Beyond the Eyepieces

Haag-Streit's METIS is a surgical visualization platform built to evolve.

With Yuri McKee, MD; Edward Meier, MD; Christopher Riemann, MD; and Kenichiro Yamazaki, MD

Historically, ophthalmic microscopes have been viewed as long-term capital equipment that is largely fixed once installed in an OR. Now, the rapid pace of innovation in digital imaging, surgical guidance, and data integration is increasing the need for platforms that can readily accommodate new technologies as they emerge. The METIS 900 surgical microscope from Haag-Streit was developed around the idea of continual expansion.

Rather than functioning only as a standalone microscope, the METIS 900 was designed as the foundation of a flexible surgical visualization platform that can continue to expand as new digital technologies, workflow tools, and guidance systems become available.

One year after the launch of the METIS 900, this envisioned platform is swiftly taking shape. With the introduction of the METIS 3D Digital Heads-Up Module (METIS HU), Haag-Streit has expanded the METIS 900 ophthalmic microscope into an integrated digital 3D visualization platform. Interoperative toric alignment guidance—a software extension currently under development—is set to further enhance the platform by closing the biometry-to-OR workflow loop.

Figure 1. The METIS 900 microscope delivers an optimized coaxial LED illumination system that stays stable and visible during low-light conditions and throughout maneuvers like instrument insertion and hydrodissection.

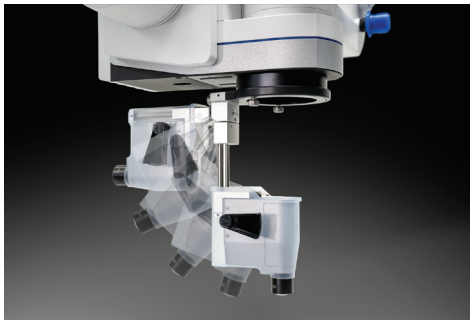

Figure 2. Surgeons can easily position the motorized oculars via a handpiece or foot pedal.

Together, METIS 900, METIS HU, and a growing pipeline of future innovations underscore Haag-Streit's vision for a surgical platform that is built to evolve.

THE FOUNDATIONAL PLATFORM: METIS 900

The foundation of the METIS 900 begins with Haag-Streit's long history of optical excellence. Its microscope combines world-class optics, a stable and brilliant red reflex, efficient workflow, proper ergonomics, and surgeon-centered control into one "surgical control center."

Red reflex: The METIS 900 was designed to provide a stable, bright, homogeneous red reflex with strong contrast and depth of field, even in low-light environments (Figure 1). This supports strong visualization throughout anterior- and posterior-segment surgery.

Customizable glaucoma workflow: For glaucoma surgeons, the METIS 900 platform supports an efficient workflow. The microscope is equipped with a motorized tilting mechanism that lets surgeons reposition it via a single hand or foot during angle-based procedures, including MIGS (Figure 2).

Ergonomics: The METIS platform prioritizes ergonomics and surgeons' wellbeing. Its overall design accommodates users' natural upright posture. The oculars extend forward so the operator does not have to lean forward, alleviating pressure on the neck and spine. Myriad functions, such as the microscope's tilt and depth-of-field, are controlled via a programmable wireless foot pedal and/or hand switch so that surgeons do not have to break the sterile field reaching for knobs.

These core features—optics, red reflex, ergonomics, workflow, and wireless control—establish the infrastructure for the METIS 900 platform's future innovation and form the basis upon which Haag-Streit can add new digital capabilities.

THE FIRST EXPANSION: METIS HU

The METIS HU is the first major example of the METIS platform's expansion beyond the traditional microscope. This "surgical cockpit" is an integrated digital 3D visualization platform that incorporates advanced 3D 4K camera technology and a large 3D display, allowing surgeons to work heads-up while maintaining access to the oculars (Figure 3). Thus, rather than forcing a single visualization style, this flexibility lets surgeons choose between ocular and digital workflows.

The heads-up approach offers several key benefits for anterior and posterior segment surgeons. The METIS HU is designed to provide greater depth-of-field, an ergonomic heads-up view, advanced digital processing, automated image inversion, quick zoom, and enhanced opportunities

Figure 3. METIS HU with 3D display and advanced 3D 4K camera technology that automatically adjusts to lighting conditions.

Figure 4. With the METIS HU, surgeons can choose between using the oculars or the digital visualization only.

for teaching, collaboration, and remote visualization. It also supports improved working posture and gives surgeons the choice to use the oculars or not (Figure 4).

Importantly, the METIS HU is more than a viewing accessory. It creates a digital visualization environment that can support future software-driven innovation.

