

Science AMA Series: I'm Dr. Jennifer Cope, a medical epidemiologist at the U.S. Centers for Disease Control and Prevention. I am here to talk about contact lenses and healthy wear and care habits. AMA!

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### **Abstract**

Hello, I am a medical epidemiologist and infectious disease doctor at CDC in the Waterborne Disease Prevention Branch. I work to prevent and stop infections caused by free-living amoebas, which are single-celled organisms found in the environment, in water and soil. They cause diseases ranging from a type of encephalitis, or brain infection, to serious eye infections. I support epidemiologic, laboratory, and communication activities related to free-living amoeba infections. Acanthamoeba is a free living amoeba that can get on your contact lenses, and lead to a painful and disruptive infection called Acanthamoeba keratitis (AK). AK can lead to vision problems, the need for a corneal transplant, or blindness. Luckily, AK and other contact lens-related eye infections are largely preventable. So while I spend a lot of time working on specific free-living amoeba infections, I also work with the CDC Healthy Contact Lens Program to help people learn about contact lens-related eye infections and the healthy habits that can reduce your chances of getting an eye infection. For more information about the CDC Healthy Contact Lens Program and our contact lens recommendations, visit our website: <https://www.cdc.gov/contactlenses/index.html>. I'll be back at 1 pm to answer your questions, ask me anything!

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## Science AMA Series: I'm Dr. Jennifer Cope, a medical epidemiologist at the U.S. Centers for Disease Control and Prevention. I am here to talk about contact lenses and healthy wear and care habits. AMA!

DR\_JENNIFER\_COPE [R/SCIENCE](#)

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My doc says that my FDA-approved overnight contacts should still not be slept in, regardless of what the FDA says.

Is she right??

[MarginallyCorrect](#)

You are correct that some types of lenses are approved by the FDA for overnight wear, but what you might not know is that they were approved in a different risk category than lenses not approved for overnight wear. Most contact lenses not approved for overnight wear are Class II medical devices (along with things like powered wheelchairs and pregnancy test kits). But contact lenses approved for overnight wear are in the highest risk category, Class III, along with pacemakers and implantable heart valves. That is because the FDA acknowledged that overnight wear could be useful for some people, but that the risk of an eye infection is higher in people who sleep in their contacts. In fact, your risk of a serious type of corneal infection called microbial keratitis is 6 to 8 times higher when you sleep in your contacts. So, if at all possible, it's best not to sleep in your lenses.

Hi Dr. Cope! Thanks for doing this AMA :)

I was wondering what you see as the most frequent mishandling of contact lenses by average users

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like myself, and how we can change our habits to avoid mishandling them?

For example, when exhausted I frequently rub my eyes or apply pressure to them, even wearing contacts. I know rubbing your eyes isn't good for you regardless but I'm wondering if I'm damaging my eyes more so because I'm wearing contacts, etc.

As someone who's had terrible vision since I was a child and wear contacts almost daily, I really appreciate this AMA and am excited to learn how I can keep my eyes and contact use healthy!

[Chamx0](#)

Glad you are finding this topic useful! Some of the most common bad habits contact lens wearers have include: topping off solution in the case (adding new solution to old solution in the case), not regularly replacing the storage case, and sleeping in lenses.

Hi!

My disposable contacts are meant to be worn for roughly two weeks. I wear them for a month (nightly soaking), and have been for years.

Am I playing Russian Roulette with my eyes, or am I sticking it to Big Contacts?

[firestormchess](#)

Thanks for the question. I'm excited to be here to talk about contact lens health. It seems like this is a common practice among contact lens wearers and I know it's tempting to want to stretch your contact lens supply for as long as possible. While the effects of not replacing contact lenses as regularly as recommended by an eye care provider have not been fully examined, studies have shown that contact lens wearers who do not follow recommended replacement schedules have more complications and self-reported discomfort than contact lens wearers who follow the replacement recommendations. Some contact lens wearers have also reported poorer vision as a result of wearing contact lenses longer than indicated by their eye care providers.

