



National Institutes of Health • Department of Health and Human Services • [newsinhealth.nih.gov](https://newsinhealth.nih.gov)

**Inside News:** 3 Hernias 4 Personalized Breast Cancer Screening 4 Vitamin Shot for Babies 4 NIH Health Information

## The World Inside Your Mouth

### How Mouth Microbes Affect Your Health

There's much more to your mouth than your teeth, gums, and tongue. Your mouth also contains billions of tiny critters that can only be seen with a microscope. These are called **microbes**. Together, all the microbes living in your mouth are known as the oral microbiome.

Scientists believe the oral microbiome can contribute to diseases both in the mouth and elsewhere in the body. That means research into these microbes might lead to new ways to prevent and treat many illnesses.

**Who's in There?** • Your mouth makes a lovely neighborhood for microbes. And many different types can move in. Scientists believe roughly 700 species of microbes live in the human mouth. Some of these may contribute to diseases. Others help keep disease-causing microbes from taking over.

"It's a natural, normal part of life to have these microbes living in your mouth," says Dr. Christian Abnet, an oral cancer researcher at NIH. "Even people with good oral hygiene have a thriving microbiome in their mouth."



The set of microbes in a person's mouth usually doesn't change much over time, at least in adults. When it does change, it can be bad news.

"People tend to have certain microbes in specific proportions," says Dr. Akintunde Emiola, a researcher who studies the oral microbiome at NIH. "When that proportion changes, that can be linked to diseases."

But which specific microbes are linked to diseases isn't clear. Researchers are trying to figure out how microbe changes in the mouth play a role in disease.

**Beyond the Mouth** • One kind of microbe that can wreak havoc in the mouth is bacteria. Dentists are well-known for pointing out that sugar-loving bacteria can harm your teeth and gums. These live in the plaque that dentists scrape off your teeth.

But the influence of these microbes is not confined to the mouth. Mouth microbes have been linked to a wide variety of diseases outside the

mouth. These include cancer, heart disease, diabetes, allergies, asthma, and even Alzheimer's disease.

For example, studies have shown that poor oral health is linked to a higher risk for Alzheimer's disease. That may be because not taking proper care of your teeth makes your mouth a friendlier place for disease-causing bacteria.

"We think the type of bacteria that live in the mouth might secrete substances that can get into your bloodstream, go into the brain, and cause things to go awry," says Dr. Colin Combs, an expert in neurodegenerative diseases at the University of North Dakota.

Combs' team has found a substance linked to Alzheimer's disease inside our mouths. Beta-amyloid is a hallmark of Alzheimer's disease. In the brain, it clumps together into "plaques." But Combs' work recently showed that beta-amyloid is also in saliva.

His team is researching how beta-amyloid in saliva affects mouth microbes, and vice versa. They're trying to figure out whether beta-

*continued on page 2*

## Definitions

### Microbes

Microscopic germs like bacteria, fungi, and viruses.

Subscribe @



[newsinhealth.nih.gov](https://newsinhealth.nih.gov)

*continued from page 1*

amyloid in the mouth plays a role in Alzheimer's disease, too.

Cancer may also be influenced by the oral microbiome. Abnet's studies have linked certain mouth microbes to a higher risk for cancer in the lungs, colon, and esophagus.

Abnet explains that there are a few ways mouth microbes might promote cancer. One is that certain bacteria produce substances that cause cancer. These are called carcinogens.

The oral microbiome can also affect the defenses that protect you from germs. Those defenses are called the immune system. One of the ways it fights off germs is with a reaction called **inflammation**. Inflammation is linked to many diseases, including cancer and Alzheimer's disease.

Changes to the immune system might also explain how mouth mi-

## Definitions

### Inflammation

Heat, swelling, and redness caused by the body's protective response to injury or infection.

## NIH News in Health

ISSN 2375-6993 (Print) ISSN 1556-3898 (Online)

**Editor** Harrison Wein, Ph.D.

**Managing Editor** Tianna Hicklin, Ph.D.

**Graphics** Erina He (illustrations) and Tianna Hicklin (layout)

**Contributors** Brandon Levy and Sarah Mann

Use our articles and illustrations in your own publication. Our material is not copyrighted. Please acknowledge *NIH News in Health* as the source and send us a copy.

[newsinhealth.nih.gov](http://newsinhealth.nih.gov)



Office of Communications & Public Liaison  
Building 31, MSC 2094  
Bethesda, MD 20892-2094  
email: nihnewsinhealth@od.nih.gov  
phone: 301-451-8224

crobes affect allergies. An allergy occurs when the immune system overreacts to something that's normally harmless. Take, for instance, peanut allergy in kids. One study showed that when kids have certain mouth bacteria, it takes a smaller amount of peanut to trigger a reaction.

