2017 ESC Focused Update on Dual Antiplatelet Therapy in Coronary Artery Disease developed in collaboration with the EACTS*

*: European Association for Cardio-Thoracic Surgery

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The Task Force for the Management of Dual Antiplatelet Therapy in Coronary Artery Disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS)

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Classes of recommendations

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Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended/ is indicated.
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	*Weight of evidence/opinion is in favour of usefulness/efficacy.*	Should be considered.
Class IIb	*Usefulness/efficacy is less well established by evidence/opinion.*	May be considered.
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended.

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Level of evidence

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Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

What is new in the 2017 ESC focussed update on DAPT?

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Change in recommendations

Before → 2017

- Pretreatment with $P2Y_{12}$ inhibitors when PCI is planned
- Liberal use of PPI to mitigate GI bleeding risk
- Elective surgery requiring discontinuation of the P2Y12 inhibitor after 1 month
- Ticagrelor interruption of 3 days prior elective surgery
- Dual therapy as an alternative to triple therapy when bleeding risk outweighs the ischaemic risk
- Discontinuation of antiplatelet treatment in patients treated with DAC should be considered at 12 months.
- Routine platelet function testing to adjust therapy

New recommendations 2017

- The occurrence of actionable bleeding while on DAPT should prompt reconsideration of type and duration of DAPT regimen.
- The decision for DAPT duration should be dynamic and reassessed during the course of the initially selected DAPT regimen.
- Discontinuation of $P2Y_{12}$ inhibitor therapy after 6 months when stenting ACS patients with PRECISE-DAPT ≥ 25
- 6-month DAPT regimen in patients with SCAD treated with drug-coated balloon
- Early administration of ticagrelor/ clopidogrel in NSTE-ACS with invasive approach
- Ticagrelor 60 mg b.i.d preferred over other oral P2Y12 inhibitors for DAPT continuation >12 months in post-MI

I IIA IIB III

New/revised concepts

Metallic stent and DAPT duration

Switch between $P2Y_{12}$ inhibitors

Risk scores to guide DAPT duration
- PRECISE DAPT score
- DAPT score

Specific profiling
- Definition of complex PCI
- Unfavourable profile for OAC and APT

Gender considerations and special populations

DAPT duration without stenting
- Medical management
- CABG or cardiac surgery

Anticoagulation and DAPT
- Acute and chronic setting
- Dosing regimen

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History of dual antiplatelet therapy (DAPT) in patients with coronary artery disease

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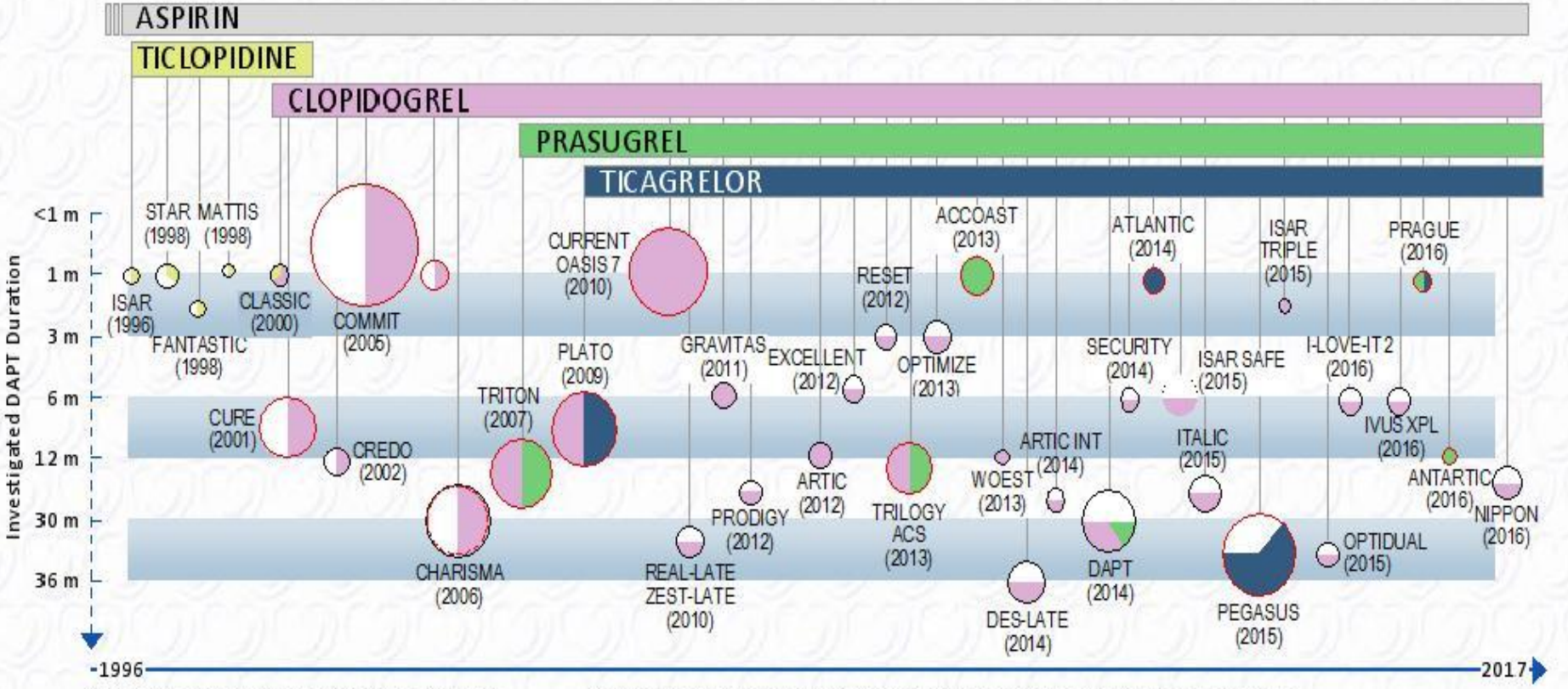

Size of the circles denotes sample size

2 5 10 20 K pts

Perimeter of the circles denotes type of investigated population

- Mixed clinical presentation at the time of stent implantation
- Acute coronary syndrome at presentation
- DAPT initiated in patients with prior myocardia infarction
- DAPT for primary prevention

www.escardio.org/guidelines 2017 ESC Focused Update on DAPT in Coronary Artery Disease, developed in collaboration with EACTS (European Heart Journal 2017 - doi:10.1093/eurheartj/ehx419)

Risk scores validated for dual antiplatelet therapy duration decision-making

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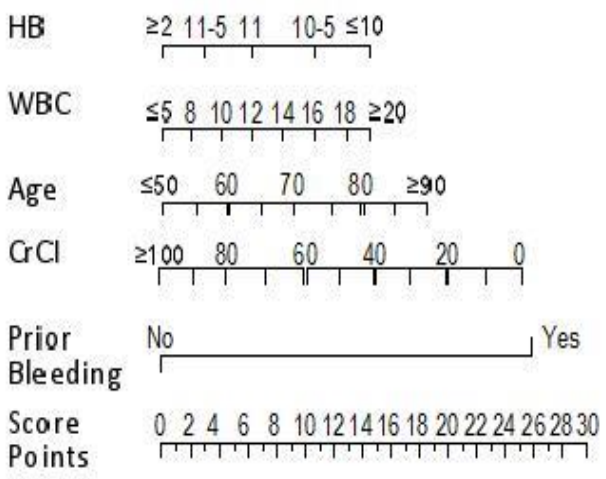
	PRECISE-DAPT score	DAPT score	
Time of use	At the time of coronary stenting	After 12 months of uneventful DAPT	
DAPT duration strategies assessed	Short DAPT (3–6 months) vs. Standard/long DAPT (12–24 months)	Standard DAPT (12 months) vs. Long DAPT (30 months)	
Score calculation		Age ≥75 65 to <75 <65 Cigarette smoking Diabetes mellitus MI at presentation Prior PCI or prior MI Paclitaxel-eluting stent Stent diameter <3 mm CHF or LVEF <30% Vein graft stent	 −2 pt −1 pt 0 pt +1 pt +1 pt +1 pt +1 pt +1 pt +1 pt +2 pt +2 pt
Score range	0 to 100 points	−2 to 10 points	
Decision making cut-off suggested	Score ≥25 → Short DAPT Score <25 → Standard/long DAPT	Score ≥2 → Long DAPT Score <2 → Standard DAPT	
Calculator	www.precisedaptscore.com	www.daptstudy.org	

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Use of risk scores as guidance for the duration of dual antiplatelet therapy

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Recommendations	Class	Level
The use of risk scores designed to evaluate the benefits and risks of different DAPT durations may be considered.	IIb	A

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$P2Y_{12}$ inhibitor selection and timing

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Recommendations	Class	Level
In patients with ACS, ticagrelor (180 mg loading dose, 90 mg twice daily) on top of aspirin is recommended, regardless of initial treatment strategy, including patients pre-treated with clopidogrel (which should be discontinued when ticagrelor is commenced) unless there are contra-indications.	I	B
In patients with ACS undergoing PCI, prasugrel (60 mg loading dose, 10 mg daily dose) on top of aspirin is recommended for $P2Y_{12}$ inhibitor-naïve patients with NSTE-ACS or initially conservatively managed STEMI if indication for PCI is established, or in STEMI patients undergoing immediate coronary catheterization unless there is a high-risk of life-threatening bleeding or other contra-indications.	I	B

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$P2Y_{12}$ inhibitor selection and timing *(continued)*

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Recommendations	Class	Level
Pre-treatment with a $P2Y_{12}$ inhibitor is generally recommended in patients in whom coronary anatomy is known and the decision to proceed to PCI is made as well as in patients with STEMI.	I	A
In patients with NSTE-ACS undergoing invasive management, ticagrelor administration (180 mg loading dose, 90 mg twice daily), or clopidogrel (600 mg loading dose, 75 mg daily dose) if ticagrelor is not an option, should be considered as soon as the diagnosis is established.	IIa	C
In patients with stable CAD pre-treatment with clopidogrel may be considered if the probability of PCI is high.	IIb	C

$P2Y_{12}$ inhibitor selection and timing *(continued)*

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Recommendations	Class	Level
Clopidogrel (600 mg loading dose, 75 mg daily dose) on top of aspirin is recommended in stable CAD patients undergoing coronary stent implantation and in ACS patients who cannot receive ticagrelor or prasugrel, including those with prior intracranial bleeding or indication for OAC.	I	A
Clopidogrel (300 mg loading dose in patients ≤75, 75 mg daily dose) is recommended on top of aspirin in STEMI patients receiving thrombolysis.	I	A

$P2Y_{12}$ inhibitor selection and timing *(continued)*

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Recommendations	Class	Level
Ticagrelor or prasugrel on top of aspirin may be considered instead of clopidogrel in stable CAD patients undergoing PCI, taking into account the ischaemic (e.g. high SYNTAX score, prior stent thrombosis, location and number of implanted stents) and bleeding (e.g. according to PRECISE-DAPT) risks.	IIb	C
In NSTE-ACS patients in whom coronary anatomy is not known, it is not recommended to administer prasugrel.	III	B

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Measures to minimize bleeding while on dual antiplatelet therapy

