

## EYE HEALTH

### Keratoconus: Get the Facts

The cornea is the clear outer layer of the eye and is normally dome shaped, like a ball. Sometimes, the structure of the cornea is not strong enough to hold this round shape. This may lead to the development of keratoconus, a condition in which the cornea bulges outward like a cone. Keratoconus is a progressive eye disease and it can occur in one or both eyes. It often begins during someone's teenage years or early 20s. It's possible for keratoconus to occur in people aged 40 and older, but this is less common.

#### Symptoms That Could be Caused by Keratoconus

- A sudden change of vision in one eye
- Double vision when looking with just one eye
- Objects both near and far looking distorted
- Bright lights looking like they have halos around them
- Lights streaking
- Seeing double or triple ghost images
- Being uncomfortable driving due to blurry vision, especially at night

Keratoconus appears to run in families and may progress more quickly in people with medical problems, including some allergies. It has also been linked to overexposure to ultraviolet rays from the sun, excessive eye rubbing, a history of poorly fitted contact lenses, and chronic eye irritation.

#### Diagnosis

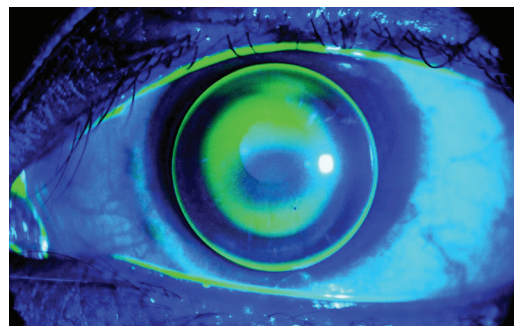
To see if you have keratoconus, your doctor will measure the shape of the cornea. The most common method is corneal topography, which uses photos of the cornea to take measurements. Children of parents with keratoconus

should have a corneal topography done every year starting at age 10. Even if results come back normal, the test should still be redone annually to detect subtle changes over time. With annual tests, your doctor can compare results and determine if treatment is necessary.

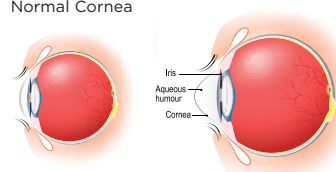
#### Treatment

Treatment for keratoconus usually starts with new eyeglasses. This is often effective for mild cases, but rigid gas permeable contact lenses may be recommended if new glasses don't work. Cornea collagen crosslinking and intacs are other treatment options that may be considered to improve vision. A specialized laser procedure called PTK may be used to smooth out a raised scar and improve contact lens comfort. If eyeglasses and contact lenses no longer provide stable, comfortable vision, a corneal transplant may be needed. This involves removing the center of the cornea and replacing it with a donor cornea that is stitched into place.

Talk to your doctor if you think you have any symptoms of keratoconus. If you or a loved one has it, your doctor may also provide ways to prevent it from worsening.



Normal Cornea      Cone Shaped Cornea



## INSIGHTS

### The Importance of Eye Donation



Donated eyes can be used to restore vision in people with corneal blindness. Other portions of the eye are used for research and training purposes. Eye donations can be authorized by the person who died before death or by their next of kin, even if they didn't pledge to donate eyes before dying.

A common misperception is that older people and those with illnesses like diabetes, hypertension, heart disease, or kidney disease are not good candidates to donate eyes. These factors, however, should not be seen as barriers. Corneas of people with these characteristics are unaffected, even if they've undergone any eye surgeries in the past. As such, their corneas are useful and may be transplanted in others.

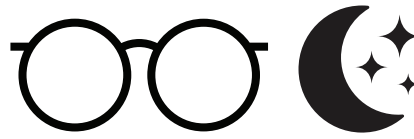
Many social awareness programs and activities are available across the country to impart the significance of eye donation and its usefulness to visually impaired people. Ask your doctor about becoming a donor.

## EYE-Q

**Q: Ommatophobia is a fear of what part of the body?**

See answer on back.

# Overcoming Night Blindness



When lighting is dim, the eyes need to adapt to the surroundings. Night blindness, or nyctalopia, occurs when the eyes are unable to adapt to low-light conditions, such as at nighttime. Night blindness can negatively affect how you see in dim light, but it doesn't cause complete blindness.

With night blindness, you may have problems seeing road signs when you're driving at night or it may take your eyes longer to adapt when going from light to dark settings. The condition could prevent you from being able to see stars in the sky on a clear night or obstacles in a dark room.

## Spot the Symptoms

To identify night blindness, ask yourself the following questions:

- Is it challenging to move around the house in dim light?
- Is driving at night increasingly difficult?
- Is it tough to recognize faces in dim light?
- Does it take too long to adjust to a well-lit room after being in the dark?
- Does it take a long time to see in a darkened room after being in the light?

Other symptoms may also occur with night blindness. The nature of these

symptoms will depend on the underlying cause. They may include headaches, eye pain, nausea or vomiting, blurry or cloudy vision, sensitivity to light, and/or difficulty seeing into the distance.

