

# Contact Lenses Could Lead to Serious Eye Infections if Not Used Properly

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## STORY AT-A-GLANCE

- › Although very popular, contact lenses can increase your risk of eye infections, corneal abrasions, corneal ulcerations, vision loss and even loss of your eye
- › Your brain depends on full-spectrum light to enter through your eyes, so UV-filtered lenses will increase your risk of certain conditions
- › Proper care of your lenses includes never sleeping, swimming or showering with your lenses in, routinely replacing your lens case, washing your lens after each use and more

***Editor's Note: This article is a reprint. It was originally published September 28, 2016.***

Two-thirds of the 41 million people in the U.S.<sup>1</sup> who wear contact lenses to correct their vision are women.<sup>2</sup> Ten percent of wearers are under 18 years and 25% are older than 45. The remaining majority are between 18 and 45 years old.

Although popular, wearing contacts increases your risk of eye infections, damage to the cornea and alters the microbial biome that exists naturally in your eye. In each case, the results can be either dangerous or disastrous to your sight.

Before understanding the risks, it's helpful to know how your eye works and how contact lenses work to help correct your vision. Children report improvements in perceived attraction when wearing lenses, but unless they care for their eyes and lenses properly, they're at increased risk of losing their eyesight altogether.

## How Your Eye Functions

What you see is not interpreted in your eyes but rather in your brain. Light passes through the front of your eye (cornea) and your lens. These structures help focus the light on the retina at the back of your eye.

The cells in the retina then convert the light to electrochemical impulses making their way over the optic nerve and into your brain. The front of your eye acts like a camera lens, letting more light in at night and less during the day. This is why your pupils are larger at night, to let in more light and allow you to see.

Contact lenses are worn in "contact" with the eye. They are prescription lenses designed to correct vision errors, much like miniature eyeglasses. They change where the light is focused on the retina, which improves your eyesight.<sup>3</sup>

These little lenses move with the eye and float on your tear film over the surface of your cornea. As far back as 1508, Leonardo da Vinci had illustrated the concept of contact lenses. The first lenses were made of glass in 1887.

Through the years they graduated to plastic, soft lenses, disposable lenses, gas permeable and, finally, custom-manufactured silicone hydrogel lenses.<sup>4</sup>

Gas permeable (GP) lenses are made of firm plastic, have less water, are less flexible and resist bacteria more than soft lenses. The GP lenses also keep their shape as you blink, maintaining your prescription better than soft lenses.

## The Importance of Full-Spectrum Light

Your eyes need [full-spectrum light](#) to stay healthy, just as your body requires sunlight.<sup>5</sup> When light enters your eye it not only helps you to see but also goes to your brain's hypothalamus. This is the gland in your brain that controls your body temperature, hunger, thirst, water balance and blood pressure.

It also has a significant impact on your pituitary gland that secretes many different essential hormones. For this reason, exposure to full-spectrum lighting is an effective therapy for treating depression, infection and more.

According to research by Dr. Martin Mainster and Dr. Patricia Turner at the University of Kansas School of Medicine:<sup>6</sup>

*"Inadequate environmental light and/or ganglion photoreception can cause circadian disruption, increasing the risk of insomnia, depression, numerous systemic disorders and possibly early mortality.*

*Artificial lighting is dimmer and less blue-weighted than natural daylight, contributing to age-related losses in unconscious circadian photoreception."*

Studies have also demonstrated poor lighting is associated with headaches, stress, fatigue and strained, watery eyes.<sup>7</sup> Poor lighting is also associated with poor work production.<sup>8</sup> Conversely, companies that have switched to full-spectrum lights report improved employee morale, greater productivity, reduced errors and decreased absenteeism.<sup>9</sup>

If you choose to use contact lenses, it is important to choose lenses that do not filter UV light as they will increase the risk your eyes and brain will not receive enough UV light to maintain your health and wellness.

