

# Myocardial injury after noncardiac surgery

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## 1 Myocardial injury after noncardiac surgery (MINS) is frequent and often asymptomatic

Defined as troponin elevation exceeding the 99th percentile of reference values within 30 days of noncardiac surgery due to ischemia, the estimated incidence is 12%–24% and is higher after nonelective procedures.<sup>1</sup> More than 80% of patients present without either symptoms related to ischemia or electrocardiographic changes, and the condition is missed without measurement of troponin.<sup>1</sup>

## 2 Postoperative morbidity and mortality are increased regardless of symptoms

Myocardial injury after noncardiac surgery is associated with increased 30-day and 1-year mortality, compared with those without MINS.<sup>2</sup> Within 16 months, 1 in 6 patients with MINS will experience a major vascular complication, including vascular death, myocardial infarction, stroke, peripheral arterial thrombosis, or symptomatic venous thromboembolism.<sup>3</sup>

## 3 High-risk patients undergoing noncardiac surgery should have routine troponin measurement

The Canadian Cardiovascular Society guideline recommends immediate postoperative electrocardiography in the recovery room, daily troponin measurement for 48 to 72 hours, and multidisciplinary management for high-risk patients.<sup>4</sup> For patients undergoing emergency or urgent or semiurgent surgery, those aged 65 years or older, or aged 18–64 years with cardiovascular disease, are deemed high risk. For patients undergoing elective surgery, those aged 65 years or older, or 45–64 years with cardiovascular disease, or with a Revised Cardiac Risk Index score of 1 or more, are deemed high risk.<sup>4</sup> In the elective setting, physicians should use preoperative

brain natriuretic peptide (BNP) level measurement, when available, to refine risk assessment; postoperative troponin is recommended when the N-terminal prohormone of BNP (NT-proBNP) is 300 ng/L or higher, or BNP 92 ng/L or higher.

## 4 Early identification allows for prompt management

Patients with high-risk features such as chest pain or electrocardiography changes may require inpatient cardiology assessment and urgent cardiac catheterization.<sup>5</sup>

## 5 All patients with MINS, regardless of symptoms, should receive secondary prevention

This includes acetylsalicylic acid, statin, and lifestyle modification. In a large randomized controlled trial, long-term treatment with dabigatran decreased major arterial and venous thrombotic complications without increasing bleeding and may be considered on a case-by-case basis.<sup>3</sup>

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