

XII Jornada Actualització Cardiologia

Cardiopatia Isquèmica



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Cardiopatía isquémica...new fashion;



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SHOCK CARDIOGÈNIC I ECMO



iiii ALTRE IAM iiiii



TROPONINES ULTRASENSIBLES

Identificación masiva de proteínas

Cuantificación diferencial masiva de proteínas



- Introducció Síndrome coronària aguda
- IV Definició IAM
- Tractament antiagregant: Duració, tipus IADP, swich d'antiagregants...
- SCA i fibril.lació auricular
- Guies pràctica clínica.

Dolor Toràctic: ECG precoç



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SCA amb elevació
segment ST
prevalença 30-42%



SCA sense elevació
segment ST
prevalença 51-63%



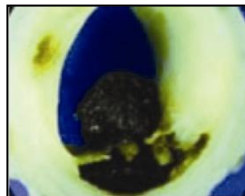
SCAEST



SCASEST

Tipus de SCA: IAMEST/SCASEST

Oclusió parcial
Trombo plaquetari



NO elevació ST

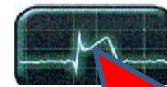


Antiplaquetaris
Anticoagulants



Revascularització diferida
(Risc isquèmic, troponines...)

Oclusió total
Trombo de fibrina

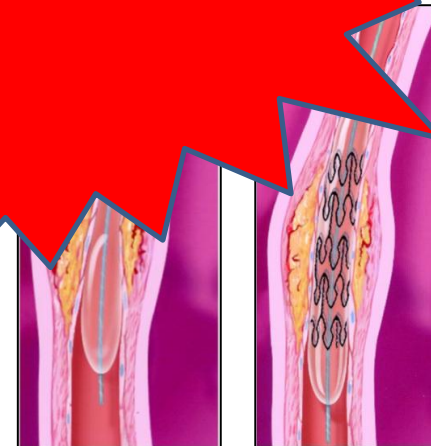


Fibrinòlisi



CODI IAM

ària



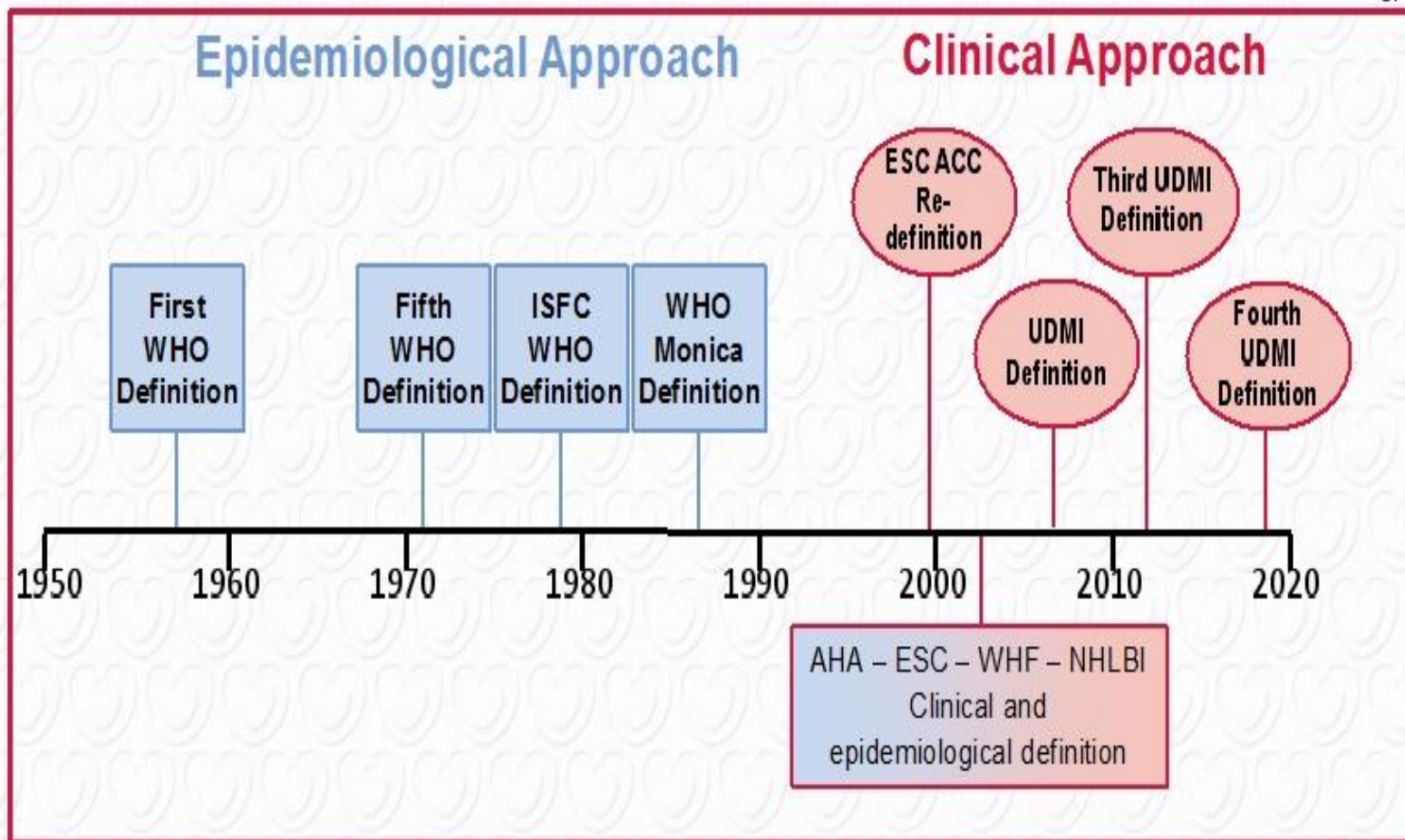
EXPERT CONSENSUS DOCUMENT

Fourth Universal Definition of Myocardial Infarction (2018)

Joint ESC/ACC/AHA/WHF Task Force for the Universal Definition of Myocardial Infarction



History of Documents on the Definition of Myocardial Infarction



ACC = American College of Cardiology; AHA = American Heart Association; ESC = European Society of Cardiology; ISFC = International Society and Federation of Cardiology; NHLBI = National Heart, Lung, and Blood Institute; WHF = World Heart Foundation; WHO = World Health Organization; UDMI = Universal Definition of Myocardial Infarction

Universal Definition of Myocardial Infarction

Criteria for Clinical Myocardial Infarction

Clinical definition of myocardial infarction denotes presence of acute myocardial injury detected by abnormal cardiac biomarkers in the setting of evidence of acute myocardial ischaemia.