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Recommendations	Class	Level
Radial over femoral access is recommended for coronary angiography and PCI if performed by an expert radial operator.	I	A
In patients treated with DAPT, a daily aspirin dose of 75–100 mg is recommended.	I	A
A PPI in combination with DAPT is recommended.	I	B
Routine platelet function testing to adjust antiplatelet therapy before or after elective stenting is not recommended.	III	A

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Switching between oral $P2Y_{12}$ inhibitors

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Recommendations	Class	Level
In patients with ACS who were previously exposed to clopidogrel, switching from clopidogrel to ticagrelor is recommended early after hospital admission at a loading dose of 180 mg irrespective of timing and loading dose of clopidogrel, unless contra-indications to ticagrelor exist.	I	B
Additional switching between oral $P2Y_{12}$ inhibitors may be considered in cases of side effects/drug intolerance according to the proposed algorithms.	IIb	C

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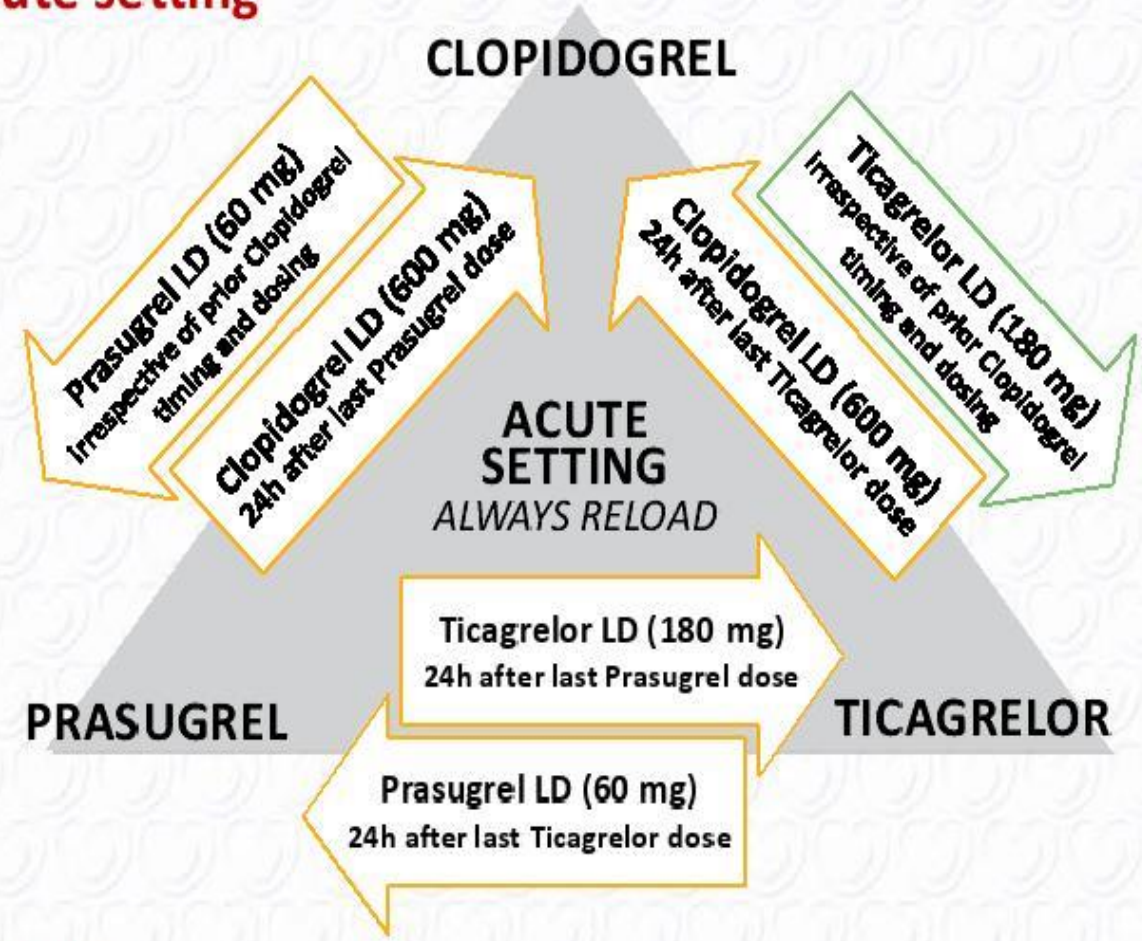
Algorithm for switching between oral $P2Y_{12}$ inhibitors in the acute setting



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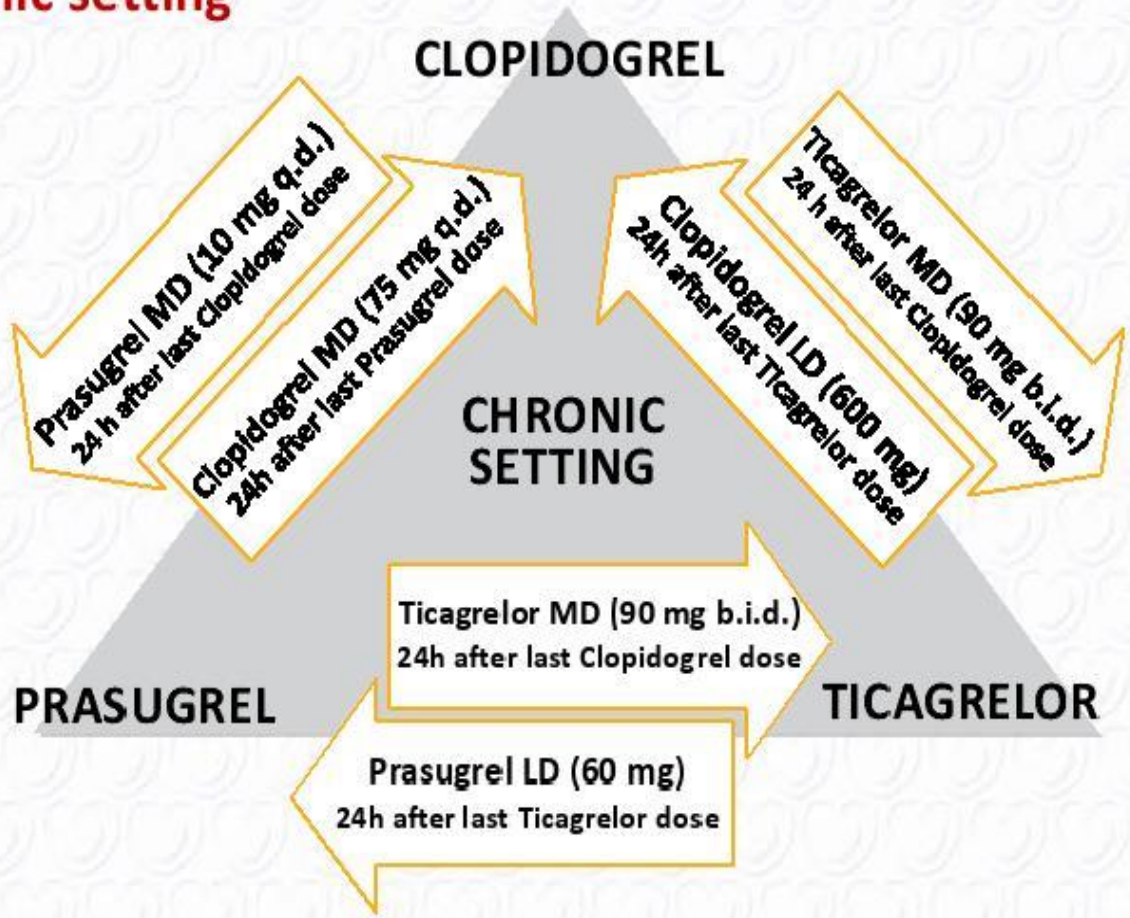
Algorithm for switching between oral $P2Y_{12}$ inhibitors in the chronic setting



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Dual antiplatelet therapy duration and related stent choices in patients with stable coronary artery disease treated with percutaneous coronary intervention

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Recommendations	Class	Level
In patients with stable CAD treated with coronary stent implantation, DAPT consisting of clopidogrel in addition to aspirin is generally recommended for 6 months, irrespective of the stent type.	I	A
Irrespective of the intended DAPT duration, DES is the preferred treatment option.	I	A
In patients with stable CAD considered at high bleeding risk (e.g. PRECISE-DAPT ≥25), DAPT for 3 months should be considered*.	IIa	B
In patients with stable CAD treated with drug-coated balloon, DAPT for 6 months should be considered.	IIa	B

*:The evidence supporting this recommendation comes from two studies where zotarolimus-eluting Endeavour sprint stent has been investigated in conjunction with a 3-month DAPT regimen.

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Dual antiplatelet therapy duration and related stent choices in patients with stable coronary artery disease treated with percutaneous coronary intervention *(continued)*

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Recommendations	Class	Level
In patients with stable CAD treated with bioresorbable vascular scaffolds, DAPT for at least 12 months should be considered.	IIa	C
In patients with stable CAD who have tolerated DAPT without a bleeding complication and who are at low bleeding but high thrombotic risk, continuation of DAPT with clopidogrel for >6 months and ≤30 months may be considered.	IIb	A
In patients with stable CAD in whom 3-month DAPT poses safety concerns, DAPT for 1 month may be considered*.	IIb	C

*;1-month DAPT after implantation of zotarolimus-eluting Endeavour sprint stent or drug coated stent reduced risks of reintervention, myocardial infarction and inconsistently of stent thrombosis compared to bare-metal stent under similar DAPT duration. It is unclear if this evidence applies to other contemporary DES.

