The Galilei G6 Lens Professional (Ziemer; Figure 1) combines Placido-disc–based topography, Scheimpflug tomography, and optical biometry all in one unit. This combination allows the device to provide complete data for comprehensive screening for cataract or refractive surgery in one measurement session, according to the manufacturer. With all data gathered and stored on one device, the practice’s clinical workflow efficiency can be improved, maintenance costs can be reduced, and office space utilization can be optimized. With access to high-definition pachymetry plus total corneal wavefront, curvature, and astigmatism data, surgeons have a complete dataset to plan cataract or refractive surgery. The addition of optical biometry and a suite of IOL power calculation formulas empowers the cataract surgeon to determine the best-suited IOL for each patient.

According to Ziemer, only the Galilei G6 combines the three elements of Placido-disc–based topography, dual-Scheimpflug tomography, and optical biometry (Figure 2). Placido-disc topography provides data on anterior corneal curvature, surface irregularities, and tear-film quality. Scheimpflug tomography provides corneal pachymetry and elevation data, plus 3-D anterior chamber analysis and ray-tracing capabilities. Optical biometry allows determination of axial length (AL), lens thickness (LT), and other intraocular distances for premium IOL planning.

The software of the G6 provides an intuitive graphical user interface including a live view image of the eye and a five-step measurement guide, and the device interfaces with electronic health record systems for optimal workflow. It also links to ray-tracing software packages such as Okulix (Tedics Peric & Jöher), offering precise tools for toric IOL planning by taking into account the true anatomic properties of the eye and total corneal astigmatism.

The software generates a biometry report including AL, LT, central corneal thickness, axial length, and lens thickness.

(Continued on page 66)
What is your overall impression of the Galilei G6?

The Galilei G6 system (Ziemer) fully meets the expectations of refractive surgery specialists. What makes this system attractive is its ability to combine all the technologies needed to screen patients for LASIK and to obtain optimal outcomes in cataract surgery. In refractive surgery, we use it to determine who is at risk for ectasia and to monitor keratoconus patients; in cataract surgery, we use it for optical biometry and total corneal power measurements as a means to optimize IOL selection. Additionally, the ability to perform highly reliable and repeatable measurements on the posterior surface, and for the system to achieve accurate pachymetry, corneal aberrations, and total corneal power data, helps us to further strengthen the safety of the decision-making process.

How do you use the Galilei G6 in clinical practice?

My clinical practice is mostly focused on LASIK procedures and refractive cataract surgery with premium IOLs. In that regard, two of the greatest advantages of the Galilei G6 are its robust refractive screening program and artificial intelligence tools, which help me rule out patients who are at risk for ectasia after surgery. The plethora and complexity of data provided by current imaging systems presents a challenge for interpretation for the ophthalmologist. Therefore, decisions are often based on personal experience and subjective recognition of patterns or empiric cutoff values that are not necessarily the same between imaging systems.

The Santhiago percentage of tissue altered (PTA) report on the Galilei G6 helps me to predict the level of risk a patient has of developing post-LASIK ectasia by taking into account the expected biomechanical alteration due to one's surgical plan. The PTA considers the relationship between corneal thickness, tissue alteration through ablation and flap creation, and residual stromal bed thickness. A PTA level of 40% can be considered a robust risk factor for ectasia, and, in our clinical practice, patients with a PTA this high are treated with PRK instead of LASIK, as long as the cornea does not show any other contraindications for refractive surgery.

The Galilei G6 also offers a more morphologic approach to identifying subclinical keratoconus at its earliest stages. Using an automated decision tree, the system is able to identify topographically normal contralateral eyes of patients with frank keratoconus with 93.6% sensitivity and 97.2% specificity (Figure 1).4 While waiting for the upcoming release of this feature, our group has

Figure 1. An AAI score of 21.5 is the most discriminant parameter to differentiate between normal corneas and subclinical keratoconus.

Figure 2. The author has reported a significant improvement in astigmatism correction when the total corneal astigmatism is used in place of keratometric astigmatism.
and anterior chamber depth. It also includes an IOL calculator with formulas including Haigis, Holladay I, Hoffer Q, SRK/T, and the Shammas no-history method for eyes after refractive surgery.

The combination of Scheimpflug imaging with optical biometry data makes the Galilei G6 especially helpful for IOL selection in post-refractive surgery eyes, according to Ziemer. Surgeons can use the refractive data from both anterior and posterior corneal surfaces, as generated by Scheimpflug imaging, plus the AL and other intraocular distances as determined by optical biometry, to calculate IOL powers for eyes after corneal refractive surgery. These data are also helpful for IOL calculations in unusually long or short eyes.

In eyes with astigmatism, the combination of high-definition pachymetry, higher-order aberration detection, and total corneal astigmatism measurement allows the surgeon to determine incision placement for cylinder correction in conjunction with cataract surgery.

In addition to its roles in cataract surgery, the device can also perform complete topographic screening of refractive surgery candidates, including keratoconus screening, and it is helpful in planning for corneal implants and in planning and follow-up of keratoplasty patients.