

TRAINING COURSE IN MANUAL SMALL INCISION SURGERY (MSICS)

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Acknowledgements

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As a note:

All materials presented in this course are from a collaboration of doctors, researchers, reviewers, as well as text books, journals, and videos. Our contributors are the authors of their original works, listed below, and hold the rights to them. Their willingness to contribute their original works made the creation of this course possible, and we are grateful for their continued efforts to train doctors around the world.

Contributors:

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- Dr. Wangchuk Doma, MS
- Dr. Suryakant Jha, MS

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- D. Michael Colvard, Clinical Professor of Ophthalmology, *Keck School of Medicine University of Southern California Los Angeles, CA* (editor)
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IOL Calculations for Cataract Surgery (Presentation)
Authored/Presented by: Jeffrey J. Caspar, MD. *University of California, Davis*

Master's Guide to Manual Small Incision Cataract Surgery (MSICS).
Authored by:

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Authored by:

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- Walter Meester Ing, Tax Software

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Authored by:

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Authored by:

- Ravi Thomas, MD.
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Authored by:

- Reeta Gurung, Deputy Medical Director, *Tilganga Eye Centre*
- Albrecht Hennig, Programme Director, *Eastern Regional Eye Care Programme Nepal*

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- Tilganga Eye Centre
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Thromboprophylaxis Policy

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Training Module for Microsurgery with IOL Implantation.

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Video Contributors:

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Introduction

Orbis International is a non-profit organization dedicated to eye care for all through strengthening healthcare systems and building institutional capacity to prevent and treat preventable blindness. Since 1982, Orbis has provided practical hands-on surgical and clinical training for eye care professionals worldwide. Orbis training and education is delivered through:

1. The Orbis Flying Eye Hospital (FEH), a state of the art surgical and training facility accredited through the American Association for Accreditation as an Ambulatory Surgery facilities International (AAAASFI).
2. Hospital Based Trainings (HBT): Training is conducted for eye care professionals within their own practice setting by global ophthalmic experts.
3. Cybersight®, a patient care consultation and online education program that extends the presence of Volunteer Faculty (VF).

At the core of all Orbis training programs is our comprehensive and diverse global cadre of over 400 Volunteer Faculty, providing ophthalmic education and instruction to increase our partners' skill, service and the quality of patient care. Our global cadre is comprised of experts from all ophthalmic subspecialties and disciplines.

Today, Orbis regularly delivers training in 16 countries where we have established multi-year projects, as well as short training courses through the Flying Eye Hospital and hospital based trainings in Asia, Africa and Latin America.

Course Objective:

This course is designed to train ophthalmologists in MSICS.

SICS has been recognized worldwide as a viable alternative to phacoemulsification for cataract surgery in resource constrained areas. It also serves as a valuable intermediary step to mastering phacoemulsification surgery.

This course aims to provide ophthalmologists with the following competencies:

1. Ability to perform a complete examination of cataract patients
2. Describe and apply the principles, indications for, mechanics of, and performance of A-scan and calculation of IOL power.
3. Formulate the differential diagnosis for cataract
4. Independently perform routine MSICS surgery with IOL placement.
5. Manage intraoperative and postoperative complications of cataract and intraocular lens (IOL) surgery
6. Post-operative management of cataract patients, including complete postoperative examinations and refraction.

7. Use of effective patient communication techniques and explaining guarded prognosis regarding cataract surgery

Course Duration:

6 weeks onsite (plus continual tele-education via Cybersight starting at one month prior to first onsite module and two months post course mentorship).

Target Audience:

This course has been developed for senior residents in ophthalmology (final year residents) who would benefit from an intensive practical skills training course in addition to convert an ECCE surgeon to perform MSICS in secondary hospitals or other resource constrained areas where phacoemulsification is not available.

Course Application:

Can be effectively delivered by Orbis International through three 2 week HBPs or one 6 week combined FEH and HBP project (please refer to course outline and schedule below). Prior to the start of each on-sight training module, pre-learning educational materials will be available through Cybersight®. For two months following the last on sight training, tele-mentorship and monitoring of surgical cases will be available through Cybersight®.