Universal Definition of Myocardial Injury

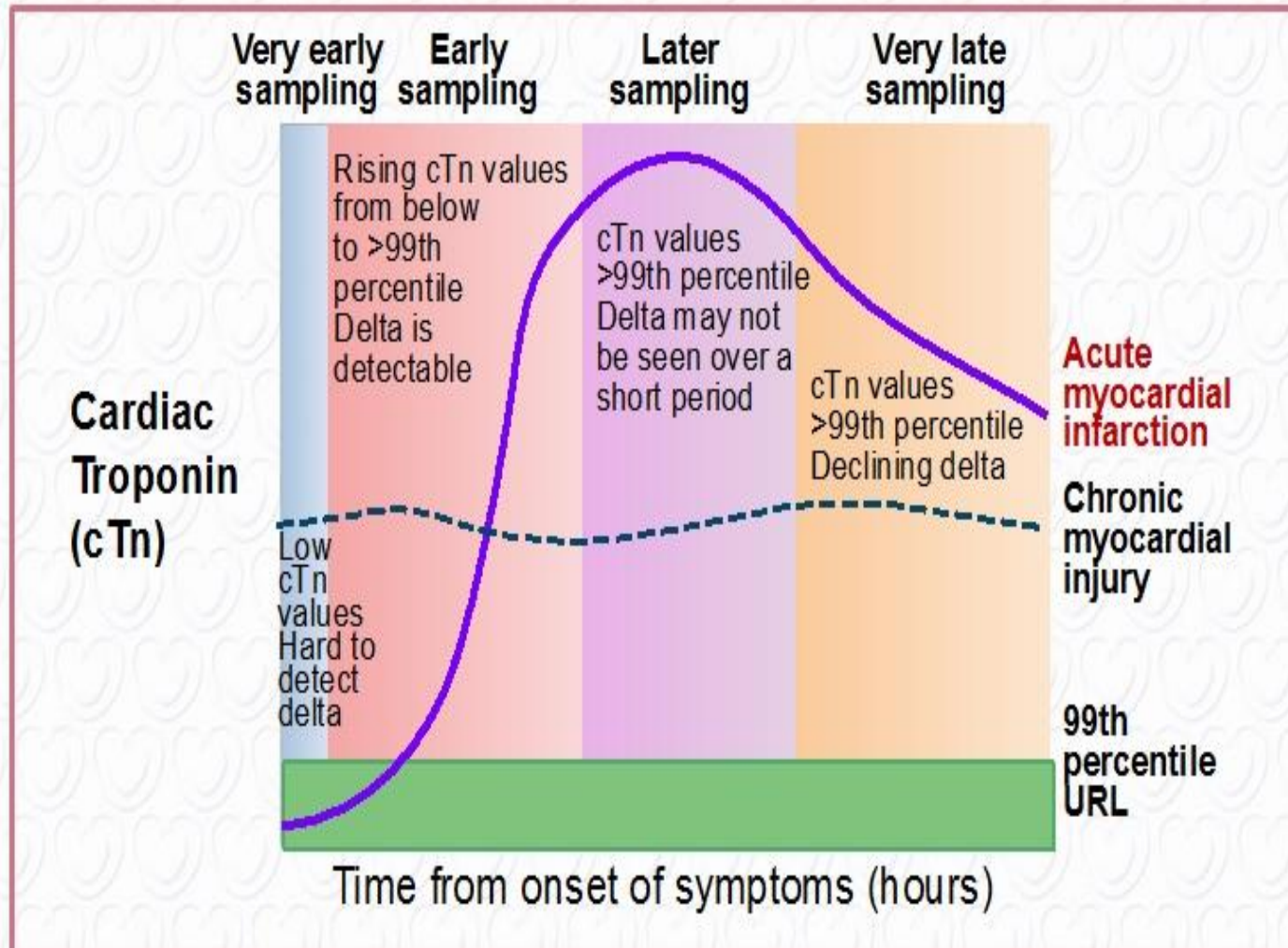
Criteria for Myocardial Injury

Detection of elevated cardiac troponin (cTn) values above the 99th percentile upper reference limit (URL) is defined as myocardial injury. The injury is considered acute if there is a rise and/or fall of cTn values

