

# Bypass Surgery Trumps PCI for Multivessel Disease

*A large study has shown that bypass surgery provides a survival advantage in patients with severe occlusion.*

BY BRUCE K. DIXON  
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CHICAGO — Bypass grafting is superior to percutaneous intervention for the treatment of severe coronary artery disease, according to a large retrospective study presented at the annual meeting of the Society of Thoracic Surgeons.

The study, prompted in part by what the authors called “limitations in the ability of randomized trials to represent typical [coronary artery disease] patients seen in clinical practice,” also found that:

► The treatment of coronary artery disease (CAD) has improved over time as measured by mortality outcome.

► Both coronary artery bypass grafting (CABG) and percutaneous intervention (PCI) are superior to medical therapy for all degrees of CAD.

► Contrary to conventional wisdom, the advantage of CABG over PCI increased in the bare stent era.

The observational data analysis of 18,481 patients with significant coronary disease (greater than 75% stenosis of at least one coronary artery) was carried out between 1986 and 2000 with subsequent follow-up at Duke University Medical Center in Durham, N.C., and the Miriam Hospital Cardiac Center in Providence, R.I. Patients with significant left main obstruction and significant mitral regurgitation, as well as those who died after medical treatment within 5 days of index cardiac catheterization (median time to surgery), were excluded from the analysis.

The team, led by Dr. Peter K. Smith at Duke, targeted all-cause mortality as the primary outcome. The goal was to assess the effectiveness of different types of treatments for CAD. The data were broken down into three “eras” of treatment selec-

tion: 1986-1990, 1991-1995, and 1996-2000.

Each group was further stratified by severity: low (predominantly one-vessel disease), intermediate (predominantly two-vessel disease), and high (primarily three-vessel disease). Patients remained in their initial treatment groups regardless of subsequent crossover to alternative therapy. The Multivariable Cox Proportional Hazard Model was used to adjust for cardiovascular risk factors and to correct for propensity of treatment selection.

In the low- and intermediate-severity disease groups, CABG and PCI appeared to contribute equally to the survival advantage, but in high-severity disease, CABG conferred a mean survival advantage of about 8 months. When examined by era in terms of absolute survival advantage in months per 7 years' follow-up, the data showed that CABG:

► Conferred an additional survival trend compared with PCI, especially for high-severity disease, in the 1986-1990 era.

► Provided a statistically significant absolute survival advantage over PCI for high-severity disease, with no difference in less severe disease, during the 1991-1995 era.

► Provided an additional 5 months of life per 7 years of follow-up in high-severity disease during the 1996-2000 era, which was characterized by the general availability of bare metal stents.

“Compared to the bypass and medical therapy groups, the PCI group had a higher ejection fraction and a higher likelihood of prior myocardial infarction but a lower incidence of congestive heart failure, diabetes, cerebral vascular disease, peripheral vascular disease, and chronic renal disease. Medical therapy and CABG patients shared similar risk factors,” Dr. Smith said. “PCI patients were more likely to have one- or two-vessel disease, and

bypass grafting most often was performed for two- or three-vessel disease.”

The inherent risk of cardiovascular death increased throughout the study period for all patients, though PCI patients had a generally lower risk over time than did the other two cohorts. “Thus, revascularization with either PCI or bypass grafting improved survival, although the overall survival at 17 years' follow-up was less than 45%,” Dr. Smith explained. The survival advantage provided by revascularization varied significantly with disease severity; less than 30% of high-severity disease patients survived to 17 years, regardless of initial therapy.

During the discussion period, prominent thoracic surgeons praised Dr. Smith and his team. “For the last 30 years we have been engaged in a series of dialogues with our cardiology colleagues . . . on the relative merits of the percutaneous treatment of coronary disease relative to bypass surgery,” said Dr. Bruce W. Lytle of the Cleveland Clinic Foundation. “Cardiologists have seized upon randomized, prospective trials which have shown little or no difference in survival between PCI and surgery, he said. Because those trials were biased at the point of patient inclusion, they tend to be made up of low-risk patient subsets that inflate PCI survival rates, he added.

