

# Survival following aortocoronary bypass graft surgery

Lucien Campeau, M.D.

*Montreal, Quebec*

Survival was studied in 807 of the 1000 patients who had pure saphenous vein graft surgery between October 1969 and June 1974. Survival curves up to 6 years were determined for the entire population and various subsets on the basis of preoperative findings and surgical techniques using the actuarial method of Cutler and Ederer.

The 6-year survival was 82% for patients who had pure saphenous vein grafts and 66% for the 126 patients who also had internal mammary artery implantation or left ventricular wall resection or both (*Table*). Survival was significantly greater when the following preoperative conditions were noted: absence of heart failure, absence of significant angina (prophylactic surgery), normal electrocardiogram at rest, one or two obstructed arteries, ejection fraction  $\geq 0.45$ . Survival did not appear to be influenced by the patient's age, risk factors, duration of illness before surgery, or previous myocardial infarction; the 6-year survival was not different for stable as opposed to unstable angina. Patients with one, two, or more grafts had a similar life span, but patients with optimal correction had a significantly greater longevity (bypass of all major coronary arteries with a stenosis  $\geq 70\%$ ).

**Table.** Factors influencing survival after aortocoronary bypass graft surgery

	No. of patients operated on	Six-year cumulative survival	
		Early mortality in- cluded	Early mortality ex- cluded
Pure bypass	807	82%	86%
+Vineberg or wall resection	126	66% $p < 0.01$	73% $p < 0.001$
Prophylactic surgery	63	90%	90%
Stable angina	563	81% $p < 0.05$	— N.S.
Heart failure absent	895	82%	86%
Heart failure present	38	35% $p < 0.001$	45% $p < 0.001$
ECG normal	214	92%	93%
ECG abnormal	571	78% $p < 0.001$	84% $p < 0.01$
No. of obstructed arteries: 1-2	519	86%	88%
No. of obstructed arteries: 3	288	75% $p < 0.001$	84% N.S.
Ejection fraction: $< 0.45$	157	67%	72%
Ejection fraction: $\geq 0.45$	650	86% $p < 0.001$	89% $p < 0.001$
Correction optimal	681	83%	87%
Correction incomplete at surgery	106	74% $p < 0.05$	82% N.S.
Correction optimal	65		98%
Correction not optimal 6-18 months after surgery	283		82% $p < 0.025$
All grafts patent	113		94%
All grafts obstructed 6-18 months after surgery	41		67% $p < 0.001$

When early mortality (first month) is excluded, the only factors which appear to determine late survival are heart failure, electrocardiogram, and ejection fraction (*Table*). The 6-year survival was also significantly greater in patients whose grafts were patent 6 to 18 months after surgery as opposed to that of patients in whom all

grafts were occluded. Also, patients who still had an optimal correction as determined by angiographic control studies 6 to 18 months after surgery had lived longer than patients in whom the correction was not optimal (successful bypass of all major arteries with a stenosis  $\geq 70\%$  at 1 year).