I. Introduction

How this curriculum was developed

CBM in partnership with the International Council of Ophthalmology (ICO) organized a workshop of international ophthalmic educators and cataract subspecialists who developed the curriculum. The phaco surgery-related learning objectives of the ICO Residency Curriculum was analyzed and evaluation methods defined for each. Teaching methods for each objective were elaborated upon, and the appropriate learning environments selected.

Curricula development has shifted from a task-oriented approach that is particular to each individual institution to a standardized, competency based, education that takes into account the future needs of the public, adult learning principles, contemporary methods.

Four laudable goals to improve medical education are: (1) having standard learning outcomes while maintaining individual learning processes, (2) integrating formal knowledge, skills and values, (3) developing habits of inquiry and innovation, and (4) developing a professional identity as a backbone of education. (Cooke, 2010 #7)

Access the online version at www.icoph.org/phaco-curric

If links in this document are broken, please contact elearning@icoph.org for assistance.
II. Training Syllabus

Background

More than 12 million people are blind due to cataract, and an additional 52.6 million are moderately to severely visually impaired. Most of these people live in low and middle income countries.

The WHO Global Action Plan 2014-2019 has the global target of reducing the prevalence of avoidable visual impairment by 25% by 2019, and in order to achieve has proposed three indicators and as way of evaluating the objectives. These indicators are measuring the prevalence and causes of visual impairment, the number of eye care personnel broken down by cadre, and cataract surgery service delivery.

Concerning this last point, it has been estimated that 75-80% of patients would benefit from a phacoemulsification surgery of the cloudy lens.

Why Phaco

Extracting cataracts by phacoemulsification makes sense when you consider the advantages of smaller incisions, faster recovery, it can also produce a reduction of ophthalmologist appointments as well as less suture related complications. These were the same reasons that propelled the shift from intracapsular cataract extractions to extracapsular techniques. It is true that the cost of equipment and consumables remains a challenge in most regions, as well as the availability of trained surgeons.

In order to address this issue, CBM has partnered with educational, private and public institutions to develop the human capability by providing phaco surgery training in the most needed regions.

How the Course Works

For many decades, development of surgical skills has depended on exposure to a high volume of actual patients. The obvious limitation being the further advancement of educational theory has brought forth theories. One is the three-stage theory of motor skill acquisition developed by Fitts and Posner. This model consists of three stages: cognitive, integrative and autonomous.

The model has served as base for shifting the initial learning curve of basic skills from the patient to different types of simulation.

During the cognitive stage the learner is slow, hesitant, and inefficient in his movements. The main goal of this stage is to learn what the task requires. The learner will focus mostly in thinking through each movement and most of the movements are undertaken consciously. Practice should be structured, and focused on specific tasks that breakdown full steps of the surgery.

Background

The essential parts of the steps are not present during the earlier parts of this stage and appear towards the end of it.

During the integrative stage, the learner becomes more fluid and reliable in his movements. The main goal is to achieve consistency in the movements. The learner will focus on linking performance and results, not having to think consciously through each step. Practice can introduce certain variability in conditions and test the ability of the learner to reproduce specific results.

Finally, during the autonomous stage, the learner is accurate, consistent and efficient in all movements. The goal becomes to make better tactical decisions and increase efficiency of movements. Movements are mostly automatic and practice focuses on achieving a higher speed, economy of movements and dealing with unexpected situations. Learners should not need to be exposed to patients during the first two stages, as these can be shortened through deliberate practice in a simulation. However, it must be noted that simulation does not replace operative volume, which has been shown to be intrinsically linked to clinical outcomes.

We have developed a three-module course using this theory of motor skill acquisition. It is our hope that you will find the information below useful as a guide in designing a course that is tailored to your institutional needs and resources. We have been careful to include options that should be available across most resources settings. It is our belief that by combining modern methods of surgical skills transfer and resources, learning phaco can be safe, efficient, and rewarding.

Course Goals

1. Describe the diagnosis, evaluation, and management of intraoperative and postoperative complications of phacoemulsification cataract and intraocular lens (IOL) surgery, including conversion to extracapsular extraction (ECCE).
2. Perform the complete preoperative ophthalmologic examination of cataract patients, including the consent for the procedure.
3. Formulate the differential diagnoses for cataract and related lens conditions.
4. Perform routine phacoemulsification cataract surgery with IOL placement.
5. Perform the complete postoperative examinations following cataract surgery.
6. Manage intraoperative and postoperative complications of cataract surgery.
7. Develop and exercise clinical and ethical decision making in all cataract patients.
8. Develop good patient communication techniques regarding cataract surgery.
9. Work effectively as a member of the medical care team.
10. Explain the components of a sustainable phacoemulsification practice.
11. Explain the principles of inclusive practices in eye health.
Learning Objectives

The following objectives have been adapted from the ICO Residency Curriculum [www.icoph.org/curricula.html]. The content has been prioritized to identify “Must Know” material. Two asterisks (**) are used to identify the “Must Know” items.

Cognitive

1. Describe the instruments and techniques of cataract extraction, including extracapsular surgery and phacoemulsification.**
   https://www.mindmeister.com/1106455740?t=OtjP0698u0

2. Describe the important parameters of the phacoemulsification machine and how to alter them for particular conditions of surgery.**
   https://www.mindmeister.com/1106455732?t=OtjP0698u0

3. Describe techniques for prevention of capsular opacification and phimosis (before, during, after surgery), including the use of capsular tension rings and IOL factors.

4. Describe the techniques to manage a small pupil, including mechanical manipulation, management of iris membrane, iris hooks, viscoelastic, and phaco techniques.

5. Describe the properties of different ophthalmic devices (OVDs) (e.g. dispersive, cohesive, adaptive) and the advantages and disadvantages for certain phases of surgery.**

6. Describe the fluid dynamics in phacoemulsification, and in viscoelastic, including the difference between peristaltic and venturi pump types.**

7. Describe the use of special devices for cataract surgery in complex situations such as specialized IOLs, capsular tension rings and segments, iris hooks, Malyugin ring, use of indocyanine green/trypan blue staining of the anterior capsule.


9. Independently evaluate and establish a management plan for complications of cataract and IOL implant surgery (e.g. posterior capsular tears, vitreous prolapse, intravitreal dislocation of cataractous fragments, corneal wound burn, expulsive hemorrhage, choroidal effusions, damage to the iris tissue).**

10. Describe instrumentation and techniques used to implant foldable and non-foldable IOLs.**

11. Describe the causes and indication for performing, repositioning, removal, or exchange of IOLs.**

12. Describe the indication and option for astigmatism management during cataract surgery (e.g. on axis incision, limbal relaxing incisions [LRI], opposite clear corneal incision [OCCI], toric IOL).

13. Describe the option for presbyopic correction solutions during cataract surgery (e.g. monovision, multifocal IOLs, accommodating IOLs, dual optic IOLs).

14. Describe the mechanisms of actions, indications, contraindications, advantages, and disadvantages of premium IOLs (e.g. multifocal, accommodative, toric, aspheric, blue blocker, intraocular mini-tracting system).

15. Describe evaluation and management of IOL complications (e.g. intraoperative damage to IOL, postoperative IOL opacification, dislocation, subluxation).**

16. Describe the advantages and disadvantages of the materials used for IOL fabrication (e.g. poly-methyl methacrylate [PMMA], silicone, hydrophobic acrylic, hydrophilic acrylic).