WHAT'S NEXT FOR METIS?

The next step in the METIS platform's evolution is the IOL Guide, Haag-Streit's toric lens alignment guidance system for premium cataract lens surgery. Currently under development, it will connect and transfer biometry data into the METIS 900 microscope, creating a digital workflow in the OR.

The IOL Guide—designed as a seamless extension of the Haag-Streit Lenstar 900 and Eyestar 900—aims to support surgeons at every step of IOL implantation. Using EyeSuite IOL software, predetermined parameters (such as incision locations, capsulorhexis diameter, and the axis of the toric IOL relative to the eye's position) can be overlaid either in the eyepiece or on a connected screen. By enabling direct data transfer to the METIS via USB or network, the system will minimize duplication of data and effort.

SURGEONS' CLINICAL EXPERIENCE WITH THE METIS PLATFORM

Several prominent surgeons shared their clinical experience thus far with the METIS 900 and METIS HU.

Kenichiro Yamazaki, MD: "I have been using the METIS 900 since its launch, and it has meaningfully improved both my workflow and my surgical execution. The exceptional visualization quality—even at low illumination—combined with its excellent red reflex and the ability to fine-tune depth-of-field via the foot pedal without ever taking my eyes off the surgical field, has allowed me to confidently manage more complex cases, including those with corneal or vitreous opacities. The compact footprint has also made repositioning between right- and left-eye surgery much more efficient for my staff, and the ergonomic body design has improved my comfort during long procedures."

Yuri McKee, MD: "I've had the privilege of being the first surgeon in the world to use the METIS 900 microscope in human surgery. The quality of its optics is exactly what I'm used to seeing from Haag-Streit. However, I am most impressed with the system's red reflex, which is both very stable and very effective. It is a product of three different illumination sources, two coaxial and one tangential, which allow a lower luminosity inside the eye to reduce light toxicity to the retina. It also keeps the red reflex stable across a variety of surgical maneuvers and eye positions."

Edward Meier, MD: "The METIS HU provides great visualization of all of the ocular structures, and the red reflex is bright and clear without pixelation. Overall, its depth-of-field is excellent, and I consider the level of detail of the cornea and lens to be perfect, with no latency or jumping of the image when pieces of nucleus move across the anterior chamber. Because the surgeon can increase the sensitivity of the camera, an excellent image can be seen with lower brightness of the microscope's light, leading to greater patient comfort during procedures. For glaucomatous eyes, MIGS procedures are much easier to perform on heads-up microscopes, because the surgeon's positioning is much more natural—he or she does not have to slouch down to see through the microscope or tilt the patient's head to visualize the angle. METIS HU also gives a great view of the angle, making MIGS surgeries much easier. Overall, METIS HU provides a very natural-feeling work environment. I found that transitioning from a traditional microscope to METIS HU was easy, and I was less tired at the end of a long day in the OR."

Christopher Riemann, MD: "As an avid 3D screen-based surgeon for over 17 years—and exclusively for the past 13 years—I am thrilled with METIS HU, especially in screen-only mode. The ability to quickly adjust camera settings on the fly to optimize visualization in different surgical viewing use cases is superb."

SEE THE METIS 900 & METIS HU IN ACTION

The METIS platform is designed to evolve with the needs of the surgeon. The METIS 900 established the platform's foundation, METIS HU added integrated digital 3D visualization, and once released, the IOL Guide will deliver toric alignment guidance and a connected cataract workflow to the platform.

This enduring approach ensures the longevity of a practice's microscope investment, preserving its flexibility and creating a path for future digital innovation.

Delegates attending the 2026 ESCRS and AAO meetings will have the opportunity to experience the METIS 900 and METIS HU firsthand and gain a deeper understanding of the technologies shaping the future of the OR.

To learn more about the METIS 900 platform, visit: https://haag-streit.com/METIS-platform ■

YURI MCKEE, MD
- East Valley Ophthalmology, Mesa, Arizona
- mckeeonline@mac.com
- Financial disclosure: Speaker (Haag-Streit)

EDWARD MEIER, MD
- Apex Eye Clinical Research, Cincinnati, OH
- Edmeier2020@gmail.com
- Financial disclosure: Consultant, Speaker (Haag-Streit)

CHRISTOPHER RIEMANN, MD
- Cincinnati Eye Institute and EyeCare Partners, OH
- criemann@fuse.net
- Financial disclosure: Consultant, Speaker (Haag-Streit)

KENICHIRO YAMAZAKI, MD
- Omiya Nanasato Eye Institute (ONEI), Saitama, Japan
- karamawari@msn.com
- Financial disclosure: None