This course was designed for Orbis multi-year projects with any of the following objectives:

1. Strengthening residency training
2. Training secondary or rural eye care professionals in cataract surgery
3. Training ophthalmologists in low resource areas, in which phacoemulsification machines and consumables are not available.

Training Ratios and Surgical Volume:

For trainees completing the entire course, the ideal training ratio is one VF mentor to two ophthalmologists. Therefore, hospital-based trainings, should limit the participants to two ophthalmologists. However, additional ophthalmologists can participate in the non-surgical components of the training, including: wet lab, structured classes, surgical demonstrations, and investigative ophthalmology workshops. For the non-surgical training it's recommended to have one VF to 6-10 ophthalmologists.

The FEH has the ability to deliver training in two locations, both the FEH OR and at the partner institution. They are also able to recruit 3-4 VF mentors per week. Therefore, the FEH can accommodate a larger number of ophthalmologists completing the full course (8-10). The FEH can also accommodate additional ophthalmologists who wish to participate in the non-surgical training. The exact number of ophthalmologists should

be determined based on space available for training, number of VFs and expected surgical volume.

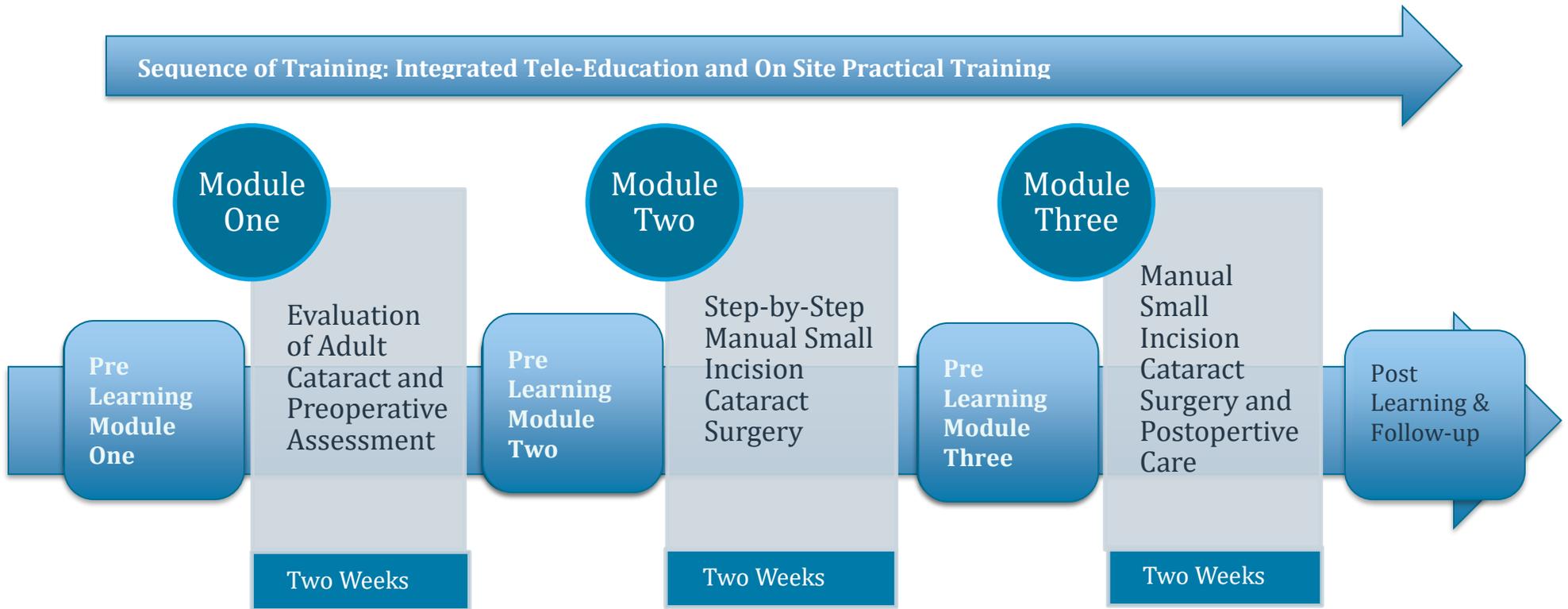
The target for surgical volume is at least 20 cases per trainee. With four weeks of surgical training, trainees should be able to garner at least 20 cases before the end of the course. If integrated into longer-term training plans, consider continued mentorship in MSICS for up to 50 surgical cases.