## Recognize the Causes

Night blindness is a symptom of underlying eye conditions and diseases. There may be several causes, but the good news is many are treatable. These can include:

- Nearsightedness
- Vitamin A deficiency
- Glaucoma
- Cataracts
- Retinitis pigmentosa

## Get Treatment

Fortunately, there are treatments for many causes of night blindness. Treatment will vary depending on the cause. For example, wearing specific types of glasses or contact lenses may be helpful. Consuming more orange and yellow vegetables and fruits and foods that contain vitamin A may also help with symptoms. Sunglasses can be used to protect the eyes from ultraviolet light, which can cause further eye damage.

With more serious causes like cataracts and glaucoma, an eye surgery may be necessary to remove a cataract or to release pressure in the eye. Retinitis pigmentosa currently has no effective treatments, but some eye devices and therapy services may improve symptoms and quality of life.

The outlook for night blindness will depend on its cause. In many cases, treatments can alleviate symptoms, but it's also important to take precautions. Ask your doctor what you can do if you think you're suffering from night blindness.

# Over-the-Counter Cold Remedies & Glaucoma



If you have glaucoma, you may wonder if it's okay to use over-the-counter (OTC) cold remedies. On the bottle of many OTC products, there are often warnings to ask a doctor before using it if you have any of several health conditions, including glaucoma. It may also be difficult to know if the product is safe because package labeling is often vague or misleading.

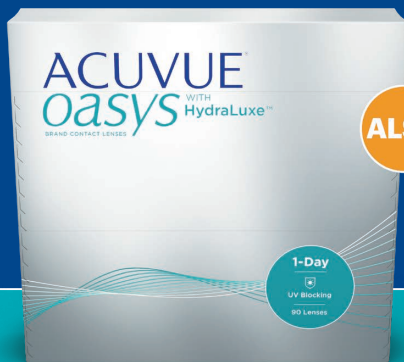
Virtually all cold products carry a warning about glaucoma, but the reality is the vast majority of people with glaucoma are at low risk of adverse events relating to OTC medications. People at highest risk for adverse events from these products include those with narrow angles or angle closure glaucoma and those with plateau iris syndrome.

If you have end-stage glaucoma or fragile optic nerves, be cautious with OTC drugs. If you have any concerns about the product being harmful, ask your doctor if you can use the remedy before you take it.





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## How Blinking Affects Eye Tracking

Eye tracking continues to evolve and is making it possible to objectively measure and quantify eye movements as part of human behavioral research. Early versions of eye trackers were highly intrusive and challenging to set up, but more modern devices are much smaller and provide more natural experiences for respondents. They are also becoming easier to use and more accessible.

Most modern eye trackers use near-infrared technology along with a high-resolution camera to track gaze direction. Eye trackers use blinks to objectively measure eye movements in real-time. This helps indicate if certain visual elements attract someone's immediate or above-average attention or if some elements are being ignored or overlooked. Trackers can also record the order that visual elements are noticed.

With eye tracking, you can tap into nonconscious mental processing. The technology is being used to assess product design and advertisements that catch your attention, and its application will continue to grow in the future.



## Lessons on Color Blindness



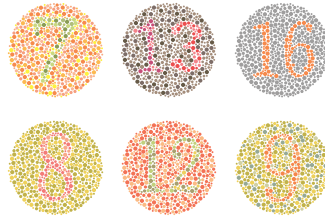
Color blindness occurs when you're unable to see colors in a normal way. It's also known as color deficiency. Color blindness usually affects both eyes equally and remains stable throughout life. There are different degrees of color blindness, but most cases are not serious. The most severe form of color blindness occurs when everything is seen in shades of gray, but this is very uncommon.

Most people with color blindness are born with it, but you can also get it later in life. Men are at higher risk than women for being born with color blindness. Most color vision problems occurring later in life are the result of different diseases, traumas, and toxic effects from drugs.

### A Look at the Science

In the retina, there are two types of cells that detect light: rods and cones. Rods detect only light and dark and are very sensitive to low light levels. Cones detect color and are concentrated near the center of your vision. They distinguish between red, green, and blue. The brain uses input from cone cells to determine how we perceive color.

Color blindness can happen when one or more color cone cells are absent, not working, or detect a different color than normal. Severe color blindness occurs when all three cone cells are absent. Mild color blindness happens



when all three cone cells are present, but one cone cell does not work right, leading to the detection of a color that's different than normal.

### Test Yourself

You can test yourself to see if you're color blind using a set of images called the Ishihara color plates. With this test, you look at several images that have numbers embedded in dots of color. The numbers are a different color than the background. If you can't see the numbers, you're probably colorblind.

For anyone taking this test, it's important to understand what it means to be color blind. The condition is rarely serious and testing positive is no reason to panic. If you think you may be color blind, do the Ishihara color blindness screening and ask your doctor about the results. If you have emerging or worsening vision problems, see your doctor right away to find out more about why this is happening.

### Managing the Condition

Currently, there is no treatment for congenital color blindness, but the good news is this type usually does not cause any significant disability. Special contact lenses and glasses may be helpful. For acquired forms of color blindness, talk to your optometrist. They may be able to address the underlying condition with medications or other treatments.



