

Intraoperative Hypotension and Postoperative Delirium in Cardiac Surgery Patients

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INTRODUCTION

- Postoperative delirium (POD) is defined as an acute alteration in mental status that could occur hours or days after a surgical procedure.³
- POD could prolong recovery time, require collaboration with other disciplines, increase mortality, and escalate costs.³
- Delirium's underlying causes stem from factors such as pain, disturbances in sleep, surgical strain, effects of anesthesia, concurrent medications, and the body's inflammatory reaction to surgical trauma. Release of inflammatory agents due to reduced blood flow to the brain possibly adds to the complexity.¹
- POD is commonly screened with the confusion assessment method-intensive care unit (CAM-ICU), that assesses for acute changes, inattention, altered levels of consciousness, and disorganized thinking.¹⁻³
- A prevalent intraoperative complication of cardiac surgery, IOH, is defined by mean arterial pressure (MAP) less than 70 mm Hg.¹
- Best evidence practice for control of intraoperative MAP is pertinent to all anesthesia professionals who are uniquely situated to manage this parameter.²
- PICOT: Among adult patients over the age of 18 years undergoing cardiac surgery, does IOH, defined as a MAP 40-60 mm Hg, compared to maintaining normotension, defined as a MAP greater than 70 mm Hg, throughout the procedure, influence the risk of developing POD up to 7 days after surgery?

METHODS

- Databases: Embase and CINAHL
- Search terms: cardiac surgery, heart surgery, intraoperative hypotension, acute hypotension, hypotension, postoperative delirium, postoperative confusion, delirium
- Number of studies retrieved: 63
- Limitations: English language, adults, age 18 or older, non-cardiac surgery
- Articles that met criteria for inclusion: 1 systematic review (SR), 1 observational analysis, and 1 retrospective observational study

Intraoperative hypotension and postoperative delirium in cardiac surgery exhibit minimal correlation

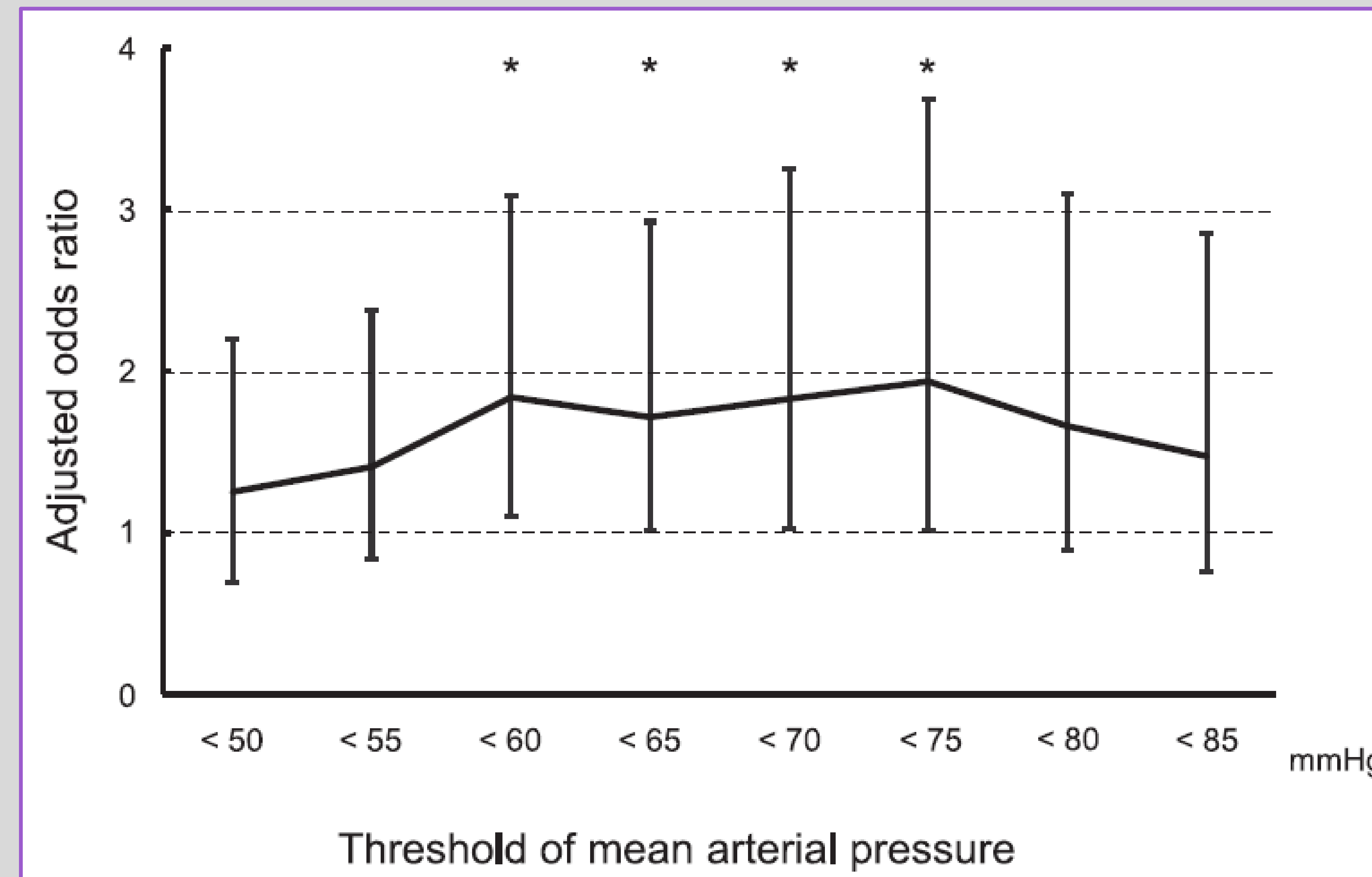


Figure 1. Longer duration of exposure to low mean arterial pressure thresholds after cardiopulmonary bypass (<60, <65, <70, and <75 mm Hg) were independently associated with postoperative delirium within a 48 hour period after cardiopulmonary bypass. *Adjusted odds ratio 1.72-1.94 (95% CI 1.01-3.69).³