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Dual antiplatelet therapy duration in patients with acute coronary syndrome treated with percutaneous coronary intervention

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Recommendations	Class	Level
In patients with ACS treated with coronary stent implantation, DAPT with a $P2Y_{12}$ inhibitor on top of aspirin is recommended for 12 months unless there are contra-indications such as excessive risk of bleeding (e.g. PRECISE-DAPT ≥25).	I	A
In patients with ACS and stent implantation who are at high-risk of bleeding (e.g. PRECISE-DAPT ≥25), discontinuation of $P2Y_{12}$ inhibitor therapy after 6 months should be considered.	IIa	B
In patients with ACS treated with bioresorbable vascular scaffolds, DAPT for at least 12 months should be considered.	IIa	C

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Dual antiplatelet therapy duration in patients with acute coronary syndrome treated with percutaneous coronary intervention *(continued)*

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Recommendations	Class	Level
In patients with ACS who have tolerated DAPT without a bleeding complication, continuation of DAPT for longer than 12 months may be considered.	IIb	A
In patients with MI and high ischaemic risk who have tolerated DAPT without a bleeding complication, ticagrelor 60 mg *b.i.d.* for longer than 12 months on top of aspirin may be preferred over clopidogrel or prasugrel.	IIb	B

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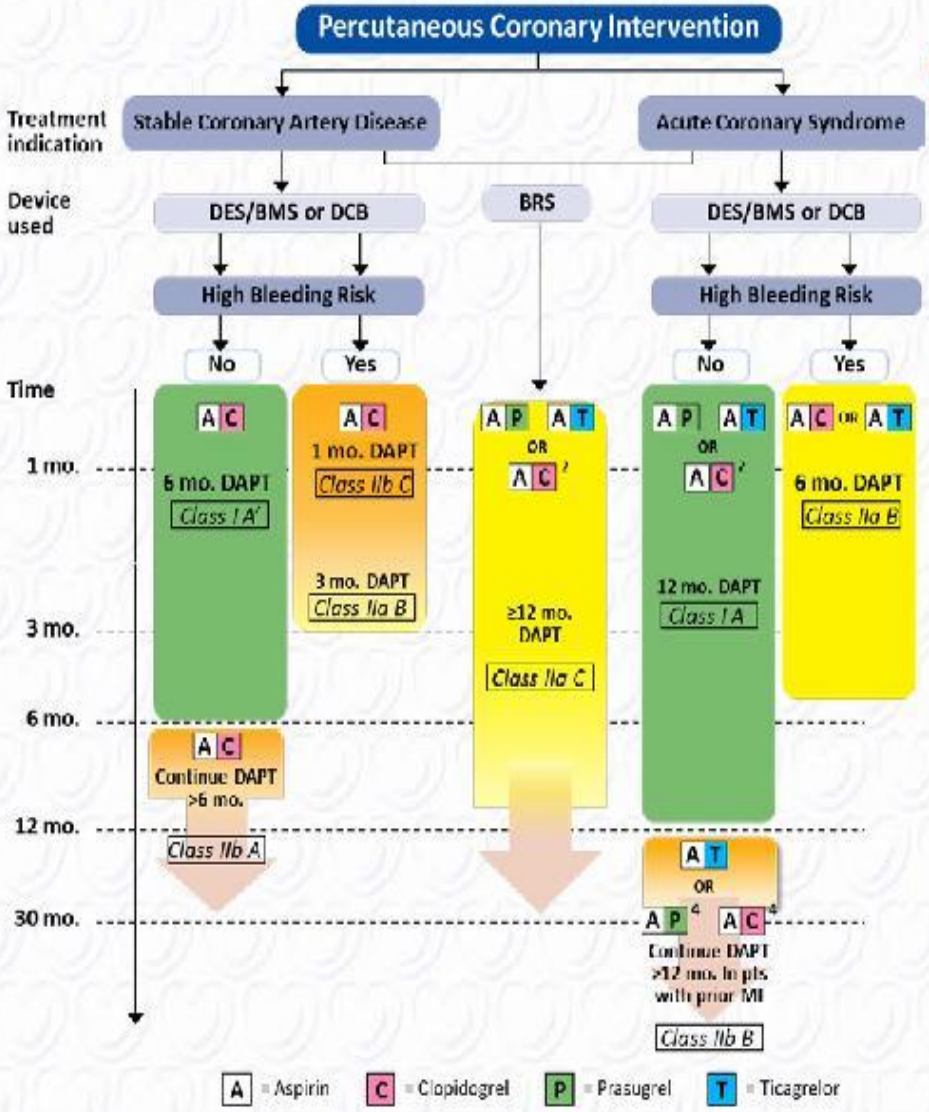
Algorithm for dual antiplatelet therapy (DAPT) in patients treated with percutaneous coronary intervention



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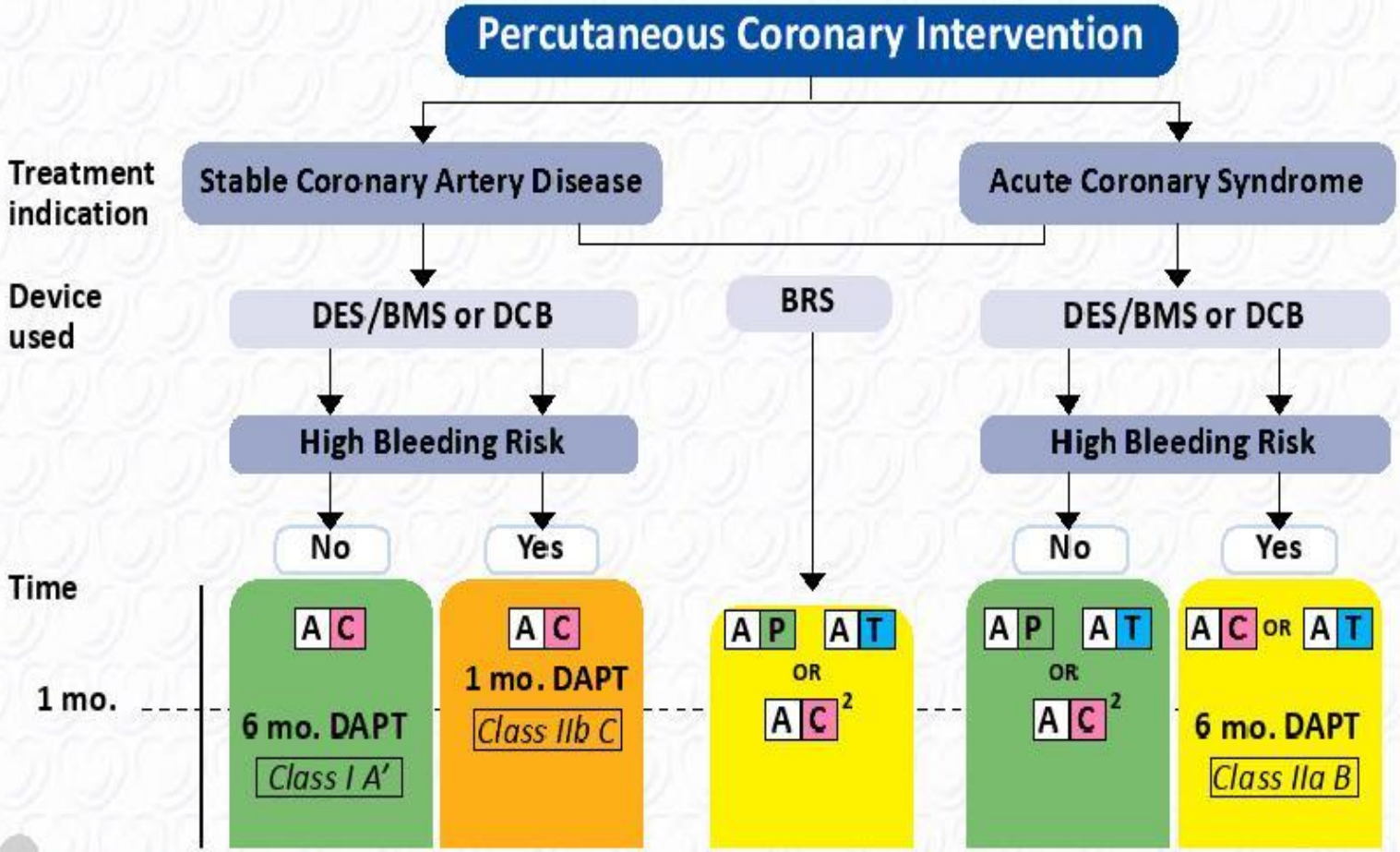

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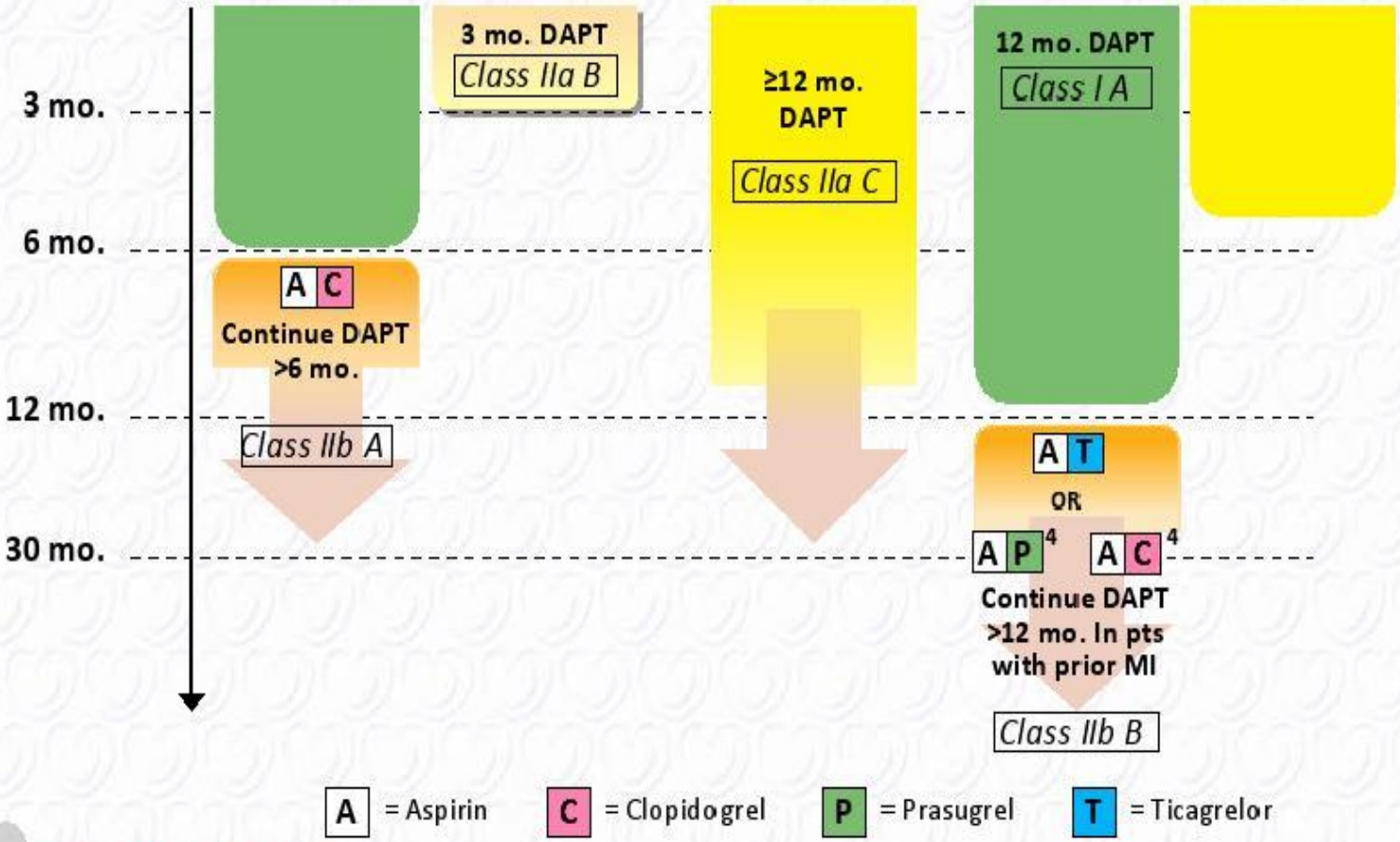

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Dual antiplatelet therapy in patients treated with cardiac surgery with stable or unstable coronary artery disease

