

## Drug-Eluting Stents Improve Long-Term Nonfatal Outcomes

Anstrom KJ, Kong DF, Shaw LK, et al. Long-term clinical outcomes following coronary stenting. *Arch Intern Med* 2008; 168:1647–55.

### Study Overview

**Objective.** To compare the long-term clinical outcomes of patients receiving drug-eluting stents (DES) versus bare metal stents (BMS) in a real-life clinical practice setting.

**Design.** Retrospective cohort study.

**Setting and participants.** Data were derived from the Duke Databank for Cardiovascular Disease, which contains data on 54,000 postcatheterization patients from the Duke Heart Center, Durham, NC. Patients who underwent revascularization with either BMS, DES, or both between 2000 and 2003 were included. Patients with prior coronary artery bypass grafting or percutaneous coronary intervention, congenital heart disease, severe left main disease, or severe valvular disease were excluded. Patients receiving both DES and BMS during the same procedure were categorized in the DES group because receipt of DES determined the postprocedure antiplatelet regimen.

**Main outcome measures.** Follow-up record reviews and interviews were used to gather information about 8 events: death, nonfatal myocardial infarction (MI), the need for target vessel revascularization (TVR), any revascularization, non-TVV revascularization, combination of death or MI, combination of death or TVR, and the combination of death or MI or TVR. The primary endpoints were the combination of death or MI and TVR.

**Main results.** There were 3165 patients in the DES group and 1501 patients in the BMS group. Cardiac events decreased over time for both groups. At 6 months postintervention, there was a lower rate of death or MI in the DES group, but this advantage did not exist at 12 or 24 months. After adjusting for baseline patient characteristics, patients in the DES group had significantly decreased rates of TVR, but there were insignificant differences in death or MI; these differences persisted over 2 years of follow-up. In extensive subgroup analyses, a significant improvement in TVR was seen with increasing number of diseased vessels in patients in the DES group. There were no differences in death or MI among diabetic patients, but rates of TVR with DES improved.

**Conclusion.** Patients who received DES had lower rates of TVR but similar long-term rates of death or MI when compared with patients who received BMS. Patients with multivessel disease experienced a greater benefit than those with isolated lesions.

### Commentary

The results of this study are concordant with recent large trials that have found little or no difference in the rates of MI or death between BMS and DES [1,2]. In contrast, a recent Swedish study found that patients with DES had higher mortality rates over time [3]; however, it was noted that antiplatelet therapy poststenting is an extremely important contributor to all of these events, perhaps one that could be a primary determinate of fatal and nonfatal event rates. This study by Anstrom et al and others [1,2] suggest that patients who receive DES will have a decreased need for repeat catheterization and revascularization. Because of the “real world” nature of this study, the authors were able to evaluate patients with multivessel disease, and a particular benefit of DES was seen in this group.

This study benefitted from the use of retrospective design that included a broad and representative scope of patients receiving stent-based interventions. The authors posit that the higher rates of death in both the DES and BMS groups and lower rates of TVR seen in this study reflect a difference in their approach to the more restrictive criteria used in traditional prospective trials. However, this study was also limited by its retrospective nature. Changes in management, technology, and other ongoing studies likely affected management choices and were confounders. In addition, since data were collected from a database of a single institution, follow-up procedures that took place outside of the study’s centers were not fully represented.

### Applications for Clinical Practice

Although most providers cannot determine which type of stent their patients receive, they will be responsible for follow-up care. Data from this and similar studies can help with counseling patients on risks and treatments following their stenting procedure. Perhaps most importantly to those delivering primary care, this study also suggests the critical

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nature of adequate antiplatelet therapy after stent-based interventions.

—*Review by Marc M. Triola, MD*

### References

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3. Lagerqvist B, James SK, Stenestrand U, et al. Long-term outcomes with drug-eluting stents versus bare-metal stents in Sweden. *N Engl J Med* 2007;356:1009–19.

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