



## Nurse-led, post-cardiac surgery targeted volume management protocol reduces level of intensive care usage and shortens overall hospital stay

McKendry M, McGloin H, Saberi D, Caudwell L, Brady AR, Singer M *Randomised controlled trial assessing the impact of a nurse delivered, flow monitored protocol for optimization of circulatory status after cardiac surgery.* BMJ 2004; 329:258-262

### Clinical Application: Post-operative in intensive care unit/cardiothoracic unit

This randomised controlled trial looked at the impact of nurse-delivered, protocol-based oesophageal Doppler monitor-guided fluid management compared to standard post-operative care in patients in the intensive care setting following cardiac surgery.

### Protocol Outline

174 cardiac surgery patients were randomly allocated to either the standard post-operative care group (Std group), with fluid management determined with reference to traditional haemodynamic parameters (urine output, arterial lines, central venous lines or base-deficit) or fluid management based on oesophageal Doppler monitor-guided stroke volume optimisation (ODM group). Fluid management was continued for up to four hours post-operatively or until the patient was taken off the ventilator. Both groups were given either crystalloid or colloids or blood as appropriate. The ODM group protocol relied on a colloid-based bolus algorithm similar to that used in other oesophageal Doppler monitor clinical trials. In the ODM group, the nursing staff were allowed to give up to three colloid boluses before consulting with senior medical staff for guidance on further intervention

### Results

Patients in the ODM group received similar amounts of crystalloid to those in the Std group, but significantly more colloid (1667ml vs. 1042ml,  $p < 0.001$ ). Key haemodynamic parameters – stroke volume, cardiac output, corrected flow time and peak velocity – were all significantly higher in the ODM group, indicating a filled and better performing heart and circulatory system.

Patients in the ODM group stayed in the intensive care unit (ICU) for a shorter length of time than the Std group (2.5 days vs. 3.2 days), but this difference was not statistically significant. The median length of hospital stay was significantly shorter in the ODM group (7 days vs. 9 days,  $p = 0.02$ ). The mean reduction in hospital stay, from 13.9 days to 11.4 days, represented an 18% saving in bed days. ICU bed usage was reduced by 23%.

### Commentary

This study demonstrates that there are significant resource and length of stay benefits that can be achieved by the implementation of a nurse-led, protocol-based approach to post-operative fluid management, guided by oesophageal Doppler monitoring.

The CardioQ™ oesophageal Doppler monitor is quick and easy to set up and use, it is minimally invasive, safe and well proven in trials in a wide variety of surgical procedures intra-operatively. This study brings evidence of post-operative benefit to add to that demonstrated in the intra-operative setting by the existing body of published evidence.

Existing data related to post-operative fluid management, including this study, suggests that there are greater clinical benefits to be derived from a proactive, intra-operative approach, rather than a more reactive, post-operative approach. This is in line with the benefits suggested for early goal-directed therapy in other clinical settings and the concept of the 'golden hour' for intervention in trauma.



This is a summary of the referenced clinical trial and should not be used for citation.

Please refer to the source material for research purposes.



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