Intraoral sodium sensor aims to simplify hypertension management

By DTI

ATLANTA, U.S.: Many people have acquired a taste for high-salt foods, which, over the years, may result in health issues related to high blood pressure. Monitoring salt consumption can help patients suffering from hypertension and certain other conditions to minimize the symptoms. In order to do that, researchers from the Georgia Institute of Technology have developed a flexible and stretchable intraoral wireless sensing system—which resembles a dental retainer—to measure the amount of sodium the wearer consumes.

The intraoral sodium sensor is based on a breathable elastomeric membrane that resembles a dental retainer. The ultrathin device is flexible and stretchable, and can wirelessly transmit data up to 10 m away. The device has been tested in three adult study participants, who wore the sensor system for up to a week while eating both solid and liquid foods, including vegetable juice, chicken soup and potato chips.

“By monitoring sodium in real-time, the device could one day help people who need to restrict sodium intake and learn to change their eating habits and diet. Our device could have applications for many different goals involving eating behavior for diet management or therapeutics,” explained Dr. Woon-Hong Yeo, an assistant professor in the George W. Woodruff School of Mechanical Engineering at the Georgia Institute of Technology.

He added: “The sensor is comfortable to wear, and data from it can be transmitted to a smartphone or tablet. Eventually the information could go to a doctor or other medical professional for remote monitoring.”

The device can record daily amounts of sodium intake as it is consumed. Thus, using a smartphone or tablet application, the system could advise users planning meals how much of their daily salt allocation they had already consumed.

Yeo and his team are currently working on improving the device by further miniaturizing it, aiming for the eventual size of a tooth, and testing it with users who have the relevant medical conditions, such as hypertension, obesity or diabetes.

The study, titled “Wireless, intraoral hybrid electronics for real-time quantification of sodium intake toward hypertension management,” was published in the Proceedings of the National Academy of Sciences of the United States of America in May 2018.