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## COLOR VISION DEFICIENCY

### What is color vision deficiency?

Color vision deficiency is called “color blindness” by mistake. Actually, the term describes a number of different problems people have with color vision. Abnormal color vision may vary from not being able to tell certain colors apart to not being able to identify any color.

### Whom does color vision deficiency affect?

An estimated 8% of males and fewer than 1% of females have color vision problems. Most color vision problems run in families and are inherited and present at birth.

A child inherits a color vision deficiency by receiving a faulty color vision gene from a parent. Abnormal color vision is found in a recessive gene on the X chromosome. Men are born with just one X and one Y chromosome. However, women have two X chromosomes. Because of this, women can sometimes overcome the faulty gene with

their second normal X chromosome. Men, unfortunately, do not have a second X chromosome to help compensate for the faulty color vision gene.

Heredity does not cause all color vision problems. One common problem happens from the normal aging of the eye’s lens. The lens is clear at birth, but the aging process causes it to darken and yellow. Older adults may have problems identifying certain dark colors, particularly blues. Certain medications as well as inherited or acquired retinal and optic nerve disease, may also affect normal color vision.

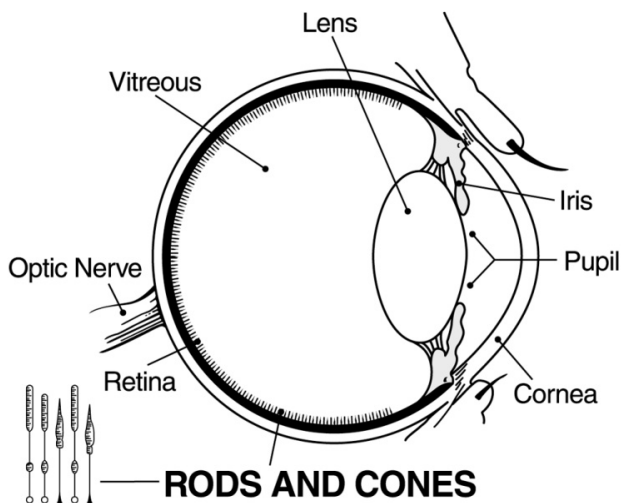
### Who should be tested for color deficiency?

Any child who is having difficulty in school should be checked for possible visual problems including color vision impairment. Those who have a family history of color deficiency, have a job that requires identifying colors accurately, or those who

have problems identifying colors, should be tested.

## What are some types of color vision deficiency?

The specialized cells in the retina are called rods and cones. You use these cells for normal vision. Rods are useful for night vision and working in dim light. Cones are responsible for color vision. They work best in daylight. Three types of cone pigments are present in normal vision. These are sensitive to either blue, green or red colored objects. Together, they let you see a wide range of colors, from purple through red.



For normal color vision, all three cone pigments must work correctly. When a cone pigment is abnormal or missing, a type of color vision deficiency results. For example, the most common deficiency causes confusion between red and green colors. Rarely, some people are born without any cones. These people are truly “color blind.”

They see the world in shades of gray. Most types of color vision deficiency are present at birth. There are also some types caused by eye disease or injury.

## How do eye doctors test color vision?

There are several ways to test color vision. Simpler tests involve colored figures (either shapes or numbers) placed against a busy, patterned background. A person with normal color vision can see the figures against the background. Those with color vision deficiencies cannot see the symbols.

A more complex test requires placing a large number of colored disks in order, from one shade to another. People with different color deficiencies place the disks in varying orders.

## How are cases of color vision deficiency treated?

Unfortunately, there is no cure for hereditary color vision deficiency. Many people with color vision deficiency develop their own “system” or learn to identify colors by other means. Some people learn to tell colors apart by brightness and location. Specially tinted eyeglasses may help some people with color vision deficiencies tell the difference between certain colors. These eyeglasses and other aids help, but cannot restore normal color vision.

If you suspect a color vision deficiency, consult your eye doctor as soon as possible.

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