

Most PCIs (such as balloon angioplasty) performed in US for acute indications appear warranted

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In an examination of the appropriateness of the widespread use of percutaneous coronary interventions (PCIs), researchers found that of more than 500,000 PCIs included in the study, nearly all for acute indications were classified as appropriate, whereas only about half of PCIs performed for nonacute indications could be classified as appropriate, according to a study in the July 6 issue of *JAMA*.

"Approximated 600,000 percutaneous coronary interventions [procedures such as [balloon angioplasty](#) or stent placement used to open narrowed coronary arteries] are performed in the United States each year, at a cost that exceeds \$12 billion. Patients who undergo PCI are exposed to risks of periprocedural complications and longer-term bleeding and stent [thrombosis](#). Moreover, recent trials in [stable patients](#) without [acute coronary syndromes](#) have shown that PCI, compared with [medical therapy](#), may provide only a modest population-average improvement in [symptom relief](#). Given the cost and invasiveness of PCI, determining the extent to which PCI procedures are performed for appropriate and inappropriate indications could identify procedural overuse and areas for quality improvement and cost savings," according to background information in the article. Recently, appropriate use criteria for [coronary revascularization](#) were jointly developed by 6 professional organizations to support the rational and judicious use of PCI.

Paul S. Chan, M.D., M.Sc., of Saint Luke's Mid America Heart and Vascular Institute, Kansas City, Mo., and colleagues conducted a study to quantify the proportion of PCIs classified as appropriate, of uncertain [appropriateness](#), and as inappropriate for acute as well as nonacute indications. The study included data from patients within the National Cardiovascular Data Registry undergoing PCI between July 2009 and September 2010 at 1,091 U.S. hospitals. The appropriateness of PCI was determined using the appropriate use criteria for coronary revascularization. Results were stratified by whether the procedure was performed for an acute indication (ST-segment elevation myocardial infarction – a certain pattern on an electrocardiogram following a heart attack; non-ST-segment elevation myocardial infarction, or unstable angina with high-risk features) or nonacute indication.

Of 500,154 procedures classified, 103,245 (20.6 percent) were for ST-segment elevation myocardial infarction, 105,708 (21.1 percent) for non-ST-segment elevation myocardial infarction, 146,464 (29.3 percent) for high-risk unstable angina, and 144,737 (28.9 percent) for nonacute elective indications. Based on the appropriate use criteria definition for acute procedures, 355,417 PCIs (71.1 percent) were for acute indications and 144,737 (28.9 percent) were for nonacute indications. Heart attack comprised 58.8 percent of all acute procedures, while high-risk unstable angina comprised 41.2 percent.

The researchers found that the vast majority (98.6 percent) of acute PCIs were classified as appropriate, with 0.3 percent classified as uncertain and 1.1 percent as inappropriate. Overall, 50.4 percent of nonacute PCIs were classified as appropriate, while 38.0 percent were for uncertain indications and 11.6 percent were for inappropriate indications. In general, compared with procedures classified as appropriate and uncertain, inappropriate PCIs were more likely to occur in patients with no angina, low-risk non-invasive stress testing results or suboptimal antianginal therapy.

There was substantial hospital-level variation in the proportion of inappropriate procedures for nonacute indications. Hospitals in the lowest quartile had rates of inappropriate PCI of 6 percent or lower, while the rate of inappropriate PCI was greater than 16 percent among hospitals in the highest quartile. Analysis of the data suggested an 80 percent greater likelihood of patients with identical clinical characteristics receiving an inappropriate PCI at one randomly selected hospital as compared with another.

"Collectively, these findings suggest an important opportunity to examine and improve the selection of patients undergoing PCI in the non-acute setting," the authors write.

"Better understanding of the clinical settings in which inappropriate PCIs occur and reduction in their variation across hospitals should be targets for quality improvement."

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