



The Orbis MSICS Wet Laboratory Curriculum

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The Orbis Wet Laboratory Curriculum

This curriculum is designed to provide wet lab training in Manual Small Incision Cataract Surgery (MSICS) for residents and junior ophthalmologists.

MSICS 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 curriculum covers 10 sessions as follows:

1. Wet Lab Session One: Introduction to MSICS
2. Wet Lab Session Two: Wound Construction
3. Wet Lab Session Three: Paracentesis and Viscoelastic/ Anterior Chamber Maintainer
4. Wet Lab Session Four: Capsulorrhexis, hydrodissection and nucleus extraction
5. Wet Lab Session Five: Intraocular Lens
6. Wet Lab Session Six: Suturing and wound closure
7. Wet Lab Session Seven: Pulling it all together 1 : MSICS Start to Finish
8. Wet Lab Session Eight: Pulling it all together 2: MSICS Start to Finish
9. Wet Lab Session Nine: Managing Complications 1: Poor wound construction and anterior Chamber instability
10. Wet Lab Session Ten (Optional): Managing Complications 2: Vitreous Loss and Capsular Tears

Overall objective of the wet lab program:

By the completion of all nine sessions, residents or junior consultants will be able:

1. Explain and demonstrate how to use the surgical microscope, including use of the foot pedal
2. Identifying key microsurgical instruments and supplies, and demonstrate their use
3. Describe the "time-out" procedure performed in the OR prior to cataract surgery.
4. Competent in simulated MSIC surgery, as assessed by the Ophthalmic Simulated Surgical Competency Assessment Rubric (OSSCAR) adapted from internationally recognized ICO-OSCAR (see appendix A)

Course Application and Duration:

Training Ratios:

Ideally, the course will have one trainee per wet lab station per session, where a wet lab station includes a surgical microscope and necessary microsurgical instruments. For example, if the host facility has a total of four wet lab stations, the ideal ratio of trainees to trainers will be 4:1 (or 2 trainers, if available). Each session is approximately 4-6 hours, depending on the content and the size of the group.

Criteria for Trainer or Mentor:

- ✓ Trainer A is at minimum a fellow, but ideally a staff ophthalmologist with MSICS experience, who is involved in a residency program and can easily articulate technical maneuvers to beginner ophthalmologists.
- ✓ Experience performing MSICS and comfortable with all steps
- ✓ Experience teaching residents and beginners who may have little to no surgical experience
- ✓ Able to provide interactive lectures and hands-on instruction in the wet lab
- ✓ Ability to do simple troubleshooting with wet lab equipment (e.g. microscopes)
- ✓ Flexible and a problem-solver if resources or infrastructure fails (e.g. back-up plans for teaching and practicing if the generator fails and there is a black out).

Wet Lab Sessions

Wet Lab Session One: Introduction to MSICS

Objectives:

- Explain and demonstrate how to use the surgical microscope, including use of the foot pedal
- Identifying key microsurgical instruments and supplies, and explain their use
- Describe the "time-out" procedure performed in the OR prior to cataract surgery.
- Describe all information on an IOL calculation sheet (see appendix B)
- Describe all steps of MSICS cataract surgery (figure One)

Lecture I: Surgical Microscope Basics and MSICS Surgical Instruments

By the completion of the lecture, trainees should be able to:

- Place themselves in a comfortable and ergonomic position at the surgical microscope
- Know their pupillary distance
- Know how to focus, zoom, X-Y, and center their surgical microscopes manually and with the foot pedals
- Able to name and visually identify the surgical instruments needed for MSICS and describe their use

Lecture II: Overview of MSICS Steps and Detailed Technique/tips for Conjunctival Peritomy and Scleral Tunnels

By the completion of the lecture, trainees should be able to:

- Name and describe all steps of the MSICS procedure
- Describe the instruments needed, location, and preferred technique for conjunctival peritomy and creation of the scleral tunnel

- Describe how to prevent and manage poor hemostasis, premature entry, shallow wounds, and button-holes

Lecture III: Biometry and IOL Selection

By the completion of the lecture, trainees should be able to:

- Understand the basic lens formulas and understand the theory behind them
- Understand and perform A scans and keratometry by multiple methods
- Troubleshoot and perform quality control with IOL selection (e.g. comparing the axial length of both eyes, checking the target refraction, checking for appropriate lens formula)
- Describe different types of lens choices (acrylic, PMMA, foldable, one piece, three piece, anterior chamber IOLs) and when to use each type
- Identify the A constant and how to account for this in IOL selection

