

## Your smile (and mouth) can tell you more than you might think

Oral health is important for your overall health and well-being

**W**hile you might not realize it, your mouth plays an important role in your health and well-being. Good oral health is about more than just avoiding cavities. It's about being able to speak, chew, taste, swallow, and express yourself. And having a pain-free mouth allows us to sleep better at night and makes it easier to focus on our everyday routines.

### A two-way street: Mouth to body and body to mouth

#### *From the mouth to the body*

Your mouth contains bacteria, both good and bad. When harmful bacteria builds up in the mouth, you're more likely to develop [gum disease](#) (inflammation of the tissue around the teeth) and [tooth decay](#) (cavities).

If not treated, gum disease and cavities can cause chronic inflammation throughout the body, which can lead to other health conditions.



### FAST FACT

The three oral conditions that most affect overall health and quality of life are **cavities, severe gum disease, and severe tooth loss.**

SOURCE: [CENTERS FOR DISEASE CONTROL AND PREVENTION](#)



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Harmful bacteria can also travel from your mouth into your bloodstream or digestive system. This may contribute to or even cause health problems.

**From the body to the mouth**

Certain health conditions and behaviors can negatively affect your oral health.

For example, chronic conditions such as [diabetes](#) (where the body has trouble regulating blood sugar) and [HIV/AIDS](#) make it harder for the body to fight infections. This can mean trouble for the mouth, including a higher risk of gum disease and a [fungal infection](#) called thrush.

Other conditions such as [Sjögren syndrome](#) (an autoimmune disease) and certain medications can cause [dry mouth](#), which increases the risk of cavities and other mouth problems. Saliva washes away bacteria and food particles, fights harmful acids from bacteria, and produces minerals that protect the teeth and mouth.

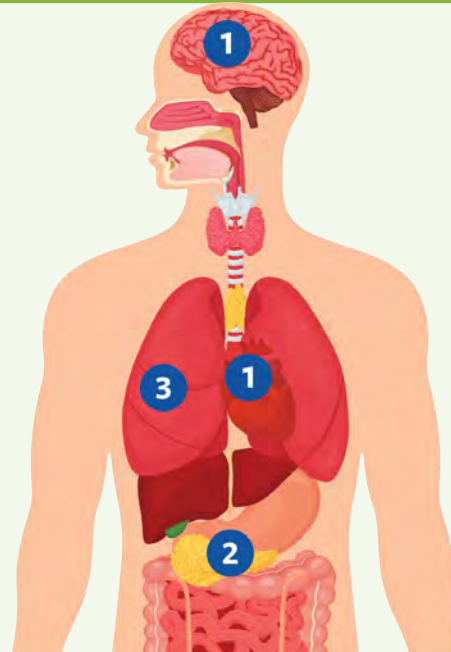
Smoking can contribute to oral health problems, too. It can worsen gum disease and complicate its [treatment](#), increase the risk of oral cancer, and lead to tooth loss. Smoking is also a major health risk for many chronic diseases that are linked to oral health problems.

**Keeping your mouth healthy**

Having good oral hygiene habits can significantly reduce your risk of developing or worsening oral health problems. And by taking care of your oral health, you're not just protecting your smile—you're investing in your overall well-being. Here are some things you can do:

- **Eat a balanced diet.** Try and limit sugary foods and drinks, a leading culprit behind cavities. Even starchy foods like white bread and potato chips turn into sugar, so enjoy them in moderation.
- **Avoid tobacco and alcohol.** Smoking and drinking (and especially doing both) increase your risk of [oral cancer](#).
- **Brush and floss.** Brush twice a day and floss regularly to remove food particles and plaque (a sticky buildup of bacteria).
- **Use fluoride.** It strengthens teeth and fights cavities! Brush with fluoride toothpaste and consider using a fluoride rinse.
- **Visit your dentist.** See your dentist for routine checkups and cleanings. By looking at your mouth, dentists can sometimes spot clues about other health problems such as vitamin deficiencies, infections, problems with your immune system, and even oral cancer. ■

