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## ANCILLARY TESTING IN AGE-RELATED MACULAR DEGENERATION

### SECTION 1: FUNDUS PHOTOGRAPHY AND AUTOFLUORESCENCE

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Paralleling the advances in age-related macular degeneration (AMD) treatment are advancements in retinal imaging, including color fundus photography and fundus autofluorescence (FAF).

#### **BASICS OF FUNDUS PHOTOGRAPHY AND FUNDUS AUTOFLUORESCENCE**

Fundus photographs help document the presence or absence of pathology, aid in monitoring disease progression, and act as a valuable educational tool for both physicians and patients. Traditionally, fundus photography has been performed using film, but in the past decade, most clinicians have adopted digital fundus photography. Digital images enable easy and immediate review, straightforward image magnification, and comparison of prior images. In AMD, color fundus photography is often obtained at baseline to enable clinical comparisons over time and to document new findings. In addition, fundus photography currently serves as the gold standard to grade dry AMD in clinical research studies.

By exciting fluorophores in the fundus and then using subsequent filters to capture the emission from these fluorophores, FAF noninvasively highlights natural and pathologic changes affecting the retinal pigment epithelium (RPE) (Figure 4-1-1). The primary fluorophore of the retina is lipofuscin, a byproduct of photoreceptor outer-segment accumulation.<sup>1</sup> The main fluorophore constituent of lipofuscin is A2E, a bisretinoid involved in the visual cycle.<sup>2</sup> Accumulation of these by-products not only interferes with normal RPE cellular function but is also toxic to the RPE.<sup>3</sup> FAF imaging can be obtained with confocal scanning laser ophthalmoscopy or a modified fundus camera. Excitation light wavelengths for confocal scanning laser ophthalmoscopy are