**Keep water away from your contact lenses.** Avoid showering in contact lenses, and remove them before using a hot tub or swimming.

Am I supposed to swim blind? Swim with glasses? I ignore this advice but discard the contacts after. Do you have a better idea?

[JavierTheNormal](#)

While not swimming at all in lenses is the best practice, discarding lenses immediately after swimming is probably the next best thing. If you are a regular swimmer, consider getting prescription goggles.

For soft contact lenses, are peroxide based cleaning solutions more effective at preventing protein buildup and microbial growth than other types? What is the most effective, foolproof way to be sure my lenses are getting properly clean while soaking overnight?

Thanks!

[kjvdh](#)

The data are not totally clear on what type of cleaning solution is the most effective, but there is some

evidence to suggest that peroxide based solutions might provide a little more comfort (make sure you rinse!). One nice thing about the peroxide based solutions is that they come with a case, making changing your case regularly easier.

What can I expect to happen to my eyes should I not be taking my contacts out each night? What if I'm not cleaning them? What if I'm using contacts that are "older" than they should be, like using daily lenses for a week.

[XlexerX](#)

All of the things you listed can increase your risk of a serious eye infection. Sometimes these infections can be sight-threatening, the recovery period can be months- long, and can even require eye drops as often as every 15 minutes around the clock. You can see what recovering from a serious eye infection can be like in these videos: <https://www.cdc.gov/contactlenses/videos.html>

Beyond eye infections, you probably won't be as happy with your contacts. You're at increased risk of having dry, red, or irritated eyes.

Can swimming in pools, oceans, lakes, etc with contact lenses in and no eye protection on lead to an increased chance of infection?

[basketballhater](#)

While rinsing and storing lenses in water are definitely risky practices, any lens contact with water could be upping your chances of an infection, including swimming. Even tap water, while safe to drink, contains microorganisms that can get on your contact lens and transfer to your eye, causing an infection. So the best policy is to not expose your lenses to water at all. If you're a regular swimmer, you might want to consider getting prescription goggles.

Is it bad to shower with contacts on? I try to not get water in my eyes but will I likely get an infection that way?

Because it's nice to see things when I'm showering.

[fringeer](#)

The scientific literature seems to show that storing and rinsing your lenses in water are the most risky behaviors but showering isn't risk free. I can totally understand wanting to see while you're in the shower. As a glasses wearer with around a -8.0 prescription, I wish I could see better in the shower but it's totally doable without lenses or glasses, which would be the safest practice.

What do you think about overnight-contacts? Like the kind you only put in at night and take out in the morning and that somehow gives you normal eyesight for a day?

[ilikemyself](#)

The practice you are referring to is known as orthokeratology (ortho-k for short). The idea is that you wear the lenses overnight and they temporarily mold your cornea so that you can see without lenses during the day. Ortho-k isn't very common so there isn't a ton of evidence on the risks, although we did see several ortho-k wearers in a 2011 outbreak of *Acanthamoeba* keratitis. We do know that sleeping

in your lenses in general raises your risk for serious eye infections by 6-8 times. If you are an ortho-k wearer, we recommend being as scrupulous with your contact lens hygiene as possible to minimize other risks for infection.

Hi , Dr Cope! I've been wearing semi-rigid gas permeable lenses for years... the thing I struggle with is: WHEN is a good time span switch to a fresh/new lens case?

Sometimes I don't realize it's time until I see mildew growing on the covers.

Gross I know.

[Countpudyoola](#)

While the exact interval at which to replace your case is not known, a good rule of thumb is every 3 months or when you switch out your bottle of solution, whichever comes first.

Is wearing once a day contacts for say, three weeks, really a big deal?

[GatorMD12](#)

I do think this is a big deal. There is some evidence that suggests daily disposables might be the safest form of contact lens wear because you are eliminating all the handling, cleaning, and storing aspects of lens care which are all opportunities for germs to get on your contacts. If you are not throwing out your dailies every day, then you are having to clean and store them, so you've eliminated all the benefits you might have gained from wearing dailies.

