abidi Cardio Thrombosis

Arrhythmia Center Since 2000

Anticoagulant and Antiplatelet Therapy

Saeed Oraii, MD Cardiologist,

Interventional Electrophysiologist,

Tehran Arrhythmia Center

Shiraz 1401

Case 1

NOAC in
AF + CAD

Medical History

74 years old man

Hypertensive
Cigarette smoker
Paroxysmal AF

Admitted to CCU with NSTEMI
Underwent successful PCI of a bifurcation lesion in LAD with stenting of both LAD & diagonal

Case ١

NOAC in
AF + CAD

Medical History

EF 40%, HK in anterior circulation
Moderate MR, Mild TR

CBC NL
Cr 1.7 (CrCl 46 ml/min)
LFT NL

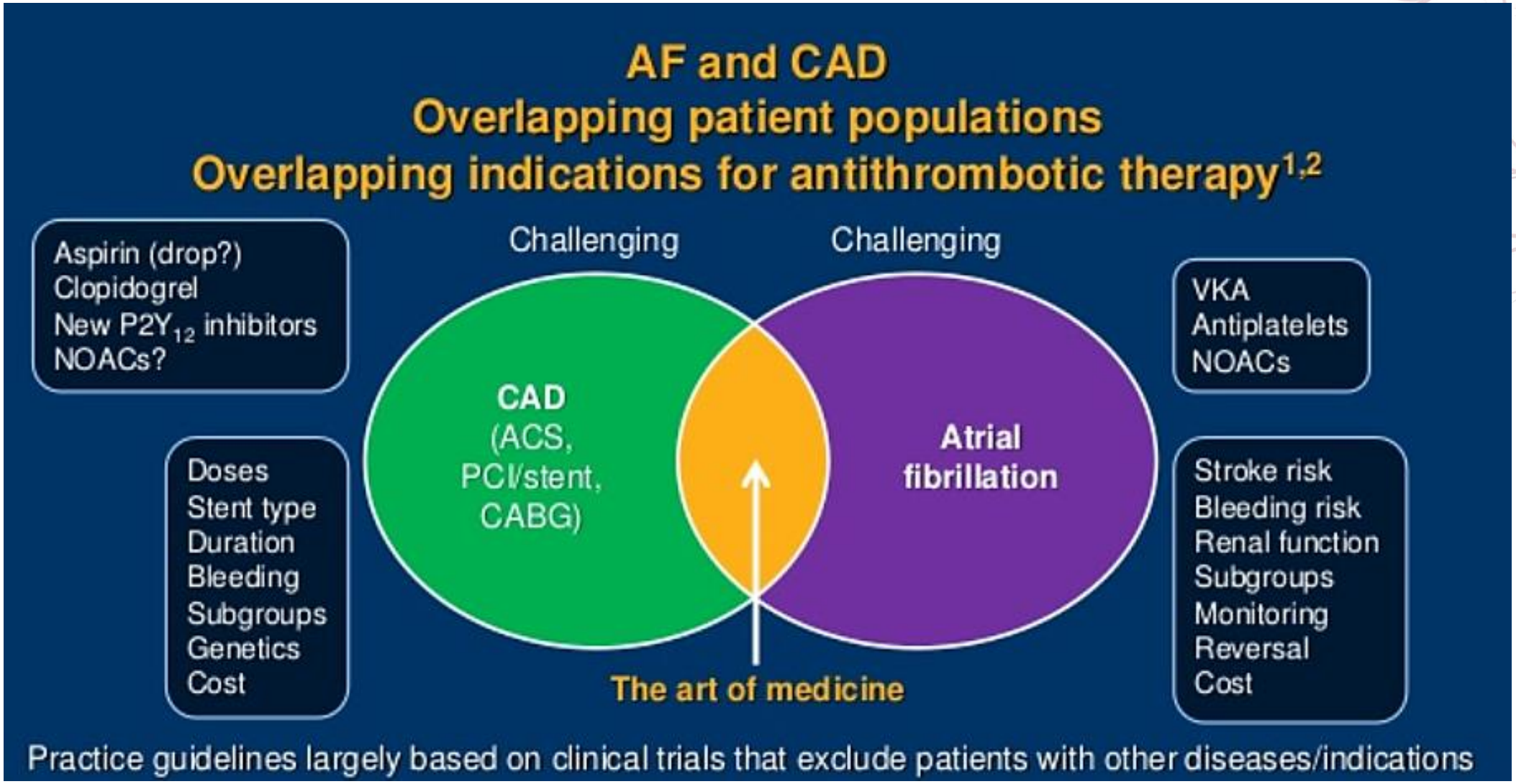
Case ١