**Oral health and other conditions**



- 1 Heart disease and stroke.** Bacteria associated with gum disease can enter the bloodstream and contribute to inflammation in the arteries. This may increase the risk of heart disease and stroke.
- 2 Diabetes.** People with diabetes are more likely to develop gum disease, which in turn can make it harder to control blood sugar levels. Diabetes can also slow down healing, which can interfere with the treatment of gum disease.
- 3 Respiratory health.** Bacteria from the mouth can be inhaled into the lungs, potentially leading to respiratory infections such as [pneumonia](#).



**Reproductive health and pregnancy.** Hormonal changes during puberty, pregnancy, and menopause can increase the risk of developing gum disease. And some studies have suggested that gum disease during pregnancy could lead to complications like preterm birth and low birth weight. If you are pregnant, it's especially important to take care of your oral health for you and for the baby.



Brushing and flossing regularly removes food particles and prevents plaque buildup.

# More than two decades of NIH research gives answers on a rare disease affecting bones, skin, and the endocrine system

Fibrous dysplasia/McCune-Albright Syndrome is genetic with no cure



Dr. Michael Collins (far left) and Dr. Alison Boyce (far right) spoke with patient community members about their experiences with FD/MAS.

**W**hy do patients with fibrous dysplasia/McCune-Albright Syndrome break their bones so easily? Or hit puberty as early as infancy? Or sometimes lose their vision and hearing? Doctors have tried to answer these questions for decades.

Twenty-six years ago, researchers at NIH began [piecing it together](#). Today, clinicians have more effective treatments for this rare disease. And patients have more tools to get the help they need.

## What is fibrous dysplasia/McCune-Albright Syndrome?

Fibrous dysplasia (FD) and McCune-Albright Syndrome (MAS) are separate conditions with the same genetic variation. It's possible to have one condition only, but when they happen together, it's referred to as FD/MAS. FD is a bone disorder and MAS affects the skin and endocrine system (which regulates hormones in the body).

FD/MAS is a genetic (but not inherited) disease that occurs while the fetus develops in the womb. Some early signs of FD/MAS include large birthmarks across the body and puberty that starts in infancy. The complications can be mild or severe. They include chronic pain, weak or misshapen bones, and a high rate of bone

turnover (when bones break down and rebuild). Bone lesions can also grow and press against organs and nerves. This sometimes causes problems with vision, hearing, or breathing.

FD/MAS can also cause hyperthyroidism, which is an overproduction of hormones in the thyroid gland, as well as other endocrine problems.

These conditions can be painful and may lower someone's quality of life. Treatments include surgery, hormone therapy, or medical device implants.

## Unlocking the source of FD/MAS

FD/MAS was first recorded in medical journals in 1937, but scientists didn't know what caused it. In 1991, Allen Spiegel, M.D., of the National Institute of Diabetes and Digestive and Kidney Diseases, led a research group that made a major discovery. They found that a mutation of a specific protein causes the skin issues and hormonal effects of FD/MAS. But what about the skeletal symptoms?

To find out, Dr. Spiegel brought bone samples from patients with FD/MAS to Pamela Robey, Ph.D., at the National Institute of Dental and Craniofacial Research (NIDCR). Dr. Robey is a biologist who specializes in bone stem cells. She found that the same mutation that causes the skin and hormones problems causes the lesions in bones.



While there are medications approved to treat hormonal symptoms of FD/MAS, there is no way to stop the growth of bone lesions yet.

### Tracking FD/MAS over the lifespan

In 1998, scientists started a [natural history study](#) to learn more about how FD/MAS changes over a person’s life. Dr. Robey and Michael Collins, M.D., an endocrinologist at NIDCR, [led](#) this research. More than 300 patients between 1 and 102 years old have already joined the study. Researchers are [still recruiting](#) participants. For this study, clinicians examine the whole patient. They record patients’ symptoms, take bone scans and tissue samples, and note how patients respond to treatments.

