OL power calculation. Even in reading this short sentence, I can hear your grumbles. Although all of you will readily admit that nailing the IOL power is crucial to the precision of refractive results, accurate measurement of anterior segment dimensions—an essential factor in calculating IOL power—continues to be a challenge. This task is especially difficult to achieve in eyes that have previously undergone corneal refractive surgery.

Since the late 1990s, optical biometers have played a tremendous role in enhancing the accuracy of IOL power calculation. In the early years of optical biometry, axial length (AL) was the only measurement provided, using the principle of partial coherence interferometry (PCI). About a decade after that technology was introduced, a device using optical low coherence reflectometry (OLCR) came to market, providing surgeons with the means to take axial measurements of multiple structures in the eye.

Since that time, many developments have been made in optical biometry, and today’s surgeons have a variety of technologies to choose from. Although PCI and OLCR biometry continue to provide precise measurement of axial parameters, many surgeons have found benefit in combining multiple forms of anterior segment imaging and ocular biometry. Is this latest trend the missing piece surgeons need to achieve better predictability in IOL power calculation? Or are there other solutions—such as ray-tracing measurement of the anterior and posterior corneal surfaces, lens, and axial length—that will ultimately provide better results?

This cover focus provides a brief background into the differences between PCI and OLCR biometry, highlights the usefulness of devices that combine anterior segment imaging with ocular biometry, and offers examples of how some surgeons use these devices to achieve accurate planning of cataract surgery.

— Laura Straub, Editor-in-Chief