For Members of Premier Business Association

Outreach

Spit Happens
The Surprising Importance of Saliva

Do you have a favorite food that makes your mouth water? The liquid that fills your mouth is called saliva. This remarkable fluid helps you digest food and stay healthy.

Saliva, or spit, has many important roles. It helps to moisten food, which affects its flavor and makes it easier to swallow. It contains proteins that help to break down food and begin the digestion process. Saliva also includes minerals that can strengthen teeth and prevent decay. And it contains antibodies, molecules that block germs and help keep your mouth clean and healthy.

Saliva can also give clues to your health. Saliva tests can quickly detect certain infections, like HIV or COVID-19, with no need for needles to draw blood for testing.

Saliva is made by several salivary glands in the mouth. It consists mostly of water (about 99%). It also contains over 1,000 different types of proteins and other molecules.

"We don't think about saliva very often, but it's always a part of our lives. When we're healthy, we're producing saliva all the time," says Dr. Blake Warner, a dentist and researcher at NIH. "Saliva even plays a role in our ability to communicate. When we talk, our lips, tongue, and teeth all move in ways that depend on having moisture in the mouth."

We might take saliva for granted. But problems can arise if you have too little saliva, or even too much.

If you feel like you don't have enough saliva, it's a condition called dry mouth. Doctors call it xerostomia (pronounced ZEER-oh-STOH-mee-ah). It can be caused by a decrease in how much saliva you produce or by changes in your saliva's makeup that make it feel different.

"Dry mouth can be simply a nuisance, arising briefly if you're dehydrated, stressed, or while taking certain medications," Warner says. "But if it lingers, it can have a major impact on your quality of life and overall health. It can make swallowing difficult and reduce your ability to taste and enjoy food." Dry mouth can also make it hard to chew and speak. And it can raise the risk for tooth decay and mouth infections.

Dry mouth can have several causes. Many medications have side effects that can reduce saliva flow. Certain cancer treatments can harm the salivary glands. Some medical conditions can trigger dry mouth, too. These include diabetes, AIDS, and a disorder called Sjögren's (pronounced SHOW-grins) disease.

Sjögren's disease damages the glands that make saliva and tears. That leads to dry mouth and dry eyes. It can be hard to diagnose because its symptoms vary and are similar to other conditions. Warner and other NIH scientists have been looking for better ways to diagnose, treat, and prevent this disorder.

In contrast to dry mouth, some people feel that they have too much saliva. When you have so much saliva that it flows outside your mouth, it's called drooling. It's normal for adults to drool when sleeping. Babies and toddlers often drool too. But sometimes drooling can be a symptom of certain infections or nervous system disorders, like Parkinson's disease or stroke. Treatments for drooling can vary, depending on the cause.

If you have concerns related to saliva and your mouth, it's important to talk with your health care provider. "In our society, we may think that saliva is gross or unpleasant. So some people might hesitate to talk with a doctor or dentist about any salivary problems they have," says Warner. "But salivary symptoms could be early signs of disease, so it's worthwhile to bring up. It's important to be mindful of your saliva and oral health."

Article reprinted from NIH-Hews In Health

Easing Dry Mouth Symptoms

- **Drink plenty of water.**
- **Chew sugarless gum or suck on sugarless hard candy to trigger saliva flow.**
- **Avoid tobacco, alcohol, and drinks with caffeine. They can dry out the mouth.**
- **Sip water or a sugarless drink during meals to make chewing and swallowing easier.**
- **Use a humidifier at night.**
- **Talk with your doctor or dentist if the problems don't go away.**

Artificial Intelligence and Your Health

How Computers are Helping Medicine

There's a lot of talk about artificial intelligence, or AI, these days. AI is everywhere—from virtual assistants to facial recognition software. The technology is even assisting doctors and scientists. So what exactly is AI? And how is it helping advance scientific research?

"AI is basically trying to teach computers to 'think' in the same way as the human brain," says
Dr. Despina Kontos, an AI researcher at Columbia University.

One approach to AI uses a process called machine learning. In machine learning, a computer model is built to predict what may happen in the real world. The model is taught to analyze and recognize patterns in a data set. This training enables the model to then make predictions about new data. Some AI programs can also teach themselves to ask new questions and make novel connections between pieces of information.

"Computer models and humans can really work well together to improve human health," explains Dr. Grace C.Y. Peng, an NIH expert on AI in medicine. "Computers are very good at doing calculations at a large scale, but they don't have the intuitive capability that we have. They're powerful, but how helpful they're going to be lies in our hands."

Researchers are exploring ways to harness the power of AI to improve health care. These include assisting with diagnosing and treating medical conditions and delivering care.

Mining Medical Images

One area that AI is already being used daily is medical imaging. Computers help doctors comb through CT and MRI scans for signs of problems like heart disease and cancer.

"AI can look at images very closely, in a way that's much more detailed than we can do with the human eye," Kontos says. That means that the computer may be able to pick up on subtleties that a person might miss.

In medicine, catching early signs of certain diseases can be the difference between life and death. Kontos and her team are testing ways AI can be used to identify women who are at high risk for developing breast cancer. They're using AI to analyze different features in mammograms—X-ray pictures of the breast—such as breast density. Women who have a higher risk of breast cancer can take preventative steps, like more frequent screenings. This approach could help lead to earlier diagnosis and more successful treatment.

The team is also testing whether they can use AI to individualize breast cancer treatment based on imaging results that show how breast tumors are responding. AI may better reveal who needs more intensive treatment, like chemotherapy, and who can safely skip it.

"That way, we could spare women who don't need intensive treatment from unnecessary side effects," Kontos explains.