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Recommendations	Class	Level
It is recommended that the Heart Team estimates the individual bleeding and ischaemic risks and guide the timing of CABG as well as the antithrombotic management.	I	C
In patients on aspirin who need to undergo non-emergent cardiac surgery, it is recommended to continue aspirin at a low daily regimen throughout the peri-operative period.	I	C
In patients treated with DAPT after coronary stent implantation who subsequently undergo cardiac surgery, it is recommended to resume $P2Y_{12}$ inhibitor therapy postoperatively as soon as deemed safe so that DAPT continues until the recommended duration of therapy is completed.	I	C

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Dual antiplatelet therapy in patients treated with cardiac surgery with stable or unstable coronary artery disease *(continued)*

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Recommendations	Class	Level
In patients with ACS (NSTE-ACS or STEMI) treated with DAPT and undergoing CABG and not requiring long-term OAC therapy, resumption of $P2Y_{12}$ inhibitor therapy as soon as deemed safe after surgery and continuation up to 12 months is recommended.	I	C
In patients on $P2Y_{12}$ inhibitors who need to undergo non-emergent cardiac surgery, postponing surgery for at least 3 days after discontinuation of ticagrelor, at least 5 days after clopidogrel, and at least 7 days after prasugrel should be considered.	IIa	B
In CABG patients with prior MI who are at high-risk of severe bleeding (e.g. PRECISE-DAPT ≥25), discontinuation of $P2Y_{12}$ inhibitor therapy after 6 months should be considered.	IIa	C

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Dual antiplatelet therapy in patients treated with cardiac surgery with stable or unstable coronary artery disease *(continued)*

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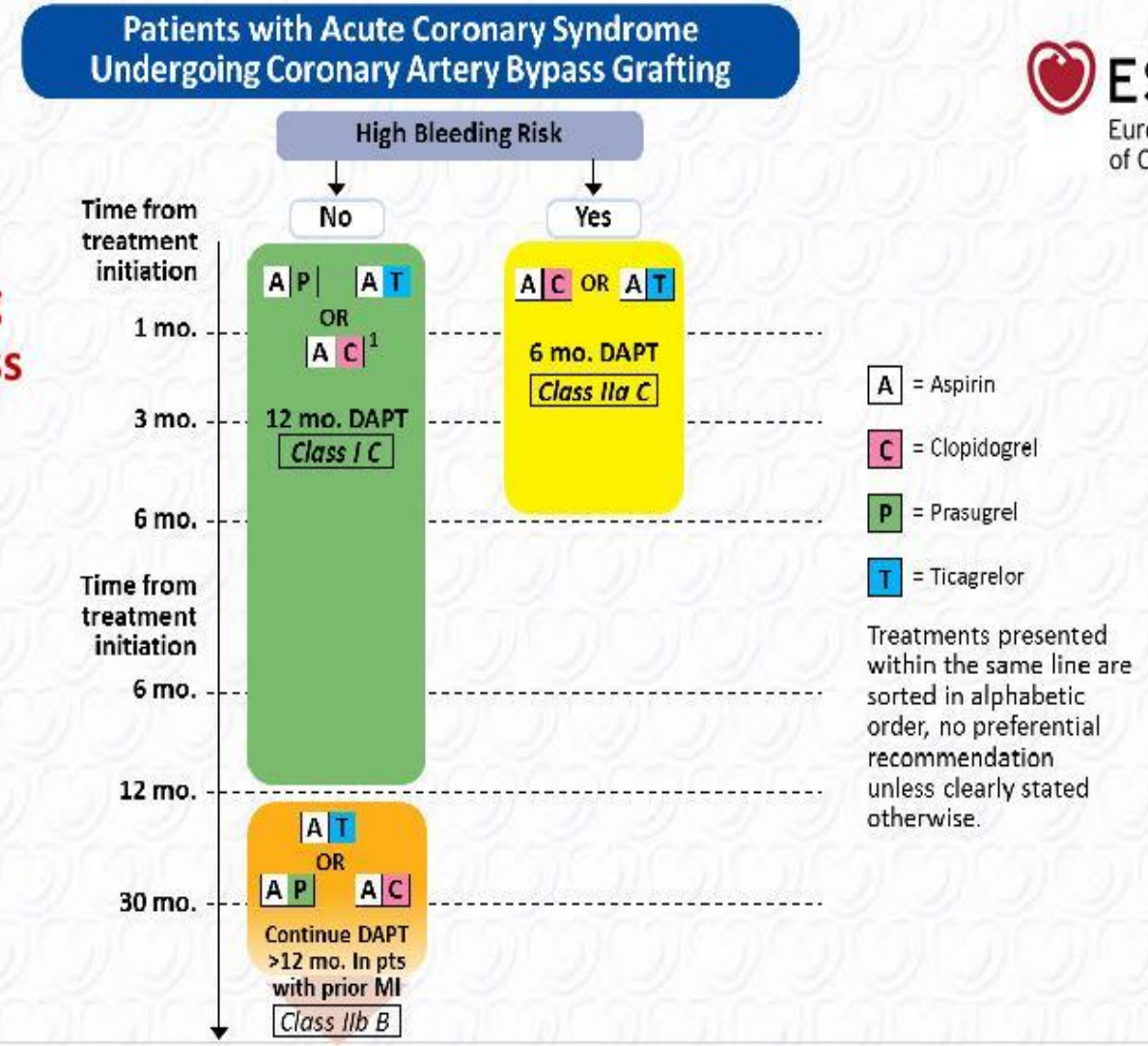
Recommendations	Class	Level
Platelet function testing may be considered to guide decisions on timing of cardiac surgery in patients who have recently received $P2Y_{12}$ inhibitors.	IIb	B
In patients perceived at high ischaemic risk with prior MI and CABG who have tolerated DAPT without a bleeding complication, treatment with DAPT for longer than 12 and up to 36 months may be considered.	IIb	C

Algorithm for dual antiplatelet therapy (DAPT) in patients with acute coronary syndrome undergoing coronary artery bypass grafting



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Algorithm for dual antiplatelet therapy (DAPT) in patients with acute coronary syndrome undergoing coronary artery bypass grafting

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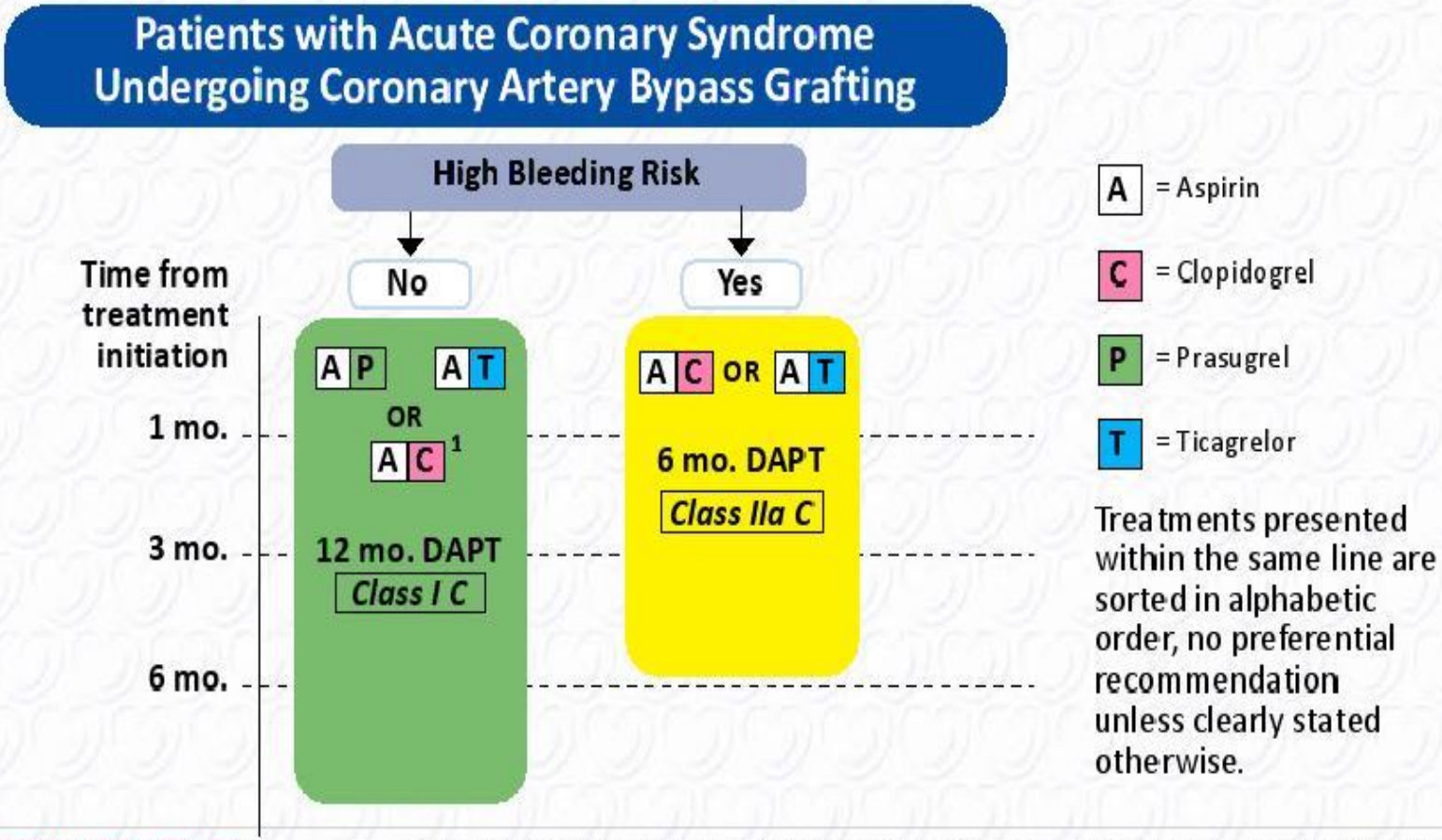

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Algorithm for dual antiplatelet therapy (DAPT) in patients with acute coronary syndrome undergoing coronary artery bypass grafting *(continued)*

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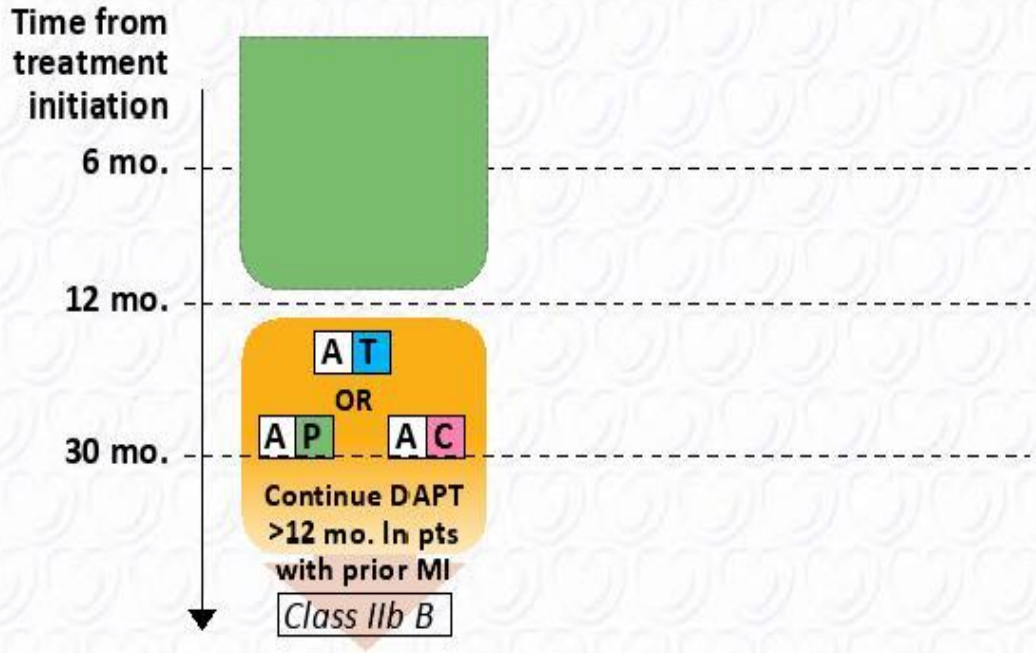
Patients with Acute Coronary Syndrome Undergoing Coronary Artery Bypass Grafting (continued)



A = Aspirin

C = Clopidogrel

P = Prasugrel

T = Ticagrelor

Treatments presented within the same line are sorted in alphabetic order, no preferential recommendation unless clearly stated otherwise.

