotome and a hook. The horizontal oval opening is used for the insertion of a prechopper.



■ Base plate ③ & Mask ④

The base plate ③ is equipped with the oculomotor device (patented) which generates eye movements very similar to the human eye while you are manipulating instruments. For every practice, placing the bottom center of the eyeball part on the iron ball in the sponge on the base plate enables the eyeball to move freely. You can learn the correlation between the instrumentation and the eyeball rotation.

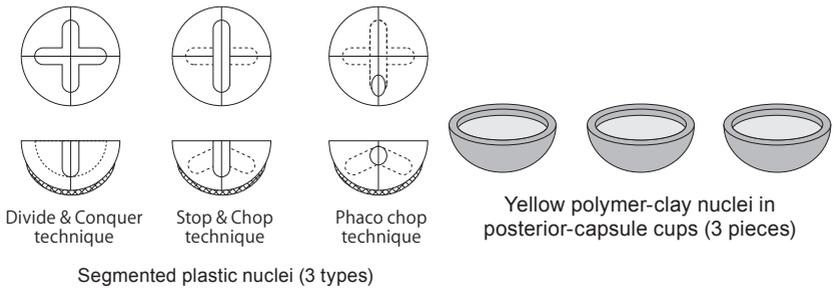


The mask ④ allows you to experience realistic surgery simulation, including the way you put your hands while manipulating instruments. The setting of the right eye is normal, while the left is a deep set eye with narrow eyelid. Beginners are recommended to start practicing with the right eye which is easier to handle.

■ Artificial Nucleus ⑤⑥

The following artificial nuclei are included in the KITARO Kit: 3 types of segmented plastic nuclei (patented) ③ for Divide & Conquer, Stop & Chop, and Phaco Chop techniques and 2 pieces of yellow polymer-clay nuclei (patented) ④. You can learn basic instrument manipulation by dividing and rotating these artificial nuclei with mock instrument.

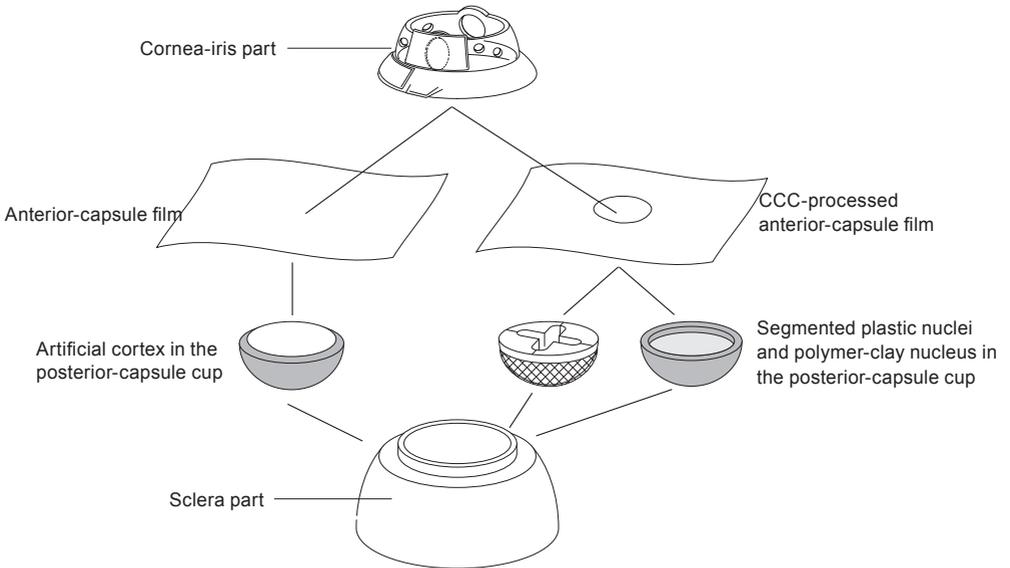
The size of these parts is 1.5 times of the human eye to facilitate your practice at the desk with the naked eye.



