

Real-Time Decision Support of Cardiovascular Parameters in Cardiac Surgery Patients: Part 2: Clinical Implementation and Evaluation.

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We have previously reported, via the ARS forum, on a real-time Decision Support System (DSS). We report on its first clinical patient trial.

Informed consent was obtained from a 73 year old patient undergoing routine aortic valve surgery. The peri-operative care was provided by the treating anaesthetist and surgeon. The trial commenced on ICU following completion of surgery, prior to awakening and endotracheal extubation. After calibration of the LiDCO monitor, the target parameters (systolic BP 110-130 mmHg, CVP 6-10) were selected by the treating anaesthetist, and inputted to the DSS screen by the study anaesthetist. The CVP was manually updated via the DSS interface. The real-time patient data displayed successfully alongside, and illuminated the 'low/normal/high' boxes of the hemodynamic classifier.

The DSS commenced its advice by selecting GTN as the targeted infusion due to rising hypertension, and each 30 seconds suggested an infusion rate in $\mu\text{g}/\text{kg}/\text{min}$ to the study anaesthetist. If the anaesthetist agreed, then the syringe motif would be clicked-on and the infusion rate would immediately and manually be input-in to the Graseby 3400 pump. As shown in Fig. 1, control was commenced with a

rising systolic blood pressures peaking at 138 mmHg, matched by rising GTN infusion rates for approximately 30 minutes. The self-tuning advisor achieved better control henceforth stabilizing the systolic pressure at around 120 ± 5 mmHg. The anaesthetist did not overrule the DSS at any point during the trial by inputting each infusion rate as suggested. Control has been maintained for approximately 70 minutes at which time the trial was electively ended.

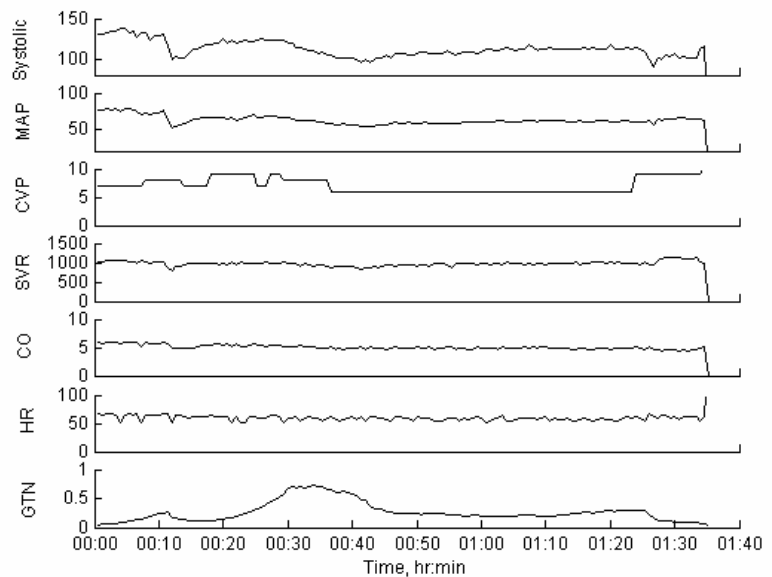


Fig 1: Hemodynamic data sampled at 30 sec by the Advisor and GTN infusion rate ($\mu\text{g}/\text{kg}/\text{min}$)

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