ACC/AHA Guideline Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery

Developed in Collaboration With the American College of Surgeons, American Society of Anesthesiologists, American Society of Echocardiography, American Society of Nuclear Cardiology, Society for Cardiovascular Angiography and Interventions, and Society of Cardiovascular Anesthesiologists

Helping Cardiovascular Professionals Learn. Advance. Heal.

American Heart Association®

Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery

Perioperative Therapy

Coronary Revascularization Prior to Noncardiac Surgery

Recommendations	COR	LOE
Revascularization before noncardiac surgery is recommended in circumstances in which revascularization is indicated according to existing CPGs.	I	C
It is not recommended that routine coronary revascularization be performed before noncardiac surgery exclusively to reduce perioperative cardiac events.	III: No Benefit	B

Timing of Elective Noncardiac Surgery in Patients With Previous PCI

Recommendations	COR	LOE
Elective noncardiac surgery should be delayed 14 days after balloon angioplasty…	I	C
…and 30 days after BMS implantation	I	B
Elective noncardiac surgery should optimally be delayed 365 days after DES implantation.	I	B
In patients in whom noncardiac surgery is required, a consensus decision among treating clinicians as to the relative risks of surgery and discontinuation or continuation of antiplatelet therapy can be useful.	IIa	C

Timing of Elective Noncardiac Surgery in Patients With Previous PCI (cont'd)

Recommendations	COR	LOE
Elective noncardiac surgery after DES implantation may be considered after 180 days if the risk of further delay is greater than the expected risks of ischemia and stent thrombosis.	IIb*	B
Elective noncardiac surgery should not be performed within 30 days after BMS implantation or within 12 months after DES implantation in patients in whom DAPT will need to be discontinued perioperatively.	III: Harm	B
Elective noncardiac surgery should not be performed within 14 days of balloon angioplasty in patients in whom aspirin will need to be discontinued perioperatively.	III: Harm	C

*Because of new evidence, this is a new recommendation since the publication of the 2011 PCI CPG

Perioperative Therapy

Perioperative Beta-Blocker Therapy

Recommendations	COR	LOE
Beta blockers should be continued in patients undergoing surgery who have been on beta blockers chronically.	I	B^{SR}
It is reasonable for the management of beta blockers after surgery to be guided by clinical circumstances, independent of when the agent was started.	IIa	B^{SR}
In patients with intermediate- or high-risk myocardial ischemia noted in preoperative risk stratification tests, it may be reasonable to begin perioperative beta blockers.	IIb	C^{SR}
In patients with 3 or more RCRI risk factors (e.g., diabetes mellitus, HF, CAD, renal insufficiency, cerebrovascular accident), it may be reasonable to begin beta blockers before surgery.	IIb	B^{SR}

These recommendations have been designated with a SR to emphasize the rigor of support from the ERC's systematic review. See the ERC systematic review report, "Perioperative beta blockade in noncardiac surgery: a systematic review for the 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery" for the complete evidence review on perioperative beta-blocker therapy.

Perioperative Beta-Blocker Therapy (cont'd)

Recommendations	COR	LOE
In patients with a compelling long-term indication for beta-blocker therapy but no other RCRI risk factors, initiating beta blockers in the perioperative setting as an approach to reduce perioperative risk is of uncertain benefit.	IIb	B^{SR}
In patients in whom beta-blocker therapy is initiated, it may be reasonable to begin perioperative beta blockers long enough in advance to assess safety and tolerability, preferably more than 1 day before surgery.	IIb	B^{SR}
Beta-blocker therapy should not be started on the day of surgery.	III: Harm	B^{SR}

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Perioperative Therapy

Perioperative Statin Therapy

Recommendations	COR	LOE
Statins should be continued in patients currently taking statins and scheduled for noncardiac surgery.	I	B
Perioperative initiation of statin use is reasonable in patients undergoing vascular surgery.	IIa	B
Perioperative initiation of statins may be considered in patients with clinical indications according to GDMT who are undergoing elevated-risk procedures.	IIb	C

Alpha-2 Agonists

Recommendation	COR	LOE
Alpha-2 agonists for prevention of cardiac events are not recommended in patients who are undergoing noncardiac surgery.	III: No Benefit	B

Angiotensin-Converting Enzyme Inhibitors

Recommendations	COR	LOE
Continuation of ACE inhibitors or angiotensin-receptor ARBs perioperatively is reasonable.	IIa	B
If ACE inhibitors or ARBs are held before surgery, it is reasonable to restart as soon as clinically feasible postoperatively.	IIa	C