## I Have Dry Eye: Can Scleral Contacts Help?



Moderate to severe dry eye can be an irritating and disabling condition, and it often limits your ability to do things that you enjoy in life. When you have dry eye, your comfort and vision are seriously affected. For many people, scleral contact lenses may be an effective treatment option, especially if you have evaporative or aqueous-deficient dry eyes.

Scleral contact lenses are custom fitted to form a vault over your eye, leaving a little bit of room for lubricating drops. These lenses, used together with the drops, can help you get crisp vision and superior comfort.

Scleral lenses may be helpful if other normal dry eye treatments have failed. The contacts can dramatically reduce pain and discomfort. They may also improve vision impairment for those with moderate to severe dry eye. Talk to your doctor today to see if you are a candidate for these lenses.





## Lazy Eye: When the Eyes Don't Work Together



Lazy eye—or amblyopia, as it's referred to medically—occurs when vision in one of the eyes is reduced because the eye and brain are not working together properly. The eye itself looks normal, but it's not being used normally because the brain is favoring the other eye.

Lazy eye is the most common cause of visual impairment in children, affecting 2 to 3 of every 100 kids. Unless it is successfully treated in early childhood, lazy eye usually continues into adulthood. It's also the most common cause of single eye visual impairment in younger and middle-aged adults.

There are several possible causes of lazy eye, but the condition typically results from things that prevent one eye from focusing clearly. Potential causes include misalignment of the eyes, the inability of one eye to focus as well as the other, and cataracts.

### Diagnosis

Since lazy eye usually occurs in only one eye, many parents and children may be unaware of the condition. Fortunately, it can be detected with early comprehensive vision exams and other diagnostics, such as special visual acuity tests that go beyond the standard 20/20 letter charts. Exams with cycloplegic drops may be needed to detect lazy eye in young children.

### Treatment

For children, treatment for lazy eye involves forcing use of the eye with weaker vision. The most common ways to do this are with patching, a drug called atropine, special vision therapy exercises or a combination of those treatments.

With patching, an adhesive patch is worn over the stronger eye for a period of weeks to months. Patching stimulates vision in the weaker eye and helps parts of the brain involved in vision develop more completely.

When treating children with atropine, the drug is placed in the stronger eye to temporarily blur vision, forcing use of the weaker eye. Some studies show that atropine eye drops and patching work equally well, but atropine may be easier for parents and children to use.

While lazy eye is treatable for children, less is known about how to treat adults. Treatment of lazy eye after the age of 17 is not dependent upon age, but it requires more extensive efforts like vision therapy. Scientists are still exploring whether treatment for lazy eye in adults can improve vision.

### Outlook

Everyone with lazy eye deserves at least an attempt at treatment and each case is different. It's important to be evaluated for lazy eye with a comprehensive functional vision exam. Improvements are possible at any age, but early detection and treatment offer the best chance of a positive outcome.



## Baby Shampoo: Beware Hidden Dangers



For years, people with blepharitis and dry eye disease have been told that it's safe to clean their eyelids with baby shampoo. While it seems like a cheap and simple solution, the reality is baby shampoo should NOT be used to clean the eyelids. Recent reports show that these products can be harmful.

Baby shampoo contains multiple synthetic ingredients and detergents that throw off the pH balance of your eyelids. In addition, many baby shampoo ingredients can lead to eye allergies. These harsh chemicals can irritate your eyes, which is the exact opposite of the outcome you're seeking.

The good news is there are more effective, expert-recommended ways of cleaning eyelids than using baby shampoo. For example, a spray-on hypochlorous-based cleanser is effective, gentle, and requires no scrubbing. Other products are also available. Ask your doctor about alternatives if you've been using baby shampoo to clean your eyelids.

### Don't forget your shades!

Too much exposure to UV rays can damage the surface of the cornea and conjunctiva, causing a condition akin to sunburn called photokeratitis.



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EYE HEALTH



## Explaining “Presbyopia”

Presbyopia is a normal part of aging. It occurs when your eyes gradually lose the ability to see things up close clearly. Symptoms often appear shortly after you reach your 40s. You may start holding reading materials farther away to see them more clearly. After age 40, the lens becomes more rigid. This makes it harder to read or do other tasks that require you to focus closely on things. There is no way to stop or reverse presbyopia. Failing to correct it can lead to headaches and eye strain.

Fortunately, presbyopia can be corrected with single vision glasses or contact lenses. If presbyopia is your only vision problem, glasses or contact lenses may be all you need. If you wear eyeglasses for other vision problems, you might need bifocals, trifocals, or progressive lenses. Some people prefer contact lenses over eyeglasses. Options include monovision or multifocal contacts, depending on your visual preferences. Several types of surgery may also be considered. Ask your doctor to learn more about presbyopia treatment options.



EYE DROPS



**NEWBORN BABIES SEE THE WORLD IN BLACK AND WHITE—AND RED.** While newborns do see black, white, and shades of gray, they can also detect red objects against a gray backdrop. The reason why they can't see more colors is because the cones in their eyes, the photoreceptor cells responsible for picking up colors, are too weak to detect them.



EYE-Q

Answer to Eye-Q (from page 1)

A: The eye

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