

RETINA: THEN AND NOW

As part of our 20th anniversary, *Retina Today* is digging into the archives to reflect on how much the profession has changed.



OCTOBER SPOTLIGHT: PROGRESS IN RETINAL LASER THERAPY

The PAttern SCAnning Laser (PASCAL, Iridex), like *Retina Today*, debuted in 2006. At the time, Julia A. Haller, MD, authored an article for us, *PASCAL Laser for Retinal Disease Treatment*, to introduce the tool, noting it was the first laser innovation in 35 years. Now, 20 years later, Dr. Haller is back to reminisce about that major update and explore what has changed since that first article.

— Rebecca Hepp, MA, Editor-in-Chief

RETINA TODAY (RT): WHAT WAS NEW ABOUT THE PASCAL IN 2006?

Julia A. Haller, MD: When the PAttern SCAnning Laser (PASCAL) was introduced, it represented one of the first truly meaningful advances in retinal photocoagulation in many years. Traditional argon laser treatment relied on relatively long pulse durations—typically 200 milliseconds—which produced effective retinal burns but also resulted in greater collateral thermal spread, more patient discomfort, and longer treatment sessions. PASCAL changed that paradigm by delivering multiple laser spots in rapid, precisely spaced patterns using much shorter pulse durations. The result was faster treatment, improved patient comfort, greater reproducibility, and more controlled energy delivery.

RT: HOW HAVE RETINAL LASERS CHANGED IN 2 DECADES?

Dr. Haller: Over the past 20 years, the biggest story has not been laser technology itself but rather how dramatically the role of laser has changed. In 2006, focal and grid laser photocoagulation remained the standard of care for diabetic macular edema (DME), and panretinal photocoagulation (PRP) was the cornerstone of treatment for proliferative diabetic retinopathy (PDR).

Today, intravitreal anti-VEGF therapy has transformed the management of many retinal vascular diseases. For DME, retinal vein occlusions, and wet AMD, pharmacologic therapy has become the first-line treatment because it often preserves or improves vision better than conventional laser alone.

That evolution has changed how retina specialists think about laser. Rather than serving as the primary intervention for many diseases, laser is used more selectively—as an adjunctive treatment, a durable therapy to reduce treatment burden, or the preferred therapy in carefully chosen clinical situations. PRP remains highly effective for PDR, especially when long-term follow-up is uncertain. Laser retinopexy continues to be indispensable for retinal tears, where it has changed remarkably little because it has been highly successful from the beginning. In many ways, laser has matured from a broadly applied technology into a more targeted and strategic tool.

RT: WHAT NOVEL ADVANCES DO YOU THINK WOULD BE BENEFICIAL IN THE LASER SPACE?

Dr. Haller: The greatest opportunities lie in making laser delivery more intelligent and individualized using image-guided systems that integrate real-time OCT, angiography, or AI to identify

the tissue that requires treatment while minimizing unnecessary retinal injury. Advances in subthreshold and selectively targeted laser technologies may continue to reduce collateral damage while preserving therapeutic efficacy. Ultimately, the ideal laser would deliver precisely the right amount of energy to exactly the right tissue at exactly the right time, tailored to each patient's unique retinal anatomy and disease activity.

The success of retinal laser therapy over the past 2 decades should not be judged solely by how much the laser itself has changed. Instead, it should be measured by how advances in imaging, pharmacotherapy, and our understanding of retinal disease have allowed us to deploy laser more thoughtfully, selectively, and effectively. PASCAL represented an important technological milestone in 2006, but the greatest advance has been our ability to choose the right treatment—or combination of treatments—for the right patient at the right time. ■

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FURTHER READING

PASCAL Laser for Retinal Disease Treatment
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