17. Describe the treatment options for “dropped IOL” and indications for referral to a vitreoretinal surgeon.

18. Describe the advantages and strategies for advanced phacoemulsification techniques such as torsional or transversal ultrasound, small incision and microincision cataract surgery (MICS), biaxial MICS cataract surgery.

19. List the indications for triple procedures or combined surgeries (e.g. phaco plus trabeculectomy, keratoplasty, silicone-oil removal).

20. List the indications for “premium” IOLs (e.g. multifocal, accommodating, toric).

21. Describe the surgical difficulties of hypermature (Morgagnian) cataract.

22. Describe the treatment options for eyes with shallow anterior chamber and cataract including high-degree hyperopic eyes and piggyback IOL implantation.

23. Describe the methods to determine typical surgically-induced astigmatism and surgeon specific A-constant.

24. Describe the etiology and management of unexpected postoperative refractive errors, including hyperopic and myopic shifts (e.g. capsular phimosis, capsular block, upside down IOL).

25. Describe the management strategies to reposition of decentered, tilted, IOLs.

Practice Management

1. List components of sustainable phaco practice (e.g. pricing, consumable procurement, machine maintenance).

2. Describe ancillary infrastructure needed (e.g. electrical requirements, sterilizing equipment).
Learning Objectives

**Inclusive Practise**

1. Explain the WHO definition and conceptualization of disability.
2. Appraise the epidemiology of disability (including due to visual impairment) and its impact in different economic settings.
3. Describe the intersection of blindness and visual impairment with other issues that may cause marginalization, including the patient’s age, gender, other impairments, poverty, ethnic group, and faith community.
4. Critically appraise the impact of disability in people’s lives (e.g. poverty, education, quality of life [social and economic], and occupation).
5. Describe the barriers to the uptake of eye care services within health systems by marginalized groups.
6. Describe the principles of rehabilitation and community-based rehabilitation with relevance to people with visual impairment and the integration of rehabilitation within a health system.
7. Describe strategies for developing inclusive practices in eye health, focusing on the rights and capabilities of people with all kinds of disabilities.
8. Describe strategies and partnerships with disability support services that can improve quality of life (e.g. health, education, livelihoods, economic security, social inclusion) of people with long term visual impairment.

**Technical/Surgical Skills**

1. Practice surgery in the operating room under supervision, including mastery of the following skills:
   a. Wound construction**
   b. Anterior capsulotomy/capsulorhexis**
   c. Instillation and removal of viscoelastics**
   d. Hydrodissection and hydrodelineation**
   e. Extracapsular technique**
   f. Beginning phacoemulsification techniques (e.g. sculpting, divide and conquer, phaco chop)**
   g. Irrigation and aspiration**
   h. Cortical cleanup**
   i. IOL implantation (e.g. anterior and posterior, special IOLs)**
   j. Wound suturing**
   k. Wound hydration**
2. Perform paracentesis of the anterior chamber.**

3. Implement advanced applications of viscoelastics in surgery (e.g. control of iris prolapse, elevation of dropped nucleus, viscodissection, aspiration of residual/retained viscoelastic, soft shell technique)**
4. Perform phacoemulsification in a practice setting (e.g. animal or practice lab), and then in the operating room, including mastery of the following skills:
   a. Wound construction
   b. Anterior capsulotomy/capsulorhexis
   c. Viscoelastics
   d. Intracapsular, extracapsular, and phacoemulsification techniques (e.g. sculpting, divide and conquer, stop and chop, phaco chop)
   e. Instrumentation and techniques of irrigation and aspiration
   f. IOL implantation (e.g. anterior and posterior, foldable and non foldable)
   g. IOL repositioning, removal, or exchange
5. Perform intraoperative and postoperative management of any event that may occur during, or as a result of, cataract surgery, including:
   a. Vitreous loss
   b. Capsular rupture
   c. Anterior or posterior segment bleeding
   d. Positive posterior pressure
   e. Choroidal detachments
   f. Expulsive hemorrhage
   g. Loss of anesthesia
   h. Elevated intraocular pressure
   i. Use of topical and systemic medications
   j. Astigmatism
   k. Postoperative refraction (simple and complex)
   l. Corneal edema
   m. Wound dehiscence
   n. Hyphema
   o. Residual cortex
   p. Dropped nucleus (referral)
   q. Uveitis
   r. Cystoid Macular Edema
   s. Elevated intraocular pressure and glaucoma
   t. Postoperative early and late intraocular infection
   u. Corneal burn
   v. Intraoperative floppy iris syndrome
6. Perform surgery when appropriate on patients with complex lens issues, including:
   a. Eyes with shallow anterior chamber
   b. High-degree myopic eyes
7. Perform reposition of malpositioned IOLs.
Course Duration & Timeline

This course is designed to last 12 months and is distributed in the following way:

<table>
<thead>
<tr>
<th>Duration</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months prior</td>
<td>Identify partners/trainee (evaluate surgical potential)</td>
</tr>
<tr>
<td>4 months prior</td>
<td>Curriculum, prerequisite knowledge, requests for 3 months surgical audit, surgical video</td>
</tr>
<tr>
<td>1 month prior</td>
<td>Prerequisite knowledge test satisfactorily completed</td>
</tr>
<tr>
<td>1 month prior</td>
<td>Completed registration, indemnity, visas, travel, training agreement signed</td>
</tr>
<tr>
<td>3 months prior</td>
<td>Surgical video received</td>
</tr>
<tr>
<td>2.5 months</td>
<td>Surgical video graded with ICO-OSCAR-SICS (reviewed by center and regional advisor) and trainee notified</td>
</tr>
<tr>
<td>1 month prior</td>
<td>Trainee granted access to cognitive objective modules with recommended completion schedule</td>
</tr>
<tr>
<td>Day 1-7</td>
<td>Structured wet lab training (+/- eyes)</td>
</tr>
<tr>
<td>Day 8-21</td>
<td>Live surgery training (10 cases) &amp; post-ops</td>
</tr>
<tr>
<td>Day 7</td>
<td>Cataract patient evaluations/pre-op</td>
</tr>
<tr>
<td>Day 15-22</td>
<td>Trainee back to hospital</td>
</tr>
<tr>
<td>1-6 months post</td>
<td>Self-auditing phaco surgeries, patient satisfaction survey completion</td>
</tr>
<tr>
<td>2 months</td>
<td>Audit report received by program (include analysis of issues [e.g. consumables] leading to low surgical rates)</td>
</tr>
<tr>
<td>4 months</td>
<td>Audit report received by program</td>
</tr>
<tr>
<td>6 months</td>
<td>Audit report received by program, patient satisfaction results received</td>
</tr>
<tr>
<td>6.5 months</td>
<td>Certificate issued</td>
</tr>
</tbody>
</table>

Participant Profiles

Training Institution

1. The training institution identified for the course should be an established teaching hospital recognized for post-graduate training in ophthalmology.
2. The institution should have appropriate infrastructure for training including wet lab facility, operating microscope with observer’s view, and recording facility, in addition to other equipment and instrumentation required for phaco emulsification surgery.
3. Adequate resources for clinical examination and surgical treatment of patients with cataract should be available. Clinical load including number of surgical patients at the hospital facility should be sufficient to provide the required learning experience to the trainees.
4. The institution must ensure the availability of all necessary professional, technical, and clerical personnel for the effective administration of the program.
5. A program director and at least two designated faculty with adequate experience and necessary qualifications should be assigned for the course.
6. A structured training program should be followed including regular case discussions and presentations, in addition to the hands on training, to provide an enriching educational experience to the trainees.
7. Participating institutions should help in making appropriate arrangements for providing accommodation to the trainees for the duration of the training period.