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Dual antiplatelet therapy duration in patients with acute coronary syndrome undergoing medical therapy management

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Recommendations	Class	Level
In patients with ACS who are managed with medical therapy alone and treated with DAPT, it is recommended to continue $P2Y_{12}$ inhibitor therapy (either ticagrelor or clopidogrel) for 12 months.	I	A
Ticagrelor is recommended over clopidogrel, unless the bleeding risk outweighs the potential ischaemic benefit.	I	B
In patients with medically managed ACS who are at high-risk of bleeding (e.g. PRECISE-DAPT ≥25), DAPT for at least 1 month should be considered.	IIa	C

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Dual antiplatelet therapy duration in patients with acute coronary syndrome undergoing medical therapy management *(continued)*

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Recommendations	Class	Level
In patients with prior MI at high ischaemic risk who are managed with medical therapy alone and have tolerated DAPT without a bleeding complication, treatment with DAPT in the form of ticagrelor 60 mg *b.i.d.* on top of aspirin for longer than 12 months and up to 36 months may be considered.	IIb	B
In patients with prior MI not treated with coronary stent implantation who have tolerated DAPT without a bleeding complication and who are not eligible for treatment with ticagrelor, continuation of clopidogrel on top of aspirin for longer than 12 months may be considered.	IIb	C
Prasugrel is not recommended in medically managed ACS patients.	III	B

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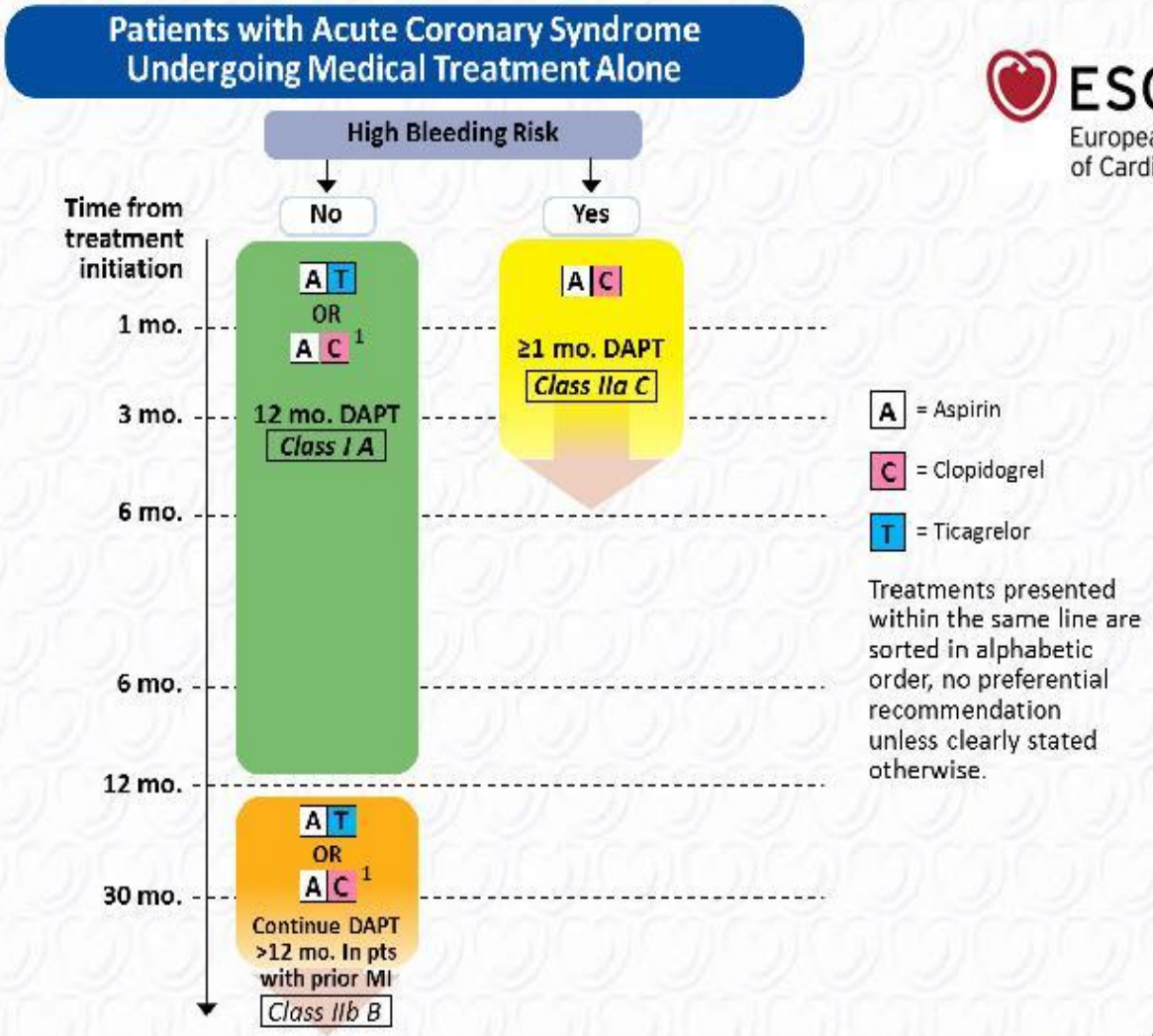

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Algorithm for dual antiplatelet therapy (DAPT) in patients with acute coronary syndrome undergoing medical management

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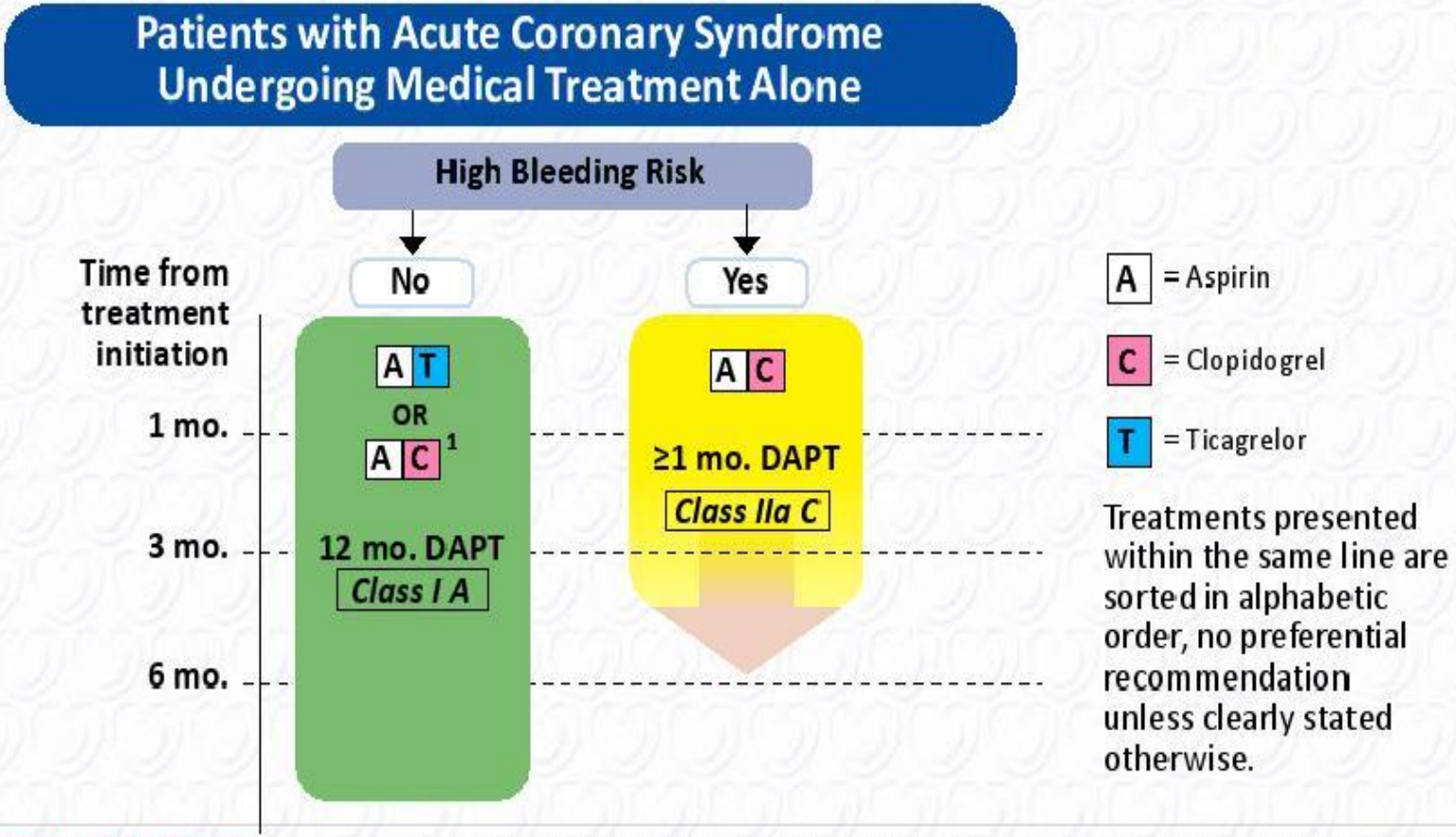

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Algorithm for dual antiplatelet therapy (DAPT) in patients with acute coronary syndrome undergoing medical management *(continued)*

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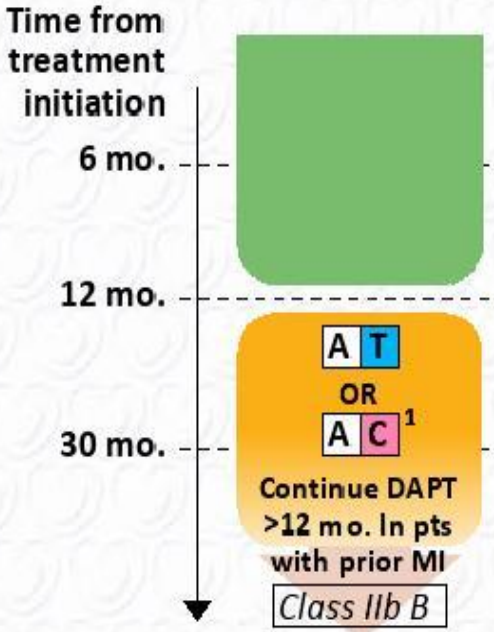
Patients with Acute Coronary Syndrome
Undergoing Medical Treatment Alone (continued)



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Strategies to avoid bleeding complications in patients treated with oral anticoagulant

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- Assess ischaemic and bleeding risks using validated risk predictors (e.g. CHA_2DS_2-VASc, ABC, HAS-BLED) with a focus on modifiable risk factors.
- Keep triple therapy duration as short as possible; dual therapy after PCI (oral anticoagulant and clopidogrel) to be considered instead of triple therapy.
- Consider the use of NOACs instead of VKA when NOACs are not contra-indicated.
- Consider a target INR in the lower part of the recommended target range and maximize time in therapeutic range (i.e. >65–70%) when VKA is used.
- Consider the lower NOAC regimen tested in approval studies and apply other NOAC regimens based on drug-specific criteria for drug accumulation.
- Clopidogrel is the $P2Y_{12}$ inhibitor of choice.
- Use low-dose (≤100 mg daily) aspirin.
- Routine use of PPIs.

