

EFFICIENCY THROUGH ADVANCED SOFTWARE SOLUTIONS



Explore cutting-edge platforms to optimize workflow and improve patient outcomes.

BY AUDREY YAN, BA; ERIC D. ROSENBERG, DO, MSCENG; AND CAROLINE WATSON, MD

STREAMLINING CATARACT SURGERY WORKFLOW

BY AUDREY YAN, BA, AND ERIC D. ROSENBERG, DO, MSCENG

The workflow of cataract surgery encompasses preoperative assessments, surgical planning, the operation itself, and postoperative evaluations. Although the procedure is brief, meticulous preoperative planning is crucial. Technological advances, including the development of cloud- and web-based platforms, have helped ophthalmologists and their surgical teams increase productivity, reduce transcription errors, and improve patient outcomes.

THE NEED FOR ADVANCED SOFTWARE Complex IOL Calculations

In cataract surgery, complex formulas incorporating corneal measurements, axial length, anterior chamber depth, and the A-constant are essential for calculating the appropriate IOL power. Although most of these formulas are integrated into diagnostic tools, patients with a history of refractive or

incisional surgery may require the use of specialized formulas such as the Barrett True K and Barrett Toric.¹ Advanced formulas are typically not included in standard biometry machines, requiring manual data transfer to a separate system. This process not only consumes considerable time but also increases the risk of errors, challenges that are compounded by the growing complexity of diagnostic testing.²⁻⁴

Navigating Multiple Data Sources

The preoperative assessment may entail evaluating the patient's tear film, ocular surface, and corneal tomography; performing an endothelial cell count; obtaining OCT imaging of the macula; and conducting other diagnostic tests. When planning surgery, ophthalmologists often review diagnostic images stored in paper charts or digital image management systems

that are separate from the biometry systems used for lens power or toric calculations. For calculations on a single eye, a surgeon might need to access the optical biometer report, enter data into multiple online calculators, review corneal topography measurements and OCT scans, and cross-check information from the medical record. They may consult six or more sources for a single surgical plan.⁵

EMERGING SOLUTIONS

Veracity

Veracity (Carl Zeiss Meditec) is a web-based platform that facilitates the input of electronic health record data and provides a comprehensive analysis by integrating both pre- and postoperative measurements to assist surgeons in making informed decisions. The software includes customizable automated tools, such as Barrett-integrated keratometry values and IOL filtering.⁶

Systems such as Veracity or SmartCataract (Alcon) offer flexibility in accommodating individual workflow. Veracity is designed to support surgical precision and assist in managing patient expectations through its vision simulator, which previews potential postoperative outcomes. Due to its specialized features, Veracity's application may be restricted to certain surgical scenarios and compatible hardware. The software's utility may be expanded by future developments, such as a printable summary sheet with relevant variables, an IOL exchange calculator, and ICL (STAAR Surgical) planning capabilities.

Eyetelligence

Eyetelligence (Bausch + Lomb) is a cloud-based platform designed to facilitate the retrieval and management of patient data for surgical planning, operative information, and analytics. The platform includes tools for IOL calculations and astigmatism management, and it offers compatibility with Apple and Android applications. These features are intended to assist surgeons, nurses, and optometrists across various clinical settings, including the office and the OR.⁷ The platform supports a range of procedures, such as cataract surgery, LASIK, and ICL implantation.

Eyetelligence may be particularly useful for surgeons who practice in multiple locations because it integrates with various diagnostic platforms, reducing the need for additional equipment. Some practitioners, however, may have concerns regarding the reliance on internet connectivity and potential security and privacy issues related to cloud-based storage. The Stellaris Elite system, which integrates with Eyetelligence, is the only phacoemulsification platform that allows the efficient retrieval and analysis of case data within this system, offering an additional layer of functionality for its users.

