CDVA using a standard 20/200 E optotype with documentation of the distance at which the patient can identify the letter orientation using standard Snellen notation (eg, "5/200"). This test provides a more accurate and reproducible measurement than does the finger-counting method.

Distance and near corrected visual acuity should be similar; a disparity may suggest a specific pathology. The clinician should document the presence of eccentric fixation (possible central scotoma), tendency to read half of the eye chart (possible hemianopic field defect), or improvement in CDVA when single optotypes are read (which may suggest amblyopia).

Color Vision Testing

Color vision testing complements visual acuity assessment. Optic nerve disease, particularly demyelinating optic neuritis, may disproportionately affect color vision compared with CDVA. In macular disease, visual acuity and color vision tend to decline correspondingly; the exception is cone dystrophy, in which color vision is more significantly decreased than visual acuity. Thus, an optic neuropathy rather than a maculopathy is the more likely etiology in the differential diagnosis for an eye with 20/30 visual acuity but severe loss of color vision. In optic neuropathy, persistent dyschromatopsia can occur even after recovery of visual acuity.

Color vision should be tested separately in each eye to detect unilateral disease. The Ishihara test (Fig 3-1A) uses a series of pseudoisochromatic color plates to test color discrimination along the protan (red) and deutan (green) axes. The plates were designed to detect congenital red-green color deficiencies and may fail to detect mild cases of acquired dyschromatopsia. Bilateral, symmetric color vision loss in men may signify congenital color deficiency rather than bilateral optic neuropathies. The Hardy-Rand-Rittler (HRR) plates can

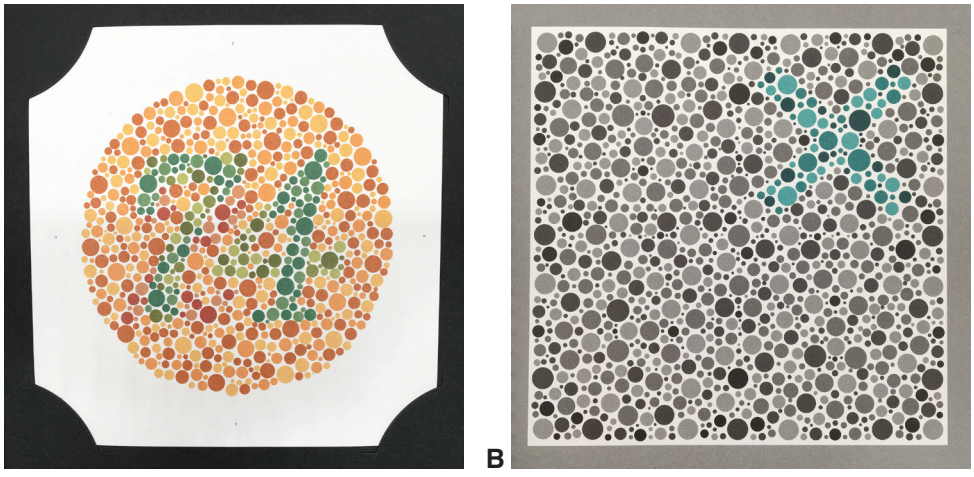

Figure 3-1 Pseudoisochromatic plates for color vision testing. **A,** Ishihara plate. **B,** Hardy-Rand-Rittler (HRR) plate. *(Courtesy of Zoë R. Williams, MD. Photography by Brittany Figenscher, CRA.)*

be used to screen for tritan (blue-yellow) axis defects as well as red-green defects (Fig 3-1B). Blue-yellow color defects often accompany acquired optic neuropathy but also can occur in a maculopathy.

More detailed color testing may comprehensively characterize a color vision defect. In the Farnsworth panel D-15 test, the patient is asked to arrange 15 colored discs in order of hue and intensity. The Farnsworth-Munsell 100-hue test is the most comprehensive test and provides the best discrimination; however, it requires a substantial amount of time to take (patients arrange 4 sets of 25 colored discs) and score, thus limiting its use in routine clinical testing. Color vision testing is discussed further in BCSC Section 12, *Retina and Vitreous*.

Pupillary Testing

Normally, light directed at either pupil causes equal constriction of both pupils (see Chapters 1 and 11). When light is shined into an eye with impaired conduction of the afferent pupillomotor signal along its optic nerve, pupillary constriction in both eyes is slower and smaller in amplitude compared with the response that occurs when light is shined into the eye with normal optic nerve conduction. In other words, both the direct and the consensual response are sluggish. This equal consensual response enables detection of a relative afferent pupillary defect (RAPD) as the light is moved back from the side with the normal conduction to the side with impaired conduction, causing dilation of the pupil on the impaired conduction side.

The most popular clinical method for detecting an RAPD is the swinging flashlight test (Video 3-1), which compares the pupillary response in the 2 eyes when they are tested with the same light source. The test involves swinging a bright light (which is shined directly into the pupil along the visual axis) between the 2 eyes. If the afferent input is significantly asymmetric, the pupils redilate immediately when the light is shined into the affected eye (Fig 3-2).

VIDEO 3-1 Left relative afferent pupillary defect.
Courtesy of M. Tariq Bhatti, MD. Narration by Helen Danesh-Meyer, MD, PhD.

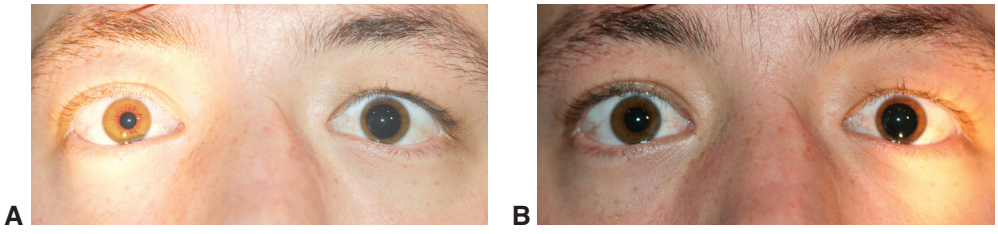

Figure 3-2 Assessing for a relative afferent pupillary defect (RAPD) in a patient with left traumatic optic neuropathy; the left pupil is pharmacologically dilated. **A,** The right pupil *constricts* in response to light directed at the right eye only. **B,** The right pupil *dilates* in response to light directed at the left eye only, indicating a left RAPD. *(Courtesy of Michael S. Lee, MD.)*