Knowing how mouth microbes are linked to diseases might one day help us create new treatments.

"Figuring out the mechanisms is really important if you want to design an intervention," Abnet says.

**Managing Our Microbes** • Getting rid of disease-causing microbes in our mouths is easier said than done. There are medications that kill microbes, called antibiotics. But current antibiotics kill off all kinds of microbes, not just harmful ones. That's why Emiola's team is working on more precise ways to destroy disease-causing microbes.

"When you kill all of the microbes, the problematic ones tend to repopulate faster," Emiola says. "But if you specifically target the bad microbes, that allows the good ones to repopulate the environment."

His lab is looking for viruses that only infect specific bacteria. These viruses are called bacteriophages. Using bacteriophages that prey only on specific bacteria in the mouth could be a way to get rid of disease-causing microbes.

Emiola's group is also trying to create medications that only harm certain bacteria. To do that, he's relying on treatments called prodrugs. "Prodrugs are compounds that are normally inactive," Emiola says.

But the prodrugs he is developing become active once inside specific bacteria. And when they're activated, they work like antibiotics.

In fact, his team has already created a promising prodrug that eliminates bacteria that cause severe gum infections. And he believes this



## Wise Choices

### Be Good To Your Microbes

You can promote a healthier oral microbiome by:

- Taking good care of your teeth and gums. That includes daily brushing and flossing and regular dentist visits.
- Eating a healthy diet, especially one that is low in added sugar.
- Drinking less alcohol.
- Avoiding tobacco products, including electronic cigarettes.

approach could one day help treat diseases outside the mouth as well.

Meanwhile, many "probiotic" and "prebiotic" supplements can already be found in grocery stores. They're often promoted for their ability to make the microbiome healthier. A prebiotic encourages the growth of certain microbes. A probiotic already contains those microbes. But researchers still don't truly know which microbes or combination of microbes are effective.

"There's really very little evidence [on specific supplements]..., so that would not be anything that I would recommend," Abnet says.

Fortunately, there are many evidence-backed ways to have a healthier oral microbiome. The habits that make for a healthy lifestyle also happen to be good for the oral microbiome. That includes good dental hygiene and a well-balanced diet.

"Maybe one day we'll have [microbiome-based treatments that are] beneficial to people," Abnet says. "But we're in the early days of that research right now."

See the Wise Choices box for more tips that are good for both you and your mouth microbes. ■



## Web Links

For more about the oral microbiome, see "Find More Information" in the online article: [newsinhealth.nih.gov/2026/03/world-inside-your-mouth](http://newsinhealth.nih.gov/2026/03/world-inside-your-mouth)

# Handling a Hernia

## When Something Slips Out of Place

Everything in your body has its proper place. Muscles and other internal structures help keep your organs where they should be. But sometimes they're not strong enough to do that. In that case, a piece of tissue or organ can slip through a gap in the weakened structures around it. The result is a condition called a hernia.

Most hernias occur in the abdomen. But they can happen in other places, like your groin or upper thigh.

Inguinal hernias are the most common type. These occur in the lower abdomen, just above the groin. Another type is an umbilical hernia, which happens near your belly button.

Hernia symptoms depend on where they happen and the organ involved. Often, the first sign is a bulge. Some hernias are painful, but not all. Some cause odd sensations or discomfort.

"You would be surprised how, just in the course of everyday life, hernia symptoms can affect someone," says Dr. John Fischer, a surgeon at the University of Pennsylvania. "A hernia can affect activities of daily living and how much you can get done in a day. It can affect sleep. It can affect your psychological well-being, your feelings about how you look, and your ability to interact socially."

Doctors can often diagnose a hernia with a physical exam. But in rare cases your doctor may not be able to see or feel the bulge a hernia causes. So they may need to order medical imaging, like an ultrasound.

Hernias aren't usually life-threatening. But in rare cases, a



hernia can become an emergency if it becomes "strangulated." That means the part of the organ causing the hernia has had its blood supply cut off by the squeezing of the muscles around it. Strangulated hernias can cause severe pain, nausea, or vomiting.

A hernia may not need treatment if it isn't causing symptoms. Your doctor might instead monitor it to make sure it doesn't get worse. If a hernia is causing problems, surgery is the only permanent solution. But even after surgery, the same organ may slip out of place again.

Many types of surgery increase the risk for a new hernia. Cutting into the internal structures that hold organs in place can weaken those structures. Organs can then more easily push through the weakened area. The result is called an incisional hernia.