[How to set a artificial nucleus and an anterior-capsule film to the eyeball part]

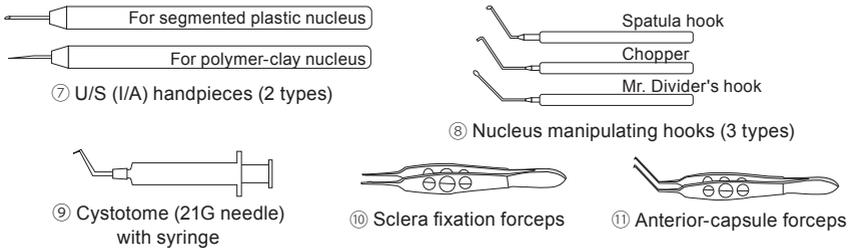
For nuclei segmentation practice, set the segmented plastic nucleus or polymer clay nucleus in the posterior cup in the hollow of sclera part, place a CCC-processed anterior-capsule film on it. Set the cornea-iris part in the sclera part.

For CCC practice, set the anterior cortex in the posterior-capsule cups in the hollow of sclera part, place the anterior capsule film on it. Set the cornea-iris part in the sclera part.



■ Mock instruments ⑦～⑪

2 types of U/S handpieces (for segmented plastic nucleus and for polymer-clay nucleus) ⑦, and 3 types of representative nucleus manipulating hooks (Mr. Divider's hook, phaco chopper, spatula hook) ⑧, The cystotome ⑨ come with KITARO DryLab. You can try each hook and then practice with the one which is best suited to you. The sclera fixation forceps ⑩ and anterior-capsule forceps for practicing CCC ⑪ are also included. The anterior-capsule forceps can be also used to fold an IOL.

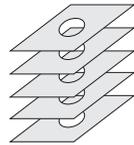


■ Semi-consumables ⑫, ⑬ and ⑥

These parts can be reusable, but may be worn out by the repeated use.

• CCC-processed anterior-capsule film ⑫

The CCC-processed anterior-capsule film ⑫ is prepared for convenience. Of course, you can use an anterior-capsule film which has CCC created by you. The film is placed on the segmented plastic nucleus or polymer-clay nucleus to practice nuclear segmentation techniques.



• Lens cortex (wheat clay) ⑬

The artificial cortex is made of wheat clay ⑬ having similar elasticity to the human lens cortex. The artificial cortex loads uniform tension on the anterior-capsule film, enabling the virtual CCC practice just like on the human



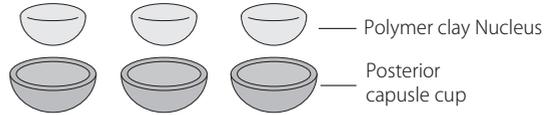
eye. The wheat clay in the posterior-capsule cup is stored in one compartment (marked with "R") of the contact lens case and set in the hollow of the sclera part for use. The spare wheat clay and resin clay are stored in the other compartment of the

case.

Please screw the lid back on the case until it clicks so that the wheat clay stays moist. If the wheat clay dries out, use spare wheat clay or resin one. Otherwise, moisten the dry clay by wrapping it with a wet tissue or towel.

• Polymer clay nucleus ⑥

Three yellow polymer clay nucleus in the posterior cup are contained in the kit. Take out one of them with



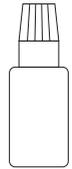
the posterior cup and set it in the hollow of the sclera part. Then practice the Prechop technique and the Phaco Chop technique.

This can be reformed after cracking, but may become smaller after being repeatedly used.

■ Consumables ⑭~⑯ & Accessories ⑰

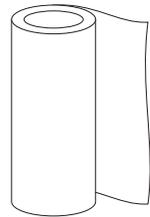
• Viscoelastic substance ⑭

The viscoelastic substance ⑯ in the eye drop bottle is 50% glycerin, which can be used as viscoelastic substance by putting a drop on the anterior-capsule film at CCC practice or as lubricant by practicing a few drops between the polymer clay nucleus and posterior-capsule cup. After using up the viscoelastic substance, you can either prepare 50% glycerin on your own or use a marketed viscoelastic substance for cornea protection or operation.