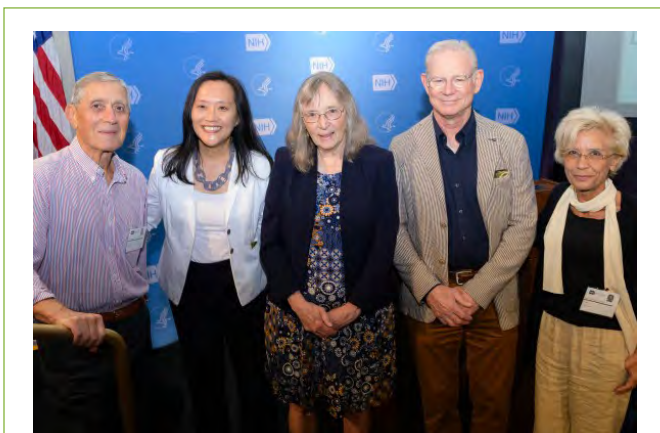
### What we know from the study

The study helped clinicians create more individualized treatment plans for patient care. In 2015, Dr. Collins and Alison Boyce, M.D., a bone disorders researcher at NIDCR, published clinical decision-making [guidelines](#) with a flowchart and checklists. Clinicians can put in a patient’s specific symptoms and get back an appropriate treatment plan. Patient advocacy groups have shared the guidelines with people to give to their health care providers. The study also helped doctors better understand when surgery would be helpful or not.

Another discovery revealed that FD cells overproduce RANKL, a protein that increases bone turnover. Bone turnover is necessary and happens throughout a person’s life, but high turnover, as in FD/MAS, can increase the risk of fractures. Researchers found that blocking RANKL could decrease bone turnover in patients. It also prevented new bone lesions in animal studies.



Bone scans of a patient before (left) and after (right) a six-month denosumab treatment show reduced turnover within fibrous dysplasia lesions (dark-colored patches).



Research by Drs. Allen Spiegel, Janice Lee, Pamela Robey, Michael Collins, and Mara Riminucci (left to right) is helping scientists better understand and treat FD/MAS.

### What’s still unknown about FD/MAS?

While there are medications approved to treat hormonal symptoms of FD/MAS, there is no way to stop the growth of bone lesions yet. Dr. Boyce’s team is [looking into](#) a drug called [denosumab](#)—a RANKL blocker normally used for [osteoporosis](#)—to see whether it can prevent bone lesions from forming in children with FD/MAS. That study is expected to end in 2026. Another NIH-supported research team in the Netherlands is studying the same drug [in adults](#) with FD/MAS.

Dr. Boyce is also [leading a study](#) on another drug called [burosumab](#) to see whether it can improve blood phosphate levels in patients with FD/MAS. These patients tend to have low blood phosphate levels. [Phosphates](#) are minerals that are important for strong bones and teeth. That study is expected to be completed this year. ■

*\*This article was adapted from a longer story by NIDCR. Read the [original article](#) to learn more about FD/MAS and the researchers who study it.*

# Gum disease: By the numbers

Nearly half of adults in the United States have some form of periodontal disease



Brush and floss regularly to prevent or control gum disease.

**G**um disease, also known as periodontal disease, is a leading threat to dental health and the most common cause of tooth loss.

[Gum disease](#) is caused by a buildup of plaque—a sticky film of bacteria—on and around the teeth. If you don't remove plaque on a regular basis, it can cause inflammation and infection. This infection can break down the gum tissue, bone, and connective tissue that support your teeth. Over time, teeth may become loose and need to be removed.

The first stage of gum disease is [gingivitis](#). During this stage, the gums may become red and swollen, and they may bleed easily. Left untreated, gingivitis can develop into [periodontitis](#), a more serious form of gum disease. In periodontitis, the gums pull away from the teeth, forming pockets that trap bacteria and lead to infection.

