Preface

Ocular imaging started with drawings and paintings that were used to show representative examples of diseases affecting the fundus. These were typically reproduced as lithographic plates in early texts. Although expensive to produce and not necessarily correct, they were often pleasing to the eye. With the advent of fundus photography, specific images of patients could be recorded, stored, and indexed at low cost. Photography provided a way to record topographic representations of the fundus. This opened many possibilities: specific patients could easily be recorded and catalogued, interval changes could be documented, and later retrieval of images could foster scientific research. Fluorescein angiography was first performed by a medical student, Harold Novotny, and an intern, David Alvis. They were initially trying to determine the levels of oxygenation in the retina, but they immediately realized that this new technique could document the circulation in the eye. The paper describing their technique and findings was rejected by a leading peer-reviewed ophthalmology journal. Even so, the use of fluorescein angiography rapidly expanded not only because of its ability to evaluate the circulation of the eye, but also because consequences of breakdowns of the blood–ocular barrier could be visualized. Fluorescein angiography provided information not only about anatomy, but also about the physiology of the eye. Early investigators integrated anatomic, physiologic, and histopathologic information together to form the foundations of field, medical retina. With further technological innovations, scanning laser ophthalmoscopy and optical coherence tomography were introduced in ophthalmology to obtain high-resolution two-dimensional and cross-sectional images of the fundus. An even more complete understanding of pathologic processes arose with the integration of information from other forms of ocular imaging with that of optical coherence tomography. New developments are underway that allow for visualization of biochemical processes in the retina. Molecular imaging has the potential to gauge the amount of oxygen in the retina, measure levels of compounds such as macular pigment, and identify disease-specific molecules to allow for earlier diagnosis and individualized therapy.

In retrospect, many, if not most, of the major advances in medical retina were made because of advances in ophthalmic imaging technology. All these advances required integration of more than one source of information. So it is fitting that this edition in the Medical Retina series is devoted to ocular imaging. This volume reviews some of the established forms of imaging and concentrates on the new – in isolation and also as integrated into a larger process aimed at giving information to clinicians and researchers alike. The chapters of this book have been written by international leaders at the forefronts of their fields. The result is a state-of-the-art overview of retinal imaging that should be interesting and useful for everyone interested in the retina. It has been our pleasure to have the opportunity to work with the authors and the publisher to produce this book.

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