Perioperative Therapy

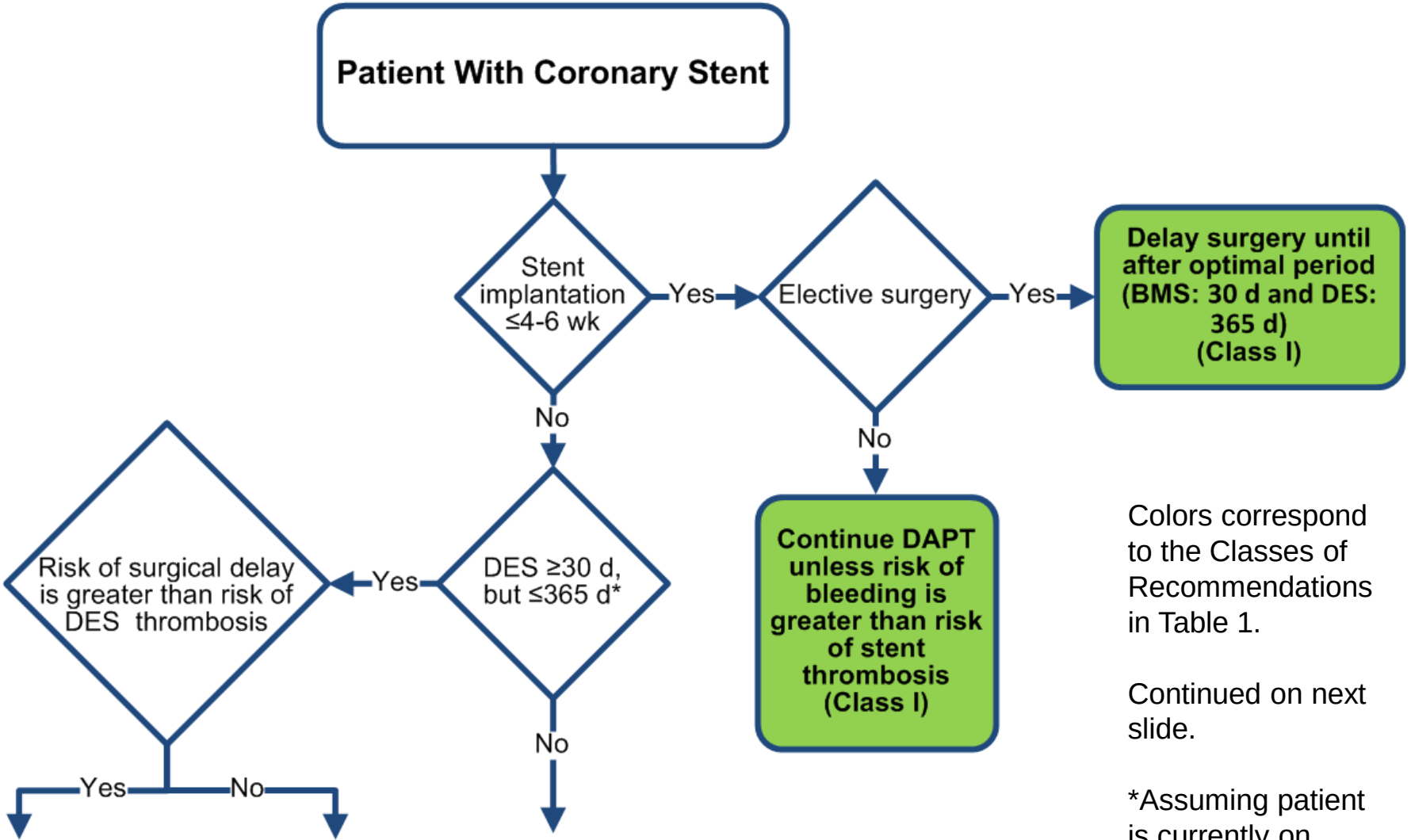
Antiplatelet Agents

Recommendations	COR	LOE
In patients undergoing urgent noncardiac surgery during the first 4 to 6 weeks after BMS or DES implantation, DAPT should be continued unless the relative risk of bleeding outweighs the benefit of the prevention of stent thrombosis.	I	C
In patients who have received coronary stents and must undergo surgical procedures that mandate the discontinuation of $P2Y_{12}$ platelet receptor–inhibitor therapy, it is recommended that aspirin be continued if possible and the $P2Y_{12}$ platelet receptor–inhibitor be restarted as soon as possible after surgery.	I	C
Management of the perioperative antiplatelet therapy should be determined by a consensus of the surgeon, anesthesiologist, cardiologist, and patient, who should weigh the relative risk of bleeding versus prevention of stent thrombosis.	I	C

Antiplatelet Agents (cont'd)

Recommendations	COR	LOE
In patients undergoing nonemergency/nonurgent noncardiac surgery who have not had previous coronary stenting, it may be reasonable to continue aspirin when the risk of potential increased cardiac events outweighs the risk of increased bleeding.	IIb	B
Initiation or continuation of aspirin is not beneficial in patients undergoing elective noncardiac noncarotid surgery who have not had previous coronary stenting,…	III: No Benefit	B
…unless the risk of ischemic events outweighs the risk of surgical bleeding.		C

Proposed Algorithm for Antiplatelet Management in Patients with PCI and Noncardiac Surgery



Colors correspond to the Classes of Recommendations in Table 1.