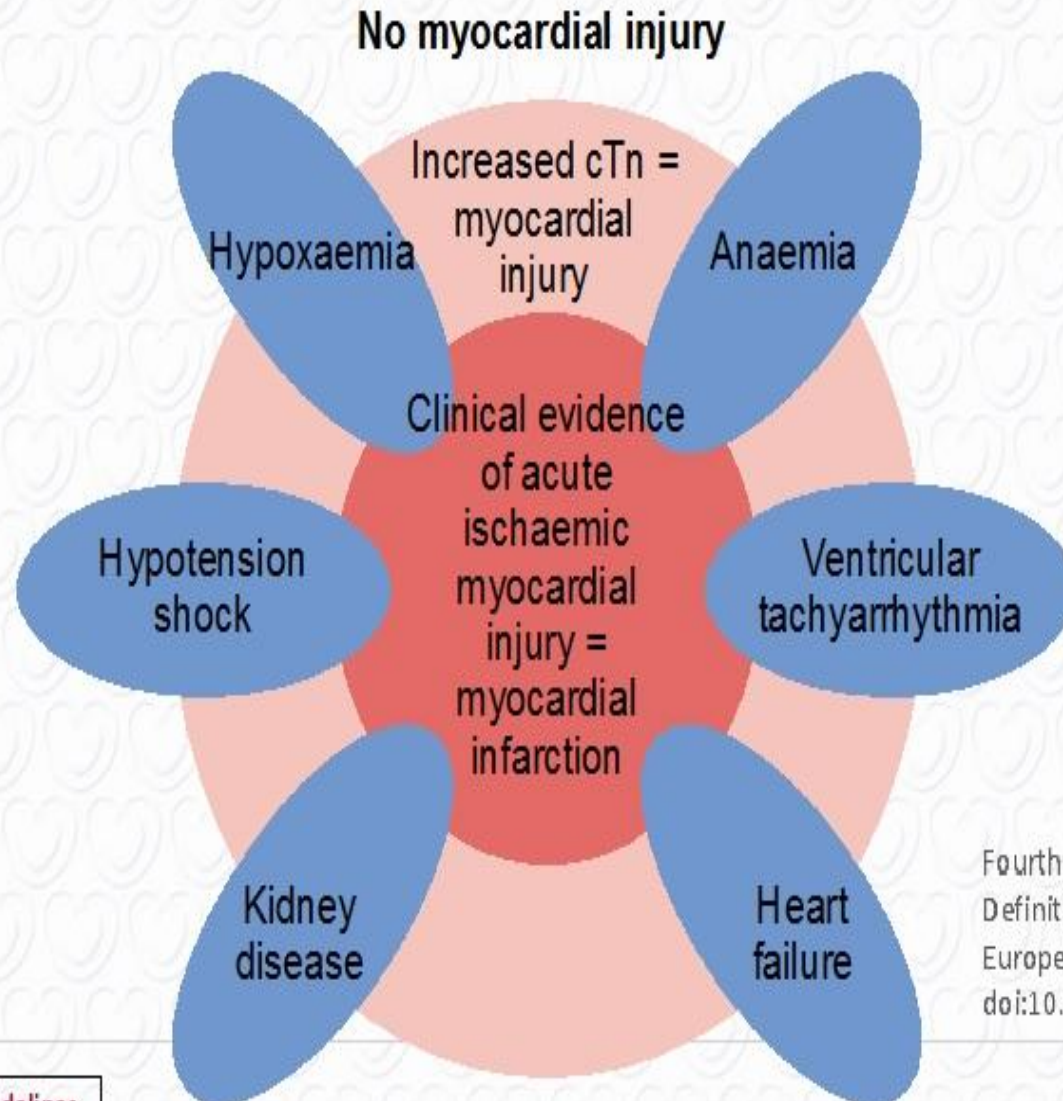
Criteria for Cardiac Procedural Myocardial Injury

Cardiac procedural related myocardial injury is defined by elevation of cTn values (>99th percentile URL) in patients with normal baseline value(s) or a rise of cTn values >20% of the baseline value when it is >99th percentile URL but is stable or falling

Conceptual Illustration of Troponin Kinetics after Acute Myocardial Injury and Infarction