• Anterior-capsule film ⑮

As the artificial anterior capsule ⑮, 5- μ m polyester film coated with special resin (patented) is used. This 2-layer structure shows very similar tear strength and elasticity to the human anterior capsule which also consists of 2 layers. It makes beginners more likely to fail as if on the human anterior capsule and allows them to practice CCC recovery.



Depending on the side of the film (the right side is outside of the roll which is slightly

red and glossy; the reverse side is inside the roll which is slightly matte and whitish), the anterior capsule has a different nature; when the right side is faced up, it is easy to be grasped with a cystotome but tends to tear towards the equator and when the reverse side is faced up, it is difficult to be grasped with a cystotome but is unlikely to tear towards the equator. Beginners are recommended to use it with the red glossy side (outside of the roll) faced up, which is easier to handle.

This roll of anterior capsule film (2.5m length) enables a few hundred practices of the CCC.

• **Precut sclerocorneal sheet ⑩ and sclerocorneal limbus ⑪**

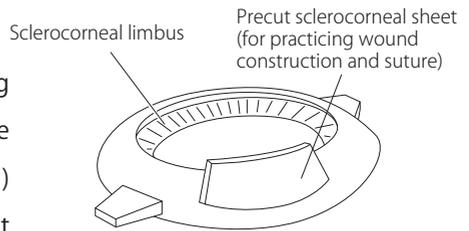
The precut sclerocorneal sheet (patented) ⑩ is made of artificial resin producing a similar feeling of cutting the human sclera and cornea when it is incised with a knife. After setting the sclerocorneal limbus in the sclera part, remove the release paper of a precut sclerocorneal sheet and attach the adhesive face to the lateral wall of the sclerocorneal limbus by pressing it firmly for seconds. After you practice self-sealing incision and suture, throw away the used sclerocorneal sheet.

This scleracorneal sheet has another roles.

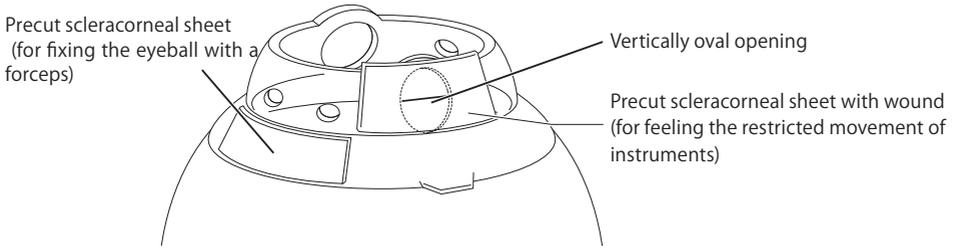
1) Applying it to the vertically oval opening of the cornea-iris part (don't apply to the horizontally oval opening, leave it open) enables you to feel the restricted movement of instruments.

2) Applying it to the limbus of the sclera part facilitates you to fix the eyeball by holding it with a forceps.

Please note that KITARO DryLab is shipped with the sclerocorneal sheet applied at the proper position. When the sheet wears out after repetitive practicing, you can replace the precut sclerocornea sheet in the kit. Apply it similarly to the original arrangement, and make an incision with a keratome before practicing. Note that when you insert the U/S tip into the incision, the glue of the incision hampers the instrumentation. Therefore, please insert the U/S tip being wet with water and take it



in and out to remove the glue prior to practicing.in and out to remove the glue prior to practicing.