Wet Lab: Learning MSICS Step by Step

- Preparation of the Eye
 - Use of microscope
 - Proper betadine
 - Lid speculum
 - Traction suture
- Wound construction
 - Conjunctival incision
 - Cauterizing the epi-sclera
 - Scleral tunnel formation
- Paracentesis & Viscoelastic
- Anterior capsulorhexis, 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)
- 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

Figure one: Steps of MSICS

Wet Lab Session Two: Wound Construction

Objectives:

1. Explain and describe preparation of the Eye
 - a. Proper betadine
 - b. Lid speculum
 - c. Traction suture
2. Demonstrate wound construction, including:
 - a. Completion of 4-8 conjunctival peritomies (4 per pig eye)
 - b. Completion of 4-8 scleral tunnels
 - c. Entrance of 4-8 wounds into the anterior chamber with the keratome through the scleral tunnel

Wet Lab Session Three: Paracentesis and Viscoelastic or Anterior Chamber Maintainer

The objective depends on the hospital's preferred technique. It's also possible to train in both if there is demand.

Objectives:

1. Completion of at least 4 paracenteses
2. Completion of filling the anterior chamber with viscoelastic (1)
3. Practice entering and exiting the eye with cannulas and the sinskey hook until one is able to do so without difficulty (suggestion 20 times)
4. Practice setting up anterior chamber maintainer and placing in the eye
5. Completion of 4 conjunctival peritomies (4 per practice eye)
6. Completion of 4 scleral tunnels
7. Entrance of 4 wounds into the anterior chamber with the keratome through the scleral tunnel

Lecture III: Detailed Technique/Tips for Paracentesis, Entering the Main Wound, Viscoelastic Insertion, and Anterior Chamber Maintainers

By the completion of the lecture, trainees should be able to:

- Describe instruments needed, location, and preferred technique for creation of the paracentesis, entrance of the main wound, viscoelastic insertion, and use of anterior chamber maintainers
- Be aware of the importance of the angle and location of the paracentesis
- Describe different types of viscoelastic (cohesive, dispersive, dual) and when they should be used
- Be aware of the Blumenthal technique and optional use of an anterior chamber maintainer

Wet Lab Session Four: Capsulorrhexis, hydrodissection and nucleus extraction

Objectives:

1. To perform at least 10 capsulorrhexis
 - a. Can opener method;

- b. Continuous Curvilinear Capsulorrhexis (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)
- c. *Recommend continuous curvilinear on artificial eyes and can opener on pig eyes*
2. Demonstrate ability to perform hydrodissection
3. Demonstrate ability to perform expression of the lens out of the capsular bag
4. Extracapsular technique: expression of lens out of the eye, options include
 - a. A glide & hydroexpression
 - b. Irrigating Vectis technique
 - c. Simcoe Cannula technique
 - d. Plain Vectis technique
5. Completion of all steps of MSICS through nucleus extraction

Lecture IV: Detailed Technique/tips for Anterior Capsulorrhexis, Hydrodissection, and Nucleus Extraction

By the completion of the lecture, trainees should be able to:

- Describe the preferred method for the creation of a continuous curvilinear capsulorrhexis, can-opener capsulotomy, and V capsulotomy
- Describe the advantages and disadvantages for each type of capsulorrhexis
- Understand basic vector forces when creating a capsulorrhexis
- Describe proper technique for hydrodissection
- Describe the various methods for nucleus extraction including use of viscoelastic, irrigating and non-irrigating vectus, irrigation with cannula, and Simcoe irrigation

Wet Lab Session Five: Intraocular Lens (IOLs)

Objectives:

1. Completion of filling the anterior chamber and capsular bag with viscoelastic (4, may use lubricant to simulate viscoelastic)
2. Completion of insertion and placement of IOL (4, may reuse lenses)
3. Removal of viscoelastic

Lecture V: Detailed Technique/tips for Cortex Removal, IOL insertion, Irrigation/Aspiration, Closure

By the completion of the lecture, trainees should be able to:

