

## **MEDICAL BREAKTHROUGHS** **RESEARCH SUMMARY**

TOPIC: 3D ANEURYSM REPAIR FROM SMARTPHONES  
REPORT: MB #4765

**BACKGROUND:** A weak bulging area in an artery in the brain is called a brain aneurysm. It's like a thin balloon or weak spot on a tire's inner tube, and this is what causes the risk for rupturing. When it ruptures, blood spills into the space between the skull and the brain, causing a stroke. An estimated 6.5 million people in the United States have an unruptured brain aneurysm, and in about 30,000 people, the aneurysm ruptures each year. Women over the age of 55 have a higher risk of rupture than men. Ruptured brain aneurysms are fatal in about 50% of cases, while those who survive, about 66% suffer some permanent neurological deficit. (Source: <https://bafound.org/about-brain-aneurysms/brain-aneurysm-basics/> and <https://bafound.org/about-brain-aneurysms/brain-aneurysm-basics/brain-aneurysm-statistics-and-facts/>)

**CAUSES AND RISK FACTORS:** Weak blood vessels can be an inherited trait for some people, which may lead to the development of an aneurysm. It is rare to see aneurysms in children. Most aneurysms develop as a result of wear and tear on the arteries throughout a person's lifetime. Occasionally, severe head trauma or infection may lead to one developing. There are several risk factors that contribute to the formation of aneurysms. Two of the most significant are ones that can be controlled like cigarette smoking and high blood pressure. Treatment options for aneurysms include open surgery, or clipping; endovascular therapy (coils, stents, flow diversion device) or no treatment but rather observation, with control of risk factors and possible repeat imaging. (Source: <https://bafound.org/about-brain-aneurysms/brain-aneurysm-basics/risk-factors/> and <https://bafound.org/treatment/>)

**NEW 3D TECHNOLOGY:** Up to 25% of patients who undergo aneurysm surgery end up experiencing renal problems caused by contrast dyes needed to pinpoint the locations of major vessels originating near or from the life-threatening bulges. A new imaging technology that joins artificial intelligence and machine learning to reduce the need for contrast agents is now being used. This technology is also reducing the patient's time in surgery and potential for post-operative kidney complications. "It allows me to fix aneurysms that were very difficult to fix before, and I can do it knowing that I'm reducing my radiation and contrast volume to my patients," said Mahmoud Malas, MD, chief of Vascular and Endovascular Surgery at UC San Diego Health. The technology builds a 3D model of the patient's aneurysm using a pre-operative CT scan. On the day of surgery, surgeons take a real-time image of the patient's body with two bone landmarks within the CT scan. Then, the data is fused with the pre-operative image to form a 3D reconstruction of the image which the surgeon can use in the operating room as a guide. (Source: <https://health.ucsd.edu/news/releases/Pages/2019-09-16-3D-tech-repairs-aneurysms-deemed-inoperable.aspx>)

**FOR MORE INFORMATION ON THIS REPORT, PLEASE CONTACT:**

JACQUELINE CARR  
EXECUTIVE DIRECTOR, COMMUNICATIONS AND MEDIA

UC SAN DIEGO HEALTH SCIENCES

[JCARR@HEALTH.UCSD.EDU](mailto:JCARR@HEALTH.UCSD.EDU)

(858) 344-3799

**If this story or any other Ivanhoe story has impacted your life or prompted you or someone you know to seek or change treatments, please let us know by contacting Marjorie Bekaert Thomas at [mthomas@ivanhoe.com](mailto:mthomas@ivanhoe.com)**