I wear glasses daily but I have contacts (dailies) for the rare instances when I go to the waterpark, etc. I wouldn't wear them if I could get away with it, but my uncorrected eyesight is really bad. What should I do to limit the chance of infection when I do wear them in those situations? Thanks for your time!

[lux\\_permanet](#)

I totally understand wanting to be able to see at a water park. Wearing dailies while at the water park and then throwing them out when you can put your glasses back on is probably the next best thing you can do, besides just not swimming in them.

are you an O.D. as well as epidemiologist? what first brought your interest to AK? if you could change one thing in an optometrist contact lens fitting appointment, what would you remove or add to/from it? i was a contact lens tech for 5 years, and it makes me extremely happy to see this thread!

[akmedic49](#)

Glad you're finding this thread useful! I am an infectious disease physician and my work at CDC focuses on free-living ameba infections which includes Acanthamoeba. Our studies on Acanthamoeba keratitis showed that there were common bad habits contact lens wearers have that put them at risk for all types of infections, not just AK. And that's how we got into the contact lens health business!

People tend to be so lax when it comes to their wearing habits, and I just can't seem to understand why. That said, what's the nastiest thing you've come across in your line of work?

[HandRailSuicide1](#)

Using spit to re-wet lenses that have fallen out is one of the nastier things I have heard about. Also using pond and lake water to clean lenses!

How real is the risk of an amoeba getting to your brain through your nose while swimming in a lake?

[BaboonsArse](#)

Sounds like you are asking about *Naegleria fowleri*, which is actually a different amoeba from *Acanthamoeba*, which can cause eye infections. Millions of people go swimming each year in lakes in the U.S. and only a handful of *Naegleria* infections are reported in the U.S. See more info here:

<https://www.cdc.gov/parasites/naegleria/general.html>

As an optometrist thank you so much for doing this. Some of the comments are already making me twitchy. Thank you!

[WokCano](#)

Glad to have you on here! Optometrists do important work in educating patients about the risks of infection related to contact lenses and what they can do to prevent them.

Best practice to make sure the lens stays clean when putting in? Do you recommend using a device? Do those devices work?

Washing my hands with water and soap...what if they are still a little bit wet, or bits of the towel get stuck to my fingers? Are contact lenses actually safe?

[thats-what-we-need](#)

Kudos to you for washing your hands with soap and water before inserting lenses! You should make sure your hands are dried with a clean lint-free towel. Contact lenses are a safe and effective form of vision correction - you just need to take care of them!

Hi, thanks for the AMA. My mom and brother both wear their contacts overnight - only taking them out to clean / soak them when their eyes are irritated. They will not listen to me when I tell them that is a bad habit and they should not sleep in their contacts. What risks are they taking in sleeping in contacts night after night?

[sunkissed21](#)

Your risk of a serious type of corneal infection called microbial keratitis is 6 to 8 times higher when you sleep in your contacts. So, if at all possible, it's best not to sleep in your lenses.

- How prevalent is AK?
- What is the most common way people injure themselves with contact lenses?
- One time, I woke up hungover and put on another pair of contacts over top of the first ones, without realizing. Instead of seeing twice as good, I was seeing twice as bad. That part is not a question.

[thisonetimeonreddit](#)

AK is actually a rare infection (estimates are between 1-33 per million contact lens wearers) but can be very serious, resulting in blindness or may require a corneal transplant. Infections are one of the most common ways people can do damage to their eyes with contact lenses, especially if they do not take care of them properly.

Hi, it's always been a dream of mine to work for the CDC as an epidemiologist. Can you tell me about your career path? How did you end up in your position?

[Vibriofischeri](#)

It was a dream of mine too! I came to CDC through the Epidemic Intelligence Service (EIS) program, a 2-year on the job training program in epidemiology and public health. See more information here: <https://www.cdc.gov/Fellowships/> <https://www.cdc.gov/eis/index.html>

Is it really necessary to change your contact solution every night? Is it that big of a deal if I keep the same solution in my case for like two days?