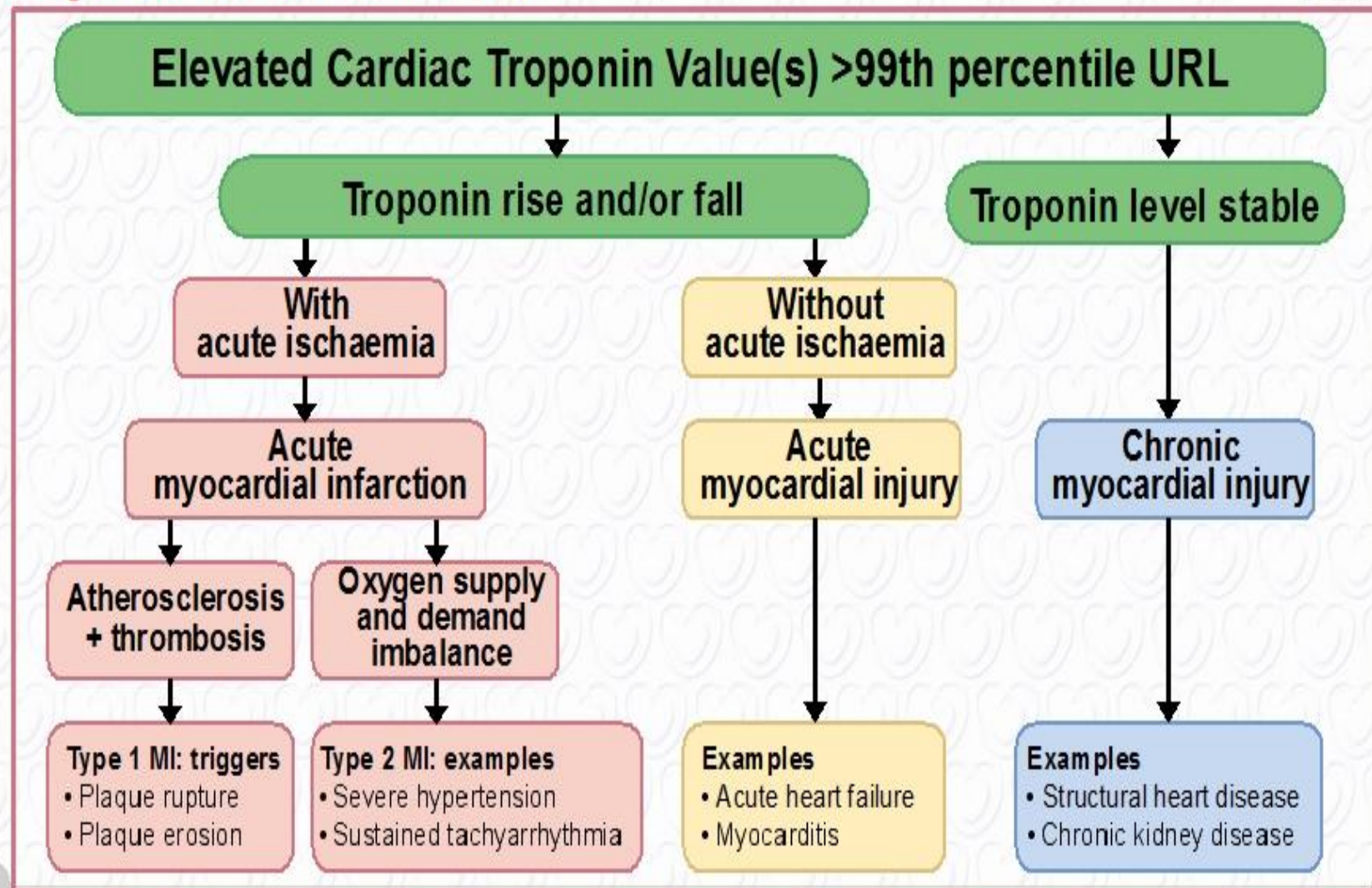


Spectrum of Myocardial Injury, ranging from no Injury to Myocardial Infarction

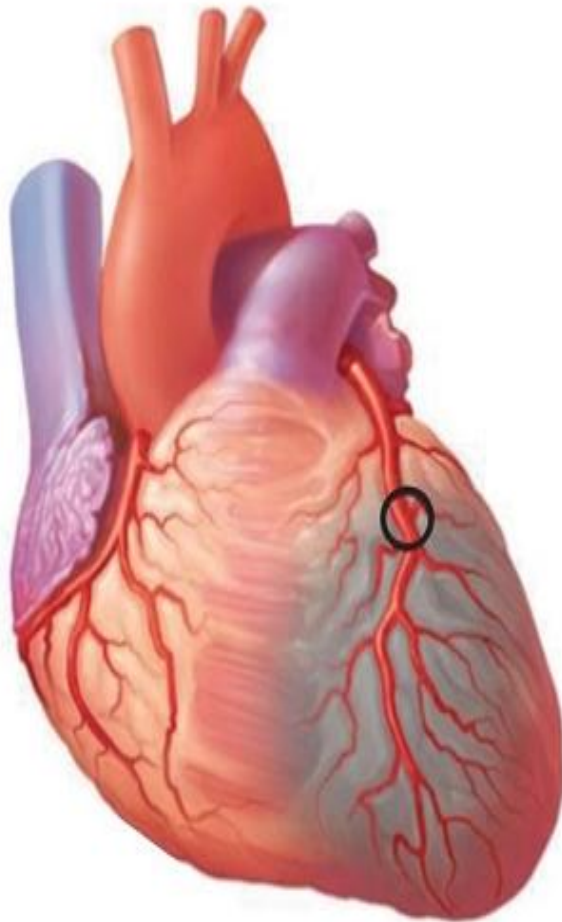


Fourth Joint ESC/ACC/AHA/WHF Universal Definition of Myocardial Infarction
European Heart Journal 2019; 40: 237-269 -
doi:10.1093/eurheartj/ehy462