SmartCataract

SmartCataract is a cloud-based platform that integrates patient data, diagnostic tools, and surgical equipment specifically for cataract surgery. The software offers customizable features tailored to the individual physician, including surgeon preferences, preferred formulas, and lens types. It also offers automatic data transfer and review. The platform operates on an agnostic framework, making it compatible with a wide range of biometers and in-office equipment. SmartCataract integrates with the Ngenuity digital microscope (Alcon) in the OR to provide an additional automated time-out check and display critical information such as the steep axis, axial length, and IOL of record before surgery begins.⁸ The use of Ngenuity is optional for those who have adopted a digital microscope.

Surgeons using SmartCataract have reported a 57% increase in efficiency for standard cases, with an average of 4 minutes and 20 seconds saved.⁹ This platform may be particularly beneficial in large practices and hospital settings, where comprehensive integration with existing data systems,

diagnostic devices, and surgical equipment can improve overall workflow. The integration of multiple systems, however, may present a steep learning curve, and tiered pricing may limit some users' access to all features.

Cassini Connect

Cassini Connect (Cassini Technologies) is a digital cataract surgery suite that provides real-time intraoperative guidance. Designed to reduce surgical time, the software can save approximately 7 minutes per patient compared to standard methods.¹⁰ Key features include the integration of patient-specific data into a customizable surgical overlay and a microscope footpedal with stable tracking for real-time guidance. Cassini Connect is designed to assist surgeons by providing real-time information and advanced tools that support precision during cataract surgery.⁹

Currently, this software is used exclusively for cataract surgery. Although the suite is associated with various digital, imaging, and surgical tools and data management systems, the software's implementation may involve a moderate learning curve and be more costly compared to other systems due to hardware integration requirements. The suite may be more cost-effective for physicians who do not already have the necessary hardware.

A PLATFORM FOR PATIENTS AND SURGEONS

RayPro (Rayner) is a data-driven platform that enables patients and surgeons to share and analyze postoperative outcomes. The software allows patients who have undergone cataract or other forms of ocular surgery to respond to surveys and questionnaires on topics such as visual acuity, vision quality, and overall satisfaction.¹¹ This patient-reported information provides physicians with valuable insights into their patients' experiences, thereby helping to improve patient care and surgeons' understanding of postoperative outcomes. The data collected through RayPro can inform decisions on IOL selection, surgical techniques, and treatment strategies by providing a quantitative foundation.

Although RayPro provides valuable postoperative insight, surgeons seeking more comprehensive pre- and intraoperative support may consider supplementing this software with other platforms.

CONCLUSION

Software integration into cataract surgery can streamline surgical workflow from the preoperative assessment to the postoperative evaluation. This can greatly reduce the time spent on manual data entry, minimize transcription errors, and allow technicians to focus on tasks that improve overall efficiency and patient outcomes. As cataract volume increases and the number of ophthalmologists decreases, the demand for efficient, high-quality patient care will grow. The early adoption of advanced digital solutions can help clinics handle an increased patient load without compromising care.

LEVERAGING TECHNOLOGY TO BUILD A PRACTICE

BY CAROLINE WATSON, MD

In my second year of private practice, I am dedicated to establishing a distinctive brand and expanding my patient base (see the sidebar). Central to my strategy is the integration of advanced technology, with a particular emphasis on interoperable devices. These cutting-edge tools facilitate a cohesive

approach to surgical planning, streamline processes, and enhance outcomes. Regardless of a surgeon's stage in their career, the adoption of interoperable technologies can significantly refine workflow, elevate patient care, optimize precision, and enrich the overall patient experience.