The best way to prevent or control gum disease is by maintaining an oral hygiene routine. Brush your teeth twice a day and floss regularly to remove plaque. Also schedule regular dental visits for professional cleanings and routine checkups.

- **More than 42% of all adults** older than 30 have some form of gum disease and **almost 8%** have severe periodontal disease.
- The rate of gum disease increases with age. **Almost 60% of adults 65 years and older** have some form of gum disease.
- Periodontal disease is **more common in men than women**. It affects more than **50% of men** and **35% of women**.
- Smoking can put you at risk for gum problems. **More than 60% of current smokers** have periodontal disease.
- People with certain health conditions may be more likely to develop gum disease. For example, almost **60% of people with diabetes** also have periodontal disease. ■

*\*This article was originally published in January 2018. It was updated in May 2024.*

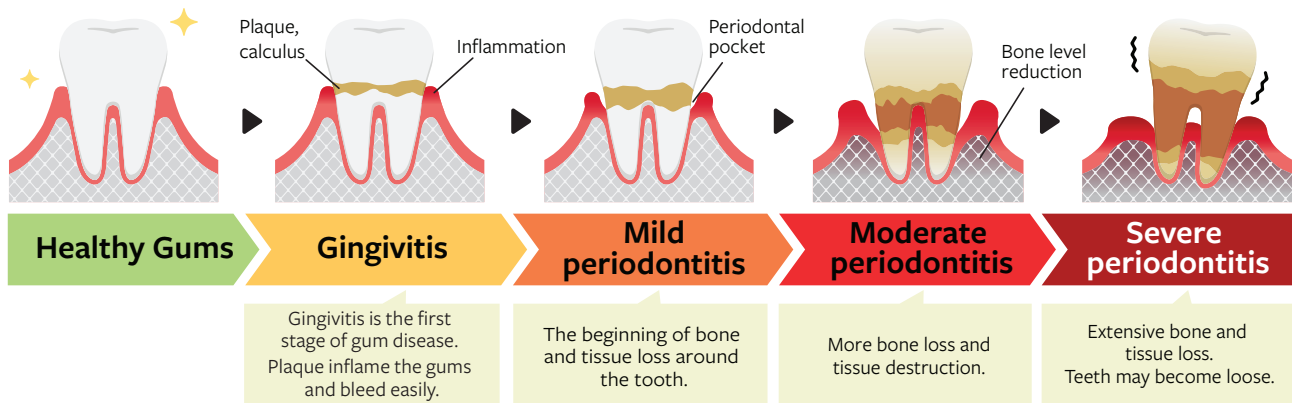
## FAST FACT

**Older adults, Black and Hispanic adults, current smokers, and those with lower incomes and less education** are more likely to have periodontal (gum) disease.

SOURCE: [NATIONAL INSTITUTE OF DENTAL AND CRANIOFACIAL RESEARCH](#)

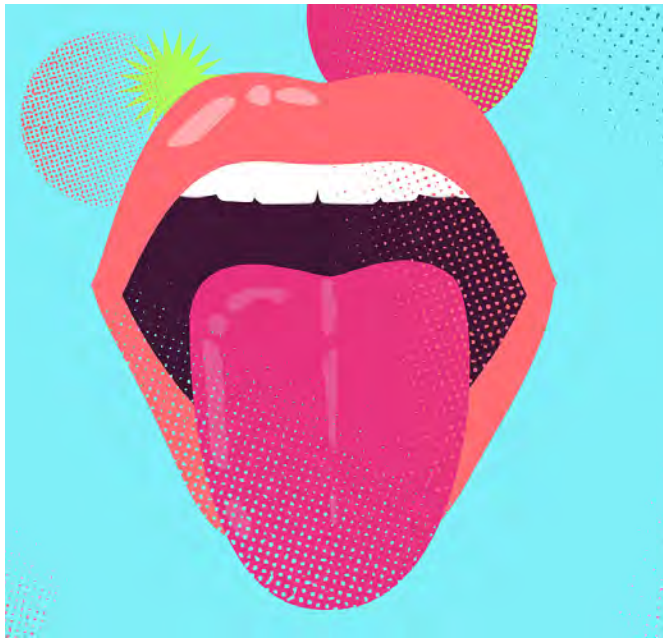


## The stages of periodontal disease



# How do we taste...and why does it go wrong?

Learn the causes of taste disorders and how they're treated



Taste comes from tiny molecules that are released when you chew, drink, or digest food or liquid.