Model for interpreting Myocardial Injury and Myocardial Infarction



Myocardial Infarction Type 1

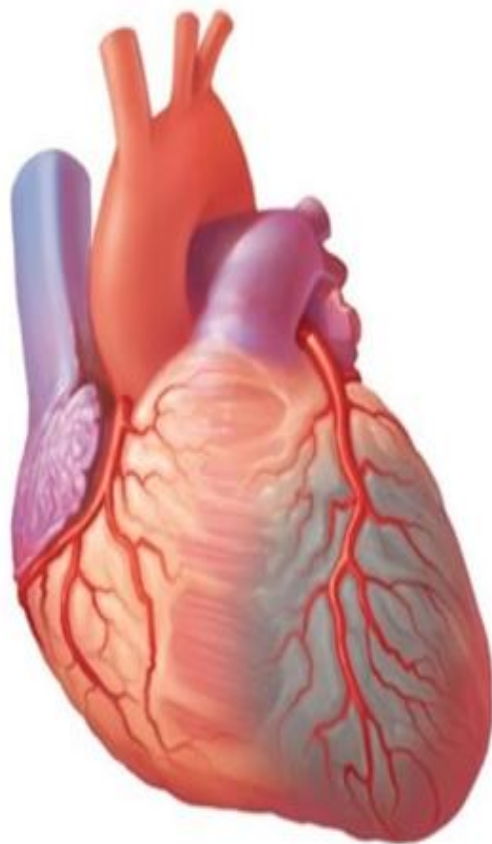


Plaque rupture/erosion with
occlusive thrombus



Plaque rupture/erosion with
non-occlusive thrombus

Myocardial Infarction Type 2



Atherosclerosis and oxygen supply/demand imbalance



Vasospasm or coronary microvascular dysfunction



Non-atherosclerotic coronary dissection



Oxygen supply/demand imbalance alone





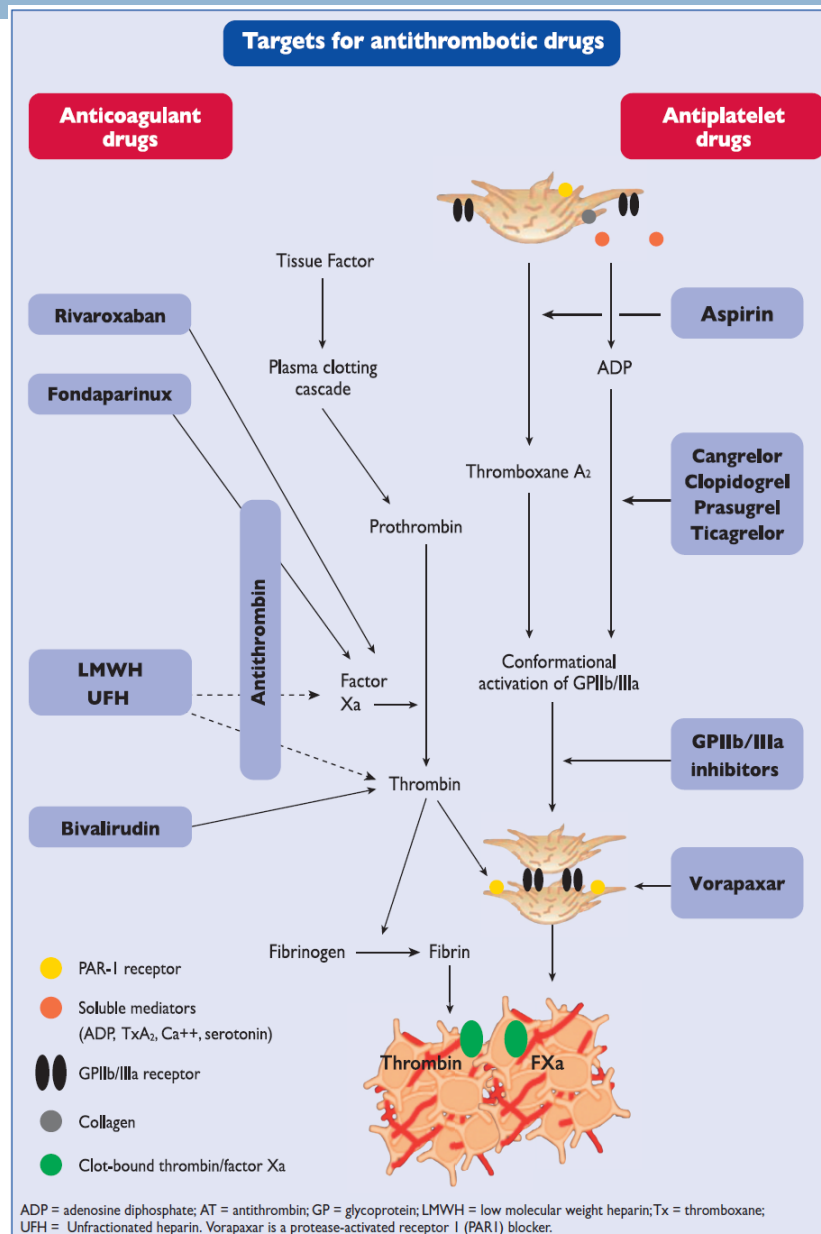
Dual Antiplatelet Therapy...

...Clopidogrel, contigo empezó todo.

SCASEST Guidelines ESC 2015



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“Nous Antiagregants” - IADP -



iCor.cat

- Ticagrelor i prasugrel, comparats amb clopidogrel

- Inici d'acció més ràpid
- Més potència d'inhibició plaquetària
- Més hemorràgies
- Més cars.
- **Benefici net clarament superior nous IADP**

SCASEST Guidelines ESC 2015



iCor.cat

Recommendations	Class ^a	Level ^b	Ref. ^c
Oral antiplatelet therapy			
Aspirin is recommended for all patients without contraindications at an initial oral loading dose ^d of 150–300 mg (in aspirin-naïve patients) and a maintenance dose of 75–100 mg/day long-term regardless of treatment strategy.	I	A	129–132
A P2Y ₁₂ inhibitor is recommended, in addition to aspirin, for 12 months unless there are contraindications such as excessive risk of bleeds.	I	A	137, 148, 153
<ul style="list-style-type: none"> • Ticagrelor (180 mg loading dose, 90 mg twice daily) is recommended, in the absence of contraindications,^e for all patients at moderate-to-high risk of ischaemic events (e.g. elevated cardiac troponins), regardless of initial treatment strategy and including those pretreated with clopidogrel (which should be discontinued when ticagrelor is started). 	I	B	153
<ul style="list-style-type: none"> • Prasugrel (60 mg loading dose, 10 mg daily dose) is recommended in patients who are proceeding to PCI if no contraindication.^e 	I	B	148, 164
<ul style="list-style-type: none"> • Clopidogrel (300–600 mg loading dose, 75 mg daily dose) is recommended for patients who cannot receive ticagrelor or prasugrel or who require oral anticoagulation. 	I	B	137

[Roffi et al. Eur Heart J. 2016 Jan 14;37\(3\):267-315](#)



2018 ESC/EACTS Guidelines on myocardial revascularization

The Task Force on myocardial revascularization of the European Society of Cardiology (ESC) and European Association for Cardio-Thoracic Surgery (EACTS)

Developed with the special contribution of the European Association for Percutaneous Cardiovascular Interventions (EAPCI)

Authors/Task Force Members: Franz-Josef Neumann* (ESC Chairperson) (Germany), Miguel Sousa-Uva*¹ (EACTS Chairperson) (Portugal), Anders Ahlsson¹ (Sweden), Fernando Alfonso (Spain), Adrian P. Banning (UK), Umberto Benedetto¹ (UK), Robert A. Byrne (Germany), Jean-Philippe Collet (France), Volkmar Falk¹ (Germany), Stuart J. Head¹ (The Netherlands), Peter Jüni (Canada), Adnan Kastrati (Germany), Akos Koller (Hungary), Steen D. Kristensen (Denmark), Josef Niebauer (Austria), Dimitrios J. Richter (Greece), Petar M. Seferović (Serbia), Dirk Sibbing (Germany), Giulio G. Stefanini (Italy), Stephan Windecker (Switzerland), Rashmi Yadav¹ (UK), Michael O. Zembala¹ (Poland)