It is important that the trainees get these initial 20 cases in a timely manner, to ingrain the surgical steps of MSICS and reach a comfort level with each step, so that they are able to perform surgery independently without the onsite VF. Ideally, within two months, trainees will have completed the required 20 cases, which means module two and three of the MSICS course should be schedule within a two month period. Overall, the course would be most effective if the onsite training was completed in a time-span of a few months.

Adaptability:

This course is designed as a series of two week modules, each focusing on specific competencies and progressing in complexity. As such, it can be adapted to match the needs and skills of participant ophthalmologists from partner institutions. For example, if participant ophthalmologists are more advanced and have strong clinical knowledge and skills, the training can be design to start at module two or even module three as appropriate. Alternatively, if participants are quite basic or beginners, each of the modules can be repeated until judged that the competencies have been met, and they are ready to progress to the next module. Project managers have the flexibility to tailor this MSICS course to the skill level and needs of their partners.

Course Outline & Schedule:



Pre Learning Module One

One Month Prior to the start of the first on-site training module, registered participants will access educational content and training materials through Cybersight®.

Pre-learning materials include:

- ✓ Pre-examination for Pre-Learning Module One
- ✓ Orbis Manual Small Incision Cataract Booklet
- ✓ Lectures: See topics in text box
- ✓ Demonstration Videos on:
 - Sterile Techniques and OR safety (Gloving, Gowning and Scrubbing)
 - Patient Prepping & Draping
 - Immersion and contact A-scan and IOL calculation
 - B-scan for white/mature cataracts
- ✓ MSIC Surgical Videos: Routine Cases
- ✓ IAPB Essential Equipment List for Cataract Surgery
- ✓ Post-Examination for Pre-Learning Module One

Learning Topics

- Most common causes and types of cataracts: epidemiology of cataract.
- Epidemiology of cataract and the significance of cataract as a cause of avoidable blindness
- Basic history taking and evaluation of adult cataract
- Screening for high risk patients, patients with co-morbidity
- IOL Power Calculation
- Intraocular lens
- Preoperative Assessment of the Cataract Patient
- Introduction to MSICS: Basic Steps and Overview

Module One: Pre-Op Assessment of Cataracts

This module is two weeks in length and can be delivered as a hospital-based training program or integrated into a FEH project.

Competencies covered in Module One:

1. Ability to perform a complete ophthalmic examination of cataract patients
2. Describe and apply the principles, indications for, mechanics of, and performance of A-scan biometry and calculation of IOL power.
3. Formulate the differential diagnosis for cataract

Two Week Module Outline:

- ✓ Structure classes on knowledge, theory and skills for MSICS, which includes:
 - Case discussions
 - Surgical video review
 - Reinforcement of educational content from Pre-Learning Module One

- ✓ Clinical training with Orbis VF on preoperative assessment of cataract patients:
 - History taking and charting
 - Full examination of the eye:
 - Examining and screening for co-morbidity (glaucoma, retina, infection, blocked NLD, etc.)
 - How to select patients and prevent possible post-op complications
 - Diagnosis and treatment plans
- ✓ Workshops in performance of key ophthalmic exams
 - Contact and Non-contact ultrasonography (where equipment is available)
 - Keratometry: To assess pre-operative astigmatism and how to correct it using different incision sites
 - B-scan
- ✓ Observation of live MSIC surgical demonstrations performed by Orbis VF
- ✓ Wet lab training on MSICS steps and technique

