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# News

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For Immediate Release

## Brain Health Not Affected by Major Heart Surgery

*New study offers important and novel way to look at 'old problem' of cognitive dysfunction*

CHICAGO (December 18, 2018)—Patients who undergo heart surgery do not experience major memory changes—either better or worse—when compared with those who have a much less invasive, catheter-based procedure, according to a study published online today in *The Annals of Thoracic Surgery*.

“It was comforting to see that the differences in cognitive decline between the two heart procedures are small, even though one involves major surgery and the other—cardiac catheterization—is a minimally invasive procedure,” said Elizabeth Whitlock, MD, from the University of California, San Francisco.

Using the Health and Retirement Study (HRS), Dr. Whitlock and colleagues examined data from 3,105 participants who reported undergoing either heart surgery or cardiac catheterization between 2000 and 2014. Cardiac catheterization is a catheter-based procedure that is usually performed as a diagnostic procedure prior to cardiac surgery. It is also used in conjunction with placing coronary artery stents to treat coronary artery disease. Funded by the National Institute on Aging, the HRS is an anonymous study of older adults in the United States. Thousands of HRS participants answer questions about their health and take brief memory tests every 2 years. Data on demographic, economic, health, quality of life, and cognitive factors are collected.

“It is important to make sure research like this includes diverse and large samples to fully account for other characteristics associated with who receives surgery,” said Dr. Whitlock. “The HRS has been an incredible resource for understanding health and aging in America.”

The researchers separated the patients—all of whom were at least 65 years old—into two groups: “catheterization” with 1,921 (62%) and “heart surgery” with 1,184 (38%). In the analysis, heart surgery was not associated with additional memory decline; researchers found that surgery participants showed little difference (-.021 memory units, equal to 4.6 months of cognitive aging) in pre- to post-procedure memory compared with those undergoing catheterization. For a 75-year-old person, this translated into a very small 0.26% increased risk of his/her inability to manage finances independently and a 0.19% increased risk of being unable to manage medications independently, said Dr. Whitlock.

### KEY POINTS

- Two methods of treating heart disease—heart surgery and catheterization—deliver almost indistinguishable cognitive outcomes.
- People who need surgery to correct serious heart disease should not avoid the operation because they worry about long-term cognitive impact.
- Average memory change after surgery is expected to be subtle, with minimal impact on independence and daily function.

“We expected to find a bigger difference in the surgery group, since there are many anecdotes about serious cognitive decline after heart surgery,” said Dr. Whitlock. “Our results are different for several reasons, one being that our follow-up is up to 2 years after surgery, to account for the fact that people may improve over time.”

In addition, the study design facilitated results that were not necessarily influenced by common factors such as pre-procedure anxiety, post-procedure pain, opioid use, and hospitalization-related stress. Dr. Whitlock explained that most participants completed cognitive testing well before the heart procedure and then again after a substantial recovery period following the procedure. This strategy reduced the risk that results would be affected by these issues. Importantly, researchers also compared like groups of patients—older adults with heart disease. Many previous studies have compared heart surgery patients with healthy patients who do not have heart disease.

“Since patients aren’t choosing between ‘surgery for heart disease’ and ‘no heart disease,’ it isn’t fair to compare the memory outcomes of these two groups,” said Dr. Whitlock. “Our findings suggest that there isn’t a major long-term impact when these two methods of correcting serious heart problems are compared. We think this is because severe heart disease itself probably has a cognitive impact.”

The American Heart Association reports that approximately 92 million people in the US suffer from some form of cardiovascular disease, with almost 8 million people undergoing heart surgery or other related procedures each year. Coronary artery bypass grafting (CABG) is one of the best known and most effective surgeries of the modern age. While it is very safe, there also are risks associated with the operation. In fact, CABG is commonly blamed for a loss of memory and thinking skills, also known as postoperative cognitive decline (POCD), especially among older adult patients.

While it is not known for certain what causes POCD, researchers explained that factors such as small strokes that happen during surgery, the impact of inflammation from tissue trauma, and pain medications may have a role. Disrupted sleep, delirium, infections, and physical inactivity also may contribute.

“Most of these factors are temporary, so while they may explain an initial cognitive decline seen in the weeks after a major surgery, cognition should gradually improve as the contributors resolve,” said Dr. Whitlock. “That’s why this approach—looking at up to 2 years after surgery—is a very important way to look at the ‘old problem’ of POCD.”

This research was funded by the National Institute of General Medical Sciences and the National Institute on Aging, both part of the National Institutes of Health, and the Foundation for Anesthesia Education and Research.

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Whitlock EL, Diaz-Ramirez LG, Smith AK, Boscardin WJ, Avidan MS, and Glymour MM. Cognitive Change After Cardiac Surgery Versus Cardiac Catheterization: A Population-Based Study. DOI: 10.1016/j.athoracsur.2018.10.021.

Find comprehensive medical information presented for patients by leading experts in cardiothoracic surgery on the STS Patient Website ([ctsurgerypatients.org](https://www.ctsurgerypatients.org)). For a copy of *The Annals* article, contact Jennifer Bagley at 312-202-5865 or [jbagley@sts.org](mailto:jbagley@sts.org).

Founded in 1964, The Society of Thoracic Surgeons is a not-for-profit organization representing more than 7,700 cardiothoracic surgeons, researchers, and allied health care professionals worldwide who are dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, and esophagus, as well as other surgical procedures within the chest. The Society’s mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy.

*The Annals of Thoracic Surgery* is the official journal of STS and the Southern Thoracic Surgical Association. It has an impact factor of 3.779.