

STEPPING INTO A NEW AGE OF AUTOMATED TECHNOLOGY WITH CHRONOS BY TOPCON HEALTHCARE



Chronos expands your practice's potential by empowering your employees to assist in examinations.

BY VINCENT GUALINO, MD, AND PIERRE JULIEN PHELOUZAT, MD

Clinicians face a number of challenges in contemporary practice, among them increased patient volume, the need to train and retain ophthalmic technicians, and a patient population that expects efficient visits and access to top-tier technology. Chronos—a single platform capable of keratometry, binocular objective, and subjective refraction—addresses all of these issues, thereby making it very helpful to a modern practice.

SIGHTPILOT™

Individuals trained in refraction feel comfortable interacting with Chronos as it provides all the familiar tests required for a standard refraction, and it outputs refractive, keratometric, and visual acuity data. Unlike other platforms, however, support staff without knowledge of refraction are also able to perform patient evaluations thanks to the proprietary SightPilot™—a guided refraction software. SightPilot simplifies examination steps and provides detailed on-screen scripts and instructions, removing the need for clinical judgement. It can easily be followed by ophthalmic technicians-in-training or clinical support staff (Figure 1). SightPilot is at least as fast as a standard refraction examination. In addition, Chronos allows a gain in surface area compared to a standard refraction room.

Leveraging the power of support staff in your clinic to perform patient evaluations using Chronos offers several advantages. Patient throughput may be increased because the SightPilot guided refraction algorithm is optimized for maximum efficiency. Workflow bottlenecks that can sometimes occur when refractionists are unavailable to interact with

patients may be eased by use of support staff who can utilize SightPilot guided refraction software to assist with patient examinations. Further, this new workplace dynamic frees staff trained in refraction to focus their time on patients who are unable to undergo automated subjective refraction, due to issues such as comorbidities or inability to interface with Chronos.

It should be emphasized that Chronos is not intended to replace professionals trained in refraction in an eye care clinic. In fact, it is meant to serve as an adjunct to such professionals, allowing them to leverage their skillset for patients whose evaluations present a challenge or who need more personalized care. Ultimately, any eye care provider or professionally trained refractionist using Chronos in a practice retains all clinical decision-making and can easily switch from an automated to a standard setting during any examination as they see fit.

THE ANATOMY OF AN EXAMINATION

A review of how an untrained clinical adjunct would use Chronos during an examination illustrates the utility of SightPilot technology and the ease of integrating this platform to a modern clinical setting. To view a video of an examination using Chronos, scan the QR code on this page.

After instructing a patient to position themselves appropriately,



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autorefractometry is performed. Chronos captures binocular autorefraction rather than monocular measurements typically acquired during clinical examinations. This step is largely the same for experienced technicians and clinical staff alike. Simultaneous binocular measurement results in an objective refraction measurement that is closer to the end point.¹

The next dataset acquired is that of subjective refraction. The Chronos Standard interface is a setting that provides as many options as a digital phoropter and should be operated by an experienced user. On the other hand, the SightPilot interface uses a semi-automated algorithm that guides

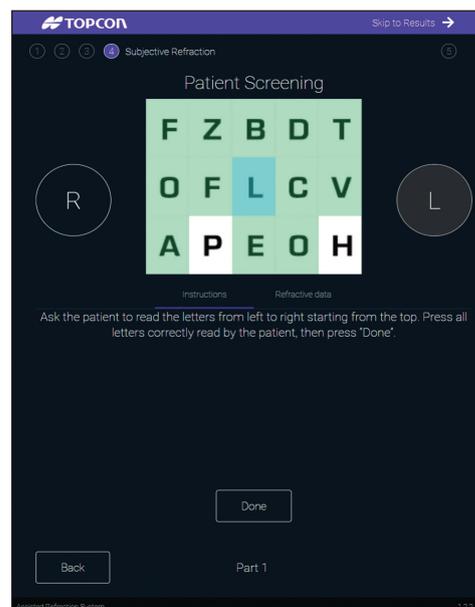


Figure 1. Support personnel rely on the SightPilot interface to direct them on how to instruct the patient during an automated evaluation. In this portion of the examination, the user will ask the patient to read letters and simply touch the letters the patient correctly communicated.

a staff member operating the system in their interactions with the patient. For example, during visual acuity assessment, the patient reads from a set of letters viewed within Chronos, and the Chronos operator taps the letters correctly identified on the control screen.

The next step in SightPilot involves monocular subjective refraction measurements captured under binocular conditions. A bichrome test is used for spherical refinement, followed by a cross-cylinder test to fine-tune the severity and axis of potential astigmatism (Figure 2). These steps leverage SightPilot technology to assist untrained personnel in execution of an examination.