You will also need to protect your eyes from overexposure to UV light. Read my article titled, "[Do Sunglasses Protect or Harm Your Eye Health?](#)" for tips about when to wear sunglasses and how to pick a pair that meet your lifestyle and physical needs.

## **Increased Risk of Infection and Eye Damage with Improper Care**

In this five-minute video, you'll discover some of the common mistakes people make when they clean or store their contact lenses. These mistakes can have serious consequences, including infection and damage to your eyesight.

In a news broadcast from ABC, Dr. William Faulkner from the Cincinnati Eye Institutes warns that 20,000 people a year develop pseudomonas infections in their eyes.<sup>10</sup> According to the Centers for Disease Control and Prevention (CDC), 50% of people sleep with their contact lenses on.

Unfortunately, these practices lead to an increased risk of infection in your eye, which leads to a debilitating infection and loss of eyesight. Left untreated, you'll even lose your eye. Faulkner relates that people who sleep in their lenses, even those marketed as overnight contacts, have a 10 times greater risk of developing an eye infection.

Nearly 1 in every 5 persons with eye **infections involving contact lenses** experience damage to their eye.<sup>11</sup> These complications include scarred corneas, corneal transplants and loss of vision.<sup>12</sup> As far back as 1996, researchers identified several factors contributing to increased risk of infection and corneal ulcers from sleeping in your contacts, including:<sup>13</sup>

- Oxygen deprivation
- Bacterial survival
- Atmospheric pollution
- Patterns of sleep
- Lack of eye and lid movement

The CDC reports keratitis, or inflammation of the cornea, triggers over 1 million visits to the emergency room each year with an estimated direct medical cost of \$175 million.<sup>14</sup> Greater than 99% of the people surveyed reported they participated in at least one behavior that increased their risk of contracting an infection.

Reports of infection and eye damage are monitored by both the U.S. CDC and Food and Drug Administration (FDA) as contact lenses are regulated by the FDA as medical devices. A high percentage of the reports involved people using overnight or extended wear contact lenses.<sup>15</sup>

# Orthokeratology

A different kind of contact lens is worn only at night in order to reshape the eye, so the wearer doesn't need glasses or contacts the next day. This product has been used by young athletes to reduce their need for glasses or contacts while they're competing. The lenses are called **orthokeratology**, also known as ortho-k.

The cost of these lenses can be steep, but many parents find the pros outweigh the cost. The practice of reshaping your cornea with contacts has been around for decades,<sup>16</sup> but the FDA only first approved them for use in 2002.

These lenses are now typically marketed to teens and children by optometrists. The lenses are used for children with mild to moderate myopia with the hope that the lens will help reduce refractive error over time. However, wearing these lenses overnight come with significant risks.

While most children experience temporary improvements in their eyesight, some practitioners believe that by prescribing the lenses at a young age, reshaping of the cornea could become semi-permanent since the cells in children's eyes divide more rapidly. This rapid cell division results in more permanent changes to the shape of the eye.<sup>17</sup>

Ophthalmologists and corneal specialists are not so taken with ortho-k lenses, citing their experience and several studies for their concern. Sleeping with contact lenses, whether they are marketed as extended wear, as are ortho-k lenses, or if you accidentally fall asleep in your lenses, increases your risk of eye damage.

## Risks Associated with Sleeping in Your Contacts

Wu Jian-Liang, the director of ophthalmology at Taipei's Wan Fang Hospital, quoted in the Daily Mail, says:<sup>18</sup>

*"Contact lens wearers are a high-risk group that can easily be exposed to eye diseases. A shortage of oxygen can destroy the surface of the epithelial tissue,*

*creating tiny wounds into which the bacteria can easily infect, spreading to the rest of the eye and providing a perfect breeding ground."*

Common risks include:

- **Hypoxia** – Wearing contact lenses reduces the amount of oxygen available to your eyes. Every tissue in your body depends on oxygen. In response, your body begins growing new vessels, called corneal neovascularization.<sup>19</sup> Additional blood vessels increase your risk of retinal damage.