ESC GUIDELINES 2018: SCASEST AMB ICP



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Recommendations	Class ^a	Level ^b
Pre-treatment and antiplatelet therapy		
Aspirin is recommended for all patients without contraindications at an initial oral loading dose of 150–300 mg (or 75–250 mg i.v.), and at a maintenance dose of 75–100 mg daily long-term. ^{681,683,721}	I	A
A P2Y ₁₂ inhibitor is recommended in addition to aspirin, maintained over 12 months unless there are contraindications such as an excessive risk of bleeding. ^{701,702,722,723} Options are:	I	A
<ul style="list-style-type: none"> • Prasugrel in P2Y₁₂-inhibitor naïve patients who proceed to PCI (60 mg loading dose, 10 mg daily dose).⁷⁰¹ • Ticagrelor irrespective of the preceding P2Y₁₂ inhibitor regimen (180 mg loading dose, 90 mg b.i.d.).⁷⁰² • Clopidogrel (600 mg loading dose, 75 mg daily dose) only when prasugrel or ticagrelor are not available or are contraindicated.^{722–724} 	I	B
	I	B
	I	B
GP IIb/IIIa antagonists should be considered for bail-out if there is evidence of no-reflow or a thrombotic complication.	IIa	C
For pre-treatment in patients with NSTEMI-ACS undergoing invasive management, ticagrelor administration (180 mg loading dose, 90 mg b.i.d.), 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
Cangrelor may be considered in P2Y ₁₂ -inhibitor naïve patients undergoing PCI. ⁶⁷³	IIb	A
GP IIb/IIIa antagonists may be considered in P2Y ₁₂ -inhibitor naïve patients undergoing PCI.	IIb	C
Pre-treatment with GP IIb/IIIa antagonists in patients in whom coronary anatomy is not known is not recommended. ^{713,714,725}	III	A
Administration of prasugrel in patients in whom coronary anatomy is not known is not recommended. ¹⁶⁵	III	B

Neumann et al. **Eur Heart J.** 2019;40:87-165.

ESC GUIDELINES: Duració antiagregació



iCor.cat

Recommendations	Class ^a	Level ^b
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 contraindications such as an excessive risk of bleeding (e.g. PRECISE-DAPT ≥ 25). ^{701,702,722,723}	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. ^{729,730}	IIa	B
In patients with ACS treated with BRS, DAPT should be considered for at least 12 months and up to the presumed full absorption of the BRS, based on an individual assessment of bleeding and ischaemic risk.	IIa	C
De-escalation of P2Y ₁₂ inhibitor treatment (e.g. with a switch from prasugrel or ticagrelor to clopidogrel) guided by platelet function testing may be considered as an alternative DAPT strategy, especially for ACS patients deemed unsuitable for 12-month potent platelet inhibition. ⁷¹⁷	IIb	B
In patients with ACS who have tolerated DAPT without a bleeding complication, continuation of DAPT for longer than 12 months may be considered. ^{700,731}	IIb	A
In patients with MI and high ischaemic risk ^c 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. ^{732–734}	IIb	B
In ACS patients with no prior stroke/TIA, and at high ischaemic risk as well as low bleeding risk, receiving aspirin and clopidogrel, low-dose rivaroxaban (2.5 mg b.i.d. for approximately 1 year) may be considered after discontinuation of parenteral anticoagulation. ⁷²⁰	IIb	B

Neumann et al. **Eur Heart J.** 2019;40:87-165.

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

*: European Association for Cardio-Thoracic Surgery

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

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

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

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 <i>b.i.d.</i> 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

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

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 s print stent has been investigated in conjunction with a 3-month DAPT regimen.

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

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

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

Recommendations	Class	Level
In patients with recent MI or other high ischaemic risk features requiring DAPT, elective surgery may be postponed for up to 6 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



- **Després de SCA: 1 any doble antiagregació (DAPT).**
 - Si risc hemorràgic alt
 - ✓ Stent farmacoactiu: 6 mesos DAPT
 - ✓ No stent ó stent no farmacoactiu: 1 mes DAPT

- **Cateterisme electiu:**
 - ✓ Stent farmacoactiu: 6 mesos DAPT
 - ✓ Stent No farmacoactiu: 1-3 mesos DAPT

- **Ticagrelor o prasugrel preferibles a clopidogrel**
 - ✓ Ticagrelor 60 mg/12 h de 1-3 anys, si alt risc isquèmic
- **Prasugrel només si ICP –stent**
- **Si cal parar antiagregació: 5-7 dies previ-IQ**
- **IQ electives: esperar 6 mesos post-IAM ó 1 mes post-ICP**

SCA i Fibril·lació Auricular



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Pioneer: Rivaroxaban

The NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

DECEMBER 22, 2016

VOL. 375 NO. 25

Prevention of Bleeding in Patients with Atrial Fibrillation Undergoing PCI

C. Michael Gibson, M.D., Roxana Mehran, M.D., Christoph Bode, M.D., Jonathan Halperin, M.D., Freek W. Verheugt, M.D., Peter Wildgoose, Ph.D., Mary Birmingham, Pharm.D., Juliana Ianus, Ph.D., Paul Burton, M.D., Ph.D., Martin van Eickels, M.D., Serge Korjian, M.D., Yazan Daaboul, M.D., Gregory Y.H. Lip, M.D., Marc Cohen, M.D., Steen Husted, M.D., Eric D. Peterson, M.D., M.P.H., and Keith A. Fox, M.B., Ch.B.

N Engl J Med. 2016;375(25):2423-2434.

Augustus: Apixavan

The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Antithrombotic Therapy after Acute Coronary Syndrome or PCI in Atrial Fibrillation

Renato D. Lopes, M.D., Ph.D., Gretchen Heizer, M.S., Ronald Aronson, M.D., Amit N. Vora, M.D., M.P.H., Tyler Massaro, Ph.D., Roxana Mehran, M.D., Shaun G. Goodman, M.D., Stephan Windecker, M.D., Harald Darius, M.D., Jia Li, Ph.D., Oleg Averkov, M.D., Ph.D., M. Cecilia Bahit, M.D., Otavio Berwanger, M.D., Ph.D., Andrzej Budaj, M.D., Ph.D., Ziad Hijazi, M.D., Ph.D., Alexander Parkhomenko, M.D., Ph.D., Peter Sinnaeve, M.D., Ph.D., Robert F. Storey, M.D., Holger Thiele, M.D., Dragos Vinereanu, M.D., Ph.D., Christopher B. Granger, M.D., and John H. Alexander, M.D., M.H.S., for the AUGUSTUS Investigators*