Our sense of taste is important for our health and happiness. Taste helps us make choices about the foods we eat and stops us from eating spoiled or potentially poisonous things. Tasting and eating are personal and social experiences. We create happy memories when we eat our favorite things and share meals with others.

More than 200,000 people visit a doctor each year because they have a problem with their sense of taste or smell. But scientists believe the actual number of people with this disorder is much higher and that the vast majority of people who experience these problems do not seek help. Surprisingly, most people who seek help for a loss of taste actually have a smell disorder instead.

## How taste works

You might have heard the myth that different “regions” of the tongue recognize specific tastes. In fact, taste cells recognizing each of the different taste qualities are scattered around the tongue.

Taste comes from tiny molecules that are released when you chew, drink, or digest food or liquid. These molecules activate taste cells in the mouth and throat. Clusters of these cells are found in the taste buds on your tongue, on the roof of your mouth, and in the lining of your throat.

Flavor is the combination of heat, coolness, texture, and five taste qualities—sweet, sour, bitter, salty, and umami. Umami, or savory, taste comes from glutamate, which is in foods like meat, certain cheeses, and chicken broth.

People who lose their ability to taste may add too much or too little sugar or salt to their food. This could be a problem for those who need to manage conditions such as heart disease, diabetes, or hypertension. Taste disorders can also weaken or remove your ability to detect spoiled food.

## Common taste disorders

Some of the [most common](#) taste disorders are:

- **Hypogeusia.** When your ability to taste is reduced.
- **Ageusia.** When you cannot taste anything.
- **Phantom taste perception.** A lingering, often unpleasant taste, even though there is nothing in your mouth.
- **Dysgeusia.** A foul, salty, rancid, or metallic taste in your mouth. Sometimes dysgeusia also occurs with burning mouth syndrome, which causes a painful burning sensation in your mouth.

## Causes

Some people are born with taste disorders, but most develop them after an injury or illness. Taste problems may be [caused by](#):

- Upper respiratory and middle ear infections ([including COVID-19, flu, or common cold](#))
- Poor [oral hygiene](#) and dental problems, as well as oral pain and denture problems
- [Dry mouth](#)
- Wisdom tooth (third molar) removal
- Surgery of the ear, nose, and throat
- Head injury
- Certain medications, including antibiotics and antihistamines
- Radiation therapy for head and neck cancers
- Smoking
- Exposure to chemicals such as insecticides

## Taste and smell work together



Your senses of taste and smell are closely linked. When you chew food, it releases aromas that travel through a channel connecting the roof of the throat to the nose. If this channel is blocked, such as when your nose is congested, those aromas can't reach sensory cells in the nose. Without smell, foods tend to taste bland.

**SOURCE:** NATIONAL INSTITUTE ON DEAFNESS AND OTHER COMMUNICATION DISORDERS





Taste disorders can create problems for those who need to manage conditions such as heart disease, diabetes, or hypertension.

### How are taste disorders diagnosed?

An otolaryngologist—also called an ear, nose, and throat doctor (ENT)—can diagnose taste disorders. The ENT will examine your ears, nose, and throat and will ask about your health history. They may recommend a dental exam to check your oral health.

It’s important to get a proper taste disorder diagnosis. Once you know the cause, your health care provider can create a treatment plan.

### How are taste disorders treated or prevented?

Treating a general medical problem can often restore your sense of taste. For example, if you have a cold or allergies, your ability to taste will likely improve as you feel better. You could also get your taste back spontaneously. Proper oral hygiene is important to regaining and maintaining a well-functioning sense of taste. If you’re experiencing taste problems, you could also prepare your food differently.

