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New blood test at UVA better monitors diabetes over time



A new, more precise version of the A1C test, which is used to monitor diabetes over time, is now being offered at the University of Virginia Health System. The improved test allows people with diabetes to more accurately track how well they’ve controlled their blood sugar over the span of months – helping prevent potentially serious complications such as nerve pain and kidney disease.

The test can also diagnose diabetes, identify people at risk for diabetes and detect blood abnormalities such as sickle-cell disease.

ABOUT DIABETES

More than 29 million Americans have diabetes, and one in four goes undiagnosed. Further, more than one in three adults in the U.S. has pre-diabetes – blood sugar that is higher than normal but not high enough to be classified as diabetes. Nearly half the U.S. population has diabetes or prediabetes. Diabetes is the seventh-leading cause of death in the United States, a statistic that speaks to the need for a fast and accurate test for diagnosis and monitoring of the condition.

“Diabetes is very prevalent in the U.S. It has a huge impact on the economy and on healthcare, and it is a chronic condition that creates burdens for those who have it,” said [David Bruns, MD](#), of UVA’s Department of Pathology, who, with Lindsay Bazydlo, PhD, and Doris Haverstick, PhD, oversees the testing in the UVA Medical Laboratories.

THE A1C TEST AND YOUR BLOOD

The A1C test is a way of knowing levels of a blood sugar called glucose that were present over the three to four months before the blood sample was collected. A1C is formed as glucose binds to hemoglobin molecules in red blood cells during their lifespan of four months in the body. More A1C is formed when the patient’s glucose is high, and less is formed while glucose is low. Results of the A1C test are reported as a percentage of the hemoglobin that has sugar attached to a specific part of the hemoglobin. There are multiple forms of hemoglobin, but up to 98 percent of hemoglobin is usually of the form A, contributing to the name of the test, A1C.

Carefully determined cut-off values for A1C define whether a person has diabetes or is at risk for diabetes. People are diagnosed with diabetes when more than 6.5 percent of their hemoglobin is bound to sugar, and they are at risk for diabetes when that figure tops 5.7 percent. The use of these fixed cut-off values requires a very accurate method of measuring A1C because small errors could lead to a misdiagnosis. “What sound like small differences in percentage of A1C in the blood are very significant in predicting health outcomes of patients,” Bazydlo said.

NEW AND IMPROVED

Bruns noted that the test now has multiple uses. “In the past, the A1C test was used solely for monitoring blood sugar levels, allowing for better adjustment of medication,” he said. “Now, physicians also use the test to diagnose diabetes without the need for a fasting sample or drinking a glucose solution for a glucose tolerance test.”

The new test uses a more accurate technique, known as capillary electrophoresis, which simultaneously allows measurement of hemoglobin A1C and detection of abnormal inherited hemoglobins that may be present. Patients with sickle-cell disease, for example, have a different form of hemoglobin, hemoglobin S, which the test can detect. The new test’s ability to detect these unusual hemoglobins prevents misinterpretations of the A1C result as occurs with less selective methods.

While the new test was not developed at UVA, UVA is the first hospital in the state and the region to offer it.

— Article by Emily Dinning

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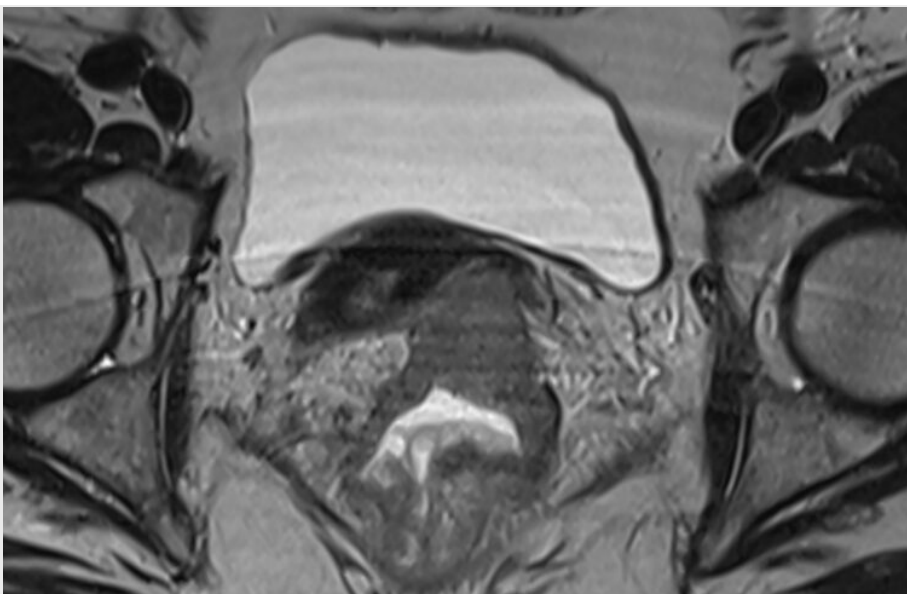
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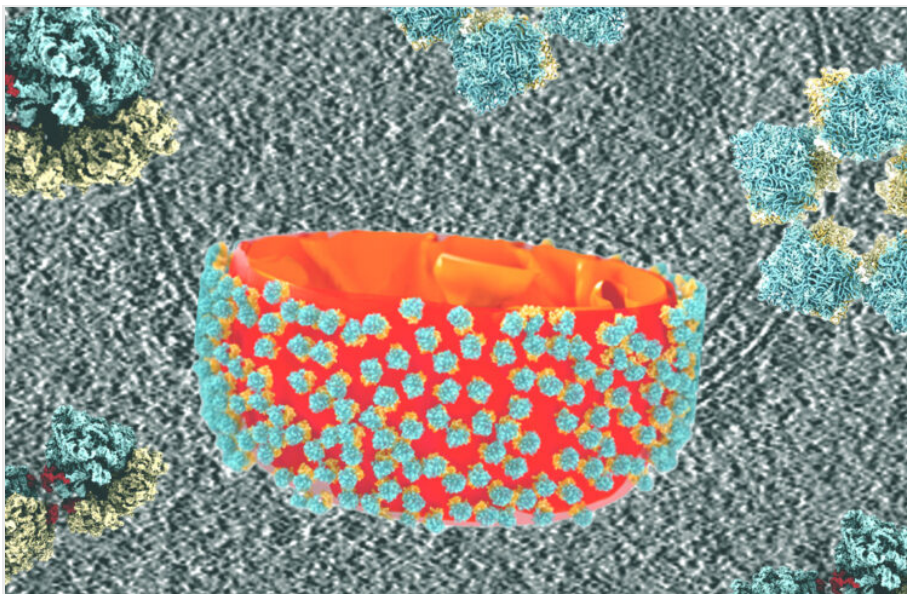
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