**Men, Whites, and Privately Insured More Likely to Get Inappropriate PCI**

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Information from Industry

KANSAS CITY, MO — The inappropriate use of angioplasty is most likely to occur in individuals with private health insurance and in those treated at suburban hospitals, a new study has shown[1]. In addition, males and white individuals are also significantly more likely to undergo inappropriate PCI compared with females and nonwhite individuals, report investigators.

"When we looked at the predictors of inappropriate or rarely appropriate PCI in an otherwise-elective setting, we're really asking whether or not the traditionally nonvulnerable populations--men, white patients, those with private health insurance--are more likely to have a procedure that has known benefits but might not always, in these instances, convey benefit, and this potentially suggests overuse," said lead investigator **Dr Paul Chan** (Mid America Heart Institute, Kansas City, MO). "What we found was there was a modest difference in patients by gender, race, and insurance status."

The results of the study are published online today in the *Journal of the American College of Cardiology*.

**Identifying Those Most Likely to Receive Inappropriate PCI**

Several high-profile cases of inappropriate stenting have garnered headlines in recent years. In 2009, six medical professional societies, including the**American College of Cardiology Foundation** (ACCF), **American Heart Association**, and the**Society for Cardiovascular Angiography and Interventions** (SCAI), teamed up to produce [appropriate-use criteria (AUC) to guide the use of revascularization procedures](http://www.medscape.com/viewarticle/586362).

Although these [criteria have been criticized](http://www.medscape.com/viewarticle/758316) and even [spoofed](http://www.medscape.com/viewarticle/791260), they were part of ongoing efforts to reduce or eliminate cases where patients received medically unnecessary procedures. In 2012, the ACCF and SCAI led an effort with other societies to create new AUC for diagnostic catheterization.

**ACC: "Inappropriate" Now "Rarely Appropriate"**

Given the negative connotations of "inappropriate" and the judgment of clinicians it implies, the societies now use "rarely appropriate" to define PCI cases that don't meet the AUC. In a statement, ACC past president **Dr Ralph Brindis** (University of California, San Francisco) said, "The new terminology acknowledges that in certain rare cases when the patient's individual circumstances are considered as part of a shared decision-making process, stents in this category would be considered 'appropriate.' "

In his statement, Brindis goes on to say that the ACC is very concerned about racial and socioeconomic disparities in care, noting that the "overuse of tests and procedures puts our patients at risk for adverse outcomes and potential complications."

Using PCI data from the **National Cardiovascular Data Registry** (NCDR), the researchers identified 221 254 nonacute PCIs performed between 2009 and 2011 and determined the appropriateness of the procedure using the 2009 AUC. Of the procedures, 49.8% were classified as appropriate, 38.1% as uncertain, and 12.2% as inappropriate.

"Part of this emanates from a whole field of research that has described disparities in care between groups, such as men and women, blacks compared with whites, and the insured vs the uninsured," said Chan. "And we have two types of disparities in the field of cardiovascular research and even noncardiovascular research, and those are disparities in outcomes, such as meaningful events--death, stroke, or myocardial infarction. There could also be disparities in the use of the procedures, such as angioplasty in this case."

In a multivariable-adjusted model, men were 8% more likely than women to undergo an inappropriate PCI and white patients were 9% more likely than nonwhite patients to receive an inappropriate intervention. Compared with individuals with private health insurance, patients on **Medicare**, other public health insurance, and those with no insurance were 15%, 22%, and 44% less likely to undergo inappropriate PCI, respectively. Also, rural hospitals were less likely to perform inappropriate PCI compared with urban centers, while suburban hospitals were more likely.

Overall, Chan said the results were not particularly surprising, but the study helps researchers get a better understanding of how much more often men, whites, and the privately insured are undergoing inappropriate procedures. Although the differences were modest, if extrapolated to the approximate 200 000 elective angioplasties performed each year in the US, they translate into 3000 to 4000 more interventions for these subgroups. He said while research has focused on the underuse of procedures in certain populations, such as women, blacks, and the uninsured/Medicare patients, the goal isn't necessarily to raise their numbers to the same rates.

"We want to get them to the rates where there is benefit," said Chan. "That might mean getting the nonvulnerable populations back down to the rates where there isn't a clear benefit to begin with."

**The Potential for Overuse**

Speaking with **heart*wire*** , **Dr Sunil Rao** (Duke Clinical Research Institute, Durham, NC), the second author on the paper, called the results provocative in that they will "start the conversation about the potential for overtreatment." However, he agrees with the editorial by **Dr Karen Joynt** (Brigham and Women's Hospital, Boston, MA)[2], noting that the number of non-PCI patients is missing from the NCDR database, making it difficult to determine the "right rates" of PCI in the populations.

"We use the term *overuse* in the paper, but we should probably qualify it by saying the potential for overuse," said Rao. "If we take a step back and ask what are the overall predictors of PCI, it's male sex, whites, and so on. Just by the fact they have more PCI, in general, you're probably going to have more inappropriate or rarely appropriate PCI." He notes that the registry doesn't account for failed medical therapy, so it's also possible inappropriate PCI might actually represent the right course of treatment.

In her editorial, Joynt said the study suggests overuse is occurring in patient populations "diametrically opposed" to those who are undertreated, that being racial and minority groups, women, the poor, and those in rural areas. The data is consistent with prior studies showing that overuse of technology or procedures contribute to disparities in care, she writes.

For Rao, the study is important because it begins to address the disparity issue from both sides. "Ultimately, if interventionalists can integrate these appropriate-use criteria into our daily work flow, maybe we can get at this from both ends, so that everybody who requires PCI gets it, without paying attention to some of things that lead to physician bias," he told **heart*wire*** .

**Inappropriate PCI and Subsequent Outcomes**

To **heart*wire*** , Chan said past research has not shown inappropriate PCI is associated with worse in-hospital clinical outcomes, such as death, stroke, or MI. However, when patients receive a stent, treatment with dual antiplatelet therapy can predispose them to bleeding events over the following 12 months. More important, said Chan, hard clinical outcomes might not be a good measure following inappropriate PCI, because these are elective cases and the patients are relatively healthy.

"It would be really challenging to find a difference in outcomes unless the patients did markedly worse," said Chan.

In the editorial, Joynt writes that the clinical consequences of overusing PCI are complex, although it does lead to greater risk exposure. Like Chan, she said the clinical consequences of these inappropriate procedures can remain "largely invisible."

Despite these difficulties, Chan said that past research has validated the AUC. In a [Canadian study performed last year](http://www.medscape.com/viewarticle/772521), researchers showed that when revascularization was performed in line with the recently created appropriateness guidelines, it was associated with reduced adverse outcomes compared with patients not undergoing revascularization. In patients without an appropriate indication according to the criteria, no such reduction was seen with revascularization procedures.

"We know based on this study, looking at the benefit of PCI vs medical therapy by the patient's appropriateness level, that when there is an inappropriate indication by the appropriate-use criteria, there does not seem to be a benefit conveyed long term among patients who undergo PCI," Chan told **heart*wire*** . "It gives some indication that these criteria are not just pulled from thin air."