- Prepare foods with a variety of colors and textures.
- Avoid adding more sugar or salt to foods; instead, use aromatic herbs and hot spices to boost flavor.



### FAST FACT

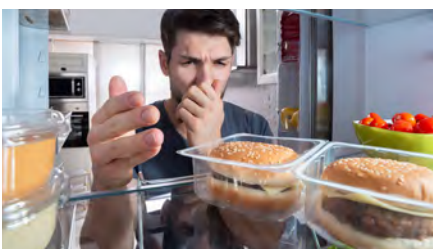
You are born with **about 10,000 taste buds**, but you may start to lose them after age 50.

SOURCE: [NATIONAL INSTITUTE ON DEAFNESS AND OTHER COMMUNICATION DISORDERS](#)

- If your diet allows, add small amounts of cheese, bacon bits, butter, olive oil, or toasted nuts on vegetables.
- Avoid combination dishes, such as casseroles, which can make it hard to detect individual flavors.

If you lost your taste because of a medication, stopping or changing that medicine may solve the problem. But do not stop taking your medications unless directed by your health care provider!

Sometimes taste disorders cannot be treated. In these rare cases, counseling may help you adjust to this condition. ■



Taste helps us make choices about the foods we eat and stops us from eating spoiled or potentially poisonous things.

# Instant replay: 6 Olympians share their unique health journeys



**N**IH MedlinePlus Magazine has talked to its fair share of Olympic athletes over the years. In those chats, we learned that even world champions can face physical and mental health challenges! With the Paris 2024 Summer Olympic Games around the corner, now is a perfect time to revisit some these great competitors' stories.



## Advantage, Caroline Wozniacki: Tennis star on taking charge of life with rheumatoid arthritis

Caroline Wozniacki represented Team Denmark in 2012, and she'll return to them for this year's Olympic Games. These games mark the first since Wozniacki was diagnosed with rheumatoid arthritis in 2018. She spoke about her condition and how she manages her symptoms while still pursuing the sport she loves.

Read the full story [here!](#) (Originally published April 2021)

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## Track star Allyson Felix is a champion for maternal health

Allyson Felix is the most decorated woman in Olympic track and field history with 11 medals to her name. But in 2018, at 32 weeks pregnant, she developed a terrifying case of preeclampsia that required an emergency cesarean section to save her and her daughter's lives. She shared her story and how her experiences pushed her to become an advocate for other pregnant people.

Read the full story [here!](#) (Originally published in October 2021)



“I want women to be aware. To know they are at risk. To know the signs to look for.”