Practice Methods

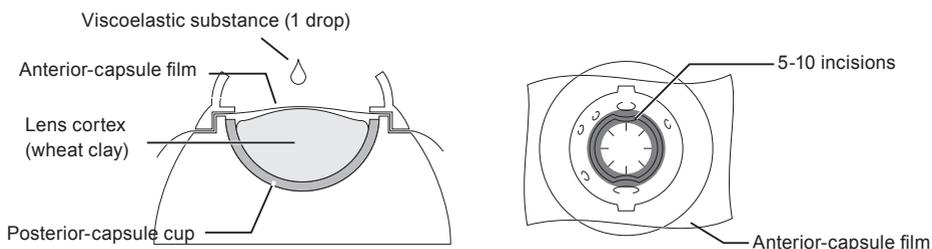
■ CCC practice

• Instruments

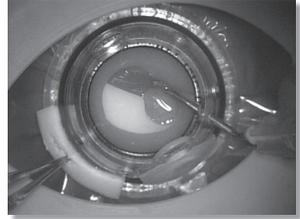
- Anterior-capsule film ⑮
- Posterior-capsule cup filled with artificial cortex (wheat clay) ⑬
- Cystotome ⑨ or anterior-capsule forceps ⑪ • Viscoelastic substance ⑭
- Sclera fixation forceps ⑩ (to fix the eyeball and remove the piece of film, which is cut out by the CCC)
- Tissue paper (to wipe viscoelastic substance off the hands)

• Procedure

- Take out the posterior-capsule cup filled with wheat clay from the storage case.
- Place it in the hollow of the sclera part.
- Cut the film into proper size from the role of anterior-capsule film.
- Place the anterior-capsule film on the sclera part.
- On top of the film, set the cornea-iris part in the sclera part until you hear a click sound.
- Place it on the iron ball at the center of the sponge, either right or left (deep-set eye), and cover it with the mask.
- Put a drop of viscoelastic substance on the center of the anterior-capsule film.
- Insert the provided cystotome or anterior-capsule forceps through the hole of the cornea-iris part.
- Ready to practice CCC on the film.



If CCC appears to stray or has strayed towards the equator, you should practice CCC recovery by pulling the film inward with a forceps or making a cut with vannas scissors and turning it back the opposite way. However, CCC recovery is easily achieved with KITARO DryLab by using a cystotome or forceps even though



CCC practice using cystotome

CCC strayed towards the equator. In order to simulate the anterior capsule where CCC tends to stray towards the equator and is difficult to recover just like in the human eye, make 5-10 radial incisions near the iris to the inferior iris on the film with a cystotome beforehand.

For the second CCC practice onwards:

- Remove the piece of the anterior-capsule film, which is cut out by the CCC.
- Place the unused area of the film on the posterior-capsule cup.
- Smooth the clay surface with a finger on top of the film.
- Set it just like the first time.

When you use a cystotome other than a cystotome attached to KITARO kit (you should use a cystotome of 21G, 25G and 26G are too small), please make the needle tip obtuse by rubbing it against something with rough surface. If you don't do so, punching out of anterior capsle film easily occurs which practicing CCC with a cystotome.

■ Nuclear segmentation practice

• Instruments

- Segmented plastic nucleus ⑤ or polymar clay nucleus ⑥ of your choice to practice
- CCC-processed anterior-capsule film ⑫ • Nucleus manipulating hooks ⑧
- U/S handpiece ⑦ • Viscoelastic substance ⑭

* Please prepare a prechopper on your own if necessary.

1) Procedure using a segmented plastic nucleus

- Take the segmented plastic nucleus of your choice out of the storage case .

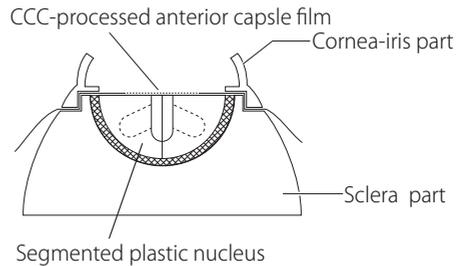
- Place it in the hollow of the sclera part.

- Place the CCC-processed anterior-capsule film on the artificial nucleus, arranging the CCC opening at the center.

- On top of the film, set the cornea-iris part in the sclera part (listen for a click).

- Place it on the center of the sponge on the base plate.

- Cover it with the mask.



With these segmented plastic nuclei, you can practice 3 major nucleus segmentation techniques. By manipulating the instruments along the ideally created grooves, tunnels or segmentation routes, you can naturally get used to the correct manipulation of instruments. You should use these nuclei to practice the most basic instrumentation such as the pendular manipulation placing the pivot point at the incision.