Trainer Profile

1. Faculty identified for training must have at least 3 years of teaching experience after completing post graduate training in ophthalmology.
2. The faculty must possess current medical licensure and appropriate staff appointment at the institution.
3. The faculty trainer should be well-experienced in performing phacoemulsification surgery and also adept in managing complicated cases of cataract.
4. The faculty should be willing to devote sufficient time to teach clinical and surgical skills to the trainees and to evaluate their performance as per recommended assessment methods.
Trainee Profile

1. The trainee must have completed post-graduate residency training in ophthalmology and passed the required exam from an institution recognized by the national medical council / regulatory body of the country.
2. The trainee must have performed a total of 300 cataract surgeries (ECCE/MSICS/Phacoemulsification) or more independently and/or should have the required surgical skills in performing certain documented steps of phacoemulsification technique.
   a. These skills must be documented through the OSSCAR at the beginning and end of simulations as well as videos of surgical cases from assistant’s eyepiece.
   b. The skills will be evaluated by the clinical admissions committee or primary surgical trainer before access to patients is granted.
3. A letter of recommendation from the Chair of Ophthalmology or the head of organization (in case of mission hospitals/private hospitals) is a prerequisite to apply for the course.
4. The Trainee must be reasonably fluent in the language used for teaching at the training center.
5. The trainee must be committed to complete the course and undergo the recommended assessment process. Trainee should also be willing to send a surgical audit report of his/her performance after returning to the home institution on a quarterly basis for one year.

Pre-course Work

Trainees are expected to pass an exam of prerequisite knowledge, as well as submit a surgical video for evaluation before they can register for the next module. Most theoretical aspects of phaco surgery will be covered during this phase.

Module 1: Simulated Surgery

Module 1 consists of a one-week intensive wet lab course that will include practice in animal, artificial and, where available, virtual reality models that have been chosen for their high fidelity. All steps of phaco surgery will be broken down into steps and simulated. The 5 to 7 day session will be distributed as follows:

<table>
<thead>
<tr>
<th>5 Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Incisions &amp; Wounds</td>
</tr>
<tr>
<td>2. Intraocular Maneuvers</td>
</tr>
<tr>
<td>3. Capsulorrhexis</td>
</tr>
<tr>
<td>4. Phacodynamics and Phaco</td>
</tr>
<tr>
<td>5. Complications</td>
</tr>
</tbody>
</table>

Course Outline

Topic List

1. Wound Closure (Including suturing, hydration, and checking security as required)
2. Viscoelastic: Appropriate Use and Safe Insertion
3. Incision & Paracentesis: Formation & Technique
4. Lens Insertion, Rotation, and Final Position of Intraocular Lens
5. Hydrodissection: Visible Fluid Wave and Free Nuclear Rotation
6. Irrigation and Aspiration Technique With Adequate Removal of Cortex
7. Capsulorrhexis: Commencement of Flap & Follow-Through, Formation and Circular Completion
8. Phacodynamics
9. Nucleus: Sculpting or Primary Chop
10. Nucleus: Rotation and Manipulation
11. Nucleus: Cracking or Chopping With Safe Phacoemulsification of Segments
12. Phacoemulsification Probe and Second Instrument: Insertion Into Eye
13. Phacoemulsification Probe and Second Instrument: Effective Use and Stability
14. The Operating Microscope
15. Phaco-Machine Setup
16. Phaco Instruments: Appropriate Use
17. Anterior Vitrectomy
18. Conversion to EECC

Module 2: Live Surgery

During Module 2 the trainee performs 10 live surgeries under close supervision. First, patients will be selected in a consultation that discusses the main risk factors for complications. After selection, one or two cases will be performed daily, during a 1-2 week period. The evaluator will use the ICO-OSCAR for Phacoemulsification form to evaluate performance during the surgery. Cases will be recorded on video and discussed thoroughly with the trainee. Subsequently, the trainer will assign tasks in the wet lab to be improved before the next day.

Module 3: Follow Up

After successfully completing Module 2, trainees will return to their institution. Outcomes of all performed phaco surgeries during the following six months will be submitted for review. If at the end of the six month probationary period, the trainee has achieved all milestones, they will be certified as a CBM Safe Phaco Surgeon.
Passing Standards

Module 1

1. Completion of the wet lab goals.
2. Final exam OSSCAR on simulated model (pig or artificial) and/or EyeSi simulator marks.

Module 2

1. 10 cases supervised.
2. 3 of last 5 cases meet consistency standards of 90 points or more on ICO-OSCAR.

Module 3

1. Comprehensive evaluation of surgical logbook including all surgeries during the 6 months following Module 2.
   b. This logbook must include, at minimum, the following:
      - Pre-operative visual acuity
      - Post-operative visual acuity
      - List of surgical complications
      - Secondary opacification cases
      - Post-operative refraction (4+ weeks)
      - If the post-operative visual acuity is equal or less than 20/200, the cause for poor visual outcome must be noted.
   c. Passing standards:
      - 80% of all cases filled out completely in logbook.
      - 80% of patients must have an uncorrected post-operative refraction of 20/60 (90% with correction).
      - Less than 30% of surgical complication rate over the last month of surgery.
      - Trend over time showing improvement.
      - Patient Satisfaction Surveys conducted with at least 25% of patients.

CBM Phaco Safe Surgeon Certification

Surgeons who successfully complete the three training modules will be eligible to receive the “CBM Phaco Safe Surgeon Certification.” This will be awarded to surgeons who in addition to the previously mentioned Module 3 passing standards have Patient Satisfaction Surveys for at least 25% of their patients.
Appendix

Resources

ICO-OSCAR
Behavioral and skill-based rubric for evaluators to objectively assess the trainee’s competence in performing a specific procedure. It also gives the trainee a tool to better gauge their own performance.
http://icoph.org/ico-oscar

Phaco Training Curriculum Selected Resources Mindmap
https://mm.tt/1106455559?t=OtjP0698u0

OSSCAR
Modified the ICO-OSCARs specially designed to assess and give feedback during simulation in the practice lab.

Safe Surgery Checklist

Inclusive Eye Health
Initiative:
Inclusion Made Easy Guide:

Online Courses
Cataract Surgery for Greenhorns Tom Oetting University of Iowa EyeRounds.org
https://webeeye.ophth.uiowa.edu/eyeforum/tutorials/cataract-oetting.htm
Orbis “Fundamentals in MSICS” Course
learn.cybersight.org
Coursera Course: Introduction to Cataract Surgery
https://www.coursera.org/learn/cataract-surgery

Video Libraries
EyeTube Cataract Channel
https://eyetube.net/cataract/
Brian Kim MD
https://www.youtube.com/user/DocBrianKimMD
Uday Devgan MD
https://cataractcoach.com/

Appendix

Reference Materials

American Society of Cataract and Refractive Surgery (ASCRS)
http://phaco.ascrs.org/

ICEH website for outcomes data
https://www.cehjournal.org/resources/monitoring-cataract-surgical-outcomes/

Teaching Improvement Form
https://docs.google.com/document/d/1SYr6xMAd7rOyw4RJKd4DA_A9VZoWMZROVtr2SWy6Kw/edit?usp=sharing

Operating Theater Preparation and Coaching Tool
https://docs.google.com/document/d/1KtRPlyCBYphOpxATnHPBxioeH7kMew1fo6CnLlojGuc/edit?usp=sharing

IAPB Essential List for Simulation-Based Learning (Cataract Surgery) PDF download

CBM EMR Cataract Program Guide
Multiple choice guidelines
https://docs.google.com/document/d/14xkwM1bH-AotRJvfnXy932ZK-HDMsPwQ_3di_dLwMk6hcY/edit

Ophthamalic Clinical Evaluation Exercise (OCEX) checklist
Knowledge Prerequisites

Based on the ICO Residency Curriculum [www.icoph.org/curricula.html]. The content has been prioritized to identify “Must Know” material. Two asterisks (**) are used to identify the “Must Know” items.