Incisional hernias are more likely to occur in people who smoke or have diabetes. These conditions can make the body heal more slowly after surgery. Slower healing causes the weakness in an area to last longer, increasing the risk for a hernia.

Fischer's NIH-funded research is looking at ways to reduce the chance of someone getting an incisional hernia after surgery. His team hopes to create a mobile app to assess a patient's risk for an incisional hernia. An app-based assessment could help doctors tailor patient conversations.

"It's important to understand what kinds of activities you can do after an operation," Fischer says.

But many factors other than surgery can make a hernia more likely to happen. See the Wise Choices box to learn what puts you at higher risk. ■



### Wise Choices

#### Are You at Risk of a Hernia?

Anybody can get a hernia, but it is more likely to happen in people who:

- Are older.
- Are male.
- Carry excess weight.
- Have a long-term cough or sneeze.
- Are smokers.
- Have a tumor in their abdomen or a medical condition that causes fluid to build up there.
- Have had abdominal surgery before.



For more about hernias, see "Find More Information" in the online article: [newsinhealth.nih.gov/2026/03/handling-hernia](https://newsinhealth.nih.gov/2026/03/handling-hernia)





## Health Capsules

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

### Personalizing Breast Cancer Screening

Breast cancer is the second most common cancer among women in the U.S. Screening tests can check for signs of breast cancer before symptoms start. If cancer is found early, it increases the chance that it can be treated more effectively.

Doctors generally recommend mammogram screening based on a woman's age. A new study shows that it's safe for breast cancer screenings to be based on women's risk factors instead of their age.

The researchers studied 28,000 women, ages 40 to 74. They tested

two screening approaches over five years. One-half of the women had the standard mammogram every year. The other half received personalized recommendations.

Women with the highest personalized risk scores had screenings every six months. They switched between mammograms and MRIs. They also had counseling to learn how to lower their chances of getting breast cancer. Women with a slightly higher risk had annual mammograms starting at age 40. Women with an average risk had mammograms ev-

ery two years beginning at age 50.

The personalized screenings worked as well as annual mammograms to find breast cancer. Screenings based on your personal risk could help reduce anxiety and costs. This approach also prevents unnecessary screenings.

"The personalized approach begins with risk assessment, incorporating genetic, biological, and lifestyle factors, which can then guide effective prevention strategies," says Dr. Laura Esserman of the University of California, San Francisco. ■

### Fewer Newborns Receiving Protective Vitamin Shot

Babies need vitamin K for their body to make blood clots. Blood clots are how the body stops itself from bleeding. But babies aren't born with vitamin K. And they don't start making it until they begin eating solid foods.

Most babies born in the U.S. get a vitamin K shot after birth. Without it, babies are at risk of bleeding in the brain and the body in the first six months of life. While rare, this is a serious condition that can lead to

death. But a recent study found that the number of babies getting the shot is declining.

Researchers looked at more than 5 million babies born in the U.S. from 2017 to 2024. In 2017, almost 3% of babies didn't receive the shot. In 2024, about 5% of babies didn't receive the shot.

It's not clear why the number of babies receiving the shot is going down. More studies are needed to see if the decrease in vitamin K shots

is leading to an increase in bleeding problems for babies.

"There may be a growing perception among parents that vitamin K is unnecessary," says Dr. Kristan Scott of Children's Hospital of Philadelphia. "Unfortunately, opting out of vitamin K for a newborn is akin to gambling with a child's health, forgoing a straightforward and safe measure that effectively prevents severe complications." ■



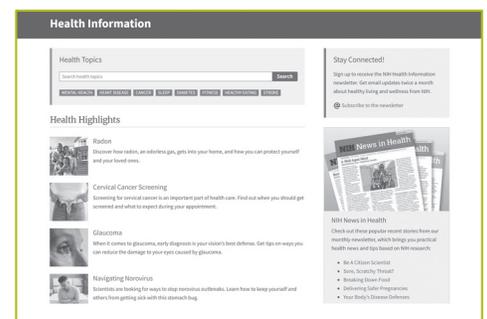
### Featured Website

NIH Health Information Portal

[www.nih.gov/health-information](http://www.nih.gov/health-information)

The NIH Health Information Portal provides access to reliable, science-based health resources. Find information from across NIH's institutes and centers.

You can browse or search for your health topic of interest. You can also sign up to receive the biweekly health information newsletter.



## How to get NIH News in Health

Subscribe for free!  
Visit [newsinhealth.nih.gov](http://newsinhealth.nih.gov)

Subscribe

Get it in print.

Contact us (see page two) to get print copies free of charge by mail for display in offices, libraries, or clinics within the U.S.