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High-risk features of stent-driven recurrent ischaemic events

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- Prior stent thrombosis on adequate antiplatelet therapy.
- Stenting of the last remaining patent coronary artery.
- Diffuse multivessel disease especially in diabetic patients.
- Chronic kidney disease (i.e. creatinine clearance <60 mL/min).
- At least three stents implanted.
- At least three lesions treated.
- Bifurcation with two stents implanted.
- Total stent length >60 mm.
- Treatment of a chronic total occlusion.

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Unfavourable patient profile for a combination of oral anticoagulant and antiplatelet therapy

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• Short life expectancy.
• Ongoing malignancy.
• Poor expected adherence.
• Poor mental status.
• End stage renal failure.
• Advanced age.
• Prior major bleeding/prior haemorrhagic stroke.
• Chronic alcohol abuse.
• Anaemia.
• Clinically significant bleeding on dual antithrombotic therapy.

2017 ESC Focused Update on DAPT in Coronary Artery Disease, developed in collaboration with EACTS
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx419)

Dual antiplatelet therapy duration in patients with indication for oral anticoagulation

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Recommendations	Class	Level
It is recommended to administer periprocedurally aspirin and clopidogrel in patients undergoing coronary stent implantation.	I	C
In patients treated with coronary stent implantation, triple therapy with aspirin, clopidogrel and OAC should be considered for 1 month, irrespective of the type of stent used.	IIa	B
Triple therapy with aspirin, clopidogrel and OAC for longer than 1 month and up to 6 months should be considered in patients with high ischaemic risk due to ACS or other anatomical/procedural characteristics, which outweigh the bleeding risk.	IIa	B
Dual therapy with clopidogrel 75 mg/day and OAC should be considered as an alternative to 1-month triple antithrombotic therapy in patients in whom the bleeding risk outweighs the ischaemic risk.	IIa	A

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Dual antiplatelet therapy duration in patients with indication for oral anticoagulation *(continued)*

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Recommendations	Class	Level
Discontinuation of antiplatelet treatment in patients treated with OAC should be considered at 12 months.	IIa	B
In patients with an indication for VKA in combination with aspirin and/or clopidogrel, the dose intensity of VKA should be carefully regulated with a target INR in the lower part of the recommended target range and a time in the therapeutic range >65–70%.	IIa	B
When a NOAC is used in combination with aspirin and/or clopidogrel, the lowest approved dose effective for stroke prevention tested in AFib trials should be considered.	IIa	C
When rivaroxaban is used in combination with aspirin and/ or clopidogrel, rivaroxaban 15 mg *q.d.* may be used instead of rivaroxaban 20 mg *q.d.*	IIb	B
The use of ticagrelor or prasugrel is not recommended as part of triple antithrombotic therapy with aspirin and OAC.	III	C

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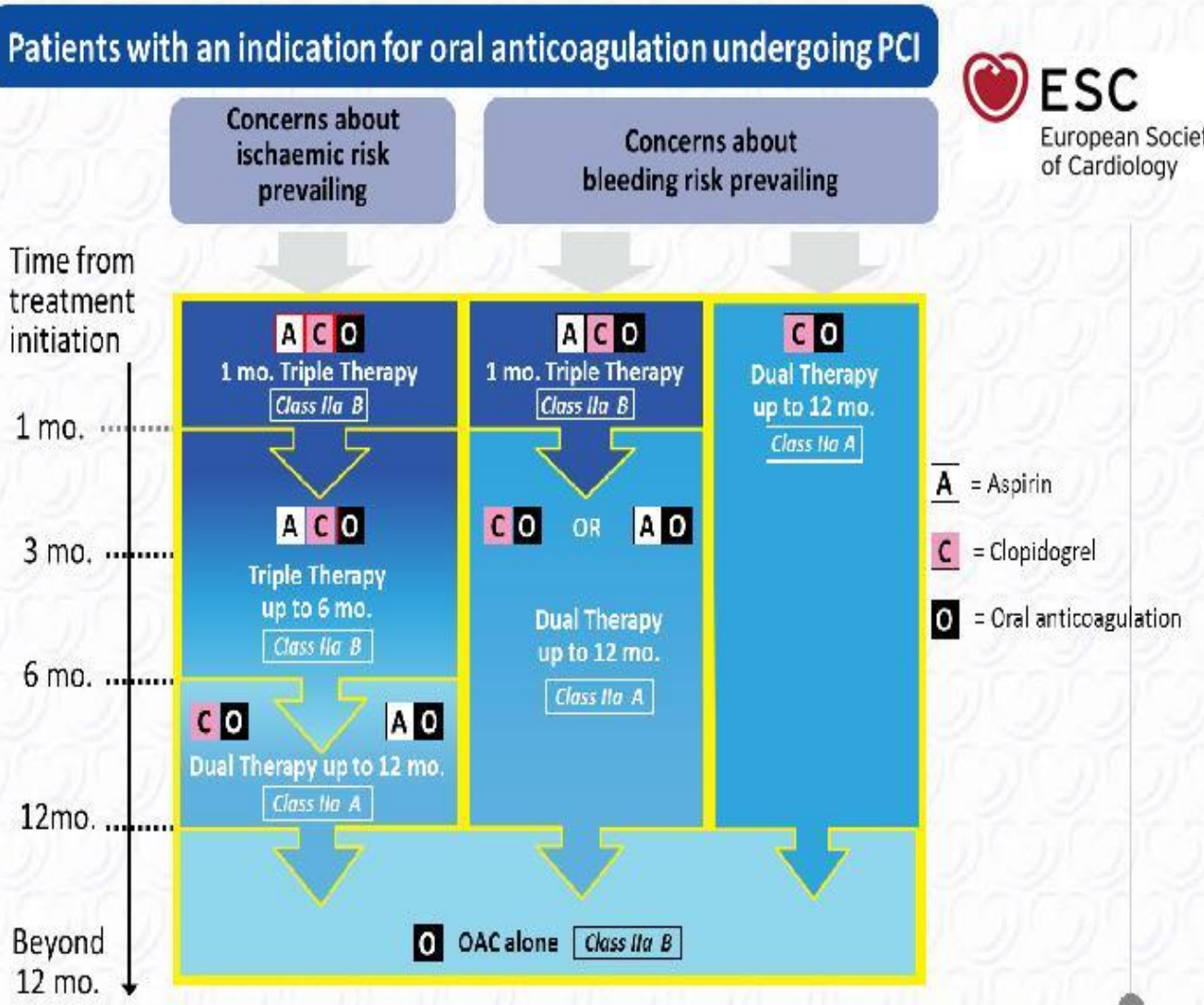
Algorithm for dual antiplatelet therapy (DAPT) in patients with an indication for oral anticoagulation undergoing percutaneous coronary intervention (PCI)



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Algorithm for dual antiplatelet therapy (DAPT) in patients with an indication for oral anticoagulation Undergoing percutaneous coronary intervention (PCI)

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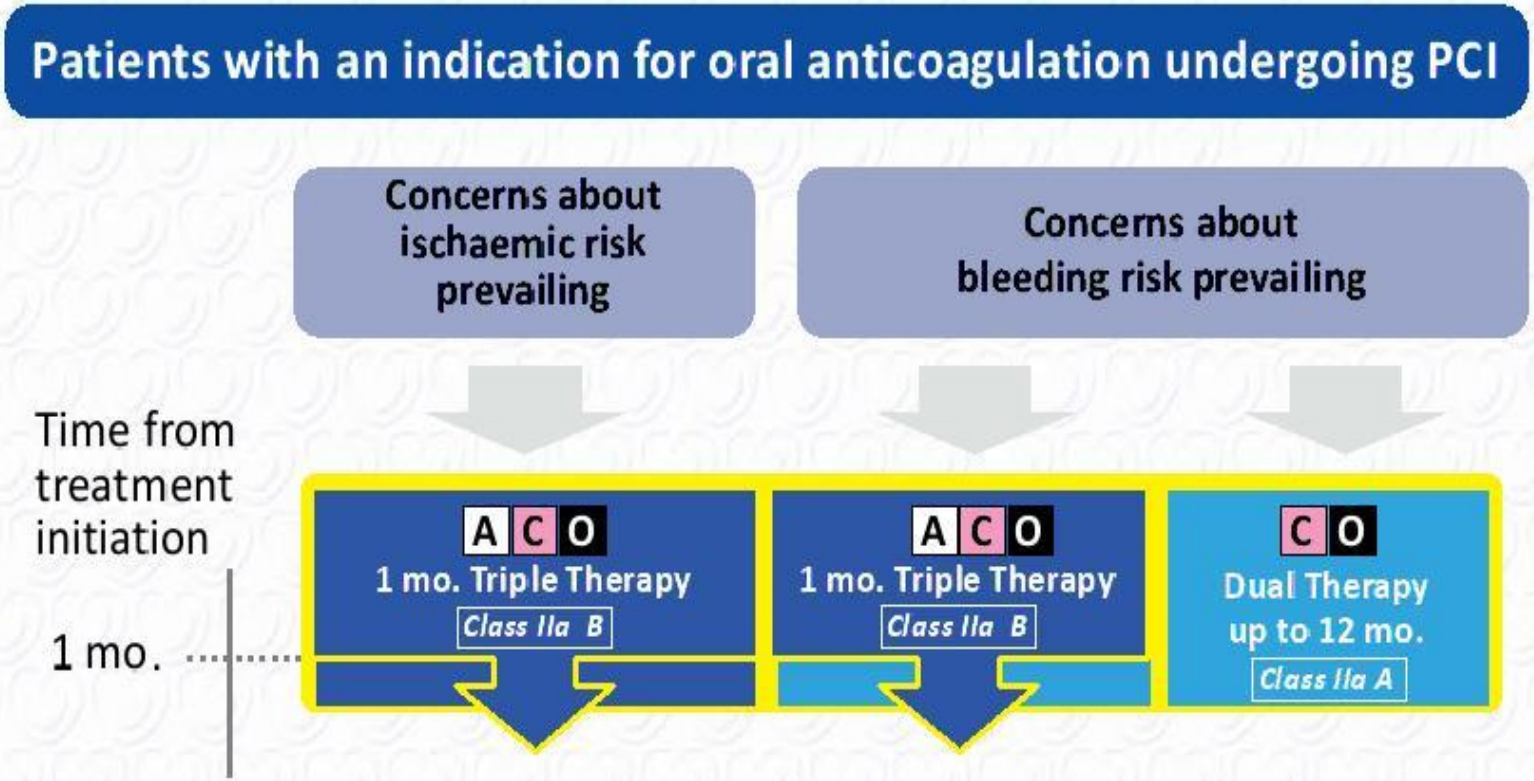

