

# NIH News in Health

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## Focus on Your Feet! Take Steps to Protect Foot Health

Most of us go through each day without ever thinking about our feet. It's only when something goes wrong that we tend to realize just how important our feet really are.

“Our feet are usually covered with shoes and socks, and they're easy to forget about, or we might take them for granted,” says Dr. David G. Armstrong, a foot doctor (podiatrist) and professor of surgery at the University of Southern California. “But we shouldn't ignore them. Foot problems can really limit activity and make it hard to move through the world.”

Your feet are surprisingly complex. Each foot has 26 bones, 33 joints, and a network of nerves and blood vessels. Your feet also have more than 100 muscles and connectors, called tendons and ligaments.

“All of these work together to give your whole body stability and balance as you move around every day,” says Dr. Stephanie C. Wu, a podiatrist at Rosalind Franklin University in Chicago. “Our lowly feet have big responsibilities.”

You can help your hard-working feet stay at their best. Start by being alert to foot pain or other problems that might need a doctor's care.

### Pay Attention to Problems •

The foot's complexity means there's



a lot that can go wrong. “Foot problems can range from annoying to devastating,” says Dr. Crystal M. Holmes, who heads the podiatry program at Michigan Medicine. “You can have skin problems like athlete's foot, which is caused by fungus. Or you can have warts, which is a viral infection. These generally are not serious. But certain other skin infections can wreak havoc if left untreated.”

You can also get painful structural problems, like bunions or hammertoes. A hammertoe is a stiff bend in a toe's middle joint. It can be caused by stubbing your toe or wearing shoes that are too tight. A bunion is a bony bump, usually on the outer side of the big toe. Bunions tend to run in families. Both conditions can first be treated by

wearing shoes with plenty of toe room. Eventually, surgery may be needed.

Other common foot problems include sports injuries, toenail troubles, and painful joints. A condition called plantar fasciitis causes sharp heel pain that declines throughout the day. Many people with plantar fasciitis recover in a few months, in part by avoiding the activities that cause pain. If the pain lasts longer, medical treatment may be needed.

Your feet can also provide early clues to problems in other parts of your body. For

example, stiff joints in your feet or ankles could be a sign of arthritis elsewhere. Swollen feet could warn of high blood pressure or kidney or heart disease. Tingling, burning, or numbness might signal some type of nerve damage. And nerve damage in the foot is often a warning sign of diabetes.

### Foot Health and Diabetes •

People who have diabetes need to pay special attention to their

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feet. Diabetes affects about one in 10 Americans. Most people with diabetes—about 60% to 70%—develop nerve problems. These can range from mild to severe. Diabetic nerve damage, or diabetic neuropathy, can make you lose feeling in your feet, which can be dangerous.

“A person with diabetic neuropathy may step on a nail and not realize it for days, because they’ve lost feeling in the feet. Or they may put their foot into a hot bath, but if the water’s scalding hot and they have no feeling, they can develop burns,” Holmes says.

Delayed detection of wounds or burns can lead to delayed treatment. And delayed treatment raises the risk of infection.

Foot infections can be especially harmful to people with diabetes. Good blood flow helps to heal foot wounds and deliver medications like antibiotics that can help fight infections. But diabetes reduces blood flow to the feet. That can prevent infections from healing.

When infections don’t heal, amputation of a toe, foot, or part of

the leg may be needed. Amputation can prevent a deadly infection from spreading to the rest of the body. But amputations are risky and can seriously affect quality of life.

That’s why NIH is funding several research efforts to improve the treatment of diabetic foot problems and reduce the need for amputations. “Research teams are looking for better ways to heal foot wounds, open up blood flow, and fight infections,” Armstrong says.

**If the Shoe Fits** • No matter your age or health conditions, wearing well-fitting, supportive shoes can have a big effect on your health. But research suggests that many of us wear shoes that are the wrong size or ill-fitting.

“Our foot tends to widen a bit as we get older, and it can also widen during pregnancy,” Wu says. “So if your foot size was measured at age 20, it probably won’t be the same years later.”

Feet also tend to gradually widen as the day goes on. “So we often recommend that if you’re shopping for new shoes, go in the afternoon or evening when your feet are a little bigger,” Wu says.

If your feet haven’t been measured in a while, consider doing so. A foot-measuring device, called a Brannock Device, can measure both the length and width of your feet. It’s usually available at shoe stores.