- Understand the fluidics of irrigation/aspiration with the Simcoe
- Describe the technique for cortex removal and viscoelastic removal
- Describe the technique for handling, insertion, and proper placement of an intraocular lens
- Understand the importance of proper IOL placement and describe the possible complications associated with poor or incorrect placement
- Describe the basic types of IOLs by location and material
- Describe how to check for stable wound closure at the end of the case
- Describe the options for conjunctival closure (pull into place, cautery, suture)

Wet Lab Session Six: Suturing and Wound Closure

Objectives:

1. Learning to load the needle under the microscope
2. Practice properly handling instruments
3. Practice properly handling tissue
4. Completion of suturing at least 3 cornea lacerations (1 straight, 1 jagged, 1 stellate)
5. Completion of suturing at least 2 scleral wounds
6. Completion of suturing conjunctiva
7. Practice three types of knots (3-1-1, slip, figure-of-eight)

Lecture VI: Suture technique, Knots, and Approaching Corneal Laceration Repair

By the completion of the lecture trainees should be able to:

- Describe the preferred technique for corneal and scleral suturing with special focus on loading the needle under the microscope, the location of the needle in the forceps, handling of tissue, angle of needle entry and exit, preferred length and depth of sutures
- Describe the throws and when to use 3-1-1, slip, and figure-of-eight knots
- Name types of suture (braided vs monofilament, dissolvable vs permanent, prolene, nylon, vicryl, plain gut, gortex), describe their purpose, and give examples of their use
- Name types of needles (spatulated vs cutting, curved vs straight), describe their purpose, and give examples of their use
- Be aware of how to approach corneal and scleral laceration repairs in straight, jagged, or stellate configurations

Wet Lab Session Seven: Pulling it all together 1: MSICS Start to Finish

Objectives:

- Knowing and performing all surgical steps of MSICS (Figure 1)

Wet Lab Session Eight: Pulling it all together 2: MSICS Start to Finish

Objectives:

- Knowing and performing all surgical steps of MSICS (Figure 1)

Wet Lab Session Nine: Managing Complications 1

Objective:

1. Practice managing surgical complications:
 - a. Poor wound construction
 - b. Anterior chamber instability

Lecture VII: Management of Common Complications

By the completion of the lecture, trainees should be able to:

- Understand how to avoid and manage capsulorrhexis rents with techniques such as the Little Maneuver
- Understand how to avoid and manage vitreous loss
- Understand basic anterior vitrectomy
- Describe when, if, and where to place an IOL in the case of anterior capsular tear or vitreous loss and how to choose the lens type and power

Wet Lab Session Ten (Optional): Managing Complications 2

Note: To cover this session, residents will need to have access to a vitrector. If one is available in the operating room, the wet lab session can be conducted in the OR with artificial eyes, in order to avoid cross contamination. Refer to the following link for demonstration videos related to simulation sessions related to managing complications: <http://simulatedocularsurgery.com/simulation/cataracts/> (At site go to section “Advance eyes” and selecte the video “phaco+vitrectomy”).

If there isn't a vitrectomy machine available, then deliver the lecture portion of this session only.

Objectives:

1. Practice managing surgical complications:
 - a. Capsular tears
 - b. Vitreous loss

Lecture VIII: Management of Complex Cataracts

By the completion of the lecture, trainees should be able to:

- Know how to plan and manage surgery in white cataracts
- Understand maneuvers to prevent an “Argentinean flag sign”
- Know how to plan and manage surgery in traumatic cataracts
- Know how to plan and manage surgery in cataracts with zonular loss or history of pseudoexfoliation

Instructional Resources

The following is a list of resources that should be read as pre-learning before the wet lab sessions begin. They can also serve as helpful resources throughout the course.

1. Orbis Fundamentals of Manual Small Incision eCourse. www.cybersight.org
2. Chapter 39: Management of Intraoperative Complications in Manual Small Incision Cataract Surgery. Arun Kshetrapal and Ramesh Kshetrapal
3. Chapter 41: Pearls and Pitfalls in Small Incision Cataract Surgery. Rajesh K. Pawar.
4. Recognizing ‘high-risk’ eyes before cataract surgery. Parlkshit Gogate and Mark Wood. Community Eye Health Journal. March 2008.

