

# Shortage of Surgeons Will Have Wide Fallout

BY BRUCE JANCIN  
Denver Bureau

SNOWMASS, COLO. — The pipeline of future cardiac surgeons is “essentially nonexistent”—and that fact will have serious downstream consequences not only for the surgical specialty but for cardiologists and all others who provide care for patients with heart disease, Dr. Andrew S. Wechsler warned.

“When I began my cardiac surgical training there were roughly 10 applicants per available position. Today there are basically more positions than applicants,” said Dr. Wechsler, professor of cardiothoracic surgery at Drexel University, Philadelphia.

Indeed, last year there were only 97 applicants for the 130 U.S. training positions, and only 68 of them were grad-



uates of American medical schools. The quality of the applicants has dropped off, he added while speaking at a conference sponsored by the Society for Cardiovascular Angiography and Interventions.

The dramatic falloff in the applicant pool began about 4 years ago. It's a trend of particular concern because of the projected increasing demand for cardiac surgical services as the population ages, coupled with the fact that one-half of practicing cardiac surgeons are above age 53. Many are contemplating retirement as a consequence of decreasing reimbursement, mounting malpractice insurance costs, and declining job satisfaction.

Reimbursement for cardiac surgery today is, in real dollars, only about 30% of what it was 15 years ago. Cases have become far more complex, with a huge increase in the number of reoperations. The average yearly cost of malpractice insurance for cardiac surgeons practicing in Pennsylvania is \$125,000. Surveys indicate only one-quarter of practicing cardiac surgeons would advise medical students to enter the field today, Dr. Wechsler said at

the conference, cosponsored by the American College of Cardiology.

Cardiac surgery is currently performed at more than 1,400 U.S. hospitals, many of which have small-volume programs. Dr. Wechsler predicted that one consequence of the looming shortage of cardiac surgeons will be governmental pressure to re-consolidate cardiac surgical services to high-volume centers, with resultant closure of many smaller programs. Referring physicians are likely to find high-quality cardiac surgeons becoming less available.

Cardiac surgical educators have launched a number of initiatives to address the predicted shortage.

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DR. WECHSLER

programs have been approved, including a 6-year program in cardiac surgery beginning right out of medical school. And vascular surgery is now accepted as a pathway to cardiac surgical training, noted Dr. Wechsler.

Former ACC president Spencer B. King III said that “we at the ACC have been worried about this [cardiac surgery workforce crisis] a lot.” Late last year the ACC and Society of Thoracic Surgeons agreed on a joint educational initiative that will focus on three broad areas: defining criteria for the appropriateness of revascularization; development of hybrid interventional cardiology/cardiac surgery procedures; and treatment of structural heart disease. “We interventional cardiologists are jumping into the area of structural heart disease with enormous enthusiasm, but how many interventional cardiologists have spent their career looking at the inside of hearts? That's where the surgeons live. So I think there are enormous opportunities for collaboration,” said Dr. King, the Fuqua Chair in Interventional Cardiology at the Fuqua Heart Center at Piedmont Hospital, Atlanta. ■

Paid internships are being offered to medical students in an effort to capture their attention early in their education in the hope of steering them into this challenging field. New integrated training

# Stem Cell Therapy During CABG Improves Ejection Fraction

BY NANCY WALSH  
New York Bureau

NEW YORK — Intramyocardial delivery of bone marrow stem cells during coronary artery bypass grafting conferred additional benefits in ejection fraction and perfusion beyond that seen with the surgery alone in two small studies, Dr. Gustav Steinhoff reported at a conference on cell therapy and cardiovascular diseases.

The first was a phase I trial that included 15 patients with chronic ischemia resulting from previous myocardial infarction. Their mean age was 63 years, and all were male and had moderate to severe symptoms of coronary artery disease, including reduced exercise capacity and chest pain.

All patients first underwent bone marrow aspiration, and from the aspirate, CD133+ cells were isolated. CD133+ cells are a subset of CD34+

hematopoietic progenitor cells that have been found to improve myocardial function in animal models and to increase vascular differentiation, Dr. Steinhoff said.

The following day coronary artery bypass grafting (CABG) was done and the CD133+ cells were injected into an area of myocardial perfusion defect.

Among patients in this first trial, the average left ventricular ejection fraction (EF) evaluated echocardiographically increased significantly, from 39% to 50% at 6 months, and to 48% at 18 months. Left ventricular end systolic volume also decreased significantly, from 92 mL to 66 mL at 6 and 18 months, while end diastolic volume decreased from 144 mL to 121 mL at 6 months and to 127 mL at 18 months (J. Thorac. Cardiovasc. Surg. 2007;133:717-25).