Experts suggest leaving a little space at the front of the shoe, because when we walk, our feet tend to shift forward.

“I’ve seen a lot of patients who end up losing a toenail, or it turns black, because the front of the shoe doesn’t have enough room,” Wu says.

Make sure that the shoes are comfortable from the start. “If they don’t feel right, don’t think that you

can break them in later. That could cause blisters and pain,” Holmes says. “Pain is meant to be a cardinal sign to tell you that something is wrong. When you don’t listen to it, you get in trouble.”

Any time you have foot pain that lingers, it’s a good idea to see a health care provider. Give your feet the attention they deserve.

“I suggest to my patients that when you go to your doctor, and you take your clothes off for the exam, make sure you take off your shoes and your socks too. Have the doctor take a look at your feet,” Holmes says. “I think that’s important, to catch foot problems sooner than later.” ■



## Wise Choices

### Basic Care for Healthy Feet

- Wash your feet every day and dry them completely.
- Change your socks at least once a day.
- Check your feet regularly for cuts, sores, swelling, dryness, and infected toenails. Apply treatment as needed.
- Wear well-fitting, protective footwear that provides proper support. Check your shoes regularly and replace them when they’re worn out.
- If visiting a salon for nail and foot care, choose a salon that is clean and licensed by your state’s cosmetology board. Make sure the salon sterilizes instruments (such as nail clippers, scissors, and other tools) after each use.
- See a health care provider if you have ongoing pain or numbness in your feet, or cuts or sores that don’t heal.

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**Web Links**

For more about healthy feet, see “Links” in the online article: [newsinhealth.nih.gov/2023/03/focus-your-feet](https://newsinhealth.nih.gov/2023/03/focus-your-feet)

# Shaping Clearer Vision

## Is Eye Surgery Right for You?

Your eyes let you picture the world. But, for many people, that image is blurry. If the shape of your eye makes it hard to see clearly, glasses and contact lenses can help bring the world into focus. For some, surgery may also be an option. But it's not for everyone. Researchers are looking for new ways to predict who will benefit from corrective eye surgeries.

Your eyes work like a camera, focusing light to capture images. The shape of your cornea, the transparent cover of the eye, is bent. This lets it focus light on the back of the eye to create a picture. The process of bending and focusing light is called refraction. If the shape of your cornea isn't perfect, it can't focus light properly, and you may have blurred or distorted vision. These are called refractive errors.



### Wise Choices

#### Is Refractive Surgery Safe for Me?

Some things make it risky or impossible to have refractive eye surgery, including:

- Unstable refractive errors.
- Certain autoimmune diseases, like lupus or rheumatoid arthritis. These are conditions in which the body's disease defense system mistakenly attacks the body's own cells and tissues.
- Chronic illnesses that may slow wound healing, like diabetes.
- Use of medications that can prevent healing.
- Dry eye, glaucoma, cataracts, and some other eye problems.
- A cornea that is especially thin or oddly shaped. Certain conditions, like one called keratoconus, can cause these types of eye problems.

"Refractive errors are the number one cause of vision loss worldwide," says Dr. Anat Galor, an eye surgeon at the University of Miami. Refractive errors can make it hard to see objects either up close or far away, or sometimes both.

Eyeglasses or contact lenses are the most common ways to fix refractive errors. "Some people love glasses, but some don't," says Galor. "And not everyone is comfortable in contact lenses."

Some people's jobs or responsibilities make it difficult to rely on glasses or contacts for vision, explains Dr. William Dupps, an eye surgeon at the Cleveland Clinic.

People looking for another option may consider refractive eye surgery. The most common type of refractive surgery is called LASIK. Other methods include PRK and SMILE. These all use lasers to change the shape of the cornea. How and where the laser removes tissue differ slightly.

Other procedures work on the lens inside the eye rather than on the cornea. A surgeon can place an additional lens in front of the existing one, or remove and replace the existing lens.

To be a candidate for surgery, your refraction must be stable. That means the prescription in your glasses can't be changing over time. The shape of the eye also changes as you grow up. So refractive surgery isn't considered until you are at least 18 years old. Some health conditions and other eye problems also make refractive surgery unsafe (see the Wise Choices box).

Refractive eye surgery won't necessarily give you perfect vision, Dupps notes. "The most common scenario is that we get you to the



level of vision you had in your glasses or contacts, but without the glasses or contacts."