Cognitive Skills

1. Describe the lens anatomy, physiology, and accommodation.**
2. Identify the most common causes and types of cataract (e.g., anterior polar, cortical, nuclear sclerotic, posterior subcapsular, posterior polar, mature lenses such as the Morgagnian cataract).**
3. Describe the relationship between the lens and systemic disease (e.g., diabetes, myotonic dystrophy).**
4. List ocular conditions that are associated with cataract (e.g., uveitis, Wilson disease, ocular ischemia, ocular tumors, including treatment for tumors such as radiotherapy).**
5. List systemic and topical medicine that can cause pathologic changes in the lens (e.g., oral and topical corticosteroid use).**
6. List the basic history and examination steps for preoperative cataract and posterior capsular opacification evaluation.**
7. Identify and describe the principles and mechanisms of the following instruments in the evaluation of cataract:
   a. Lensometer
   b. Autorefractor
   c. Retinoscope
   d. Phoropter or loose lenses**
   e. Keratometer
   f. Slit-lamp biomicroscope**
   g. Glare and contrast testing devices
   h. Potential acuity meter
8. Describe the basics of IOL power estimation, including:
   a. Linear regression formulas (e.g., Sanders-Retzlaff-Kraff [SRK] and SRKII)**
   b. Theoretical eye model prediction formulas (e.g., SRKT, Holladay, and Haigis)**
9. Describe the methods to estimate axial eye length, including:
   a. Contact ultrasound**
   b. Immersion ultrasound**
   c. IOLMaster, LENSTAR, or equivalent, even if equipment is unavailable**
10. List the steps of routine intracapsular cataract extraction (ICCE), ECCE, SICS and phacoemulsification.**
11. Define the elementary refraction techniques to obtain best-corrected vision prior to considering cataract extraction.**
12. Describe the major etiologies of dislocated or subluxated lens (e.g., pseudoexfoliation syndrome, trauma, Marfan syndrome, homocystinuria, Weill-Marchesani syndrome, syphilis).**
13. Describe the following:
   a. Basic ophthalmic optics as related to cataract**
   b. Types of refractive error in cataract**
   c. Retinoscopy techniques for cataract**
   d. Subjective refraction techniques for cataract patients**
14. Describe methods to decrease postoperative infection, including presurgical preparation, intraoperative antibiotics, and postoperative antibiotic techniques.
15. Describe postoperative medications used for cataract surgery, including antibiotics, nonsteroidal anti-inflammatory drugs, and corticosteroid therapy.
16. Describe the risk factors for intraoperative floppy iris syndrome (IFIS) and intraoperative techniques to limit the risk of this syndrome (e.g., alpha blockers, use of rings, hooks).
17. Describe the special considerations when dealing with a unilateral cataract (trauma, history of uveitis, history of topical steroid use, past surgeries).
18. Describe the less common causes of lens abnormalities (e.g., spherophakia, lenticonus, ectopia lentis, coloboma).**
19. Describe the preoperative evaluation of the cataract patient, including:
   a. Phoropter or loose lenses**
   b. Systemic diseases of interest or relevance to cataract surgery**
   c. Systemic medication of relevance to cataract surgery (e.g., alpha 1 adrenergic blocking agent, blood thinning agents, corticosteroids)**
   d. Relationship of external and corneal diseases of relevance to cataract and cataract surgery (e.g., lid abnormalities, dry eye)**
   e. Management of uveitis prior to and following cataract surgery**
   f. Management of glaucoma prior to and following cataract surgery, including options for postoperative intraocular pressure (IOP) control**
20. Describe glare analysis testing for cataract surgery.**
21. Describe the use of A-scan and B-scan contact and immersion ultrasonography and optical coherence techniques in cataract surgery to measure axial eye length.**
22. Describe the types, indications, and techniques of anesthesia for cataract surgery (e.g. topical,**, general).
23. Describe indications, techniques, and complications of surgical procedures, including: ECCE, ICCE, and IOL placement.**
24. Describe the pathogenesis and strategies for prevention of posterior capsular opacification.**
25. Describe history and techniques of basic IOL implantation.
26. Correlate the level of visual acuity with the lens or capsular opacities.**
Cognitive Skills

27. **Describe the pathogenesis, clinical presentation, differential diagnosis, evaluation, clinical course, treatment, and outcome of the common complications of cataract and anterior segment surgery (e.g. intraoperative floppy iris syndrome, corneal edema, IOP elevation, hyphema, endophthalmitis, toxic anterior segment syndrome (TASS), cystoid macular edema (CME), retinal detachment, IOL dislocation, lens-induced glaucoma, uveitis).**

28. **Describe the indications for, principles of, and techniques of yttrium aluminium garnet (YAG) laser capsulotomy, and understand the proper timing of YAG laser capsulotomy.**

29. **Describe advanced IOL power calculation (e.g. after radial keratotomy [RK], myopic laser-assisted in situ keratomileusis [LASIK]/photorefractive keratectomy [PRK], hyperopic LASIK/PRK).**

30. **Recognize and treat common postoperative complications of cataract surgery (e.g. endophthalmitis, toxic anterior segment syndrome, elevated IOP, CME, wound leak, uveitis, capsular block syndrome).**

31. **Define the more complex indications for cataract surgery (e.g. better view of posterior segment, lens-induced glaucoma).**

32. **Describe techniques to diagnose and operate on patients with posterior polar cataract.**

33. **Describe the preoperative preparations for surgery and special intraoperative considerations for patients with uveitis.**

34. **Describe the principles, indications for, mechanics of, and performance of contact and immersion A-scan ultrasonography and calculation of IOL power.**

35. **Describe the performance of and describe the complications of more advanced anterior segment surgery (e.g. pseudoxefoliation, small pupils, intraoperative floppy iris syndrome, mature cataract, hard nucleus, posttraumatic, zonular dehiscence, cataract surgery after pars plana vitrectomy, short eye, corneal endothelial diseases).**

36. **Describe the indications for, techniques of, and complications of cataract extraction in the context of the subspecialty disciplines of the following:**
   a. **Glucoma (e.g. combined cataract and glaucoma procedures, glaucoma in cataractous eyes, cataract surgery in patients with prior glaucoma surgery)**
   b. **Retina (e.g. cataract surgery in patients with scleral buckles or prior vitrectomy)**
   c. **Cornea (e.g. cataract extraction in patients with corneal opacities) and the use of fiber optic for better visualization**
   d. **Ophthalmic plastic surgery (e.g. ptosis following cataract surgery)**
   e. **Refractive surgery (e.g. cataract surgery in eyes that have undergone refractive surgery)**

37. **List indications for and techniques of intracapsular surgery (e.g. rare cases may require this procedure, or patients may have had the procedure performed previously).**

Technical/Surgical Skills

38. **Describe the evaluation and management of common and uncommon causes of postoperative endophthalmitis and TASS.**

39. **Describe the government and hospital regulations that apply to cataract surgery.**

40. **Describe the use of corneal topography and wavefront analysis to help select the best type of IOL for a patient especially following keratorefractive surgery.**
III. Wet Lab Curriculum

Introduction

The following material is a practice guideline that can be used to develop microsurgical skills. It was prepared with the experienced manual cataract surgery surgeon in mind, but can be used by surgeons at any level to attain, improve and maintain surgical skills.