“There is compelling evidence now that coronary bypass is superior to percutaneous intervention for multivessel disease,” said Dr. Robert A. Guyton of the Emory Clinic in Atlanta. “The New York State Reg-

istry reported in 2000 that in the present era, there was a highly significant survival advantage for coronary bypass at 3 years and a 43% relative survival advantage for triple-vessel disease, including the proximal left anterior descending. But the cardiologists responded, ‘now we have stents,’ and told their patients there was no mortality difference between stenting and coronary bypass. Last year, the data from New York were presented for the stent era, and there still was a highly significant survival ad-



In low- and intermediate-severity disease, CABG and PCI were similar in terms of survival advantage, Dr. Peter K. Smith said.

vantage—46%—for coronary bypass. Cardiologists responded, ‘now we have drug-eluting stents,’” Dr. Guyton said, adding that coronary occlusion, not restenosis, delivers the fatal blow.

“With these new data, can we continue to passively let the interventionalists present their position . . . to multivessel disease patients?” Dr. Guyton asked Dr. Smith. “With the data you presented and the data from New York, is there not now an ethical imperative to confront cardiologists with these data and to educate primary care physicians?”

Following extended applause, Dr. Smith replied, “The short answer is ‘yes.’” ■

## Coronary Bypass Worth the Risks in Some Octogenarians

BY BRUCE K. DIXON  
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CHICAGO — Percutaneous coronary intervention may not be the best revascularization option for all octogenarians with multivessel coronary artery disease, according to a large study that pitted the procedure against surgical bypass.

The study of nearly 1,700 patients, aged at least 80, found that although in-hospital mortality and short-term survival were better for percutaneous coronary intervention (PCI), survival from 6 months to 8 years was significantly higher among the patients who underwent coronary artery bypass grafting for either two- or three-vessel disease. The data, from the Northern New England Cardiovascular Disease Study Group, anchored at Dartmouth-Hitchcock Medical Center in Lebanon, N.H., were presented at the annual meeting of the Society of Thoracic Surgeons.

“For a long time we never told octoge-

narians that there was a survival advantage to surgery. The emphasis was on quality of life. I think what we've found is that these older patients actually live quite a long time after treatment. Median survival was 7.7 years, and for those who had bypass it exceeded 8 years,” lead investigator Dr. Lawrence J. Dacey said in an interview.

Over the study period, there were 514 deaths and 5,530 person-years of data. In-hospital mortality was 6% in the 991 patients who underwent coronary artery bypass grafting (CABG) and 3% in the PCI group. Survival in the first 6 months was slightly better in the PCI cohort. From 6 months post treatment out to 8 years, CABG patients showed a trend toward increased survival that was most pronounced for those with three-vessel disease.

“However, among those who survived for 6 months beyond their procedures, there was a significant 28% adjusted reduced risk of death at 8 years if they had had CABG rather than PCI,” the Dart-

mouth physician said. Among patients with two-vessel disease, CABG conferred a highly significant 32% reduced risk of death. For patients with three-vessel disease, there was a trend toward improved survival with CABG that may have fallen short of statistical significance because of the relatively few PCI patients with three-vessel disease.

The study included patients aged 80-89 years with two-vessel disease (58%) and three-vessel disease (42%) but no left-main disease, undergoing a first, nonemergent revascularization during 1992-2001 in northern New England. CABG patients tended to be younger, more often male, and have more peripheral vascular disease and congestive heart failure. PCI patients had more renal dysfunction and a larger number of recent myocardial infarctions.

There exists among physicians what Dr. Dacey called a “bias that patients in this older group are too fragile to undergo major surgery. On the contrary, they're pretty robust and can handle a lot, and in our

study those with the biggest advantage from bypass were those who were sickest to begin with.

Previous studies have shown the effectiveness of revascularization in enhancing the quality of life in elderly patients by providing both improved functional status and relief from angina. “Quality of life is particularly important for this age group. Studies have shown that CABG is equal or superior to PCI in improving quality of life. Patients aged 80 and older with multivessel coronary disease must carefully consider the trade-off between the increased up-front risk of CABG in return for improved long-term survival. Not everybody is appropriate for CABG, but those who do want to go through it should be allowed the opportunity to do so,” he concluded.

The seven-center study was not randomized, there were no data on subsequent revascularization, and both PCI and CABG are evolving and improving technically, Dr. Dacey noted. ■