Some side effects are normal after refractive eye surgery. These include dry eyes, pain, sensitivity to light, and blurry or double vision. These usually go away with time. Some people may need a second procedure to fix remaining blurriness, says Dupps.

Rarely, side effects can be permanent, or refractive surgery can make vision worse. Both Galor and Dupps are researching ways to predict who is likely to develop such effects, so they can avoid these procedures.

Galor and a colleague, Dr. Sue Aicher, are trying to find molecules in tears that could be measured to predict people at risk for dry eye or pain after surgery. Dupps is using imaging to find early changes in eye shape and strength that could make surgery risky.

If you're having trouble seeing clearly, talk with an eye doctor. They can check for refractive errors and other vision problems during a comprehensive eye exam. They can also refer you to a refractive surgery specialist. ■



Web Links

For more about refractive eye surgery, see "Links" in the online article: [newsinhealth.nih.gov/2023/03/shaping-clearer-vision](https://newsinhealth.nih.gov/2023/03/shaping-clearer-vision)



## Health Capsules

For links to more information, please visit our website and see these stories online.

### Bivalent Boosters Block Severe COVID-19

COVID-19 vaccines have saved many lives. The original vaccines were released in late 2020. They targeted the initial strain of SARS-CoV-2, the virus that causes COVID-19. Since then, different versions of the virus have evolved. So scientists created an updated booster shot. It's called a bivalent booster because it targets two versions of the virus: the original strain and a newer one called Omicron.

Earlier research showed that the bivalent boosters were safe. A new

study found that they're also better than the original booster at reducing the risk of severe disease.

Scientists looked at vaccine data collected in North Carolina in 2022. Nearly 300,000 people received one of the original boosters. More than 1 million got one of the updated boosters. The researchers compared these two groups. They looked at hospitalizations and deaths from COVID-19 from about two weeks to three months after the shots were given.

The team found that the updated

booster was 62% effective at blocking severe COVID-19. The original booster was only about 25% effective. Overall, the updated shots were 37% more effective than the original boosters.

"The increased effectiveness found in this study demonstrates why it's important for people to protect themselves with the updated booster, even if they had already gotten the original booster dose," says Dr. Zack Moore of the North Carolina Department of Health and Human Services. ■

### Enter NIH's Teen Video Contest

The future of science depends on the young people of today. If you're a teen who loves science, you can enter the Eye on the Future Teen Video Contest. NIH's National Eye Institute created the contest so they could hear from the next generation of scientists.

Videos can be created in three different categories. "Science in Your World" shows what science means to you and its role in your life. "Science in the Field or Lab" shares something

you've learned about science and its importance. "Science in Your Future" highlights the role that science will play in our future lives.

Teens currently in high school and living in the U.S. can enter. Videos can be as short as 30 seconds or up to three minutes long. You can work on your own or team up with one or two friends.

Three first-place winners will be selected—one in each category. Videos will be judged based in part

on scientific accuracy, creativity, and relevance.

Creators of the winning videos will receive \$2,000 in cash and a free trip to the NIH campus in Bethesda, Maryland. The NIH visit will be a day of science, networking, and fun!

The deadline for video submission is April 16, 2023. To learn more about contest rules and get tips for video creation, visit [nei.nih.gov/EyeOnTheFuture](http://nei.nih.gov/EyeOnTheFuture). ■



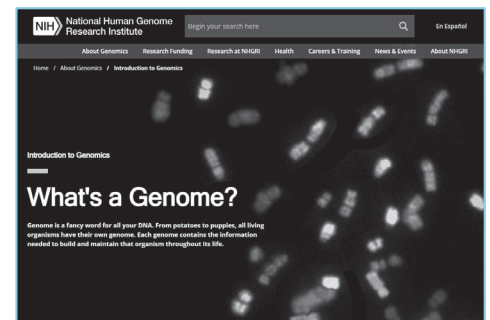
### Featured Website

#### What's a Genome?

[www.genome.gov/about-genomics/introduction-to-genomics](http://www.genome.gov/about-genomics/introduction-to-genomics)

"Genome" is a fancy word for all your DNA. From potatoes to puppies, all living things have their own genomes. The more you

know about the genome and how it works, the more you'll understand your own health and make informed health decisions.



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