Nucleus dividing using segmented plastic nucleus

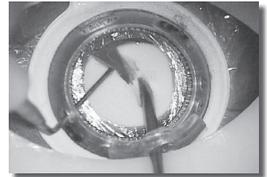
Note that incorrect instrumentation will not help you to improve your surgical skills at all. Indeed, straight and angled instruments should be manipulated in different ways. For example, angled instruments have to be manipulated 'by rotating the handle of the instrument in the fingers to move the tip from side to side.' You are recommended to learn the correct instrumentation from the textbook "The Secrets to Phaco Mastery Revealed – The Scientific In's-and-Out's of Phaco Surgery –".

2) Procedure using a polymer-clay nucleus

The yellow polymer-clay nucleus is most suitable for practicing the Prechop and Phaco Chop techniques.

- Take the polymer clay nucleus in posterior cup from the case.
- Place it to the sclera part.
- Place the CCC processed anterior-capsule film on it.
- Set the cornea-iris part and cover it with the mask.
- Put 2-3 drops of viscoelastic substance or water in the posterior-capsule cup for smooth nucleus rotation.

When you practice the Phaco Chop technique, you can learn more effectively if you choose the U/S handpiece with a sharp tip which allows you to insert the U/S tip smoothly into the nucleus.



Practicing Phaco Chop technique using polymer clay nucleus

The polymer-clay nucleus can be used repeatedly if you knead and return it to the original shape with your fingers. After you use one nucleus, however, you should use another nucleus. If you use the nucleus immediately after kneading it, nuclear segmentation will be unfavorable (it will take 20 minutes to restore the original condition).

■ Foldable IOL insertion practice

• Instruments

- Posterior-capsule cup
- Water or viscoelastic substance
- CCC-processed anterior-capsule film

(Please prepare IOL, IOL forceps, IOL injector, or dialing hook on your own if necessary.
(The provided mock instruments can substitute them.)

• Procedure

- Place the empty posterior-capsule cup in the hollow of the sclera part.
- Cover it with CCC-processed anterior-capsule film.
- On top of the film, set the cornea-iris part in the sclera part.
- Place it on the base plate and cover it with the mask.

- Put viscoelastic substance or water in the posterior-capsule cup.
- Insert an IOL with an IOL forceps (or the provided anterior-capsule forceps) or injector through the incised sclerocorneal sheet.

■ Wound construction and suture practice

• Instruments

- Precut sclerocorneal sheet ⑩ • Sclerocorneal limbus ⑪ • Sclera holding forceps ⑫
- Knife • Suture

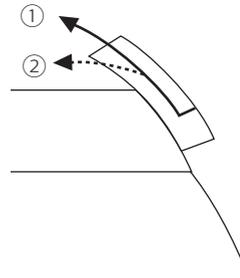
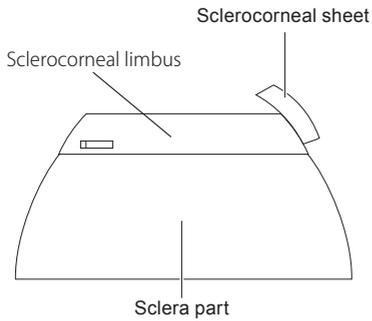
• Procedure

- Set the sclerocorneal limbus in the sclera part.
- Remove the release paper of a precut sclerocorneal sheet and attach the sheet to the lateral face of the sclerocorneal limbus by tightly pressing it with a finger (keep the upper area of the sheet from the sclerocorneal limbus).
- Set it on the base plate of KITARO. Cover it with the mask.
- Ready to practice wound construction using knives and suture.
- Throw away the precut sclerocorneal sheet after use.

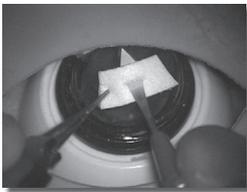
The eyeball should be appropriately rotated by holding the sclerocorneal sheet with the sclera holding forceps.

You can effectively learn self-sealing wound construction by moving the blade of keratome or crescent knife in the middle of the thickness of the sheet along the curve of the eyeball until the blade edge comes out of the upper sheet edge so that you can check the depth where the blade is going through.