Connecting People With Care

Over the last year, advanced "chatbots," like ChatGPT, have burst on the scene. These AI programs are designed to have realistic conversations with people. People are starting to use the technology to find health information.

Many chatbots are a form of "generative AI." This type of AI can create new content based on what it learns from analyzing existing data. Such chatbots use what's called large language models, which are trained on huge data sets that are gathered from across the internet. The training teaches them to predict what words are most likely to appear after another.

It may be tempting to ask these tools to answer medical questions. "But these chatbots don't actually understand what you're asking," Peng says. "They're just looking at the phrases and making predictions about what comes next." So it's important to use caution if you're using them to seek health advice.

"These tools also don't have a lot of context," explains Dr. Ellen Fitzsimmons-Craft, a mental health researcher at Washington University in St. Louis. "They may be able to state something that's the right medical advice in a general sense. But that may not be the right medical advice for you personally."

"We don't always know what information these tools like ChatGPT are trained on," Fitzsimmons-Craft adds. "We don't know if they're getting information from reputable sources or not."

Still, the idea of using chatbots in medicine has promise, explains Fitzsimmons-Craft. Right now, there is a shortage of health care providers in many fields, including mental health. Chatbots may be able to fill in some gaps.

"Not many people follow through with recommendations provided after a mental health

screening," Fitzsimmons-Craft says. "And we don't have enough providers to connect with every one of those people."

Fitzsimmons-Craft and her team are developing a chatbot to help guide people with eating disorders toward seeking care. Their chatbot is made using a rule-based model, with limited AI. Rule-based means that human experts write entire conversations beforehand. Then, the chatbot picks what to say based on the responses of the person using it.

"Nothing this chatbot says should come as a surprise," Fitzsimmons-Craft explains. "That's in contrast to generative AI, where you have to work a lot harder to build in guardrails."

Her team is now testing their chatbot to see which conversation pieces are the most effective. They'll then test whether it can increase the number of people seeking help after a screening for eating disorders.

Other NIH-funded researchers are studying whether chatbots can help in additional areas, like suicide prevention and encouraging heart-healthy diet changes.

Looking Toward the Future

As AI moves into more areas of health care, many ethical issues will need to be addressed, explains Kontos. "These systems learn from human data, so they may learn our biases," she says.

For example, in the past, research studies have included far more men than women. This means that the resulting data may not be as accurate for guiding women's health care. So, if this information is fed into AI models, that bias will follow.

Recognizing biases before they reach the machines may provide a chance to break this cycle. "Can we end up training the machines better because we learned from the mistakes that we have in our own society about training people?"
Peng asks.

NIH-funded researchers are working on these issues, as well as many other ways to use AI in medicine. These include modeling the ways a virus might spread between countries and predicting if new drugs will be safe.

All of these projects need human imagination and computing power. So AI is not a replacement for people, says Fitzsimmons-Craft. "AI is just another tool in the toolbox, that's offering another form of help."

Article reprinted from NIH-Hews In Health

Testing AI for Health

NIH funds studies to test AI in many areas of health, including:

- Predicting who's at high risk for breast cancer.
- Connecting people with quality medical information via chatbots.
- Modeling disease spread across countries.
- Identifying new drug candidates.
- Diagnosing Alzheimer's disease before symptoms develop.
- Predicting changes in blood sugar levels before they occur in people with diabetes.
- Creating "smart clothing" that can reduce back pain by warning the wearer about unsafe movements.
- Improving colonoscopies so colon cancers can be detected and treated at earlier stages..

NOTICE OF ANNUAL MEETING OF MEMBERS

The Annual Meeting of the Members of Premier Business Association will be held at 12444 Powerscourt Drive, Suite 500A, St. Louis, MO 63131, on Wednesday, December 11, 2024 at 1:30 p.m. (CST) for election of Directors and for the transaction of such other business as may properly come before the meeting and any adjournment thereof.

The above notice is given pursuant to the By-Laws of the Association.

PROXY
Premier Business Association
December 11, 2024 Annual Meeting of Members
THIS PROXY IS SOLICITED ON BEHALF OF
PREMIER BUSINESS ASSOCIATION

The undersigned member of Premier Business Association does hereby constitute and appoint the President of Premier Business Association, the true and lawful attorney(s) of the undersigned with full power of substitution, to appear and act as the proxy or proxies of the undersigned at the Annual Meeting of the Members of Premier Business Association and at any and all adjournments thereof, and to vote for and in the name, place and stead of the undersigned, as fully as the undersigned might or could do if personally present, as set forth below:

1. FOR [ ], or to [ ] WITHHOLD AUTHORITY to vote for, the following nominees for Board of Directors: Jacquee Bardget, Jerry Talamantes, and Nathan Dierking
2. In their discretion, the proxies are authorized to vote upon such other business as may properly come before the Meeting.

This proxy, when properly executed, will be voted in the manner directed by the undersigned member. If no direction is made, this proxy will be voted for the election of directors and officers.

DATED: _____ , 2024

Signature _____

Name (please print) _____

Please date and sign and return promptly to 12444 Powerscourt Drive, Suite 500A, St. Louis, MO 63131 whether or not you expect to attend this meeting. The Proxy is revocable and will not affect your right to vote in person in the event that you attend the meeting.

St. Louis, Missouri
December 9, 2024
Date

The Outreach Newsletter is published by:
Premier Business Association

For information regarding your membership
and association services, call or write:

Membership Services Office
Premier Business Association
12444 Powerscourt Drive
Suite 500A
St. Louis, MO 63131

1-800-992-8044 or (636) 530-7200