REFRACTOMETRY: FINALIZE THE SPHERE ADJUSTMENT

# How to approach the duochrome test

By Sue Corwin, CO, COMT

The traditional order of doing refractometry refinement is S-A-C-S: sphere, axis, cylinder, then sphere again. During the final sphere adjustment, it is important to find the most plus (or least minus) that a patient will accept to make sure the he/she is not accommodating. If the patient has to accommodate all day, it may lead to headaches, eye strain, and reduced or uncomfortable near vision. One way to check the sphere again is the duochrome test.

How it works

During this test, the patient looks at a half-red and half-green chart. Many of the modern electronic chart systems have a specific red/green chart for this purpose, but a red/green filter may be applied to a manual projector.

The examiner adds a "fog" of +0.50 D sphere on top of the prescription to relax the accommodation of the patient. Then, the examiner asks if the letters (or numbers, depending on the chart system) appear clearer and easier to see on the red side, the green side, or if they are about the same. The examiner adds minus if the patient prefers the characters on the red side and plus if the patient likes the characters on the green side. One way to remember this is "RAM GAP," which stands for "red add minus" and "green add plus."

Because we induced less hyperopia (or have made the patient artificially myopic) by adding +0.50 D sphere, the expected response is that the characters on the red side appear clearer. Also, we anticipate adding -0.50 D but should add only -0.75 D at the most.
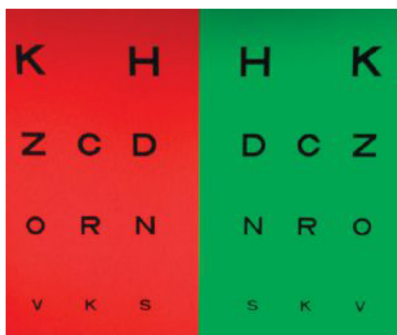
The duochrome test is a half-red, half-green chart designed to assist with a patient's final sphere adjustment.

Sample duochrome test

We refined the right eye S-A-C and the Rx is -2.00 +1.00 x 90. Now, we add +0.50 D to the Rx and we have -1.50 +1.00 x 90. We instruct the patient to look at the duochrome chart and ask, "On which side are the letters easier to read: the red, the green, or are they about the same?" The patient replies "the red side," so we add -0.25 D sphere to get -1.75 +100 x 90.

Then we ask again, "Now on which side are the letters easier to read: the red, the green, or are they about the same?" The patient replies "the red side," so we add -0.25 D sphere to get -2.00 +100 x 90.

For the last time we ask, "On which side are the letters easier to read, the red, the green, or are they about the same?" The patient replies "the same," and we have completed the test.

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