You can also simulate the actual operation by moving the blade of knives so that the blade edge comes out of the upper part of the sheet, where the sheet is not attached to the sclerocorneal limbus.



- ① Direction for confirming incision depth
- ② Direction for simulating actual surgery



Practicing one plane incision using keratome



Practicing self-sealing incision using crescent knife

POSTSCRIPT

It took us three years to develop KITARO which consists of 14 patented technologies including the anterior-capsule film. For the development and production of KITARO, not only the time but also huge costs have been required, however, we offer KITARO without thought of return on investment so that young learners throughout the world can afford to use it. We have released KITARO globally in the hope that a larger number of young surgeons can master the surgery by using KITARO to benefit more patients. Most of the profits from KITARO will be used for support activities in developing countries.

Simultaneously with placing KITARO on the market, we have published the textbook titled “The Secrets to Phaco Mastery Revealed – The Scientific In’s-and-Out’s of Phaco Surgery –” authored by Junsuke Akura, Kunihiro Nagahara, and Yoshihiro Tokuda. This book is designed for easy-to-learn and easy-to-memorize key knowledge. Further, KITARO is described in relation to the key knowledge. Reading this textbook in addition to practicing with KITARO would be recommended.

Lastly, I would like to express our appreciation to many enterprises and their staff for their great cooperation for the development of KITARO.

Inventor: Junsuke Akura MD. PhD.

Clinical Professor of Tottori University

Chairman of Association for Ophthalmic Cooperation in Asia

Cooperative enterprises (in no particular order):

Rokko Butter Co., Ltd., Ina Food Industry Co., Ltd., General Technology Co., Ltd., Apply Inc., Tou-Free International Co., Ltd., Osaka Shisakushitsu Co., Ltd., Hayashi Manufacturing, Hoya Corporation, Santen Pharmaceutical Co., Ltd., Ciba Vision Corporation

To view the KITARO Manual on the video

KITARO DryLab

SEARCH

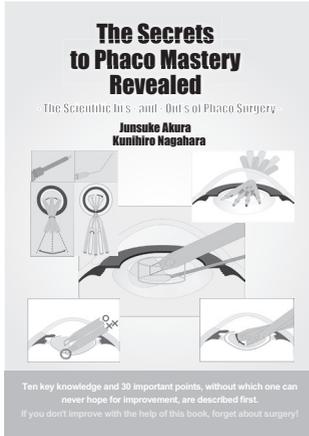




KITARO's Reference Textbook

The Secrets to Phaco Mastery Revealed – The Scientific In's-and-Out's of Phaco Surgery –

Authors: Junsuke Akura, Kunihiro Nagahara, Yoshihiro Tokuda



If you don't improve with the help of this book, forget about surgery.

CHAPTER 1 Key Knowledge and Basic Instrument Manipulation

CHAPTER 2 At-the-Desk Training Using Model Eye

CHAPTER 3 Phacoemulsification Particulars

"The Secrets to Phaco Mastery Revealed – The Scientific In's-and-Out's of Phaco Surgery –" which was prepared through scientific thorough analysis of the way of teaching is related to the KITARO series. This textbook tells the effective usage of KITARO. Practicing and using instruments with KITARO at the desk while learning from this textbook will produce optimal results.

The unique contents of this textbook include:

- 1) You can learn the key knowledge in the order you should know. The essence to lead you to a Master of Surgery is summarized in 30 points in 10 categories. Without the key knowledge, you will never improve your surgical skills even if you learn respective techniques.
- 2) Sensory manipulations that nobody has taught are scientifically analyzed and explained in writing; for example, the expression of "move the tip of the angled instrument by rotating the handle of the instrument in the fingers." This is a very important manipulation, but such explanation has not been mentioned in other textbooks. In addition, the "Check sheet" is designed to review and memorize the essential knowledge. As just described, a variety of ingenious ideas are used for easy-to-understand and easy-to-memorize key knowledge of phaco surgery. Getting this book together with KITARO would be recommended.

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