N Engl J Med. 2019;380(16)

RE-DUAL PCI: Dabigatran

The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Dual Antithrombotic Therapy with Dabigatran after PCI in Atrial Fibrillation

Christopher P. Cannon, M.D., Deepak L. Bhatt, M.D., M.P.H., Jonas Oldgren, M.D., Ph.D., Gregory Y.H. Lip, M.D., Stephen G. Ellis, M.D., Takeshi Kimura, M.D., Michael Maeng, M.D., Ph.D., Bela Merkely, M.D., Uwe Zeymer, M.D., Savion Gropper, M.D., Ph.D., Matias Nordaby, M.D., Eva Kleine, M.Sc., Ruth Harper, Ph.D., Jenny Manassie, B.Med.Sc., James L. Januzzi, M.D., Jurrien M. ten Berg, M.D., Ph.D., P. Gabriel Steg, M.D., and Stefan H. Hohnloser, M.D., for the RE-DUAL PCI Steering Committee and Investigators*

Cannon CP, et al. NEJM, August 27, 2017



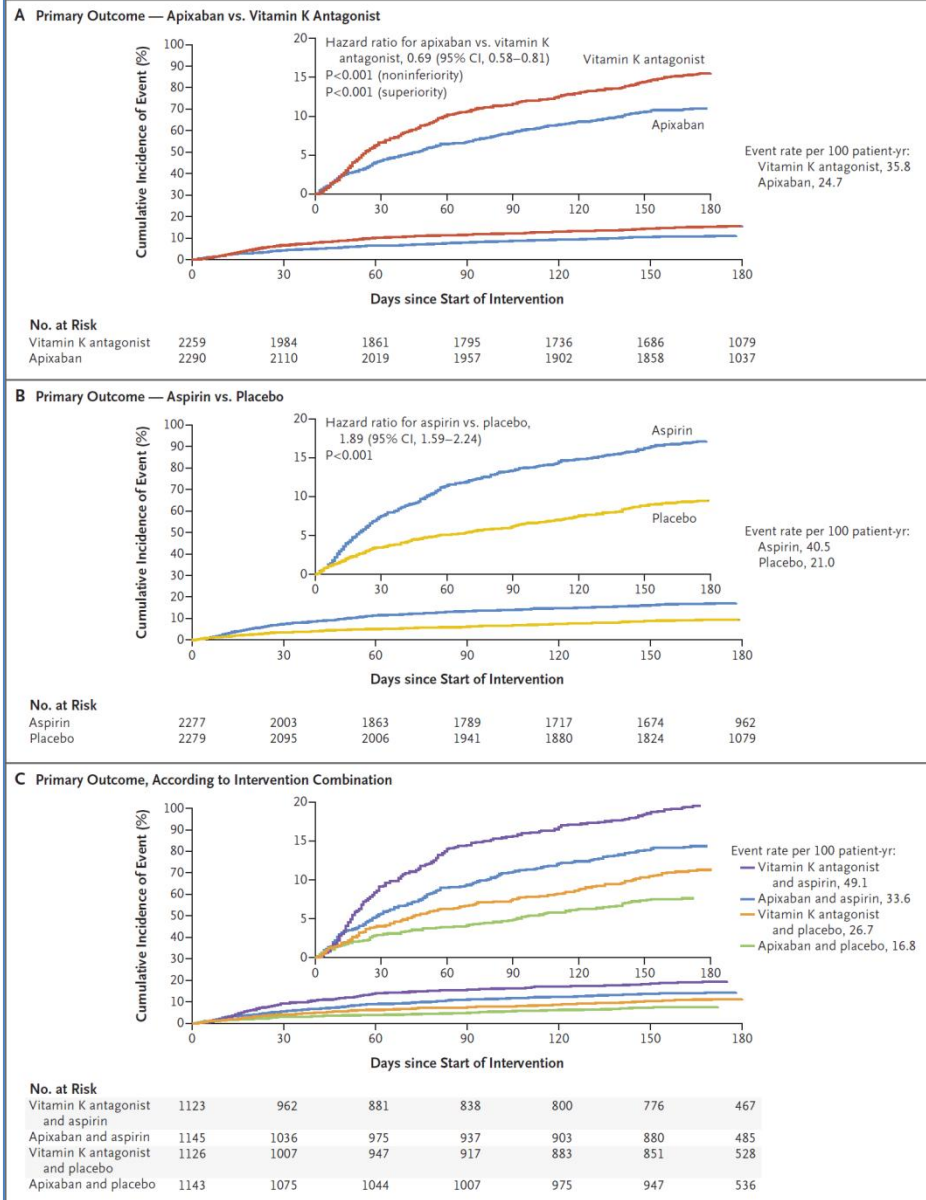
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SCA i Fibril·lació Auricular



Dual antiplatelet therapy duration in patients with indication for oral anticoagulation

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.	Ila	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.	Ila	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.	Ila	A