NOAC in
AF + CAD

Medical History

How long you will continue triple therapy in this patient with Ticagrelor or Clopidogrel?

- **1 month for both drugs**
- **1 week for both drugs**
- **1 week with ticagrelor and 1 month with clopidogrel**
- **Ticagrelor is contraindicated in this setting and the only choice is clopidogrel for 1 week to 1 month**



1. Euro Heart J. 2016; 37:2893-2962.
2. Euro Heart J. 2013;34:2949-3003.

Anticoagulant and Antiplatelet Therapy

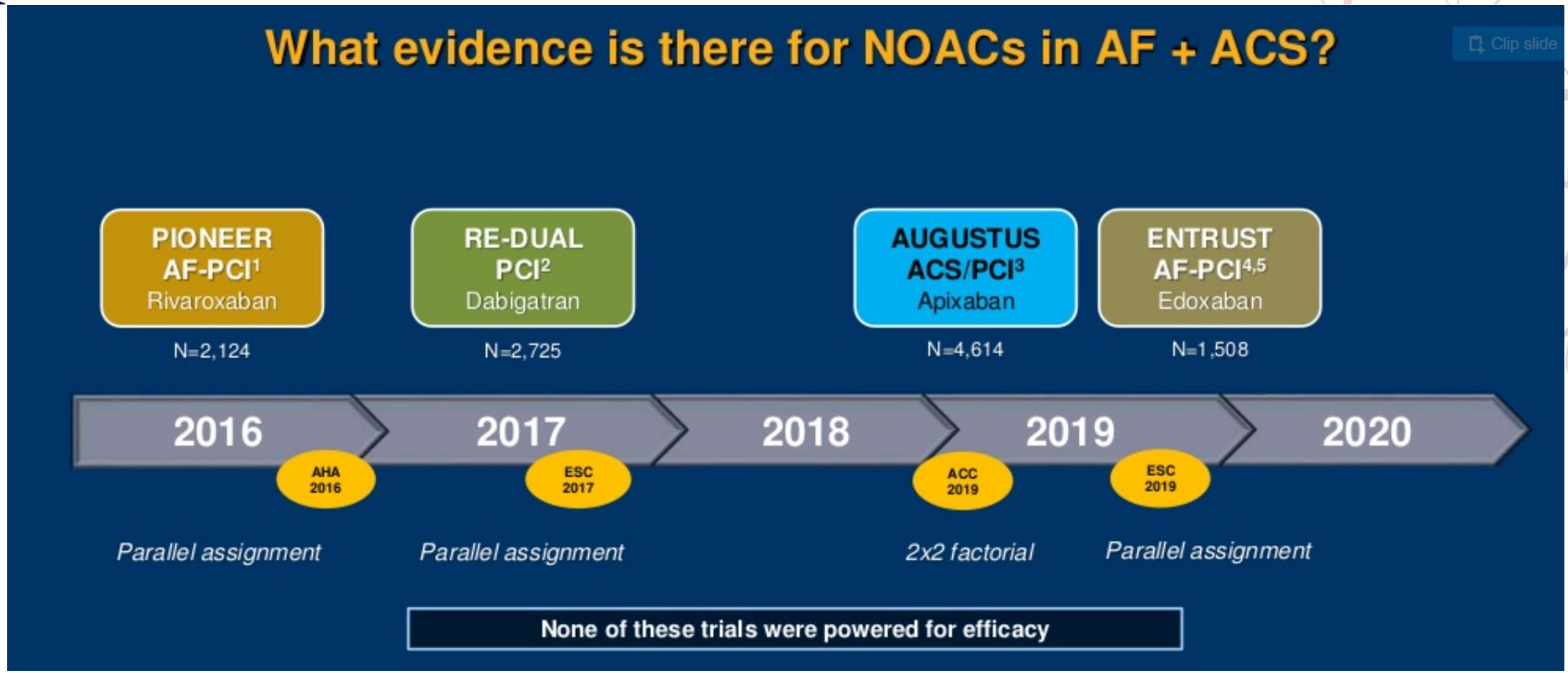
CAD is a common comorbidity in patients with AF, occurring in roughly **25% to 35%** of this population.