Wet Lab: Learning MSICS Step by Step

- Preparation of the Eye
 - Use of microscope
 - Sub tenon & peribulbar blocks
 - Proper betadine
 - Lid speculum
 - Traction suture
- Paracentesis & Viscoelastic
- Anterior capsulohexis, options:
 - Can opener
 - CCC (while not essential for SICS, CCC greatly adds to surgical safety, less PC breaks, and efficacy; and is the pre requisite for learning Phacoemulsification, so should be included in training)
- Would construction*
 - Conjunctival incision
 - Cauterizing the epi-sclera
 - Scleral tunnel formation
- Anterior Chamber Maintainer (ACM)
- Hydrodissection & expression of the lens out of the capsular bag
- Extracapsular technique: expression of lens out of the eye, options include
 - A glide & hydroexpression
 - Irrigating Vectis technique
 - Simcoe Cannula technique
 - Plain Vectis technique
- Cortical Cleanup
- IOL insertion & implantation
- Wound inspection & closure
 - Includes scleral wound (possible need to suture)
 - Conjunctiva

**This step is critical to MSICS and requires a lot of demonstration, explanation and training from the Orbis VF*

Module allocation:

- ✓ Structured Classes: 25% of module time
- ✓ Clinical Training: 25% of module time
- ✓ Wet lab Training: 50% of module time

Following the completion of module one, registered participants can access pre-learning Module Two educational content and training materials through Cybersight®.

Pre Learning Module Two

Following to the completion of module one, registered participants can access module two educational content and training materials through Cybersight®.

Pre-learning materials include:

- ✓ Pre-Examination for Pre-Learning Module Two
- ✓ Manuals and Guidelines on MSICS and Intra-operative complications for MSICS
- ✓ Lectures: See topics in text box
- ✓ MSIC Surgical Videos: Intraoperative complications
- ✓ MSIC Surgical Videos: Complex Cases
- ✓ Post-Examination for Pre-Learning Module Two

Lecture Topics:

- Step by Step Manual Small Incision Cataract Surgery
- Importance of Wound Closure: Sutures - When to Use, Materials, Gauge
- Management of intraoperative complications with MSICS
- Cataract surgery in difficult situations
- Tips for avoiding surgical complications in MSICS
- strabismus patient

Module Two: Step by Step MSICS

This module is two weeks in length and can be delivered as a hospital-based training program or integrated into a FEH project.

Competencies covered in Module Two:

1. Independently perform routine MSICS surgery with IOL placement.
2. Begin to manage intraoperative and postoperative complications of cataract and intraocular lens (IOL) surgery

Two Week Module Outline:

- ✓ Structured classes on managing intraoperative and postoperative complications, which includes:
 - Case discussions
 - Surgical video review
 - Reinforcement of educational content from Pre-Learning Module One
- ✓ Continuation of Wet lab focusing on the management of intraoperative complications with MSICS
- ✓ Perform step by step MSIC surgery under the supervision of Orbis VF
- ✓ Observation of anterior vitrectomy surgery in response to cataract complications performed by Orbis VF

Step-by-Step MSICS

The Following Cases are Ideal for Beginners in MSICS:

- Nucleus sclerosis grade 1 and 2
- Normal anterior chamber depth
- Clear and healthy cornea
- Well dilated pupil
- No associated ocular morbidity

Step: Preparation of the eye

- Use of microscope
- Sub-tenon and peribulbar blocks
- Proper betadine
- Lid Speculum
- Traction suture

Step: Paracentesis and Viscoelastic

Step: Anterior capsulorhexis, options include:

- Can opener
- CCC (While not essential for SICS, CCC greatly adds to surgical safety (less PC breaks) and efficacy; and is the pre-requisite for learning phacoemulsification, so should be included in the training for MSICS)

Step: Wound construction*

- Conjunctival incision
- Cauterizing the epi-sclera
- Scleral tunnel formation

Step: Anterior Chamber Maintainer (ACM)

Step: Hydrodissection and Expression of the lens out of the capsular bag

Step: Extracapsular Technique: Expression of lens out of the eye, options include:

- A glide and hydroexpression

Step: Cortical cleanup

Step: IOL insertion and implantation

Step: Wound inspection and closure

- Includes scleral wound (possible need to suture)
- Conjunctiva

*This step is critical to MSIC and requires a lot of demonstration, explanation and training from the Orbis VF

Module allocation:

- | | |
|-----------------------|--------------------|
| ✓ Structured Classes: | 25% of module time |
| ✓ Clinical Training: | 25% of module time |
| ✓ Surgical Training: | 50% of module time |

Following the completion of Module Two, registered participants can access pre-learning Module Three educational content and training materials through Cybersight®.

