



## Research to Prevent Blindness

# Advances in Eye Research: Cataract

A cataract is a common eye condition in which the lens, located behind the eye's colorful iris, becomes cloudy instead of clear. More than 24 million Americans over the age of 40 have been diagnosed with a cataract. Cataracts are the leading cause of blindness in the world, according to the World Health Organization.

In the healthy eye, the eye's lens contains water and proteins and is crystal clear. The lens functions to focus light onto the center of retina (the macula) in the back of the eye to provide clear vision. When the proteins in the lens begin to clump together, the lens becomes cloudy and can't focus light as well. A cataract begins as a small cloudy spot in the lens, and grows until it interferes with vision.

The most common symptoms of a cataract include:

- vision seeming hazy or blurred,
- colors appearing faded—blue might look green and yellow might appear white,
- lights giving off a glare or halo,
- night vision decreasing, and
- seeing double.

### Risk Factors

One of the most significant risk factors for cataracts is age—older people are more likely to develop the condition. Women are slightly more likely than men to develop cataracts. Long-term exposure to sunlight and smoking cigarettes may also cause cataracts.

Other risk factors include having close relatives with cataracts, experiencing an eye injury, having high cholesterol or diabetes, having other eye conditions such as nearsightedness or retinitis pigmentosa, using steroidal drugs and having high-dose radiation therapy of the head.

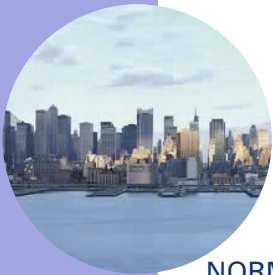
Many people have cataracts and don't even notice until the lens becomes significantly cloudier. Ultimately, cataracts can affect vision enough to cause everyday tasks to become challenging, although the rate of progression of these changes is quite variable from person to person.

Regular dilated eye exams by an eye care professional are extremely important to prevent vision loss from cataracts.

### Prevention and Treatment

You can take several steps to prevent cataracts. Wear sunglasses that block both ultraviolet A and B (UVA and UVB) rays and a hat to protect your eyes when outdoors. If you smoke, quitting can reduce your risk of developing the condition. If you have diabetes, it is important to maintain tight control of your blood sugar to prevent all forms of diabetic eye disease, including cataracts.

More than half of Americans age 65 and older and more than 70 percent of Americans 75 and older have cataracts.



NORMAL VISION



ADVANCED CATARACT

The only effective treatment for cataracts is surgery, in which a surgeon removes the clouded lens and replaces it with a clear artificial lens.

It is recommended that patients considering cataract surgery inform eye care specialists about medications that they are taking or have taken to treat enlarged prostate or other lower urinary tract symptoms. These medications, called alpha-blockers, may cause a problem during the surgery. However, surgeons can alter their approach to the surgery if they are aware of these medications.

## Hope Through Research

The mission of Research to Prevent Blindness (RPB) is to preserve and restore vision by supporting research to develop methods to prevent, treat, and cure all conditions that damage and destroy sight.

Scientists funded by RPB are investigating the details of lens structure and function, and exploring how genetics, age, and other risk factors contribute to cataract formation.

### Learning How UV Rays Contribute to Cataract

A recent study revealed more about the link between sunlight exposure and the risk of developing cataracts. Ultraviolet light was found to trigger a distinct reaction in the eye that damages lens proteins and causes them to clump together. This study confirms the importance of protecting your eyes from ultraviolet light.

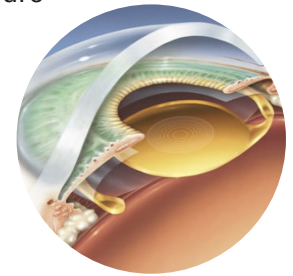
### Eye Drops for Cataract Treatment

Researchers have shown that eye drops made from a compound naturally occurring in the human body improved the transparency of mouse lenses affected by cataracts. The compound selected for use in the eye drops works by stabilizing crystallins (the major component of fiber cells that form the eyes' lenses) and preventing them from clumping together. Clinical trials in humans are needed to establish the value of the compound as a cataract treatment.

### Stem Cells Regenerate Lens After Cataract Surgery

Stem cells occur naturally in the lens and generate new lens cells throughout a person's life. Currently, surgeons remove these stem cells during cataract surgery.

Recently, scientists showed that after leaving stem cells intact in the eye during cataract surgery in children with inherited cataracts, a functional lens was regrown. Researchers are now looking to study this approach in adults with age-related cataracts.



Cataract surgery involves replacement of the eye's natural lens with an artificial intraocular lens (IOL). Different types of IOLs help patients see at single distances or at multiple distances, and some block damaging ultraviolet and blue light. Fewer than 2 percent of patients who undergo cataract surgery experience complications.

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## Invest in Your Vision

You can join RPB in supporting critical research in the fight against vision loss by sending your tax-deductible donation to the address shown below or online at [www.rpbusa.org](http://www.rpbusa.org). RPB is a public 501(c)(3) foundation.



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360 Lexington Avenue, FL 22, New York, NY 10017-6528  
800-621-0026 · 212-752-4333  
[www.rpbusa.org](http://www.rpbusa.org) · [inforequest@rpbusa.org](mailto:inforequest@rpbusa.org)

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Since 1960, RPB has led a research effort to preserve vision and restore sight, supporting nearly every major development in the treatment of blinding disorders.