

Cardioplegia Pump CP4000 with Calafiore Concept

Our clinical team has been using modified intermittent tepid blood cardioplegia technique for more than 1000 patients. We have recently adopted a new cardioplegia pump CP4000 with Calafiore Concept (programmable feature) into our practice.



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Reference: Antonio Calafiore, MD, Intermittent Antegrade Warm Blood Cardioplegia, The Annals of Thoracic Surgery, 1995;59:398-402

Cardioplegic solution: normal CPB circulating blood and potassium mixture (mainly retrograde perfusion with open technique)

Frequency	Volume	Potassium concentration	Perfusion temperature
1 st	1,000 ml	25 mEq/L	29°C
2 nd	600 ml	16 mEq/L	29°C
3 rd and after	600 ml	12 mEq/L	29°C
Before aortic declamp	300 ml	Blood only	37°C

Summary: (Age 68.5 ± 8.4; Body Weight 59.8 ± 10.3 kgs)

Disease	Main procedure	Concomitant procedure	Patients	Aortic clamp time	Max. K concentration during aortic clamp (mEq/L)*	K concentration immediately after aortic declamp (mEq/L)	Spontaneous recovery of heartbeat
Aortic valve	Aortic valve replacement	Bentall, MVR, TAP, PVI, CABG,	8	136 ± 50	6.33 ± 0.84	5.11 ± 1.06	7 (87.5%)
Mitral valve	Mitral valve repair/replacement	TVR, TAP, Maze, CABG	7	133 ± 49	6.10 ± 1.20	5.16 ± 1.09	4 (57.1%)
Thoracic aorta	Ascending/arch replacement (DHCA)	Bentall, AVR, CABG	15	139 ± 50	6.49 ± 0.64	4.97 ± 0.94	11 (73.3%)

* K concentration measured by CDI500.

Comments: The principal feature of CP4000 is that the potassium concentration is always maintained constant by automatically-regulated 2 roller pumps (main/slave). The system releases perfusionists from the troublesome task of frequently adjusting the syringe pump for KCL infusion. Although potassium concentration elevated during aortic cross-clamping, it became acceptable at the time of aortic declamping. Spontaneous recovery of heartbeat was observed in 73.4% of the patients.

CP4000 Specifications:
 Blood Pump: 120 mm (4.72")
 KCL Pump: 75 mm (2.95")
 Built-in Water Reservoir
 Calafiore Concept software

AVR: aortic valve replacement, CABG: coronary artery bypass graft, DHCA: deep hypothermic circulatory arrest, MVR: mitral valve repair/Replacement, PVI: pulmonary vein isolation, TAP: tricuspid annuloplasty, TVR: Tricuspid Valve Replacement



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