Corneal microcysts and vacuoles also develop from chronic hypoxia. Generally, you don't have symptoms, but your eyes will get mildly irritated or you will experience hazy vision.<sup>20</sup> Treatment is to stop using contact lenses. Many times, the condition is reversible when treated.

Hypoxia also has a risk of causing contact lens acute red eye (CLARE) when high levels of gram-negative bacteria take up residence under your lens after sleeping in your contacts.<sup>21</sup> Treatment includes removing your lenses, anti-inflammatory eye drops and eye lubricants. Antibiotics are not used as CLARE is the result of endotoxin reaction and not invasive infection.

- **Ulcers** – Corneal ulcers are open sores that form when contacts scratch the surface of the cornea and may cause permanent damage.<sup>22</sup> The scratches leave your eye open to infection. If something is left on the contact lens it can also scratch the cornea. Lack of oxygen from sleeping in the contacts can also leave the tissue more vulnerable to ulceration.
- **Parasites** – The primary parasite and infection found associated with contact lenses is *Acanthamoeba keratitis*. When you wear your contacts during the daytime and night hours you keep the parasite in contact with your eye where it can feed on the corneal tissue. Although it is relatively rare, it can result in permanent structural damage to your eye and vision loss.<sup>23</sup>

Showering and swimming in your contact lenses increase your risk of parasitic infection. The acanthamoeba parasite lives in the water supply and doesn't usually cause other health problems. The parasite is also resistant to most of the contact lens disinfectants on the market, so cleaning your lens after swimming doesn't reduce your risk.<sup>24</sup>

## Prevent Overuse

Overusing your contact lenses is another factor that increases your risk of infection and damage to your eye. If you over wear your lenses, they become so thin they tear and scratch your cornea. Calcium and protein deposits also build up, scratch your cornea and affect your vision.<sup>25</sup>

You should always be able to rotate your lens in your eye. If your eye becomes dry and your lenses are no longer floating over your eye take them out immediately. Clean and soak them while you give your eyes a rest. You can reduce the risk of over wearing by following these tips:

- **Take contacts out at least once daily** — Even if you own extended-wear contacts, it's important your eyes are exposed to oxygen and rest. Wearing your contacts overnight increases your risk of hypoxia, infection and corneal ulcerations.
- **Carry a pair of glasses** — Keep a clean storage case and travel-size solution, as well as a pair of glasses, with you. Contacts cause eye strain, resulting in headaches or feeling your eyes are stressed. At these times use your clean storage and glasses to help your eyes rest.
- **Replace your contacts** — Your ophthalmologist will recommend your contacts are replaced at an interval specific to your brand and use of contact lenses. If you are prescribed weekly or daily contacts it's important you change them each day or week, even if you feel the lenses are still working well.

# Proper Care of Your Lenses and Eyes Will Reduce Your Risk of Infection

This short video demonstrates how to properly clean and store your lenses. Proper care of your lenses will reduce your potential risk for injury, infection or damage to your eyesight. Here are several more tips:<sup>26,27</sup>

Before handling your lenses to insert or take them out, wash your hands with soap and water and dry with a lint-free towel.

Change your contact lens case every one to three months.

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Keep your lens case clean; allow it to air dry between uses.

Always use fresh solution; don't wait for the bottle to pass the expiration date to change it.

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Never sleep, shower, swim or use a hot tub in your contact lenses.

Replace your contact lenses as your doctor prescribes.

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Never share contact lenses.

Never clean your lenses with tap water.

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Visit your eye doctor annually to check your prescription and ensure your lenses fit your eyes.

Do not use saline or rewetting solution to store or disinfect your lenses.

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Do not top off the solution in your lens case.

Do not allow the tip of the lens solution to come in contact with anything.

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Do not transfer lens solution to a travel-size container, as this affects the sterility of the solution.

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