Pre Learning Module Three

Following the completion of module two, registered participants can access module three educational content and training materials through Cybersight®.

Pre-learning materials include:

- ✓ Pre-Examination for Pre-Learning Module Three
- ✓ Manuals and Guidelines on Post-operative complications for MSICS
- ✓ Lectures: See topics in text box
- ✓ Guidelines on refraction
- ✓ Demonstration videos/Instruction on:
 - Keratometer
 - Refraction
 - Retinoscopy
- ✓ Tips for effective patient communication
- ✓ Surgical Log
- ✓ Post-Examination for Pre-Learning Module Three

Lecture Topics:

- Patient counseling before and after cataract surgery
- Post-operative care and follow-up
- Management of post-operative complications
- Clinical audit of cataract surgery outcome: How to improve and maintain good outcomes after cataract surgery.

Module Three: MSICS & Post Op Care

This module is two weeks in length and can be delivered as a standalone hospital-based training or hospital based training integrated into a FEH project. However, in module three, it is important to perform the majority of surgical hands-on training in the partner hospital OR suite. This ensures effective skills transfer, which is sustainable in the partner's practice setting.

Competencies covered in Module Three:

1. Independently perform routine MSICS surgery with IOL placement.
 - Including the use of sutures where wound integrity is in doubt.
2. Manage intraoperative and postoperative complications of cataract and intraocular lens (IOL) surgery
3. Post-operative management of cataract patients, including complete postoperative examinations and refraction.
4. Use of effective patient communication techniques and explaining guarded prognosis regarding cataract surgery

Two Week Module Outline:

- ✓ Structured classes continued:
 - Review of surgical tape from course participants (sourced from module two)

- Reinforcement of educational content from Pre-Learning Module One
- Workshops on:
 - Patient communication techniques
 - Explaining Guarded Prognosis for Cataract surgery
 - Professionalism.
- ✓ Clinics: Trained in post-operative examinations and management of cataract patients with Orbis VF. Includes:
 - Medications
 - Astigmatism
 - Keratometer
 - Refraction (to include any of the following, depending on available equipment):
 - Autorefractor
 - Trial lens
 - Uveitis
 - Glaucoma
 - Endophthalmitis
- ✓ Continue to perform routine surgeries under supervision of Orbis VF towards full competency in routine MSICS.
- ✓ Perform surgery on complicated cataract cases under the supervision of Orbis VF

Module allocation:

- ✓ Structured Classes: 25% of module time
- ✓ Clinical Training: 25% of module time
- ✓ Surgical Training: 50% of module time

Following the completion of Module Three, registered participants can access post learning and mentorship through Cybersight®.

Post Learning & Follow Up

For three months following the course completion, registered participants will continue to receive mentorship from Orbis Volunteer Faculty through Cybersight®.

Continued mentorship includes:

- ✓ Cybersight® Consult: Connects participants to the mentors who conducted the onsite training. Participants upload monthly cases and benefit from consultation and case discussion with the course mentors. This allows them to continue to receive guidance and skill development from the mentors for an additional three months as they increase their surgical volume and clinic work. eConsult is currently available in several international languages.
- ✓ Cybersight® Learn: All the course material will remain available to participants, so they can continue to reference them as they develop their practice.

Post-course follow-up includes:

- ✓ Participants will be obliged to upload 4 cases per month to eConsult for three months post training. The mentors rank all consult cases for quality. This data will be monitored to track the participant's progress.
- ✓ Participants will submit a surgical log (this log will be provided to participants) once they have completed 20 surgical cases post training (This will be reviewed by the mentor and also tracked for monitoring purposes).
- ✓ Certificate of completion distributed to all participants that complete the full course, including:
 - Completion of all three pre-learning modules
 - Passing all three pre-learning post module examinations
 - Completion of all three onsite modules and competency sign off by Orbis VF Mentor
 - Meeting the post course deliverables
 - Monthly upload of cases to Cybersight
 - Upload of surgical log