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Algorithm for dual antiplatelet therapy (DAPT) in patients with an indication for oral anticoagulation undergoing percutaneous coronary intervention (PCI) *(continued)*

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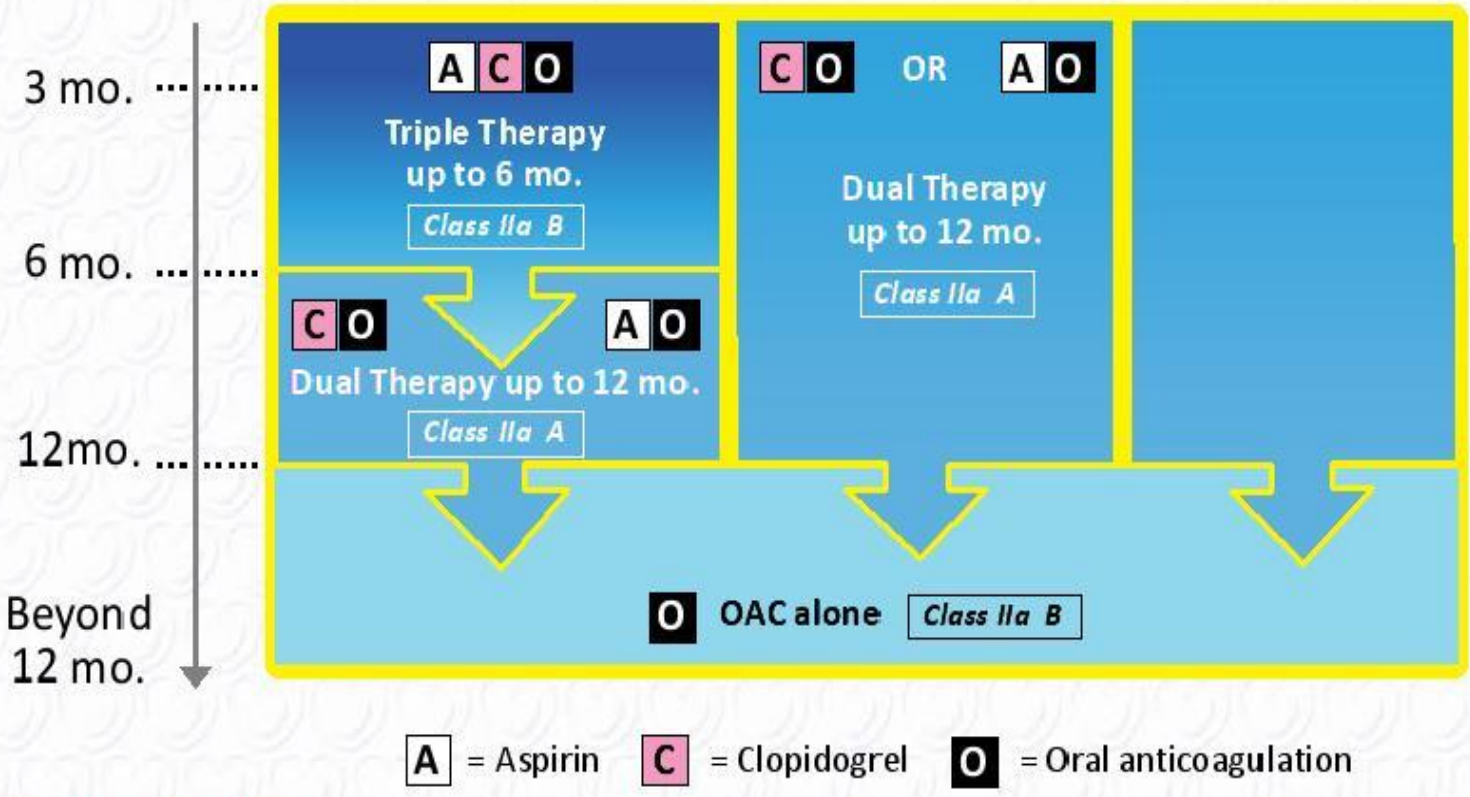

A = Aspirin C = Clopidogrel O = Oral anticoagulation

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Dual antiplatelet therapy in patients undergoing elective non-cardiac surgery

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Recommendations	Class	Level
It is recommended to continue aspirin perioperatively if the bleeding risk allows, and to resume the recommended antiplatelet therapy as soon as possible post-operatively.	I	B
After coronary stent implantation, elective surgery requiring discontinuation of the $P2Y_{12}$ inhibitor should be considered after 1 month, irrespective of the stent type, if aspirin can be maintained throughout the peri-operative period.	IIa	B
Discontinuation of $P2Y_{12}$ inhibitors should be considered at least 3 days before surgery for ticagrelor, at least 5 days for clopidogrel and at least 7 days for prasugrel.	IIa	B
A multidisciplinary expert team should be considered for pre-operative evaluation of patients with an indication for DAPT before elective surgery.	IIa	C

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Dual antiplatelet therapy in patients undergoing elective non-cardiac surgery *(continued)*

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Recommendations	Class	Level
In patients with recent MI or other high ischaemic risk features requiring DAPT, elective surgery may be postponed for up 6 to months.	IIb	C
If both oral antiplatelet agents have to be discontinued perioperatively, a bridging strategy with intravenous antiplatelet agents may be considered, especially if surgery has to be performed within 1 month after stent implantation.	IIb	C
It is not recommended to discontinue DAPT within the first month of treatment in patients undergoing elective non cardiac surgery.	III	B

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(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx419)

Timing for elective non-cardiac surgery in patients treated with dual antiplatelet therapy (DAPT) after percutaneous coronary intervention (PCI)

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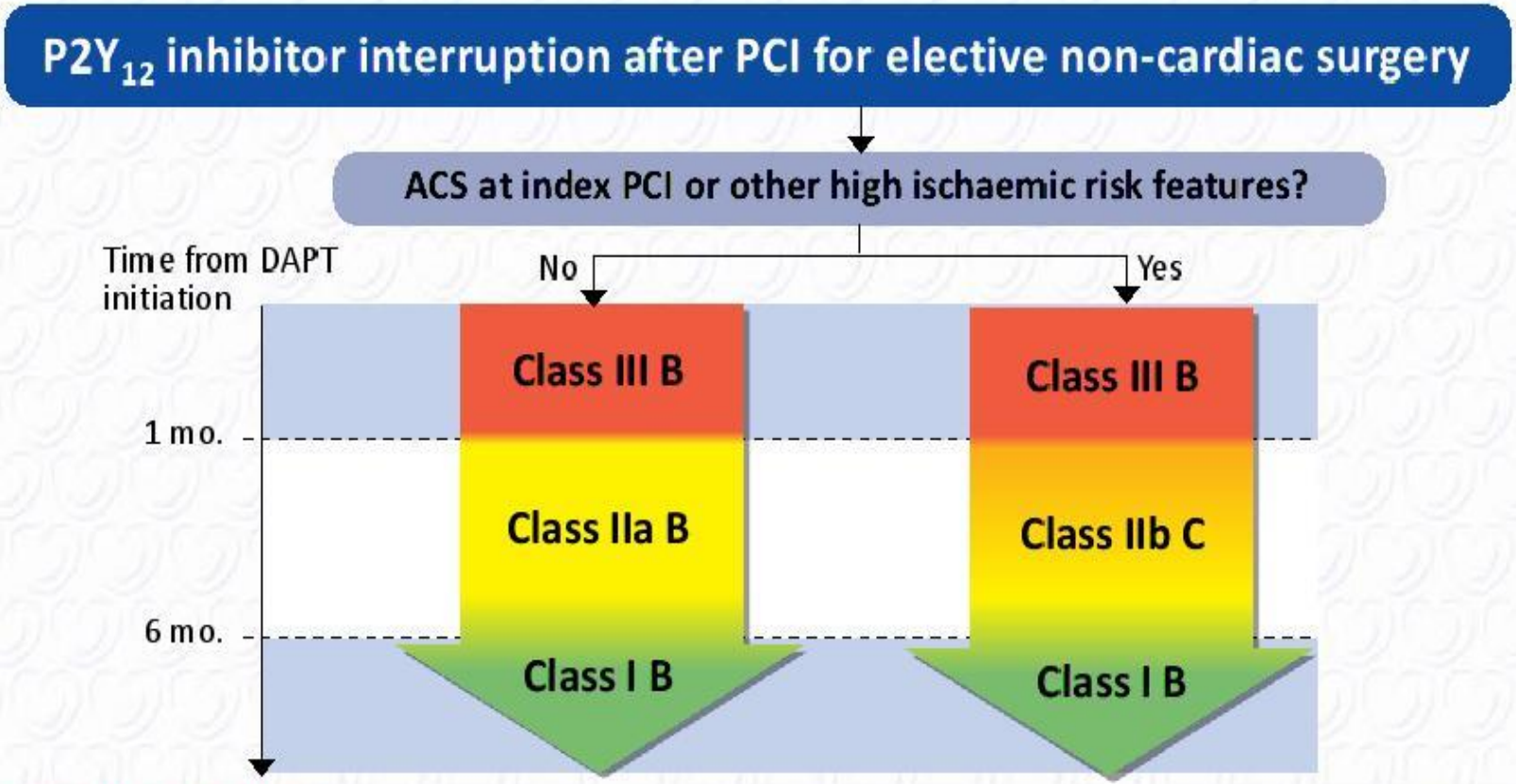

