



Guidelines for Perioperative Management of Patients Undergoing Non-Cardiac Surgery who are Receiving Anti-Platelet (Aspirin and Thienopyridine) Therapy Who Need or Have Had a Percutaneous Coronary Intervention

Wei C. Lau, MD*, Patrick E. Benedict, MD*, James B. Froehlich, MD, MPH**, Hitinder S. Gurm, MD**, Kim A. Eagle, MD**, Kevin K. Tremper, MD, PhD*. Consultant: Peter K. Henke, MD***

*Department of Anesthesiology **Division of Cardiovascular Medicine ***Department of Surgery

Clinical Problem

Antiplatelet therapy – weighing cardiac and surgical risks. Physicians must determine how to minimize both cardiac and surgical risks when considering non-cardiac surgery for patients on antiplatelet therapy. Perioperative use of dual antiplatelet therapy (aspirin and thienopyridine) to reduce cardiac risk will also result in an increase in perioperative bleeding and transfusion requirements. Even aspirin monotherapy may increase the risk of perioperative bleeding. Holding antiplatelet medications prior to elective surgery will minimize risk of perioperative bleeding and transfusion. However, discontinuing these medications increases the risk of acute coronary syndrome, an important consideration for patients at high risk for acute coronary syndrome (e.g., high-risk coronary anatomy).

Additional considerations with percutaneous coronary interventions. Implanting a stent increases the risk of acute coronary syndrome resulting from coronary stent thrombosis, especially in high-risk patients with a recent coronary stent implantation due to acute myocardial infarction. This risk should be considered for patients who need or have had percutaneous coronary interventions (PCI) requiring antiplatelet therapy. The duration of dual antiplatelet therapy post-PCI depends on whether the PCI was balloon angioplasty, a bare-metal stent, or a drug-eluting stent (see Table). Scheduling elective non-cardiac surgery requires consideration of the timing of coronary angioplasty and type of coronary stent implantation to avoid unnecessary disruption of the optimal period of dual antiplatelet therapy post-PCI.

Recommendations for Antiplatelet Therapy with Non-Cardiac Surgery

Individual risk assessment for antiplatelet therapy. Surgical teams should strongly consider referring patients receiving aspirin or dual antiplatelet therapy to the Preoperative Anesthesia Clinic or Cardiovascular Medicine Clinic for a thorough risk assessment and formulation of a specific perioperative plan.

When bleeding risk outweighs cardiac risk. Antiplatelet therapy is generally discontinued for intracranial surgery, prostatectomy, or individual surgical procedures where the surgical and cardiology services consider the risk of surgical bleeding to be greater than the risk of stent thrombosis or acute coronary syndrome from discontinuing both aspirin and thienopyridine.

When cardiac risk outweighs bleeding risk. Decisions are guided by the urgency of surgery, whether coronary angioplasty or PCI needs to be or has been performed, and, if PCI has been performed, the type of coronary stent implanted. Antiplatelet therapy should not be discontinued prior to surgeries with a low bleeding risk.

Patients receiving antiplatelet therapy requiring urgent or emergent non-cardiac surgery. Proceed with surgery and postoperatively continue the antiplatelet therapy (aspirin or dual therapy) as soon as possible.

Patients needing PCI now who also require immediate (1-6 weeks) elective non-cardiac surgery. Balloon angioplasty is a reasonable option since elective surgery can be performed 14 days after angioplasty with continuation of aspirin perioperatively (see Table). Drug-eluting stents are not recommended for PCI in this situation due to the length (365 days) of dual therapy recommended. After PCI is performed, use the Table to guide decisions regarding the timing of surgery and associated antiplatelet therapy.

Patients with previous PCI who now require elective/nonurgent non-cardiac surgery. Elective non-cardiac surgery should be scheduled after the optimal period of dual antiplatelet therapy post-PCI when possible. The Table summarizes recommendations by type of PCI.