[bslovecoco](#)

Solution loses its disinfecting power over time, especially if your case or lens is especially germmy. You can also start growing a film of microorganisms in the case if you don't allow the case to dry. A similar practice is adding new solution to old solution in the case, which we call "topping off". The little bit of new disinfectant that is added gets diluted by the old, used-up disinfectant in the case. Topping off is one of the most common risk factors for serious eye infection. The best thing to do is each day after you put your lenses in, rub and rinse your contact lens case with contact lens solution—never water—and then empty and dry with a clean tissue. Store upside down with the caps off after each use. This helps reduce the chance that you'll develop that film of microorganisms in your case.

What other liquids can we use as a substitute for contact solution? For unexpected sleepovers/ parties

[Trippy\\_Mexican](#)

There are no substitutes for contact lens solution. For sleepovers/ parties, would recommend carrying a backup pair of lenses or glasses.

How can you best prevent getting AK

[Ploxzzz](#)

Here some great tips for protecting your eyes from all types of infections:

<https://www.cdc.gov/contactlenses/protect-your-eyes.html>

Hello Dr Cope, I am currently using some monthly contacts that I take out, clean and soak every night. My question is around each time I switch to next months contacts.

Generally the first day or so with the new contacts will be fine, but then for the next two weeks or so it feels like there is sand in my eyes and it also feels like my left eye's contact lens isn't on all the way as

it kind of feels like it's lifting off my eye.

After two weeks or so this goes away and I can't even tell I am wearing contacts anymore. What is causing this initial discomfort in my eyes?

[wonkeybanana](#)

I'm sorry you're having trouble with your contacts. This might be something you want to talk to your eye doctor about.

As a contact lens wearer that is about to participate in my first triathlon, do you suggest wearing prescription goggles and then glasses for the rest of the race as an alternative to wearing contact lenses with goggles? What is the incidence of AK among swimmers that wear contact lenses underneath their goggles?

[speedylenny](#)

While wearing prescription goggles and then glasses for the rest of the race is probably the safest option to prevent infection, I can understand why you might want to wear contact lenses. If you do wear contacts, I would throw out the pair you wear for the race and replace them with a new pair. Best of luck with your first triathlon!

Can you safely use a case pre-filled with contact lens solution for emergency lens removal and storage until you can get fresh solution?

[Peng-Win](#)

This seems risky. The disinfectant in your solution will lose efficacy over time. Additionally, if the case had been used before and contained bacteria, it could contaminate the solution. Would it be possible to have a small bottle of solution and an empty case on hand?

Two questions:

1. Is there an increase in the prevalence of Acanthamoeba keratitis related health issues (hopefully backed up by hard data), and is there any differences in occurrence in tropical climates vs temperate climates?
2. Does chlorination have any significant impact on reducing AK amoeba in potable water?

[Odd-This-Happened](#)

Great questions! 1. Unfortunately, we do not have formal surveillance for AK in the United States so monitoring trends is difficult. 2. In general, maintaining adequate levels of disinfectant in water systems is important for controlling amoebas. However, tap water is not sterile and should not be used for rinsing and storing lenses.

I never knew you could spell amoeba that way. I don't like it...that I was wrong.

Anyhoo, is there currently a way to deal with the vascularisation of the conjunctiva resulting from prolonged contact lens wear?

[arabsandals](#)

About the Term "Ameba" In U.S. English, the single-celled living organism described here is an ameba. The word amoeba, with an "o", is used as part of a scientific genus name (such as Amoeba or Acanthamoeba). In British English, both the generic organism term and genera names are spelled amoeba with an "o".

Neovascularization can be a complication of contact lens overwear.

With more and more diseases becoming resistant are these amoebas in this category and have you noticed resistance in them?

[piugattuk](#)

We are not seeing increasing resistance but Acanthamoeba has a cyst form that is inherently resistant to drugs. This is why AK is so hard to treat.

Do contact lenses expire? I don't wear my daily ones daily so I have a bunch left over from 4 years ago. Can I still wear them?

[Cavs032](#)

Yes, they do expire. Check the package for the expiration date.