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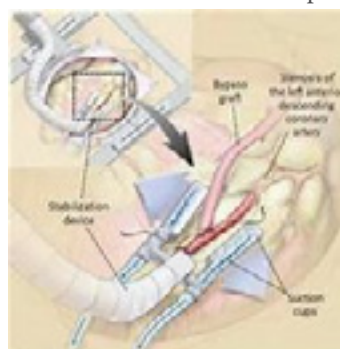
### Pump-assisted beating-heart coronary arteries bypass grafting: Application and advantages

**Background:** The techniques utilized to accomplish Coronary Artery Bypass Grafting (CABG) include the traditional use of cardiopulmonary bypass (CPB) with aortic cross-clamping and cardioplegic arrest to totally Off-Pump (i.e. OP-CAB) without CPB. The purpose of this report is to describe a hybrid approach—Pump-Assisted Direct CABG (PAD-CAB)-- with the aid of CPB without aortic cross-clamping and cardioplegic arrest.

**Methods:** Between November 2003 and December 2016, 317 PAD-CAB procedures were performed by the author/surgeon. The PAD-CAB procedures were achieved with standard CPB via sternotomy under normothermic conditions with the mean arterial pressures (MAP) kept between 60 and 80 mmHg. Outcome measures included hospital mortality and specific major adverse events (MAE) benchmarked against the Society of Thoracic Surgeons (STS) database. The number of bypass grafts, status of the case, specific patient factors, and postoperative length of stay (LOS) were also assessed.

**Results:** There were 238 male (75%) and 79 (25%) female patients. The mean age was 67 years (range: 38 to 92 years). The mean ejection fraction (EF) was 50% (range: 0 to 75%) with 66 cases (21%) having an EF < 40%. Two hundred seventy-seven cases (87.4%) were non-emergent with forty cases (12.6%) classified as emergent/salvage. The average of number of bypass grafts was 3.24 (range: 1 to 5). The postoperative LOS averaged 7.5 days with a median of 6 days. There were two hospital deaths (0.65%). Major Adverse Events were: 1 deep SWI (0.32%), 3 CVAs (0.95%), and 5 POBs (1.58%).

**Conclusions:** PAD-CAB is a safe and effective operation with outcomes that are equivalent or superior to the outcomes reported in the STS registry for CABG. The PAD-CAB technique takes advantage of the circulatory stability achieved with CPB assistance and eliminates the potential risks associated with aortic cross-clamping and cardioplegic arrest.



### Biography

Louis Samuels is working as Professor of Surgery at Thomas Jefferson University in Philadelphia Pennsylvania. His medical school, general surgery and cardiothoracic surgery training were completed at Hahnemann University in Philadelphia Pennsylvania. He has published over 100 peer-reviewed manuscripts on a variety of topics in cardiothoracic surgery, most notably in the field of artificial heart technologies and the management of acute and chronic heart failure. In the past 15 years, he has also taken interest in beating heart coronary artery bypass grafting (CABG) and has performed over 1000 of these procedures including totally off-pump (i.e. OP-CAB) and pump-assisted CABG (i.e., PAD-CAB). He maintains a busy clinical practice and continues to be involved with clinical research as well as serving on various committees related to the oversight of ongoing and prospective clinical trials.

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