This curriculum follows the three-stage theory of motor skill acquisition model developed by Fitts and Posner. This model consists of three stages: cognitive, integrative and autonomous. The model has served as base for shifting the initial learning curve of basic skills in the first two stages from the patient to different types of simulation.

In order to develop this curriculum, the ICO-OSCAR evaluation rubric was used to identify learning objectives, and these were later developed into 5 practices that focus on the construction and care of incisions and wounds, the necessary movements and vectors to create a continuous circular capsulorhexis, the basics of phacodynamics, phaco machines and how they affect cataract surgery and finally the surgeon’s approach to prevent and manage surgical complications.

For experienced surgeons, a week of 8 to 12 hr practice days should suffice to achieve a passing standard on the ICO-OSCAR evaluation (as described for module 1 in the Phaco Training Center Curriculum). Having said that, we suggest not moving forward until you have completed all practice steps and evaluation criteria.

Each of the five sessions has four sections that can be used:
Topics, Materials, Self-Study Materials and Procedure.
Topics should be communicated previously to the trainee for self-study.
Materials should be readily at hand at the beginning of each day.
Self-study materials should be used to discuss a 1 hr. discussion between the trainee and trainer to ensure comprehension of all learning objectives.
Finally, the Procedure explains how to conduct the session.

Please feel free to adapt the course as needed for each trainee and continue to add your own resources to the manual.
Wet Lab Sessions

1. Incisions and Wounds
2. Intraocular Maneuvers
3. Capsulorhexis
4. Phacodynamics and Phaco
5. Complications

Incisions and Wounds

1. Topics:
   a. Phaco Instrument Tray
   b. Entering and Exiting the Eye for each instrument
   c. Wound Closure
      I. Hydration
      II. Suturing
      III. Checking Security
   d. Incision & Paracentesis (Types of wounds, Position of wounds, Keeping the eye neutral)
   e. Operating Microscope and Ergonomics
   f. Optional: EyeSi Modules A and B (1 hr.)
      I. Anterior Chamber Navigation
      II. Intracapsular Navigation
      III. Bimanual Navigation
      IV. Instruments
      V. Navigation and Instruments
      VI. Capsulorhexis
      VII. Intraocular Tissue
      VIII. Stop and Chop
      IX. IOL Insertion

2. Materials:
   a. Phaco instruments
   b. Practice Eyes (5 Animal, 2 Artificial per participant, plus 1 Animal Eye for demonstrations)
   c. Microscope with pedals
   d. Eye drapes, artificial head, lubricant gel and other basic wet lab material, etc.
   e. Suture sponge
   f. Blades (Use blades of the same type as will be used during live surgery, 2.2 Slit, 15°, etc.)

3. Self-Study Materials:
   b. https://umichumhs.qualtrics.com/SE/?SID=SV_950AXxzkF3KpAAa0
   e. https://jamanetwork.com/journals/jamaophthalmology/fullarticle/1484710
   f. https://www.cehjournal.org/article/understanding-and-caring-for-an-operating-microscope/
   g. https://www.cehjournal.org/article/understanding-your-operating-microscopes-assistant-scope-and-beamsplitter/
   h. Basic Principles of Ophthalmic Surgery (AAO) Chapters 6, 7, 8, 9, 12, 13, 15, 17
   i. Assorted handouts

4. Procedure:
   a. Ask the participant to sit at the microscope and adjust:
      I. Pupillary Distance
      II. Appropriate Posture and Ergonomics
      III. Patient and hands positioning when operating at 12 O’Clock
      IV. Patient and hands positioning when operating from temporal side.
      V. Focused plane without pedal use.
         1. Demonstrate the use of microscope pedal
         2. Demonstrate appropriate magnification for phaco surgery.
            When appropriate, how magnification changes for specific steps.
         3. Demonstrate appropriate handling of each Phaco instrument in tray
      4. How and where to grab each instrument.
      5. Insert and extract each instrument from demonstration eye.
      6. Discuss appropriate wound closure
      7. Perform 5 sutures under supervision.
      8. Participant will be required to complete 50 more sutures as a self-guided exercise. Sutures must be adequate.
      9. Discuss appropriate wound (main incision and paracentesis) construction and placement.
      10. Discuss the refractive effect of wound placement.
      11. Perform 10 Paracentesis (1 eye)
      12. Perform 12 Clear Corneal Incisions (3 eyes)
      13. Perform 4 Sclerocorneal Incisions (1 eye)
      14. Final evaluation is to perform 5 sutures in PK Artificial eye.
Wet Lab Sessions

Intraocular Maneuvers

1. Topics:
   a. Viscoelastic
   b. Hydrodissection
   c. I/A
   d. IOL insertion, rotation and final position
   e. Phaco machine Setup
   f. Optional: EyeSi Module C (2 hrs.)

I. Capsulorhexis
II. Divide and Conquer
III. Chopping
IV. I/A
V. Toric IOLs

2. Materials:
   a. Dispersive and Cohesive OVDs
   b. Trypan Blue or other stain for OVDs
   c. Simcoe I/A
   d. Phaco machine with Co-axial and bimanual I/A probes)
   e. Assortment of IOL’s, cartridges, and insertors
   f. Lens-less Eyes for IOL insertion (Animal? Artificial?)
   g. Operating Microscope
   h. Video recording equipment (Phone camera)

3. Self-Study Materials:

4. Procedure:
   a. Discuss OVDs and their main characteristics
   b. Discuss Tri-Soft Shell Technique and demonstrate principles with dyed OVDs
   c. Demonstrate IOL preparation and mounting (each type, until done correctly and independently) *Optional, have the participant prepare a video that shows how to mount an IOL in their own language. It will be used with their own nursing team.
   d. Demonstrate phaco machine setup.
   e. Have participant setup the phaco machine
   f. Demonstrate coaxial and bimanual I/A techniques.

Capsulorrhexis

1. Topics:
   a. Commencement of flap & follow-through
   b. Formation and Circular completion
   c. Little Rescue Technique
   d. Intro Phacodynamics
   e. Optional: Kitaro dry-lab kit, EyeSi Capsulorrhexis Course (Custom built with all the Capsulorrhexis exercises) (2.5 hrs. Divided in 50 min. Sessions)

2. Materials:
   a. Paracentesis blade
   b. 0.12 forceps
   c. Viscoelastic
   d. Keratome blade
   e. Cystotome needle
   f. Utrata forceps
   g. 3 cc syringe (for injection of air bubble if trypan blue available)
   h. AC cannula (for injection of air bubble if trypan blue available)
   i. Trypan blue if available
   j. Kitaro Drylab/ Tomatoes/ Grapes/ Cellophane paper, Aluminum Foil
   k. Operating Microscope
   l. Video recording equipment (Phone camera)
Wet Lab Sessions

3. Self-Study Materials:
   a. [Link to Cataract Preparation Guides]
   b. [Link to Artificial Eye Wetlab]
   c. [Link to Cataract Tips]
   d. [Link to Phaco Fun Do-You-Know-Your-Machine Webinar]
   e. [Link to Phaco Fundamentals How Well Do You Know Your Machine Optimizing Settings Routine and Complex]

4. Procedure:
   a. Discuss CCC technique and instrument vector changes.
   b. Discuss Little Rescue Technique
   c. Perform as many CCC as possible in a one-hour session. Using a variety of instruments, flap formation placement, caxis direction.
   d. Evaluate CCCs for size and roundness.
   e. Test-case video can also be used for evaluation.