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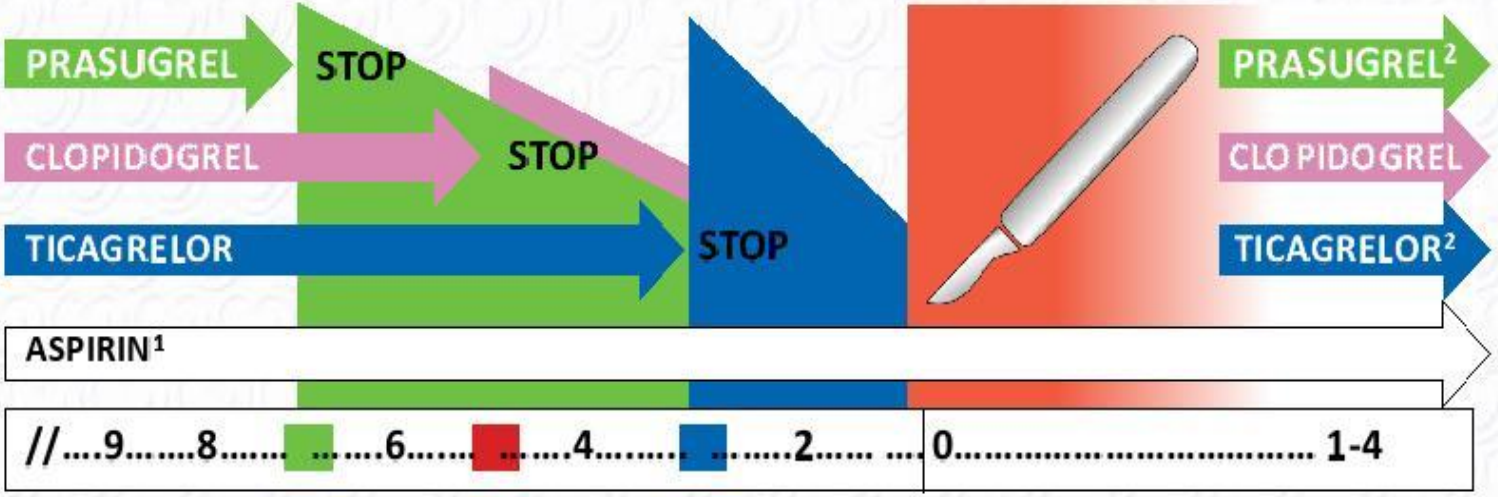
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx419)

Minimal discontinuation and re-implementation time frames of dual antiplatelet therapy (DAPT) for patients undergoing elective surgery



= Expected average platelet function recovery

[1] Decision to stop aspirin throughout surgery should be made on a single case basis taking into account the surgical bleeding risk.

[2] In patients not requiring OAC.

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Gender considerations and those for special populations

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Recommendations	Class	Level
Similar type and duration of DAPT are recommended in male and female patients.	I	A
It is recommended to reassess the type, dose and duration of DAPT in patients with actionable bleeding complication while on treatment.	I	C
Similar type and duration of DAPT should be considered in patients with and without diabetes mellitus.	IIa	B
Prolonged (i.e. >12 months) DAPT duration should be considered in patients with prior stent thrombosis, especially in the absence of correctable causes (e.g. lack of adherence or correctable mechanical stent-related issues).	IIa	C

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Gender considerations and those for special Populations *(continued)*

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Recommendations	Class	Level
Prolonged (i.e. >12 months) DAPT duration may be considered in CAD patients with LEAD.	IIb	B
Prolonged (i.e. >6 months) DAPT duration may be considered in patients who underwent complex PCI.	IIb	B

Bleeding during treatment with dual antiplatelet therapy ± OAC

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TRIVIAL BLEEDING

Any bleeding not requiring medical intervention or further evaluation

e.g. skin bruising or ecchimosis, self-resolving epistaxis, minimal conjunctival bleeding

- Continue DAPT.
- Consider OAC continuation or skip one single next pill.
- Reassure the patient.
- Identify and discuss with the patient possible preventive strategies.
- Counsel patient on the importance of drug-adherence.

Legend

- DAPT management
- OAC management
- General recommendations

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Bleeding during treatment with dual antiplatelet therapy ± OAC

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MILD BLEEDING

Any bleeding that requires medical attention without requiring hospitalization

e.g. not self resolving epistaxis, moderate conjunctival bleeding, genitourinary or upper/lower gastrointestinal bleeding without significant blood loss, mild haemoptysis

- Continue DAPT.
- Consider shortening DAPT duration or switching to less potent $P2Y_{12}$ inhibitor (i.e.from ticagrelor/ prasugrel to clopidogrel), especially if recurrent bleeding occurs.

- In case of triple therapy consider downgrading to dual therapy, preferably with clopidogrel and OAC.

- Identify and possibly treat concomitant conditions associated with bleeding (e.g. peptic ulcer, haemorrhoidal plexus, neoplasm).
- Add PPI if not previously implemented.
- Counsel patient on the importance of drug-adherence.

Legend

DAPT management

OAC management

General recommendations

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Bleeding during treatment with dual antiplatelet therapy ± OAC

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MODERATE BLEEDING

Any bleeding associated with blood loss (>3 g/dL HB) and/or requiring hospitalization, which is haemodynamically stable and not rapidly evolving

e.g. genitourinary, respiratory or upper/lower gastro-intestinal bleeding with significant blood loss or requiring transfusion

- SAPT, preferably with the $P2Y_{12}$ inhibitor especially in case of upper GI bleeding.
- Reinitiate DAPT as soon as deemed safe.
- Consider shortening DAPT duration or switching to less potent $P2Y_{12}$, especially if recurrence occurs.

- Consider OAC dis. or reversal until bleeding is controlled, unless very high thrombotic risk
- Reinitiate treatment within one week if clinically indicated. For VKA target INR of 2.0–2.5 unless overriding indication (i.e. mechanical heart valves or cardiac assist device) for NOAC consider the lowest effective dose.
- In case of triple therapy consider downgrading to dual therapy, preferably with clopidogrel and OAC.
- If patients on dual therapy, consider stopping antiplatelet Tx.

- Consider i.v. PPI if GI bleeding occurred.
- Identify and possibly treat concomitant conditions associated with bleeding (e.g. peptic ulcer, haemorrhoidal plexus, neoplasm).
- Counsel patient on the importance of drug-adherence.

Legend

DAPT management

OAC management

General recommendations

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Bleeding during treatment with dual antiplatelet therapy ± OAC

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SEVERE BLEEDING

Any bleeding requiring hospitalisation, associated with a severe blood loss (>5 g/dL HB) which is haemo-dynamically stable and not rapidly evolving

e.g. severe genitourinary, respiratory or upper/lower gastrointestinal bleeding

- Consider stopping DAPT and continue with SAPT, preferably with the $P2Y_{12}$ inhibitor especially in case of upper GI bleeding.
- If bleeding persists despite treatment or treatment is not possible, consider stopping all antithrombotic medications.
- Once bleeding has ceased, re-evaluate the need for DAPT or SAPT, preferably with the $P2Y_{12}$ inhibitor especially in case of upper GI bleeding.
- If DAPT is re-started, consider shortening DAPT duration or switching to less potent $P2Y_{12}$ inhibitor (i.e. from ticagrelor/prasugrel to clopidogrel), especially if recurrent bleeding occurs.

- Consider stopping and reversing OAC until bleeding is controlled unless prohibitive thrombotic risk (i.e. mechanical heart valve in mitral position, cardiac assist device).
- Reinitiate treatment within one week if clinically indicated. For vitamin-K antagonists consider a target INR of 2.0-2.5 unless overriding indication (i.e. mechanical heart valves or cardiac assist device) for NOAC consider the lowest effective dose.
- If patient on triple therapy consider downgrading to dual therapy with clopidogrel and OAC. If patients on dual therapy, consider stopping antiplatelet therapy if deemed safe.

- Consider i.v. PPI if GI bleeding occurred.
- RBC transfusion if HB < 7-8 g/Dl.
- Consider platelet transfusion.
- Urgent surgical or endoscopic treatment of bleeding source if deemed possible..

Legend

DAPT management

OAC management

General recommendations

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Bleeding during treatment with dual antiplatelet therapy ± OAC

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LIFE-THREATENING BLEEDING

Any severe active bleeding putting patient's life immediately at risk

e.g. massive overt genitourinary, respiratory or upper/lower gastrointestinal bleeding, active intracranial, spinal or intraocular haemorrhage, or any bleeding causing haemodynamic instability.

- Immediately discontinue all antithrombotic medications.
- Once bleeding has ceased, re-evaluate the need for DAPT or SAPT, preferably with the $P2Y_{12}$ inhibitor especially in case of upper GI bleeding.

- Stop and reverse OAC.

- Fluid replacement if hypotension.
- Consider RBC transfusion irrespective of HB values.
- Platelet transfusion.
- Consider i.v. PPI if GI bleeding occurred.
- Urgent surgical or endoscopic treatment of bleeding source if deemed possible.

Legend

DAPT management

OAC management

General recommendations

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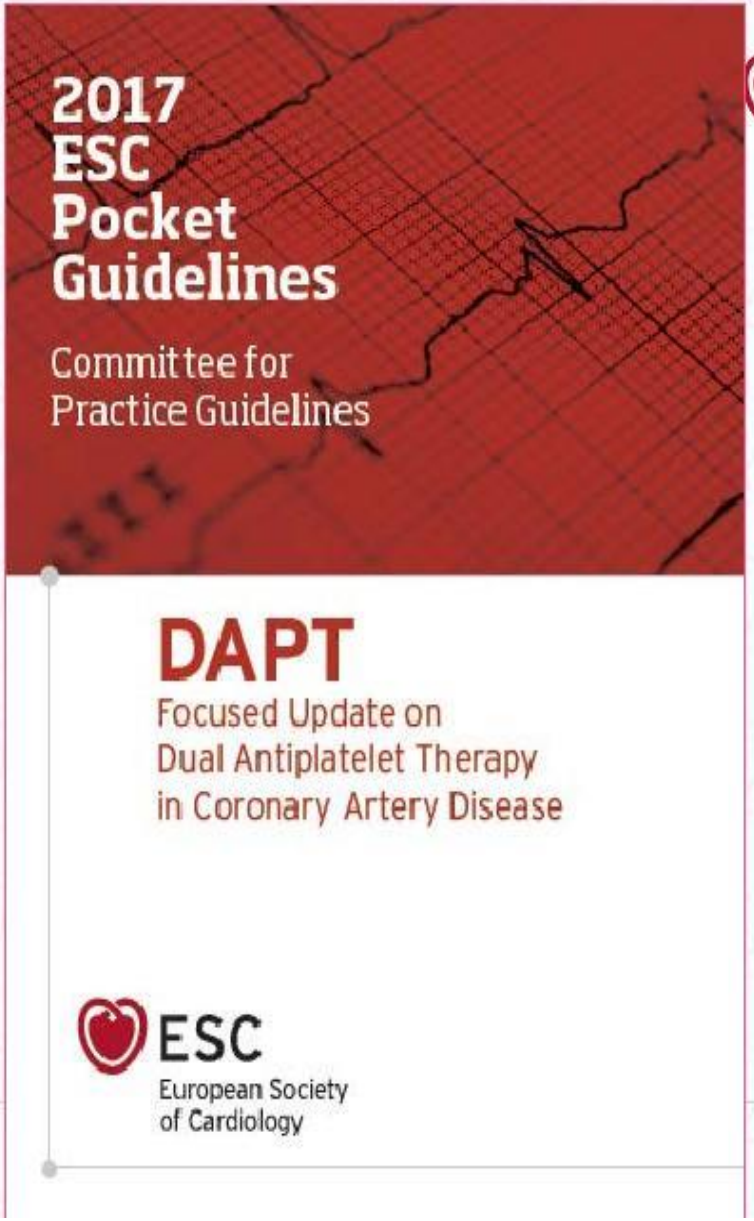

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