TEN ESSENTIAL TOOLS FOR ESTABLISHING A SUCCESSFUL REFRACTIVE CATARACT SURGERY PRACTICE

- 1 Relationships with colleagues and mentors.** Ophthalmology is a close-knit community. Networking is essential. Establish relationships with experienced colleagues and mentors who can provide guidance, support, and insights as you navigate the early stages of your career. Get involved with various societies and organizations.
- 2 Skills development.** I completed a fellowship with Robert J. Weinstock, MD, before entering private practice. I learned invaluable skills and pearls during this time. It is crucial, however, to stay abreast of the latest advances and techniques. Attend conferences, webinars, wet labs, and training sessions to enhance your knowledge and skills in cataract surgery and related areas.
- 3 A strong referral network.** Outreach to optometrists, general ophthalmologists, and other health care providers in your area can help build a robust referral network. Cultivate relationships based on trust, communication, and mutual respect to ensure a steady stream of patients. Practice within the scope of current comanagement guidelines in your state.
- 4 Patient-centered care.** Delivering exceptional patient care is at the forefront of my practice. I take the time to listen to patients, address their concerns, and provide treatment plans tailored to their individual needs and preferences. Hiring individuals with the same mindset is a priority for me.
- 5 Branding.** A comprehensive marketing strategy can raise public awareness of your practice and attract new patients. This is crucial in the first few years. Digital marketing tools, social media platforms, and traditional advertising methods can effectively reach your target audience.
- 6 Optimized operations and workflow.** Streamlining operations and workflow maximizes efficiency and productivity. This may not seem crucial in the first years of practice, but putting systems in place early can pay dividends in the future. Practice management software, electronic health record systems, and other tools that automate administrative tasks and streamline patient scheduling, billing, and documentation processes are good places to start.
- 7 Advanced technology.** Regularly gauge the efficiency of new technologies and consider how they improve parameters such as visual outcomes, patient satisfaction, and long-term vision stability. Balancing advantages with cost can be challenging, especially for a new practice owner. Consider reimbursement pathways and other approaches to financial viability.
- 8 Quality and safety.** Prioritize patient safety and quality outcomes above all else. Adhere to evidence-based practices, follow established clinical guidelines, and implement quality assurance protocols to ensure the highest standards of care throughout every stage of the patient journey.
- 9 Audits.** Perform routine audits to gather and analyze postoperative outcomes, patient and employee satisfaction, and other areas you seek to improve. Implement changes accordingly and embrace a culture of continuous improvement to foster professional growth and enhance practice performance.
- 10 Nimbleness.** Building a successful refractive cataract surgery practice takes time and resilience. Adapt to changing circumstances and recognize that novel innovations will continue to alter practice patterns and the ophthalmology landscape.

THE POWER OF INTEGRATION

Interoperability is a significant workflow advantage that has transformed my surgical planning. It is crucial for maintaining efficiency and avoiding the pitfalls of a disjointed workflow. I am currently a beta tester for SeeNa (Bausch + Lomb), an optical biometry and topography system that integrates with Eyetelligence. SeeNa combines data points, eliminates the need for multiple documents, and streamlines surgical planning and information flow. Other notable technologies in this domain include SmartCataract, a cloud-based digital health solution platform that interfaces with the Argos biometer, LenSx femtosecond laser, LuxOR Revalia ophthalmic microscope, and the ORA System with VerifEye+ (all from Alcon). Additionally, the Zeiss Cataract Workflow integrates various technologies such as the IOLMaster 700, Zeiss EQ Workplace, OPMI Lumera microscope, and Quatera 700 (all from Carl Zeiss Meditec).

Software planning solutions help create a cohesive environment where different systems communicate seamlessly. These solutions account for surgeon preferences, including formulas and IOL types, and encapsulate preoperative data in the cloud for easy access. This facilitates the creation, review, and revision of surgical plans and can reduce transcription errors. The technology helps save time during the preoperative evaluation, surgical planning, surgery, and the postoperative evaluation.

EFFICIENCIES GAINED

The efficiencies gained from interoperable technologies are substantial. Tasks that once required multiple steps and moving patients between diagnostic devices can now be completed in a fraction of the time. SeeNa captures nine key measurements—axial length, keratometry, anterior chamber

depth, central corneal thickness, lens thickness, corneal topography, corneal wavefront, photopic and mesopic pupillometry, and corneal white-to-white distance—in a single acquisition. Measurements are uploaded to Eyetelligence, allowing seamless and secure data transfer from the office to the OR. This streamlines workflow, enhances the patient experience by minimizing wait time, maximizes convenience, and decreases the risk of inaccurate IOL power calculations and effective lens position prediction.