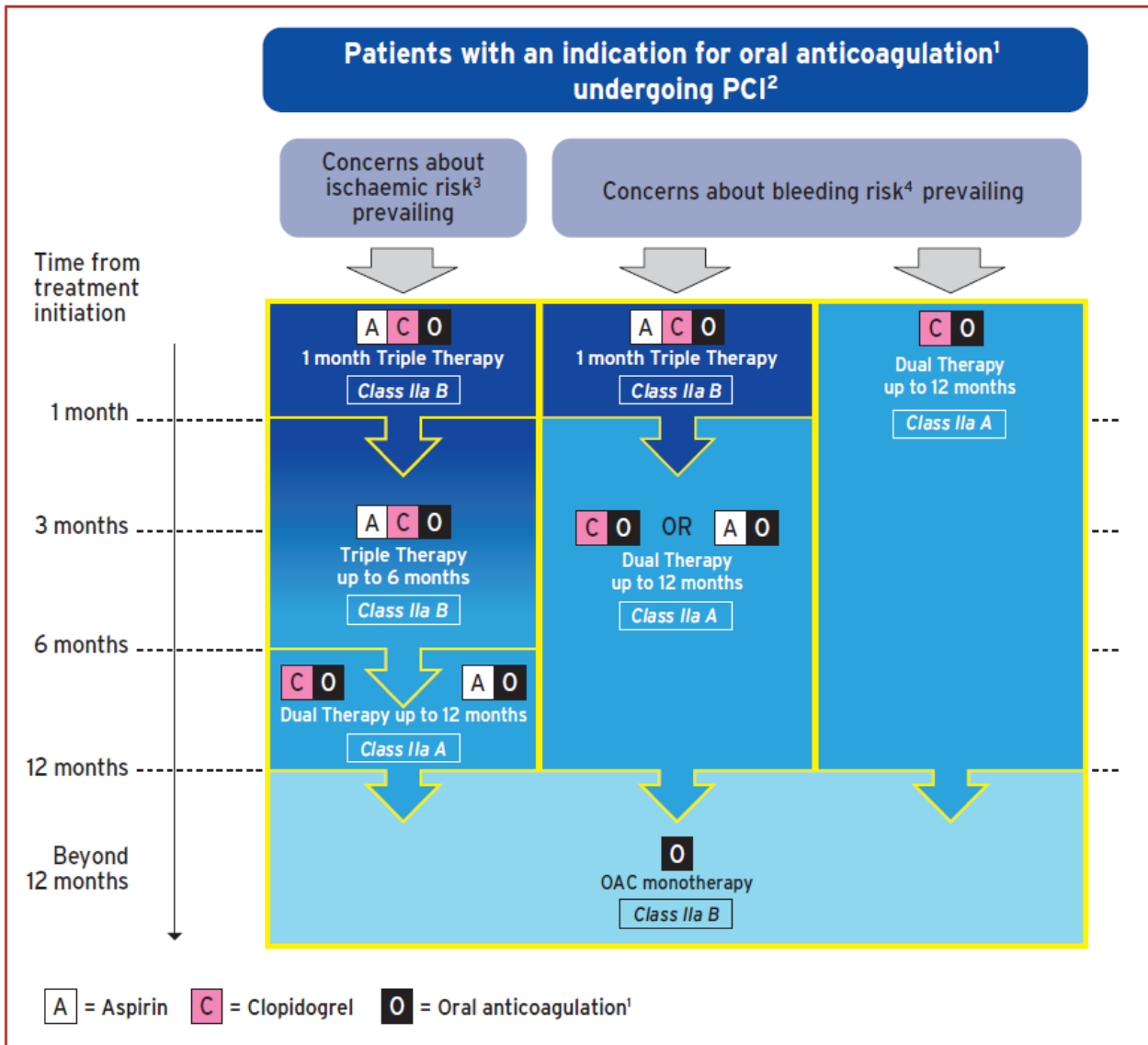
Dual antiplatelet therapy duration in patients with indication for oral anticoagulation (continued)

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 <i>q.d.</i> may be used instead of rivaroxaban 20 mg <i>q.d.</i>	IIb	B
The use of ticagrelor or prasugrel is not recommended as part of triple antithrombotic therapy with aspirin and OAC.	III	C

ANTICOAGULACIÓ ORAL I STENT (ICP)



iCor.cat



Neumann et al. *Eur Heart J.* 2019;40:87-165.



- **Evitar triple terapia (AAS + clopi + sintrom):
1 mes si SCA alt risc**
- **Doble terapia: clopidogrel i ACOD**
- **No associar prasugrel ni ticagrelor a ACO**
- **Després 1 any: ACO, sense antiagregants**



ESC

European Society
of Cardiology

European Heart Journal (2018) 39, 3165–3241
doi:10.1093/eurheartj/ehy340

ESC GUIDELINES

2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy

The Task Force for the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC)

Endorsed by: the International Society of Gender Medicine (IGM), the German Institute of Gender in Medicine (DGesGM), the European Society of Anaesthesiology (ESA), and the European Society of Gynecology (ESG)

Authors/Task Force Members: Vera Regitz-Zagrosek* (Chairperson) (Germany), Jolien W. Roos-Hesselink* (Co-Chairperson) (The Netherlands), Johann Bauersachs (Germany), Carina Blomström-Lundqvist (Sweden), Renata Cífková (Czech Republic), Michele De Bonis (Italy), Bernard Jung (France), Mark Richard Johnson (UK), Ulrich Kintscher (Germany), Peter Kranke¹ (Germany), Irene Marthe Lang (Austria), Joao Morais (Portugal), Petronella G. Pieper (The Netherlands), Patrizia Presbitero (Italy), Susanna Price (UK), Giuseppe M. C. Rosano (UK/Italy), Ute Seeland (Germany), Tommaso Simoncini² (Italy), Lorna Swan (UK), Carole A. Warnes (USA)

Guidelines ESC Embaraç i cardiopatia



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Recommendations	Class ^a	Level ^b
ECG and measurement of troponin levels are recommended when a pregnant woman has chest pain. ^{225,227}	I	C
Primary coronary angioplasty is recommended as the preferred reperfusion therapy for STEMI during pregnancy. ²²⁶	I	C
An invasive management strategy should be considered for NSTEMI-ACS with high risk criteria. ²²⁶	IIa	C
Conservative management should be considered for stable NSTEMI-ACS with low risk criteria.	IIa	C
Follow-up should be considered over at least the next 3 months.	IIa	C
Breastfeeding is not recommended in mothers who take antiplatelet agents other than low-dose aspirin due to a lack of data (see section 12).	III	C

- IV definició IAM: Dany miocàrdic
- Antiagregació complexe
- Antiagregació SCASEST: AAS +
Ticagrelor (si risc hemorràgic no elevat)
- FA i antiagregació: Clopidogrel i ACOD



....Moltes gràcies per l'atenció