

AMANDA A. FOX, M.D.

ASA ANNUAL MEETING

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**STUDY FINDS PREOPERATIVE BIOMARKER LEVELS MAY BE MORE RELIABLE  
THAN POSTOPERATIVE LEVELS FOR PREDICTING POTENTIAL PATIENT  
COMPLICATIONS AFTER CORONARY ARTERY BYPASS GRAFT SURGERY**

New Orleans — Results from a clinical study presented at the 2009 American Society of Anesthesiologists (ASA) Meeting suggest that elevated preoperative levels of the B-type natriuretic peptide (BNP) biomarker may predict hospital length of stay and mortality after primary coronary artery bypass graft surgery better than measurements of elevated postoperative BNP levels.

In the study, 1183 patients undergoing primary coronary artery bypass graft (CABG) surgery were tested for elevated preoperative and postoperative levels of a biomarker in their blood called B-type natriuretic peptide. BNP is an established heart failure biomarker that is secreted primarily by the ventricular chambers of the heart when they are stretched. Previous research has shown that elevated BNP levels pre-surgery can predict increased adverse events, including death, after heart surgery.

“This study was designed to examine the potential prognostic value of assessing postoperative BNP concentrations in the cardiac surgery population, particularly with regards to what these postoperative levels may add to what can already be predicted using preoperative BNP levels. This is an important question, as factors that occur during and immediately after

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surgery can also contribute to adverse outcomes after CABG surgery and may be reflected by elevated postoperative BNP measurements,” said Amanda A. Fox, M.D., lead author of the study and Assistant Professor of Anesthesiology, Perioperative and Pain Medicine at Brigham and Women’s Hospital. “We took the approach of simultaneously assessing the value of preoperative and postoperative BNP measurements to see what postoperative BNP can add to what is already known from preoperative BNP and clinical risk factors for perioperative risk stratification.”

## **About the Study**

This study was a prospective longitudinal study of 1,183 patients undergoing primary coronary artery bypass graft surgery at Brigham and Women’s Hospital in Boston, MA and at the Texas Heart Institute, Baylor College of Medicine, Houston, TX.

Mortality was defined as all deaths within five years after surgery. Subjects were followed for a minimum duration of just over two years after surgery with an average follow-up of about four years. During this follow-up period after coronary artery bypass surgery, 115 deaths (9.7 percent) occurred in the patients being studied.

After statistical analysis, researchers determined that preoperative BNP remained an independent predictor of hospital length of stay and approached being an independent predictor of mortality after clinical risk factors and postoperative BNP were statistically accounted for. If considered separately along with important clinical risk factors, both preoperative BNP and postoperative BNP were independent predictors of the two studied outcomes.

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“Our results suggest that when preoperative and postoperative BNP measurements are considered together along with clinical risk factors for negative outcomes after CABG surgery, preoperative BNP appears to be the more reliable predictor of longer hospital stay and all-cause mortality. However, it may be that when cardiac specific outcomes such as development of longer term postoperative heart failure are assessed in future studies, postoperative BNP will be better able to capture the likelihood of developing those events,” said Dr. Fox. “We believe that such future investigation is warranted. What our present findings suggest is that preoperative BNP remains a good risk stratification tool for hospital length of stay and all-cause mortality in primary CABG patients, even when postoperative BNP is also considered as a risk stratification tool.”

**The American Society of Anesthesiologists**

*Anesthesiologists: Physicians providing the lifeline of modern medicine. Founded in 1905, the American Society of Anesthesiologists is an educational, research and scientific association with 43,000 members organized to raise and maintain the standards of the medical practice of anesthesiology and improve the care of the patient.*

*For more information on the field of anesthesiology, visit the American Society of Anesthesiologists Web site at [www.asahq.org](http://www.asahq.org). For patient information, visit [lifelinetomodernmedicine.com](http://lifelinetomodernmedicine.com).*

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