Phacodynamics and Phaco

1. Topics:
   a. Phaco pedal use
   b. Nucleus
      i. Sculpting
      ii. Quadrant Engagement
      iii. Quadrant Removal
   c. Optional: EyeSi Module C and D (4 hrs. divided in 2 hr. sessions.)
      i. EyeSi Module C (2-4 hrs.)
         1. Capsulorhexis
         2. Divide and Conquer
         3. Chopping
         4. I/A
      ii. EyeSi Module D (2-4 hr)
         1. Toric IOLs
         2. Capsulorhexis errant tear
         3. Weak Zonules and Capsules
         4. White Cataracts
         5. Capsular Plaques
         6. Varying Cases
   d. Handouts

2. Materials:
   a. Operating Microscope
   b. Phaco Machine
   c. Phaco instruments according to technique
   d. 5 Practice Eyes (animal or artificial) and 2 Demo Eyes
   e. Microwave Oven
   f. Formalin Solution
   g. Wet Gauze
   h. Small microwave-resistant container
   i. Soap bar or play-dough

3. Self-Study Materials:
   a. [Link to Cataract Preparation Guides]
   b. [Link to Continuous Curvilinear Capsulorhexis On]
   c. [Link to Cataract Tips from the Teachers November 2011]
   d. [Link to D. Rex Hamilton Capsulorhexis Pearls]
   e. [Link to Phaco Fundamentals How Well Do You Know Your Machine Optimizing Settings Routine and Complex]

4. Procedure:
   a. Discuss the effects of Ultrasound energy on ocular tissue.
   b. Use phaco machine to teach pedal position and appropriate use.
      i. The participant should:
         1. Keep irrigation consistently.
         2. Learn to listen to phaco machine and be aware of current position.
            a. Consider using fixed power at first.
         5. Set appropriate phaco settings for each surgical step.
         6. Use position 2 to engage nuclei and listen for occlusion.
         7. Disengage position 3 when the phaco tip is free.
   c. Using Kitaro:
      i. Follow instructions for maneuvers using mock instruments to illustrate appropriate placing of instruments and vectors.
      ii. Complete artificial eye wetlab.
Wet Lab Sessions

d. Using pig eyes and soap bar or play-dough:
   I. Practice Quadrant separation with play-dough or soap bar.
   1. Illustrate appropriate placing of instruments and vectors.
   II. Prepare Cataract according to instructions found in Self-Study Materials.
   III. Perform cataract surgery.

e. Using EyeSi:

f. Discuss expected differences between simulated model and human eye.
   (e.g. capsular tension in pig eye vs. human eye, lack of tactile feedback on the EyeSi).

Complications

1. Topics:
   a. The leaking Wound
   b. The prolapsing Iris
   c. Descemet’s
   d. Corneal Edema
   e. Posterior Capsule Rupture
   f. Anterior Vitrectomy
   g. Dropped Lens
   h. Optional: EyeSi Complications Workshop.
      I. Recently developed.

2. Materials:
   a. Operating Microscope
   b. Phaco Machine

3. Self-Study Materials:
   d. https://eyetube.net/portals/unplanned-vitrectomy/m/index.asp#home

4. Procedure:
   a. Discuss how to prevent and handle defective wounds, prolapsing iris, Descemet’s detachment and corneal edema.
   b. Discuss posterior capsule rupture and approach by surgical timing and vitreous presence.
   c. Discuss appropriate use of triamcinolone and vitreous staining agents
   d. Discuss manual vitrectomy technique, disadvantages and end points.
   e. Discuss appropriate automated anterior vitrectomy settings, technique and end points.
   f. Posterior Capsule Rupture with Vitreous loss can be simulated by injecting egg whites into the posterior segment.
**Wet Lab Curriculum Appendix**

Steps of Phacoemulsification included in this wet lab curriculum. Obtained from ICO-OSCAR for Phacoemulsification.

- Incision & Paracentesis: Formation & Technique
- Viscoelastic: Appropriate Use and Safe Insertion
- Capsulorrhexis: Commencement of Flap & follow-through.
- Capsulorrhexis: Formation and Circular Completion
- Hydrodissection: Visible Fluid Wave and Free Nuclear Rotation
- Phacoemulsification Probe and Second Instrument: Insertion Into Eye
- Phacoemulsification Probe and Second Instrument: Effective Use and Stability
- Nucleus: Sculpting or Primary Chop
- Nucleus: Rotation and Manipulation
- Nucleus: Cracking or Chopping With Safe Phacoemulsification of Segments
- Irrigation and Aspiration Technique with Adequate Removal of Cortex
- Lens Insertion, Rotation, and Final Position of Intraocular Lens
- Wound Closure (Including Suturing, Hydration, and Checking Security as Required)

**Tentative Schedule**

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.00 - 9:00 am</td>
<td>Lectures</td>
<td>Incisions and wounds</td>
<td>Viscoelastic Devices</td>
<td>Capsulorrhexis</td>
<td>Phacodynamics</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>9:00 - 12:30 pm</td>
<td>Incisions, Suturing Workshop</td>
<td>OVDs Demonstration</td>
<td>Capsulorrhexis Workshop</td>
<td>Divide and Conquer Workshop</td>
<td>Anterior Vitrectomy Workshop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phaco machine setup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30 - 2:00 pm</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>2:00 - 5.00 pm</td>
<td>Independent practice, sutures</td>
<td>Independent practice, setup, sutures</td>
<td>Independent practice, capsulorrhexis, phaco</td>
<td>Independent practice, D&amp;C</td>
<td>Independent practice, putting it all together.</td>
</tr>
</tbody>
</table>
IV. Cataract Quality Assurance Questionnaire

The following questionnaire has been adapted from the Quality Standards for Cataract Services of the Royal College of Ophthalmologists (https://www.rcophth.ac.uk/standards-publications-research/quality-and-safety/quality-standards/). It is meant to be used as a self-study questionnaire for assuring high quality Cataract surgical services. It is not a comprehensive questionnaire, instead, it focuses on the processes that if followed, can improve the safety and quality of care for all cataract surgery patients at your institution. Most cataract services will not answer YES to all questions, and that is expected, as it will point out areas for improvement.