Table. Elective Non-Cardiac Surgery and Anti-platelet Therapy in Patients with Previous PCI

Method of PCI	Antiplatelet Therapy Post-PCI *	Days Post-PCI	Elective Non-Cardiac Surgery
Balloon angioplasty	At least 14 days of daily aspirin monotherapy	≤ 14 > 14	Delay until > 14 days post balloon angioplasty. <u>Preoperatively:</u> Proceed to surgery with aspirin. If aspirin therapy was discontinued, give a single aspirin 325 mg dose immediately preop. <u>Postoperatively:</u> Continue aspirin.
Bare-metal stent	45 days of dual antiplatelet therapy: daily aspirin and thienopyridine. Continue daily aspirin long term including perioperatively.	≤ 45	Delay until > 45 days (preferred; minimum 30 days) post bare-metal stent placement. <u>Preoperatively:</u> If on dual therapy, risk assessment with cardiology for discontinuation of clopidogrel or ticlopidine for 5 days, or prasugrel for 7 days preoperatively. Proceed to surgery with aspirin or, if indicated, with dual antiplatelet therapy. If dual therapy was discontinued give a single aspirin 325 mg dose immediately preop. <u>Postoperatively:</u> Continue aspirin and resume dual therapy as soon as feasible, preferably by the 2 nd -3 rd day.
		> 45	<u>Preoperatively:</u> If on dual therapy, risk assessment with cardiology for discontinuation of clopidogrel or ticlopidine for 5 days, or prasugrel for 7 days preoperatively. Proceed to surgery with aspirin or, if indicated, with dual antiplatelet therapy. If dual therapy or aspirin was discontinued, give a single aspirin 325 mg dose immediately preop. <u>Postoperatively:</u> Continue aspirin and, if on longer term dual therapy, resume it as soon as feasible, preferably by the 2 nd -3 rd day.
Drug-eluting stent	365 days of dual antiplatelet therapy: daily aspirin and thienopyridine. Continue daily aspirin long term, including perioperatively.	≤ 365	Delay until > 365 days post drug-eluting stent placement. <u>Preoperatively:</u> If on dual therapy, risk assessment with cardiology for discontinuation of clopidogrel or ticlopidine for 5 days, or prasugrel for 7 days preoperatively. Proceed to surgery with aspirin or, if indicated, with dual antiplatelet therapy. If dual therapy or aspirin was discontinued give a single aspirin 325 mg dose immediately preop. <u>Postoperatively:</u> Continue aspirin and resume dual therapy as soon as feasible, preferably by the 2 nd -3 rd day.
		> 365	<u>Preoperatively:</u> If on dual therapy, risk assessment with cardiology for discontinuation of clopidogrel or ticlopidine for 5 days, or prasugrel for 7 days preoperatively. Proceed to surgery with aspirin or, if indicated, with dual antiplatelet therapy. If dual therapy or aspirin was discontinued give a single aspirin 325 mg dose immediately preop. <u>Postoperatively:</u> Continue aspirin and, if on longer term dual antiplatelet therapy, resume it as soon as feasible, preferably by the 2 nd -3 rd day.

* Note: Anticoagulants like subcutaneous fractionated or unfractionated heparin do not substitute the antiplatelet protection of thienopyridine and/or aspirin therapy in patients with bare-metal or drug-eluting stents undergoing non-cardiac surgery. Thienopyridines include ticlopidine, clopidogrel, or prasugrel.

Basis for Recommendations

The Division of Cardiovascular Medicine and the Section of Cardiovascular Anesthesiology, in consultation with the section of Vascular Surgery, developed the preceding clinical recommendations for the use of antiplatelet therapy to minimize combined cardiac and surgical risks in patients who are to undergo non-cardiac surgery. These recommendations are based on UMHS expert opinion that is consistent with expert opinion and evidence presented in guidelines from the American College of Cardiology/American Heart Association (ACC/AHA), Society for Cardiovascular Angiography and Intervention, American College of Surgeons, and American Dental Association Science Advisory Committees.¹

Disclosures

The authors and consultant do not have personal financial relationships with companies whose products are addressed in this clinical guide.

Reference

Fleisher LA, Beckman JA, Brown KA, et al. 2009ACCF/AHA focused update on perioperative beta blockade incorporated into the ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. *J Am Coll Cardiol.* 2009;54(22):e13-e118.

Reviewed by P&T Committee: May 2010