5. Small incision cataract surgery: tips for avoiding surgical complications. Reeta Gurung and Albrecht Hennig. Community Eye Health Journal. March 2008.
6. Tilgana Eye Centre. Standard Operating Procedure Manual For: Modern Small Incision Cataract Surgery (SICS) NON-PHACO. Morans Eye Center, University of Utah, 2006.
7. Tips for MSICS. Dr. Shivkumar Chandrashekharan, M.S; Cataract and IOL Services, Aravind Eye Hospital and Postgraduate Institute of Ophthalmology, India
8. Chapter 1: Clinical Significance and Relevance of Manual Small Incision Cataract Surgery in the 21st Century Era. Ashok Garg.
9. Chapter 2: The 3-in-1 Simplified Approach for ECCE, MSICS, and Phacoemulsification. Kadil Jojo Jr Sinolinding.
10. Chapter 32: MSICS in Difficult Situations. Arun Kshetrapal and Ramesh Kshetrapal.
11. Chapter 40: Management of Astigmatism in SICS. Kamaljeet Singh.
12. IOL Calculations Combined. Powerpoint.
13. IOL Designs and Materials. Yashpal Goel, Kirti Jaisingh and Kshitij Aditya. Guru Nanak Eye Centre, New Delhi, India.
14. IOL Power Calculation. Javed H. Farooqui and Dr. Ranjan Dutta.
15. Tele-medicine Wet Lab Cataract Surgery Course 2017. Instituto Regional De Oftalmologia (IRO).
16. Master's Guide to Manual Small Incision Cataract Surgery (MSICS). Jaypee Brothers Medical Publishes (P) Ltd. 2009.
17. Training Course in Manual Small Incision Surgery (MSICS). Amelia Geary. Orbis International. September 2016.
18. MSICS instrument cheat sheet
19. Manual Small Incision Cataract Surgery Booklet. Orbis International. 2006.
20. Subjective Refraction and Prescribing Glasses: Guide to Practical Techniques and Principles. Richard J Kolker, MD. November 2014.
21. Biometry. Suryakant Jha and Wangchuk Doma. Venu Eye Institute and Research Centre, Sheikh Sarai, New Delhi, India.
22. Video Content - Demonstration videos:
 - a. Cybersight.org
 - b. Simulatedocularsurgery.com
 - c. <http://gallery.simulatedocularsurgery.com>
 - d. PAAO: <http://www.campuspao.org>
 - e. AAO One Network: <https://www.aao.org/clinical-education>

Wet Lab Session Supplies:

Each wet lab session should be outfitted with the following equipment each day:

- Clean workspace
- Disposable gloves in small, medium, and large- ideally, non-latex to avoid allergic reactions
- Paper towels

- Water and detergent to clean instruments- ideally, distilled water to prevent rusting
- The practice eye head, plastic casing or a piece of styrofoam and 3-4 pins to mount the practice eye (These are reusable.)
- Chair- ideally one that adjusts in height
- Surgical microscope
- Instrument kit that includes the following:
 - Blunt Wescott Scissors (1)
 - 0.12 toothed forceps (1)
 - Utrata forceps (1)
 - Mosquito hemostat (1)
 - Hydrodissection cannula, 22G or 25G (1)
 - 5cc syringe (2)
 - 1cc syringe (1)
 - Sinsky hook (1)
 - Simcoe with tubing (1)
 - Vectus (irrigating or non-irrigating, 1)
 - Tying forceps (2)
 - Anterior chamber maintainer with tubing (1)
 - Microsurgical needle driver
 - Lens insertion forceps (optional, 1)
 - 10cc syringes (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft, may be used for the week)

Wet Lab Session One: Introduction to MSICS

- Additional Supplies
 - None

Wet Lab Session Two: Wound Construction

- Additional Supplies
 - 2 pig eyes, per person
 - Basic saline solution bottle (2 per person)
 - Crescent blade (1 unused, per person if disposable)
 - Keratome blade (1 unused, per person if disposable)
 - Sideport blade (1 unused, per person if disposable)
 - Saline bag (1 for AM session, 1 for PM session to inject into vitreous if eyes are too soft)
 - 18G needle (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft)
 - Viscoelastic (2 per person)
 - 22G anterior chamber cannula (disposable, 1 per person)

Wet Lab Session Three: Paracentesis and Viscoelastic/ Anterior Chamber Maintainer

- Additional Supplies
 - 1 pig eye, per person (may store the eye for use on Day 3 if supplies are limited)