Self Study Questions

1. Care is compliant with national/local cataract surgery guidelines. Staff are aware of and follow guidelines, or use local cataract care guidelines, based on the best available evidence:
   - Yes
   - No
   Evidence / comments:

2. Pre- and post-surgical cataract patients are managed by appropriately trained clinical staff, or trainees under the supervision of fully trained staff, and appropriate protocols are adhered to:
   - Yes
   - No

2a. Care is compliant with national/local cataract surgery guidelines. Staff are aware of and follow guidelines, or use local cataract care guidelines, based on the best available evidence:
   - Yes
   - No

3. Cataract patients are evaluated preoperatively for risk of posterior capsule rupture. (e.g. age, deep orbits, PSX, pupil dilation, previous vitrectomy, phacodonesis, etc.)
   *Refer to: Br J Ophthalmol 2004; 88:1242–6
   - Yes
   - No

4. Cataract relevant imaging and diagnostic instruments are available for use when appropriate:

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser interferometry (optical) biometry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A scan ultrasound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corneal topography and keratometry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autorefractor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retinal OCT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Evidence / comments:

5. Instruments are suitably calibrated and adjusted:
   - Biometry equipment is calibrated regularly in accordance with manufacturer’s instructions.
     - Yes
     - No
   - Refractive outcomes are utilized to adjust biometric A constants for IOL calculation.
     - Yes
     - No

   Evidence / comments:
IV. Cataract Quality Assurance Questionnaire

6. A cataract surgery or ophthalmic specific WHO checklist is used.

- Yes
- No

Evidence / comments:

7. Lost nuclear fragment into vitreous cavity management.

<table>
<thead>
<tr>
<th>The unit has clearly documented systems for:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior/Posterior Vitrectomy machine and consumables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referral to a specialized vitreo-retinal surgeon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring rates of dropped nucleus by surgeon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evidence / comments:

8. Endophthalmitis management.

<table>
<thead>
<tr>
<th>The unit has clearly documented systems for:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>The prevention of endophthalmitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring rates of endophthalmitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management of endophthalmitis following cataract surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification and management of a possible cluster of cases of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>endophthalmitis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evidence / comments:

9. Patients have clear written information and a clear, agreed upon pathway for seeking advice and care for postoperative concerns, particularly for possible serious complications (such as retinal detachment, raised intraocular pressure and endophthalmitis) both in and out of hours:

- Yes
- No

Evidence / comments:

10. Outcomes of cataract surgery are audited, using recognized standards, and used for quality assurance and to improve services. Outcome audits should be case mix adjusted. If necessary, postoperative data should be obtained from community optometrists:

- Yes
- No

<table>
<thead>
<tr>
<th>Issue identified</th>
<th>Action to be taken</th>
<th>Who will lead action</th>
<th>Date for completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR rates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual acuity results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endophthalmitis</td>
<td></td>
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</tr>
</tbody>
</table>

Action plan
V. Pre-Operative Risk Assessment

The following form summarizes salient facts about patients scheduled for cataract surgery and provides a tool to assess the risk of posterior capsule rupture during the surgery.

PATIENT’S DATA

DATE: _______________________
____________/____________/____________

NAME: ______________________________________ Record No: ________________

AGE:__________ SEX: □ M □ F PROVENANCE: ________________________________

PATHOLOGICAL PERSONAL HISTORY

□ DM □ HT □ STROKE □ MYOCARDIAL INFARCTION □ ANTICOAGULANT □

□ ALLERGIES □ ASTHMA □ PROSTATIC HYPERTROPHY □

(DRUGS, OTHER DISEASES, etc.)

OCULAR HISTORY: □ GLAUCOMA □ RETINAL □ OCULAR TRAUMA □

(NOTE: R EYE L EYE) ONLY EYE □

(INFORMED CONSENT: YES □ NO □

EYE SCHEDULED

<table>
<thead>
<tr>
<th>EYE SCHEDULED</th>
<th>RIGHT EYE</th>
<th>LEFT EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISUAL ACUITY</td>
<td>LP □ HM □ CF □</td>
<td>LP □ HM □ CF □</td>
</tr>
<tr>
<td>KERATOMETRY</td>
<td>K1 x _______</td>
<td>K2 x _______</td>
</tr>
<tr>
<td>AXIAL LENGTH</td>
<td>_______mm</td>
<td>_______mm</td>
</tr>
<tr>
<td>ANESTHESIA</td>
<td>LOCAL □</td>
<td>GENERAL □</td>
</tr>
</tbody>
</table>

MYDRIASIS ³

<table>
<thead>
<tr>
<th>mm (Positive if &lt;6 mm) es</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSEUDOEXFOLIATION ³</td>
</tr>
<tr>
<td>PHACODONESIS ³</td>
</tr>
<tr>
<td>CATALRACCT N OPACITY N COLOR</td>
</tr>
<tr>
<td>1 2 3 4 5 1 2 3 4 5 1 2 3 4 5</td>
</tr>
</tbody>
</table>

TOTAL RISK SCORE ___________ pts

* Corneal: Prominent Senile Arc, corneal scar. ** Consider in the operating room.

Exam criteria

IOP mmHg

FUNDUS C / D: _____ / 10

RETINA: APPLIED: N/A:

Specular Microscopy

YES -> NORMAL / ALTERED NO

Ultrasound B-SCAN Posterior C. IOL Constant:

IOL Calculation Anterior C. IOL Constant:

Plan: PHACO □

Next Step

Or Ready □

Pending: STUDIES □ CONSENT □ CLINICAL □ ASSESSMENT □

OCULAR □ CLINICAL EVALUATION □
Presurgical Summary Sheet Cataract Surgery

Glossary

Patient Data
Sex: M / F - male or female

Pathological personal history
DM- diabetes mellitus
TM- tympanic membrane

Visual acuity
LP- light perception
HM- hand motion
CF- counting fingers

Risk Assessment Criteria
PPV- Pars Plana Vitrectomy

Exam Criteria
IOP- Intraocular Pressure
Fundus c/d - cup to disc ratio

IOL calculation
IOL- intraocular lens
Constant- intraocular lens power calculation

Plan
OR Ready- operation ready or okay to proceed
VI. Program Evaluations by Trainee

We are very interested in your opinion of the training that you have undergone recently and would like to use your feedback to improve future workshops.

Please take a few minutes to answer the following questions.

• Surgical Preceptor Assessment

• Exit Evaluation Part 1: Conclusion of Module 1

• Exit Evaluation Part 2: Conclusion of Module 2

Surgical Preceptor Assessment

Operating Theater Preparation & Coaching Tool for Instructors

Surgeon:

Assigned Faculty Instructor/Supervising Consultant:

Date: __________________________ Case Number ________________ #

Pre-Operation Planning & Discussion

1. Case Chart Review

<table>
<thead>
<tr>
<th>Did not have time to review case with faculty before starting procedure.</th>
<th>Needed more time with case review with faculty but did look at either pre-op measurements or patient clinic notes with faculty.</th>
<th>Clearly reviewed ALL pre-op measurements, patient pre-operative examination, and together had a surgical plan.</th>
<th>In addition to complete chart review, I was clear on the instructor’s expectations and the key learning objectives in this case.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. Time Out/Surgical Safety Checklist- With faculty present, we timed out the case for patient and team members identification, surgical site, IOL type and Power (if applicable), and any other relevant issues or concerns.

