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Validated pre-procedure risk score reduces bleeding complications and can shorten stays

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A clinical decision support tool helped physicians identify patients at high risk of bleeding complications prior to undergoing a coronary intervention procedure and helped guide the use of bleeding avoidance strategies, leading to less complications and a shorter hospital stay, according to a study being presented March 10 at the American College of Cardiology Scientific Sessions.

More than 1.3 million percutaneous coronary interventions (PCIs) are performed each year in the United States. Bleeding during and after these procedures is a common risk (3 – 6%).

"Bleeding complications after PCI can lead to worse outcomes for the patient, including death, as well as an increase in the length of stay in the hospital, which leads to an increase in hospital costs," says the study's lead author Craig E. Strauss, MD, MPH, a research cardiologist at the Minneapolis Heart Institute Foundation and physician at the Minneapolis Heart Institute® at Abbott Northwestern Hospital in Minneapolis.

Therefore, the cardiologists across the Allina Health System used a validated pre-PCI bleeding risk score to accurately identify high-risk patients, allowing them to employ strategies to avoid bleeding and improve patient outcomes. Among those strategies, bivalirudin (Angiomax, The Medicines Company) is a direct thrombin inhibitor that has been shown to reduce bleeding complications in PCI.

"This risk-stratification tool can be used real-time in the cath lab to

identify and mitigate a patient's risk for bleeding around the time of the procedure," says Strauss. "The cath lab team uses a web-based calculator, which takes less than 1-2 minutes, and determines the risk category of each patient." Due to the ease of use, the tool achieved a high adoption rate of 92 percent at three high-volume PCI centers in Minnesota.

Among the 2,608 PCI cases performed at the three PCI centers, 24.4 percent of the patients were identified as high risk for bleeding complications. The use of bivalirudin as a bleeding avoidance strategy in high-risk patients increased from 24.2 percent pre-implementation of the risk-stratification protocol to 60.3 percent after the implementation of the protocol.

Among high bleeding risk patients, the researchers reported significant reductions in overall complications (22.8% vs. 14.9%), bleeding events within 72 hours (7.7% vs. 2.1%), and median length of hospital stay (2.9 vs. 2.3 days) following protocol implementation. There also was a reduction in the use of blood transfusions and death. Finally, the total variable costs decreased from approximately $15,000 to $14,200.

"This clinical decision support tool helps cardiologists objectively validate which patients are at high risk for bleeding complications based on existing evidence," Strauss says. "Previously, we could attempt to identify which patients were at risk based on clinical intuition, but this tool gives a much more accurate assessment, as shown through the improved patient outcomes. Furthermore, this tool can help reduce the variability in practice patterns among physicians that can be costly to the healthcare system."

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