- Basic saline solution bottle (2 per person)
- Crescent blade (1 unused, per person if disposable, may keep for Day 3)
- Keratome blade (1 unused, per person if disposable, may keep for Day 3)
- Sideport blade (1 unused, per person if disposable, may keep for Day 3)
- Saline bag (1 per person)
- 18G needle (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft)
- Viscoelastic (2 per person)
- 22G anterior chamber cannula (1 per person)

Wet Lab Session Four: Capsulorrhexis, hydrodissection and nucleus extraction

- Additional Supplies
 - 1 pig eye per person
 - 3 plastic practice eyes per person
 - Basic saline solution bottle (1 per person)
 - Crescent blade (1 unused, per person if disposable)
 - Keratome blade (1 unused, per person if disposable)
 - Sideport blade (1 unused, per person if disposable,)
 - Saline bag (1 per person)
 - 18G needle (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft)
 - Viscoelastic (2 per person)
 - 5 cc syringe (1 per person)
 - 1 cc syringe (1 per person)
 - trypan blue (1 per person)
 - 22G anterior chamber cannula (2 per person)
 - cystotome (2 per person, may substitute a 27G needle if necessary)

Wet Lab Session Five: IOLs

- Additional Supplies
 - 2 practice eyes per person
 - Basic saline solution bottle (1 per person)
 - Crescent blade (1 unused, per person if disposable)
 - Keratome blade (1 unused, per person if disposable)
 - Sideport blade (1 unused, per person if disposable,)
 - Saline bag (1 per person)
 - 18G needle (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft)
 - Viscoelastic (3 per person)
 - 5 cc syringe (1 per person)
 - 1 cc syringe (1 per person)
 - trypan blue (1 per person)
 - 22G anterior chamber cannula (2 per person)
 - Cystotome (2 per person, may substitute a 27G needle if necessary)
 - IOL (per person: 1 piece PMMA, 1 three-piece acrylic)

Wet Lab Session Six: Suturing and Wound Closure

- Additional Supplies
 - 2 practice eyes, per person
 - Basic saline solution bottle (2 per person)
 - Crescent blade (may use from Day 2)
 - Keratome blade (May use from Day 2)
 - Sideport blade (May use from Day 2)
 - Viscoelastic (2 per person)
 - 10-0 nylon (2 per person)
 - 9-0 nylon (2 per person)
 - 8-0 vicryl (1 per person)

Wet Lab Session Seven and Eight: Pulling it all together: MSICS Start to Finish

- Additional Supplies
 - 5 practice eyes per person
 - Basic saline solution bottle (1 per person)
 - Crescent blade (1 unused, per person if disposable)
 - Keratome blade (1 unused, per person if disposable)
 - Sideport blade (1 unused, per person if disposable,)
 - Saline bag (1 per person)
 - 18G needle (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft)
 - Viscoelastic (3 per person)
 - 5 cc syringe (1 per person)
 - 1 cc syringe (1 per person)
 - trypan blue (1 per person)
 - 22G anterior chamber cannula (2 per person)
 - cystotome (2 per person, may substitute a 27G needle if necessary)
 - IOL (per person: 1 piece PMMA, 1 three-piece acrylic)

Wet Lab Session Nine: Managing Complications 1: Poor wound construction and anterior Chamber instability

- Additional Supplies
 - 2 practice eyes per person
 - Basic saline solution bottle (1 per person)
 - Crescent blade (1 unused, per person if disposable)
 - Keratome blade (1 unused, per person if disposable)
 - Sideport blade (1 unused, per person if disposable,)
 - Saline bag (1 per person)
 - 18G needle (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft)
 - Viscoelastic (3 per person)
 - 5 cc syringe (1 per person)
 - 1 cc syringe (1 per person)
 - trypan blue (1 per person)
 - 22G anterior chamber cannula (2 per person)

- cystotome (2 per person, may substitute a 27G needle if necessary)
- IOL (per person: 1 piece PMMA, 1 three-piece acrylic)