Surgical planning software and interoperable systems play a pivotal role in enhancing patient engagement and education. With 80%–90% of my patient base being engineers, I have observed that integrating advanced preoperative planning technologies, such as SeeNa, has bolstered my confidence in recommending premium IOLs. Although some ophthalmologists may hesitate to offer advanced IOLs to this demographic, I have found that leveraging sophisticated planning tools allows me to provide the detailed explanations and comprehensive treatment plans that my well-informed patients expect. Utilizing their specific preoperative data and images not only builds trust and instills confidence but also enriches the overall patient experience.

Ensuring data integrity has become increasingly crucial in modern practice. With SeeNa, I no longer rely on printouts and paper charts. Instead, I utilize data analytics to assess trends, make well-informed decisions, and customize treatment plans with enhanced precision, tailored to each patient's unique needs.

CONCLUSION

Harnessing advanced technology and integrating interoperable devices into my practice has been transformative. The seamless amalgamation of software into a unified digital environment enables me to access critical data for

IOL selection and surgical planning from a single platform, regardless of location or time. This integration enhances efficiency, optimizes precision, and empowers me to make well-informed decisions with assured confidence. This advancement has proven to be the most significant factor in the growth and success of my practice. ■

1. Congdon N, Vingerling JR, Klein BEK, et al. Prevalence of cataract and pseudophakia/aphakia among adults in the United States. *Arch Ophthalmol*. 2004;122(4):487-494.
2. Lamoureux EL, Fenwick E, Pesudovs K, Tan D. The impact of cataract surgery on quality of life. *Curr Opin Ophthalmol*. 2011;22(1):19-27.
3. Ferreira TB, Ribeiro F. How can we improve toric intraocular lens calculation methods? Current Insights. *Clin Ophthalmol*. 2020;14:1899-1908.
4. Lindholm JM, Laine L, Hippala H, Ylinen P, Tuuminen R. Improving eye care services with a lean approach. *Acta Ophthalmol*. 2018;96(7):724-728.
5. Talley-Rostov A. Patient-centered care and refractive cataract surgery. *Curr Opin Ophthalmol*. 2008;19(1):5-9.
6. Lim SB, Shahid H. Distribution and extent of electronic medical record utilization in eye units across the United Kingdom: a cross-sectional study of the current landscape. *BMJ Open*. 2017;7(5).
7. Gujral T, Hovanesian J. Cataract surgical planning using online software vs traditional methods: a time/motion and quality of care study. *Clin Ophthalmol*. 2021;15:3197-3203.
8. ZEISS VERACITY Surgery Planner. ZEISS. Accessed April 17, 2024. <https://www.zeiss.com/medtec/en/products/veracity.html>
9. Zavadni Z, Pan LC, Mok K, Cheng H, O'Boyle D. End-to-end impact of a cloud-based surgical planning system on efficiency in cataract surgery: a time-and-motion study. *Clin Ophthalmol*. 2023;17:1885-1896.
10. Cassini Guidance. Cassini Technologies. Accessed April 17, 2024. <https://www.cassini-technologies.com/guidance#surgical-planner>
11. RayPRO. Rayner. Accessed April 17, 2024. <https://rayner.com/raypro>

ERIC D. ROSENBERG, DO, MSCENG

- Cornea and complex anterior segment surgeon, SightMD, Babylon, New York
- Assistant Professor, New York Medical College, Valhalla, New York
- Cofounder, Digital Ophthalmic Society
- Member, Bookmarked* and Eyetube** Editorial Advisory Boards
- ericr29@gmail.com
- Financial disclosure: Consultant (Alcon, Bausch + Lomb, Carl Zeiss Meditec)

CAROLINE WATSON, MD

- Cataract, refractive, and cornea surgeon, Alabama Vision Center at the Range, Huntsville, Alabama
- carolinewatsonmd@gmail.com;
- Instagram @CarolineCWatsonmd;
- X (formerly Twitter) @CarolineWatsonMD
- Financial disclosure: Consultant (Alcon, Bausch + Lomb)

AUDREY YAN, BA

- Medical student, West Virginia School of Osteopathic Medicine, Lewisburg, West Virginia ayan@osteo.wvso.edu
- Financial disclosure: None

*Bookmarked is a sister publication to CRST

**Eyetube is powered by Bryn Mawr Communications, parent company of CRST