Following an examination, Chronos generates a detailed report showing the patient's sphere power, cylinder power, cylinder axis, and visual acuity, for both far and near, as well as objective refraction data and the patient preferences during the comparison tests (Figure 3). This report can be printed, emailed, or otherwise electronically stored, and the data can also be exported to the clinic EMR.

PEARLS FOR EARLY ADOPTERS

Chronos users who have been working with the platform for several months have observed some pearls that may be useful to clinicians who will be incorporating it into their clinics.

- **SightPilot is eligible for updates.**

The automated software embedded in Chronos will continue to evolve as developments will equip it with wider capabilities. This dynamic alleviates any concerns that Chronos will quickly become obsolete—in fact, it ensures that Chronos will remain relevant as advances in automated refraction software emerge.

- **Patient positioning is important.**

The patient should be seated on a chair or stool that allows them to be positioned close to Chronos so that their arms can be rested comfortably on the table. The height of the device should be adjusted to ensure their face is vertical and not tilted slightly forward or backward with respect to the vertical.

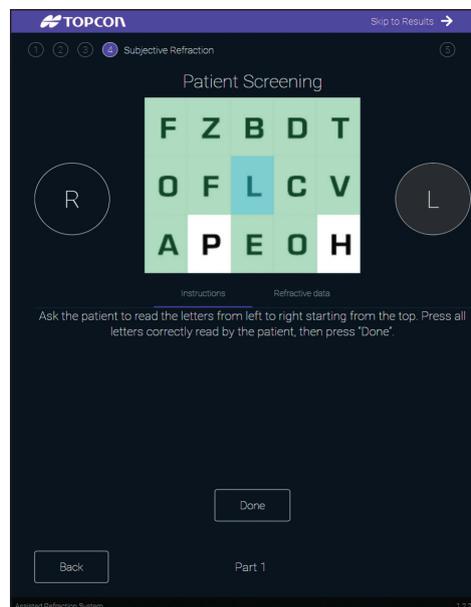


Figure 2. During cylinder axis assessment, the operator communicates instructions to a patient by reading the on-screen text generated by SightPilot. The algorithm judges when to move to the next step based on the patient responses.

- **Moving from the automated interface to the standard refraction interface is seamless.** In instances in which a member of the support staff is performing an evaluation using SightPilot and determines that intervention from an experienced refractionist is warranted, moving from a semi-automated examination to a standard interface does not significantly disrupt a patient evaluation.

SMALL FOOTPRINT, INNOVATIVE TECHNOLOGY

Chronos combines several modalities into a single platform, requiring only a small room that can house the device and enough space for a patient to sit. The state-of-the-art experience of using Chronos identifies your practice as a progressive clinic interested in providing efficient and detail-oriented service while still allowing the patient to spend quality time with the clinician.

MOVING YOUR CLINIC INTO THE FUTURE WITH CHRONOS

Proactive clinicians may find that the Chronos optimizes the workflow of their clinic. Patients are less likely to be

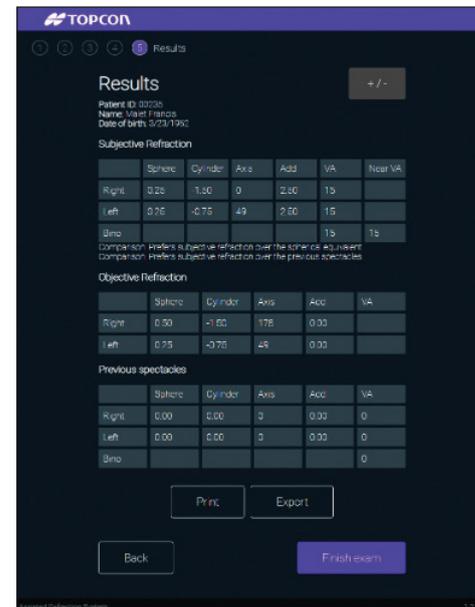


Figure 3. Chronos generates a succinct summary of each patient's examination findings after standard or semi-automated modes are used.

subjected to staffing-related bottlenecks, will experience efficient examinations, and will be afforded increased facetime with clinicians who are no longer tied up with the cumbersome particulars of outdated methods of data capture. Further, the ability to leverage the power of support staff could lead to increased patient volume without the associated costs of hiring and retaining staff trained in refraction, thereby alleviating issues related to employee turnover and reducing staff-related overhead. ■

1. Trusit D, Fukuma Y. Clinical evaluation of the Topcon BV-1000 automated subjective refraction system. *Optometry and Vision Science*. 2004; 81(5):323-333.

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