Wet Lab Session Ten: Managing Complications 2: Vitreous Loss and Capsular Tears

- Additional Supplies
 - 2 practice eyes per person (must be artificial eyes if practicing in the OR)
 - Consumables for the vitrector (cassettes, vitrector tips, triamcinolone, egg whites)
 - Basic saline solution bottle (1 per person)
 - Crescent blade (1 unused, per person if disposable)
 - Keratome blade (1 unused, per person if disposable)
 - Sideport blade (1 unused, per person if disposable,)
 - Saline bag (1 per person)
 - 18G needle (2 for AM session, 2 for PM session for injecting the vitreous if eyes are too soft)
 - Viscoelastic (3 per person)
 - 5 cc syringe (1 per person)
 - 1 cc syringe (1 per person)
 - trypan blue (1 per person)
 - 22G anterior chamber cannula (2 per person)
 - cystotome (2 per person, may substitute a 27G needle if necessary)
 - IOL (per person: 1 piece PMMA, 1 three-piece acrylic)

**Annex A: International Council of Ophthalmology (ICO)
Ophthalmology Surgical Competency Assessment Rubric
(OSCAR) and adapted Ophthalmology Surgical Simulation
Competency Assessment Rubric (OSSCAR)**

Recommended to use the OSCAR or the adapted OSSCAR to assess the competency of each wet lab participant post course.

OSCAR: <http://www.icoph.org/resources/230/Surgical-Assessment-Tool-ICO-OSCAR-in-English-Chinese-Portuguese-Russian-Spanish-Vietnamese-and-French.html>

OSSCAR: <http://simulatedocularsurgery.com/simulation/cataracts/>

Annex B: IOL Calculation Sheet

Name: ID: Date of Birth: Exam Date: Eye Surgeon: A. Kitzmann, M.D.		Formula: SRK@/T Target Ref.: plano n: 1.3375					
The AL- readings should be checked for plausibility, as there might be pathological changes.							
<div style="font-size: 2em; font-weight: bold;">OD</div> right	AL: 23.67 mm (SNR = 23.1) K1: 43.44 D / 7.77 mm @ 134° K2: 43.60 D / 7.74 mm @ 44° R / SE: 7.75 mm / 43.52 dpt Cyl.: 0.16 D @ 44°		AL: 23.86 mm (SNR = 316.1) K1: 43.10 D / 7.83 mm @ 172° K2: 43.95 D / 7.68 mm @ 82° R / SE: 7.75 mm / 43.53 dpt Cyl.: 0.85 D @ 82°		<div style="font-size: 2em; font-weight: bold;">OS</div> left		
Eye Status: phakic			Eye Status: phakic				
SN60WF		CZ70BD		SN60WF		CZ70BD	
A Const: 118.7		A Const: 118.8		A Const: 118.7		A Const: 118.8	
IOL (D)	REF (D)	IOL (D)	REF (D)	IOL (D)	REF (D)	IOL (D)	REF (D)
22.0	-1.13	22.0	-1.04	21.5	-1.18	21.5	-1.09
21.5	-0.78	21.5	-0.69	21.0	-0.82	21.0	-0.74
21.0	-0.43	21.0	-0.34	20.5	-0.48	20.5	-0.39
20.5	-0.08	20.5	0.00	20.0	-0.13	20.0	-0.05
20.0	0.26	20.0	0.34	19.5	0.21	19.5	0.29
19.5	0.60	19.5	0.67	19.0	0.55	19.0	0.62
19.0	0.93	19.0	1.01	18.5	0.88	18.5	0.95
Emme. IOL: 20.38		Emme. IOL: 20.50		Emme. IOL: 19.81		Emme. IOL: 19.92	
MTA3UO		MA50BM		MTA3UO		MA50BM	
A Const: 115.3		A Const: 118.9		A Const: 115.3		A Const: 118.9	
IOL (D)	REF (D)	IOL (D)	REF (D)	IOL (D)	REF (D)	IOL (D)	REF (D)
18.5	-1.32	22.0	-0.95	18.0	-1.29	21.5	-1.00
18.0	-0.90	21.5	-0.60	17.5	-0.87	21.0	-0.66
17.5	-0.49	21.0	-0.26	17.0	-0.47	20.5	-0.31
17.0	-0.09	20.5	0.08	16.5	-0.06	20.0	0.03
16.5	0.31	20.0	0.42	16.0	0.33	19.5	0.36
16.0	0.71	19.5	0.75	15.5	0.73	19.0	0.69
15.5	1.10	19.0	1.08	15.0	1.11	18.5	1.02
Emme. IOL: 16.89		Emme. IOL: 20.62		Emme. IOL: 16.42		Emme. IOL: 20.04	

(* = Changed manually, != Borderline Value)

Remark:
clm