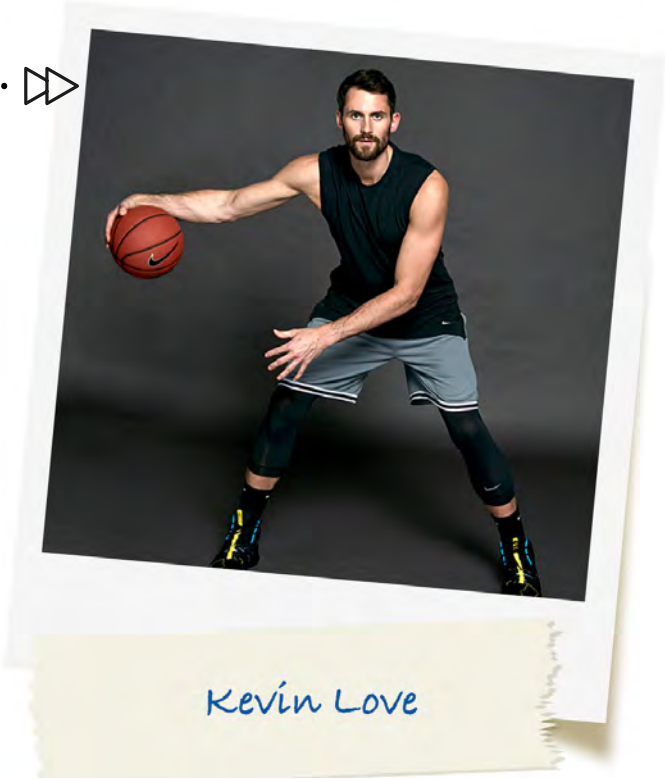
– Allyson Felix



**Basketball star Kevin Love is reaching great heights with anxiety and depression** . . . . . ▶▶

Kevin Love took home the gold as a member of Team USA Men’s Basketball at the 2012 Olympic Games and is currently a power forward for the Miami Heat. He also lives with depression and anxiety and has suffered from panic attacks, including while playing in the NBA. He opened up about his mental health and why he wants to encourage everyone, especially men and athletes, to take mental health seriously.

Read the full story [here!](#) (Originally published in November 2019)



“We need to share our stories and make sure people know they are not alone.”

– Kevin Love

**Paralympic snowboarder Amy Purdy isn’t slowing down**

Amy Purdy won three back-to-back Paralympic medals for snowboarding in 2014 and 2018...even after she lost her legs, spleen, kidney function, and hearing in one ear in 1999, when she was only 19, from a deadly blood infection. She spoke about her life’s journey, using prosthetics, and her advice to always live in the present.

Read the full story [here!](#) (Originally published in April 2023)



“It’s been a journey but another reminder for me of how incredible and adaptable the human body is.”

– Amy Purdy

**Olympic gymnast Shannon Miller: Accepting help was essential to ovarian cancer recovery** . . . . . ▷▷

With seven Olympic medals and multiple Olympic Hall of Fame inductions, Shannon Miller knows her body can do great things. But in 2011, she faced a very different physical challenge: treatment for ovarian cancer. She explained how she stayed positive throughout her recovery and learned to accept help when she needed it.

Read the full story [here!](#) (Originally published in September 2021)



“One of the hardest and most important things we have to learn is to ask for help and accept help when it is offered.”

– Shannon Miller



**Olympic swimmer Dara Torres breathes like everyone else, even with asthma**

Swimmer Dara Torres broke her first world record at age 14 and went on to win 12 Olympic medals between 1984 and 2008. She won her last two medals at age 41 as the oldest swimmer ever to earn a spot on a U.S. Olympic team—all while living with asthma. She shared her journey living with this chronic lung disease, as well as her advice for others living with the condition.

Read the full story [here!](#) (Originally published in March 2022)



“Some had the gall to suggest that I didn’t actually have asthma and was taking the asthma medication just to gain a competitive advantage. At the time I responded by saying my advantage is trying to breathe like everyone else.”

– Dara Torres



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## Overnight oatmeal

Oatmeal can be a heart-healthy alternative to other quick breakfast foods or snacks. It’s a good source of fiber, which helps you feel full, as well as key vitamins and minerals.

But if you don’t have time to make a batch during your busy day, do it before you go to sleep instead with this hearty recipe. For a grab-and-go breakfast, separate servings into airtight containers and keep refrigerated for up to five days. For more healthy recipes, check out [Healthy Recipes](#) on MedlinePlus.

**Prep time:** 15 minutes

**Cook time:** 6 hours

**Total time:** 6 hours 15 minutes

**Number of Servings:** 4

### INGREDIENTS

1 cup uncooked old-fashioned rolled oats

1 cup low-fat yogurt

1/2 cup nonfat or 1% milk

1/2 cup berries, fresh or frozen

1/2 cup chopped apple (about 1/3 of a medium apple)



### DIRECTIONS

1. In a medium bowl, mix oats, yogurt, and milk.
2. Add the fruit now or add just before eating.
3. Cover and refrigerate oatmeal mixture for 6–12 hours.
4. Refrigerate leftovers within 2 hours.

### WHO WE ARE

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NLM provides **free, trusted health information** in this magazine and at [MedlinePlus.gov](#).

Thanks for reading!

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