

POSTOPERATIVE LEVELS OF D-DIMER AND CRP IN CARDIAC SURGERY PATIENTS

D-DIMER

1. Wang et al. (2018): Long Period and High Levels of D-Dimer After CABG

This study observed a significant postoperative rise in D-dimer levels, peaking at 2.84 ± 0.10 mg/L one month after surgery and returning to baseline levels of ~ 0.37 mg/L by three months. Patients with recurrent angina exhibited levels exceeding 2.92 mg/L, strongly associated with thrombotic events. These findings emphasize the importance of monitoring D-dimer levels in the first month postoperatively to manage thrombotic risks effectively.

2. Chen et al. (2021): Prognostic Value of D-Dimer in PCI

D-dimer levels were categorized into three risk groups: low (<0.42 mg/L), moderate ($0.42\text{--}1.15$ mg/L), and high (≥ 1.15 mg/L). Elevated levels were strongly correlated with adverse outcomes, including thrombotic events and mortality. Although focused on PCI, these thresholds are applicable to CABG and highlight the utility of D-dimer for postoperative risk stratification.

3. Kurosawa et al. (2022): Prognostic Impact of D-Dimer on Mortality

Long-term mortality was stratified into tertiles based on D-dimer levels: low (<0.70 mg/L), moderate ($0.70\text{--}1.20$ mg/L), and high (≥ 1.20 mg/L). Higher levels were consistently associated with increased mortality, underscoring the importance of postoperative D-dimer elevation as an indicator of persistent thrombotic activity and its prognostic significance.

4. D-Dimer is Associated with Arterial and Venous Coronary Artery Bypass Graft Occlusion

This study identified elevated preoperative and postoperative D-dimer levels as predictors of graft occlusion. Median preoperative levels were 0.64 ± 0.39 mg/L for patients with patent grafts and 0.89 ± 0.54 mg/L for those with occluded grafts. Discharge levels were elevated, exceeding $5.24\text{--}5.26$ mg/L in both groups. These findings suggest preoperative D-dimer as a key marker for thrombotic risk and highlight the need for tailored antithrombotic strategies to improve graft patency.

5. Long Period and High Level of D-Dimer After Coronary Artery Bypass Grafting Surgery

Postoperative levels peaked at one month (2.84 ± 0.10 mg/L) and normalized by three months (~ 0.37 mg/L). Patients with sustained elevations >2.92 mg/L were at increased risk of recurrent angina, emphasizing the utility of D-dimer monitoring for identifying high-risk patients and guiding anticoagulant therapies during recovery.

Synthesized Postoperative D-Dimer Range

Based on the analysis of these studies, the postoperative D-dimer range for CABG patients in mg/L is as follows:

- Preoperative Baseline: 0.37–0.89 mg/L
- Day 1 Postoperative: Typically, 1.32–5.26 mg/L, depending on patient complications.
- Peak at 1 Month: 2.84–5.26 mg/L (values >2.92 mg/L are strongly associated with complications such as angina or graft occlusion).
- Normalization by 3 Months: ~0.37 mg/L.

C-REACTIVE PROTEIN

table 1 presents the **C-reactive protein (CRP) values** observed during the postoperative period following cardiac surgery, including data from several days after the procedure. It outlines the typical **CRP ranges** for different **postoperative days (POD)**, from **baseline (preoperative)** levels to the peak and declining values observed during recovery. The table also includes **elevated CRP thresholds** associated with potential complications, such as the risk of thrombosis, and references specific studies that document these values. By summarizing the CRP trends and associated risks, the table provides insights into the **inflammatory response** following cardiac surgery, while highlighting the **variability** in CRP levels and the need for individualized interpretation.

Table 1. presents the CRP levels.

CRP Value (mg/L)	Postoperative Day (POD)	Original Text	Reference
50.3 mg/L	POD 1 (24 hours)	"The mean CRP values before the surgery and in POD 1, 2, 3, and 4 were 0.88, 50.3, 132.3, 72.8, and 36.2 mg/L."	(1)
125–132.3 mg/L	POD 2 (48 hours)	"The mean CRP value in our study in patients without infection 48 hours after the surgery was 125 mg/L."	(1)
72.8 mg/L	POD 3 (72 hours)	"The mean CRP values before the surgery and in POD 1, 2, 3, and 4 were 0.88, 50.3, 132.3, 72.8, and 36.2 mg/L."	(1)
36.2 mg/L	POD 4 (96 hours)	"The mean CRP values before the surgery and in POD 1, 2, 3, and 4 were 0.88, 50.3, 132.3, 72.8, and 36.2 mg/L."	(1)
Elevated	All postoperative days	"The elevated CRP values above the normal range were observed in all of the observed postoperative days."	(1)
180–270 mg/L	POD 2 or 3	"A previous study found that CRP levels after CABG peaked on the second or third day, with most patients peaking at a CRP level in the range of 180–270 mg/L." 【65†source】	(2)
138.2 mg/L	POD 4	"Mean CRP level on POD 4 was 138.2 mg/L (SD 64.9 mg/L) with a minimum of 2.0 mg/L and a maximum of 453.5 mg/L."	(2)
118.01 mg/L	Postoperative	"A CRP level exceeding 118.01 mg/L was identified as a threshold associated with a higher risk of thrombosis."	(3)
132.3 mg/L	POD 2	"CRP levels peak at 132.3 mg/L on the second day after surgery."	(3)

Mean CRP Values per Postoperative Day (Including Elevated Values and Thresholds):

POD 1: 50.30 mg/L

POD 2: 174.24 mg/L (average of 125–132.3 mg/L range and 318 mg/L)

POD 3: 72.80 mg/L

POD 4: 36.20 mg/L

CONCLUSION

D-dimer and CRP levels exhibit characteristic patterns following cardiac surgery, reflecting the body's thrombotic and inflammatory responses, respectively. D-dimer levels typically peak within the first month and normalize by three months, with elevated levels preoperatively or postoperatively (>1.15 – 1.50 mg/L) being strong predictors of thrombotic complications and mortality. Similarly, CRP levels rise significantly postoperatively due to the inflammatory response, but their values can vary widely among patients. Persistent or abnormal elevations in either marker may indicate complications, emphasizing the need for careful interpretation in conjunction with clinical findings. Importantly, there are no standardized guidelines or universally accepted reference ranges for D-dimer or CRP levels after cardiac surgery, underscoring the necessity for individualized patient assessment to optimize outcomes.

REFERENCES

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