Recording

3. Was it possible to record the surgical procedure (with consent when appropriate)?

| No | Yes |
### Intra-Operative Planning & Discussion

4. Were you able to review the video recording with a faculty member or alone?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
</table>

5. Communication

<table>
<thead>
<tr>
<th></th>
<th>Limited communication during case that did cover all of my needs</th>
<th>Focused communication which supported my surgery at critical times throughout the case whenever necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

6. Guidance & Anticipation

<table>
<thead>
<tr>
<th></th>
<th>More reactive communication to my questions, but helpful suggestions once I asked</th>
<th>Highly engaged throughout the case and pro-actively helped me plan for the next step before I asked or had a question</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

7. During the case, the assigned faculty took over for at least part of the case

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

7a. If yes, was it done at the appropriate time?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

7b. If yes, then did the instructor let you resume the case at the appropriate time?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

7c. If no, please explain why: ____________________________

### Post-Operation Planning & Discussion

8. Case Review

<table>
<thead>
<tr>
<th></th>
<th>There was not time for case review with faculty.</th>
<th>Not all steps done by the resident were reviewed.</th>
<th>All steps of the case were reviewed and discussed with faculty.</th>
<th>In addition to the entire case review, faculty also completed ICO-OSCAR score with me.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9. Detailed Discussion of Key Learning and Development Plan

<table>
<thead>
<tr>
<th></th>
<th>There was not time for detailed review of case, participant progress, or development plan with faculty.</th>
<th>We had some discussion (&lt; 5 minutes) about the key point or teaching from the case.</th>
<th>Detailed discussion (&gt;5 minutes) about a key focal point from the case including the use of other resources including drawings, diagrams, or other videos.</th>
<th>In addition to detailed discussion, we clearly discussed my development plan and their expectations (or suggested focus) for my next case.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Score: 0-3 (Not met), 4-5 (Met)
VI. Program Evaluations by Trainee
Exit Evaluations

Exit Evaluation: Module 1

1. How likely is it that you would recommend this course to a friend or colleague?
   [10–0 EXTREMELY LIKELY to NOT AT ALL LIKELY]

2. Overall, how satisfied or dissatisfied are you with the cataract course?
   Very satisfied
   Somewhat satisfied
   Neither satisfied nor dissatisfied
   Somewhat dissatisfied
   Very dissatisfied

3. Which of the following words would you use to describe the simulation training?
   Select all that apply.
   - Realistic feel (fidelity)
   - High quality
   - Useful
   - Unique
   - Good value for money
   - Impractical
   - Unrealistic: don’t feel real
   - Poor quality
   - Unreliable
   - Other (please specify) ___________________________

4. How well does the simulation training meet your needs?
   Extremely well
   Very well
   Somewhat well
   Not so well
   Not at all well

Exit Evaluation: Module 1

5. How would you rate the quality of artificial eyes?
   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

6. How would you rate the quality of the suturing practical?
   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

7. How would you rate the quality of wound construction practical?
   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

8. How would you rate the quality of pre-operative assessment discussion?
   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

9. How would you rate the quality of pre-operative assessment course discussion?
   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality
Exit Evaluation: Module 1

10. How would you rate the quality of capsulotomy practical?

   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

11. How would you rate the quality of the complications talk?

   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

12. How would you rate the quality of endophthalmitis discussion?

   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

13. How would you rate the quality of cataract surgery practicals with the artificial eyes?

   Very high quality
   High quality
   Neither high nor low quality
   Low quality
   Very low quality

14. How would you rate the usefulness of cataract surgery practicals with the artificial eyes?

   Very useful
   Useful
   Neutral
   Not very useful
   Useless

15. Any comments about the cataract surgery practical sessions with the artificial eyes?

   [Open answer]

16. If you have the chance, how likely are you to attend any of our courses again?

   Extremely likely
   Very likely
   Somewhat likely
   Not so likely
   Not at all likely

17. Are there any aspects of the course that you would NOT include in future courses?

   [Open answer]

18. Are there any aspects of cataract training that were not available, that you would want to include in future courses?

   [Open answer]

19. Any further comments about cataract training?

   [Open answer]

20. Do you have any other comments, questions, or concerns?

   [Open answer]
VI. Program Evaluations by Trainee
Exit Evaluations

Exit Evaluation: Module 2

1. How would you rate the quality of pre-operative assessment discussion?
   - Very high quality
   - High quality
   - Neither high nor low quality
   - Low quality
   - Very low quality

2. How would you rate the quality of post-operative care talk?
   - Very high quality
   - High quality
   - Neither high nor low quality
   - Low quality
   - Very low quality

Considering all cases that were performed during Module 2 (Live Surgery), please answer the following:

Pre-Operation Planning & Discussion

3. Overall, how would you rate the pre-operative case chart reviews?
   - Very useful
   - Useful
   - Neutral
   - Not very useful
   - Useless

4. Overall, how would you rate the Time Out / Surgical Safety Checklist interactions?
   - Very useful
   - Useful
   - Neutral
   - Not very useful
   - Useless

Exit Evaluation: Module 2
Recording

5. Overall, how would you rate the quality of recordings?
   - Very high quality
   - High quality
   - Neither high nor low quality
   - Low quality
   - Very low quality

6. Overall, how would you rate the usefulness of the video recording reviews?
   - Very useful
   - Useful
   - Neutral
   - Not very useful
   - Useless

7. Did you find the recording system to be user-friendly?
   - Very easy to use
   - Easy to use
   - Neither easy nor difficult
   - Difficult to use
   - Very difficult to use

8. Did you find the video editing platform (hardware+software) to be user-friendly?
   - Very easy to use
   - Easy to use
   - Neither easy nor difficult
   - Difficult to use
   - Very difficult to use
Exit Evaluation: Module 2

Intra-Operative Planning & Discussion

9. Overall, how would you rate the surgical instructor’s communication skills?
   - Very Good
   - Good
   - Regular
   - Poor
   - Very Poor

10. Overall, how would you rate the timing of the surgical instructor’s interventions and complication prevention measures?
    - Very Good
    - Good
    - Regular
    - Poor
    - Very Poor

11. Overall, how would you rate the usefulness of the surgical instructor’s interventions and complication prevention measures?
    - Very useful
    - Useful
    - Neutral
    - Not useful
    - Useless

Post-Operation Planning & Discussion

12. Overall, did you find the case reviews and post-operative discussions to be useful?
    - Very useful
    - Useful
    - Neutral
    - Not useful
    - Useless

Exit Evaluation: Module 2

13. Overall, did you find the detailed discussion of key learning and development plans to be useful?
    - Very useful
    - Useful
    - Neutral
    - Not useful
    - Useless

14. How many days did you spend in Module 2?

________________________________________________________________________

15. How many surgeries were you able to perform with assistance?
    [Open answer]

________________________________________________________________________

16. How many surgeries were you able to perform without assistance? (Although minor interventions occurred, you performed all steps of the surgery.)
    [Open answer]

________________________________________________________________________

17. Did you find the number of surgeries for Module 2 to be adequate for your learning level?
    - I needed more surgeries to accomplish my development objectives.
    - I had enough surgeries to accomplish my development objectives.
    - I could have accomplished my development objectives with fewer surgeries.
Exit Evaluation: Module 2

18. If you have the chance, how likely are you to attend any of our courses again?
   Extremely likely
   Very likely
   Somewhat likely
   Not so likely
   Not at all likely

19. Are there any aspects of the course that you would not include in future courses?
   [Open answer]

________________________________________________________________________
________________________________________________________________________

20. Are there any aspects of cataract training that were not available, that you would want to include in future courses?
   [Open answer]

________________________________________________________________________
________________________________________________________________________

21. Any further comments about cataract training?
   [Open answer]

________________________________________________________________________
________________________________________________________________________

22. Do you have any other comments, questions, or concerns?
   [Open answer]

________________________________________________________________________
________________________________________________________________________

Appreciation

Appreciation is extended to the following for their time and work to develop this curriculum:

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