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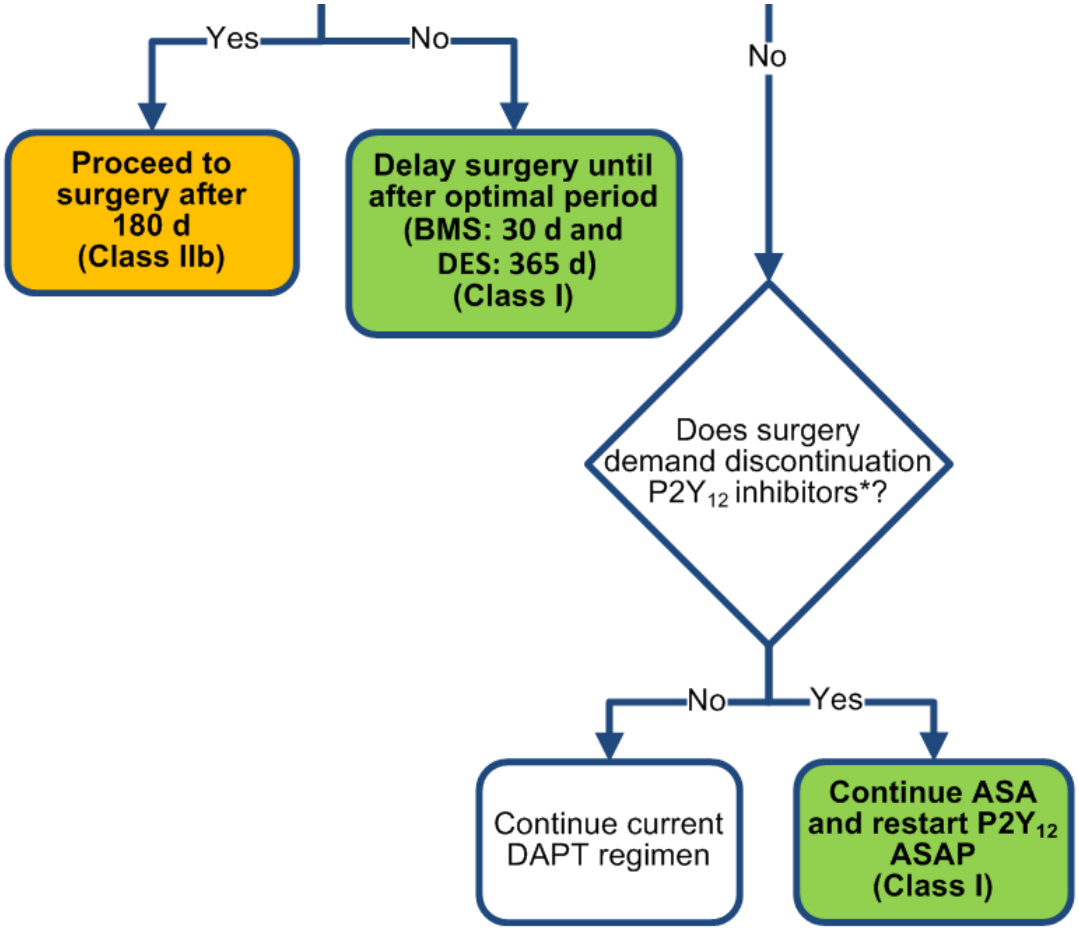
*Assuming patient is currently on DAPT.

Proposed Algorithm for Antiplatelet Management in Patients with PCI and Noncardiac Surgery (cont'd)



Colors correspond to the Classes of Recommendations in Table 1.

*Assuming patient is currently on DAPT.

Perioperative Management of Patients With CIEDs

Recommendation	COR	LOE
Patients with ICDs who have preoperative reprogramming to inactivate tachytherapy should be on cardiac monitoring continuously during the entire period of inactivation, and external defibrillation equipment should be readily available. Systems should be in place to ensure that ICDs are reprogrammed to active therapy before discontinuation of cardiac monitoring and discharge from the facility.	I	C

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