REVIEW of LITERATURE/CRITICAL APPRAISAL

- Czok et al: Two of the 4 studies that met the criteria for the PICOT question reported a direct correlation to the low MAP group, indicating IOH, with POD, while the other half reported no correlation.²
- Wang et al: reported no association with IOH and POD.¹
- Ushio et al: reported an association between IOH and POD in one phase of surgery, the post-CPB period (figure 2).³

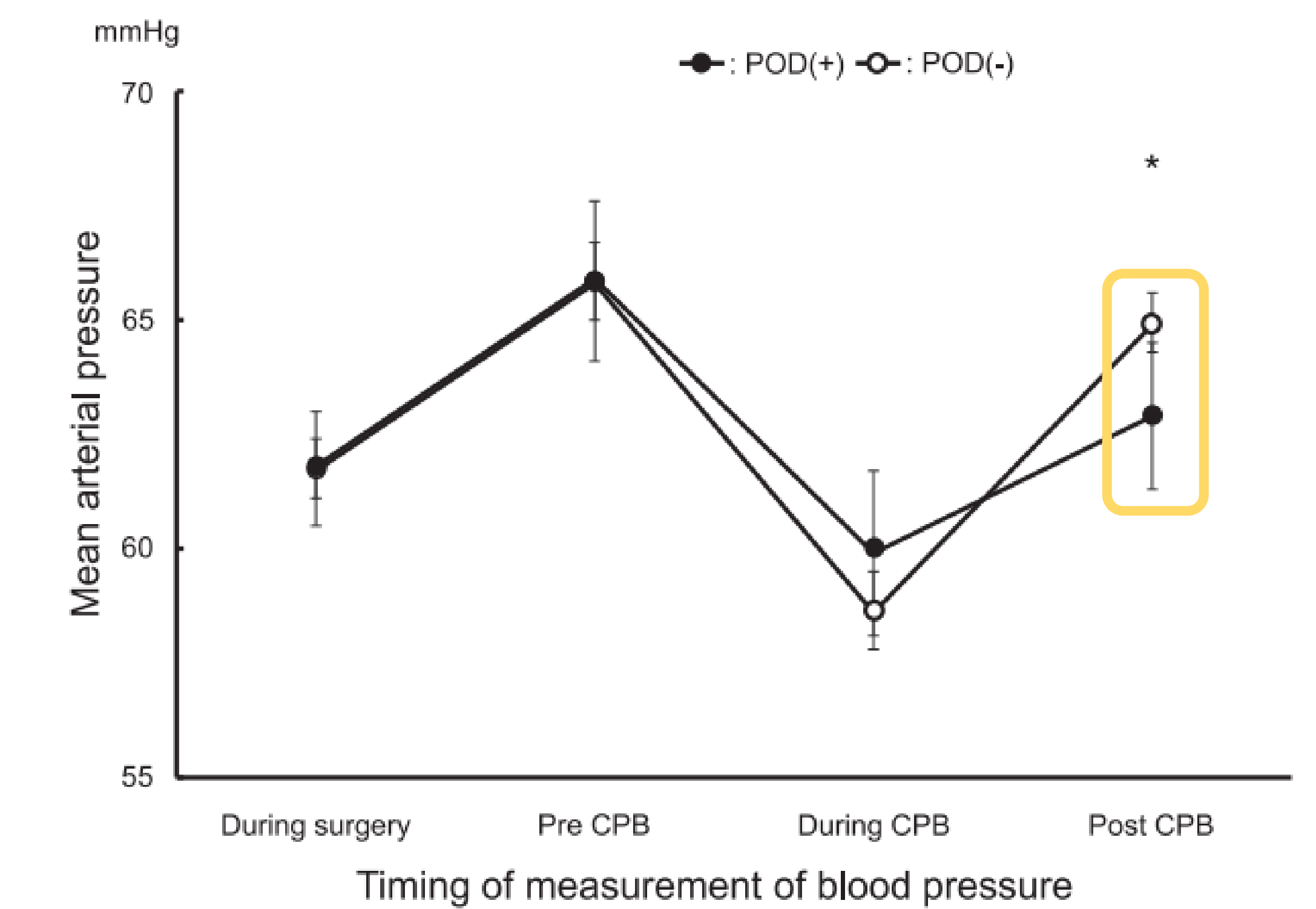


Figure 2. Mean arterial pressures in each perioperative period and patients with or without postoperative delirium. An association is noted between low mean arterial pressures in the post-cardiopulmonary bypass period and development of postoperative delirium *P = .02.³

- Small and inconsistent samples, use of single centers, undefined IOH/MAP values, variable POD definitions and criteria to identify POD exhibited bias which reduced generalizability to other patients.¹⁻³
- Variability within a specified MAP range for the classification of IOH, along with the utilization of various diagnostic assessments for POD, posed challenges in comparing results.¹⁻³

RECOMMENDATIONS for PRACTICE/CONCLUSIONS

- Inconclusive evidence does not support practice change as a whole, but therapy guided by patient-specific indicators warrants further investigation.³
- Use of cerebral perfusion pressure to assess regional tissue oxygenation specific to the site of injury.²
- Future research addressing the specific evaluation of duration and timing of IOH throughout cardiac surgery is needed to better identify whether a stronger correlation exists with POD (figure 1).¹⁻³

REFERENCES



*IRB/IACUC approval does not apply to this evidence-based project.