All patients tolerated the procedure well, and there were no serious adverse events related to the treatment. One patient died of a stroke 9 months later.

The remaining 14 have survived for up to 5 years, for a total of 739 patient-years, said Dr. Steinhoff of the department of cardiac surgery, University of Rostock (Germany).

The promising results of the phase I study prompted Dr. Steinhoff and his colleagues to perform a phase II trial that included 55 patients who were randomized to stem cell therapy plus CABG or CABG alone. In this study, the mean age also was 63 years, and three-quarters of the patients were male.

Disease severity was similar to that seen in the phase I trial.

Among patients who had the cell treatment, left ventricular EF increased from 37% to 47% at 6 months, while in the CABG-only patients it increased from 38% to 41% at 6 months. The difference between the groups was statistically significant, he said.

Moreover, gains in perfusion seen on single-photon emission CT scans were “long standing and impressive in many patients,” Dr. Steinhoff said. In one patient, perfusion had virtually normalized by 6 months, he noted.

Mean follow-up time now is 41 months in the cell therapy group and 39 months in the control CABG-only group. There have been two deaths in each group, for a mortality rate of 5.7% in the cell therapy group and 10% in the control group, Dr. Steinhoff said.

Additionally, two patients in the cell therapy group subsequently underwent

percutaneous transluminal coronary angioplasty. Among the control patients, one has had a pulmonary embolism and another experienced cardiac decompensation.

“We concluded that safety and clinical

feasibility was shown in the phase I trial, and that the phase II trial supported the safety and suggested clinical activity. We are now proceeding with a phase III trial scheduled to begin this year,” he said.

A total of 142 patients whose EF is 25%-30% will be enrolled, and the primary end point will be left ventricular EF at 6 months measured by cardiac magnetic resonance imaging.

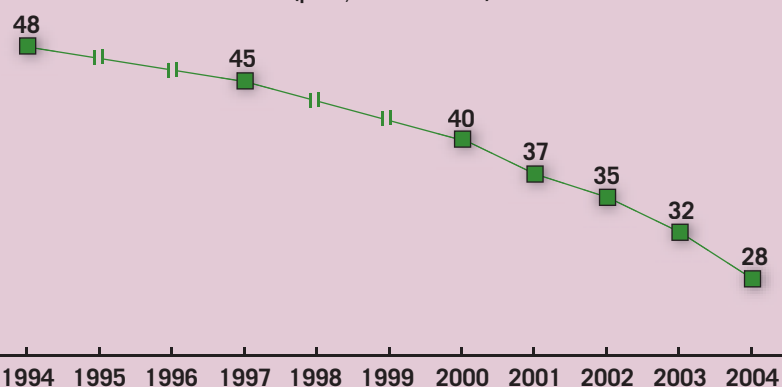
But much remains to be done in the final development of this treatment, Dr. Steinhoff cautioned. Further efforts must include clarifying patient selection, assessing whether patients with worse pre-operative left ventricular function derive more benefits, and confirming the long-term safety of the procedure. ■

**Gains in myocardial perfusion, seen on SPECT scans, in the cell-treated group were ‘long standing and impressive in many patients.’**

## DATA WATCH

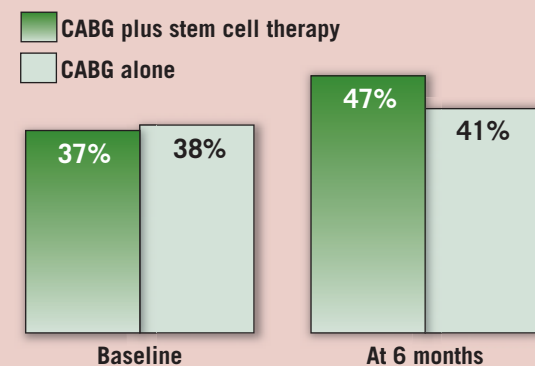
### Inpatient Mortality From Coronary Artery Bypass Graft Declining

(per 1,000 admissions)



Source: Healthcare Cost and Utilization Project

### Left Ventricular Ejection Fraction After Coronary Artery Bypass Grafting



Note: Based on a phase II randomized trial of 55 patients with chronic ischemia with moderate to severe symptoms of coronary artery disease.

Source: Dr. Steinhoff