**The IOLMaster 700**

Better predictability and optimized workflow compared with other biometers.

**BY OLIVER FINDL, MD, MBA, FEBO**

Introduction of the first Swept Source OCT-based biom-
eter, the IOLMaster 700 (Carl Zeiss Meditec; Figure 1),
enables OCT imaging and visualization across the entire
length of the eye. In comparison to A-scan biometry, in
which the eye is visualized in one dimension only, the
IOLMaster 700 provides an image-based measurement,
allowing one to view the complete longitudinal section of
the eye—from the cornea to the retina.

Therefore, the IOLMaster 700 can also be used to iden-
tify irregular eye geometries, such as lens tilt (Figure 2),
and, thanks to imaging of the fovea in the macula, to alert
the user to insufficient fixation during measurements
(Figure 3). Furthermore, use of telecentric keratometry
allows particularly robust and reproducible corneal
surface measurements. For these reasons and more, the
IOLMaster 700 is an advantageous diagnostics device for
the anterior segment surgeon in that it helps to signifi-
cantly improve refractive results after cataract surgery.

**HIGH PRECISION, SIMPLIFIED WORKFLOW**

Because OCT images can be captured
along the entire length of the eye, the
IOLMaster 700 allows identification of
all ocular peaks and interfaces. This
helps in selecting the best measure-
ments, not only for axial length but
also for keratometry (K). This is
especially important in patients
who do not always fixate on the
light. Off-axis fixation during
keratometry also results in false K
readings. The absence of the foveal
pit in the IOLMaster 700’s retinal scan
can be an indication for off-axis fixa-
tion.

By eliminating all measurements in
which the patient was not fixated, I
have even better and more precise
measurements than before.

As with the IOLMaster 500, the latest version
simplifies my preop-
erative workflow. In eyes
with astigmatism, the
IOLMaster 700 acquires
a reference image of the scleral and conjunctival vessels.
The image of the eye is taken along with the keratometry
measurement and directly transferred, over the hospi-
tal’s intranet, to the CALLISTO eye (Carl Zeiss Meditec)
computer in the operating theater. CALLISTO eye is con-
ected to the LUMERA microscope (Carl Zeiss Meditec).
During surgery, the image allows intraoperative matching
with the live eye image, eliminating the need for manual
pre- and intraoperative markings of the astigmatism
axis in conjunction with implantation of a toric IOL. It
also avoids manual data transfer because the images are
directly transferred over the hospital’s intranet. There is
also a built-in toric IOL calculator in the IOLMaster 700.

Other advantages of the IOLMaster 700 are its compat-
ibility with previous versions and that it provides access
to the database of the User Group of Laser Interference
Biometry (ULIB), containing the lens constants of more
than 270 IOL models.

**PATIENT EXPECTATIONS**

Patient education is important. With rising demands
and expectations, patients want to know not
only what is happening, but also what the
surgeon is doing. With other biometry sys-
tems, the surgeon was only able to show
patients some peaks, and that was
not only abstract for the patient
but also difficult to understand.

With the IOLMaster 700, patients
can view a scan of the entire
eye—with the cornea, the lens, the
retina, and the pupillary edge. This
helps patients to understand what
the surgeon sees and what he or she
will try to accomplish with surgery.

It is easier to tell patients where the
artificial lens will be positioned and,
if they have a tilted lens, to explain
t hat there is a possibility that the IOL
may also be tilted. Patients are
fascinated by images, and the
IOLMaster 700 gives us the
capability to appeal to this
side of their intellect.

Figure 1. The IOLMaster 700.
ENHANCING REFRACTIVE OUTCOMES

In my short-term experience with the IOLMaster 700, I have seen better refractive outcomes as a result of the highly precise measurements.

In the future, this device may allow us to be much more precise in our predictions of effective lens position and in our imaging of the posterior corneal surface. Swept Source OCT with the IOLMaster 700 will open many doors with regard to biometry and IOL power calculation. IOL POSITION

Effective IOL position is still the holy grail of IOL power calculation and its prediction error is the main source of refractive surprises in modern cataract surgery. However, now that we can actually see the entire lens—the front and back surfaces and not just peaks—we at least can see a tilted, and maybe even decentered, lens already. In future, we might be even able to consider tilt and decentration in IOL power calculation; however, more data is needed to confirm that.

CONCLUSION

The use of Swept Source OCT in biometry, whereby the entire eye is scanned three dimensionally, allows me to not only better understand the eye before surgery but also to have better refractive outcomes after surgery. The technology is now here, and we have many things to learn in the coming months and years with regard to what the IOLMaster 700 can do.

Oliver Findl, MD, MBA, FEO, is Director and Professor of Ophthalmology at the Hanusch Hospital, Vienna, Austria, and a Consultant Ophthalmic Surgeon at Moorfields Eye Hospital, London. He is the Founder and Head of the Vienna Institute of Research in Ocular Surgery (VIROS), Hanusch Hospital, Department of Ophthalmology, Vienna, Austria. Dr. Findl states that he is a scientific advisor to Carl Zeiss Meditec. He may be reached at oliver@findl.at.

* Tilt reference line not shown with IOLMaster 700.