Approximately **10%** of patients with recent PCI have concomitant AF. Others may have concomitant VTE. Choosing the optimal antithrombotic regimen can be a challenge.

The addition of single APT to an OAC increases the risk of bleeding **≥ 20% to 60%** and the addition of DAPT to an OAC further increases the risk 2- to 3-fold.

The risk of major bleeding with triple antithrombotic therapy can be as high as 2.2% at 1 month and 4% to 12% at 1 year. Major bleeding is associated with an up to **5-fold increased risk of death** following an ACS.

2020 ACC



1. N Engl J Med. 2016; 375:2423-2434.
2. N Engl J Med. 2017;377: 1513-1524
3. N Engl J Med. 2019; 380: 1509-1524.
4. Am Heart J. 2018; 196:105-112.
5. Available at:clinicaltrials.gov/ct2/show/NCT02866175.

What's his CHA_2DS_2-VASc Score?

- 0
- 1
- 2
- 3
- 4

Risk Index	Score
Congestive heart failure	1
Hypertension	1
Age >75	2
Diabetes mellitus	1
prior Stroke or TIA	2
Vascular disease	1
Age 65-74	1
Sex category (female)	1

What's his bleeding risk?

HAS-BLED score

- 0
- 1
- 2
- 3
- 4

Letter	Clinical characteristic*	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age > 65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

*Hypertension is defined as systolic blood pressure > 160 mmHg.

Thrombotic vs. Bleeding Risk Factors

THROMBOTIC RISK FACTORS

- Diabetes mellitus requiring therapy
- Prior ACS/recurrent myocardial infarction
- Multivessel CAD
- Concomitant PAD
- Premature CAD (occurring at age of <45 y) or accelerated CAD (new lesion within 2 years)
- CKD (eGFR <60 mL/min)
- Clinical presentation (ACS)
- Multivessel stenting
- Complex revascularisation (left main stenting, bifurcation lesion stenting, chronic total occlusion intervention, last patent vessel stenting)
- Prior stent thrombosis on antiplatelet treatment
- Procedural factors (stent expansion, residual dissection, stent length, etc.)

BLEEDING RISK FACTORS

- Hypertension
- Abnormal renal or liver function
- Stroke or ICH history
- Bleeding history or bleeding diathesis (e.g., anaemia with haemoglobin <110 g/L)
- Labile INR (if on VKA)
- Elderly (>65 years)
- Drugs (concomitant OAC and antiplatelet therapy, NSAIDs), excessive alcohol consumption

STRATEGIES TO REDUCE BLEEDING ASSOCIATED WITH PCI

- Radial artery access
- PPIs in patients taking DAPT who are at increased risk of bleeding (e.g., the elderly, dyspepsia, gastro-oesophageal reflux disease, Helicobacter pylori infection, chronic alcohol use)
- Non–administration of unfractionated heparin in patients on VKA with INR >2.5
- Pre-treatment with aspirin only, add a $P2Y_{12}$ inhibitor when coronary anatomy is known or if STEMI
- GP IIb/IIIa inhibitors only for bailout or periprocedural complications
- Shorter duration of combined antithrombotic therapy

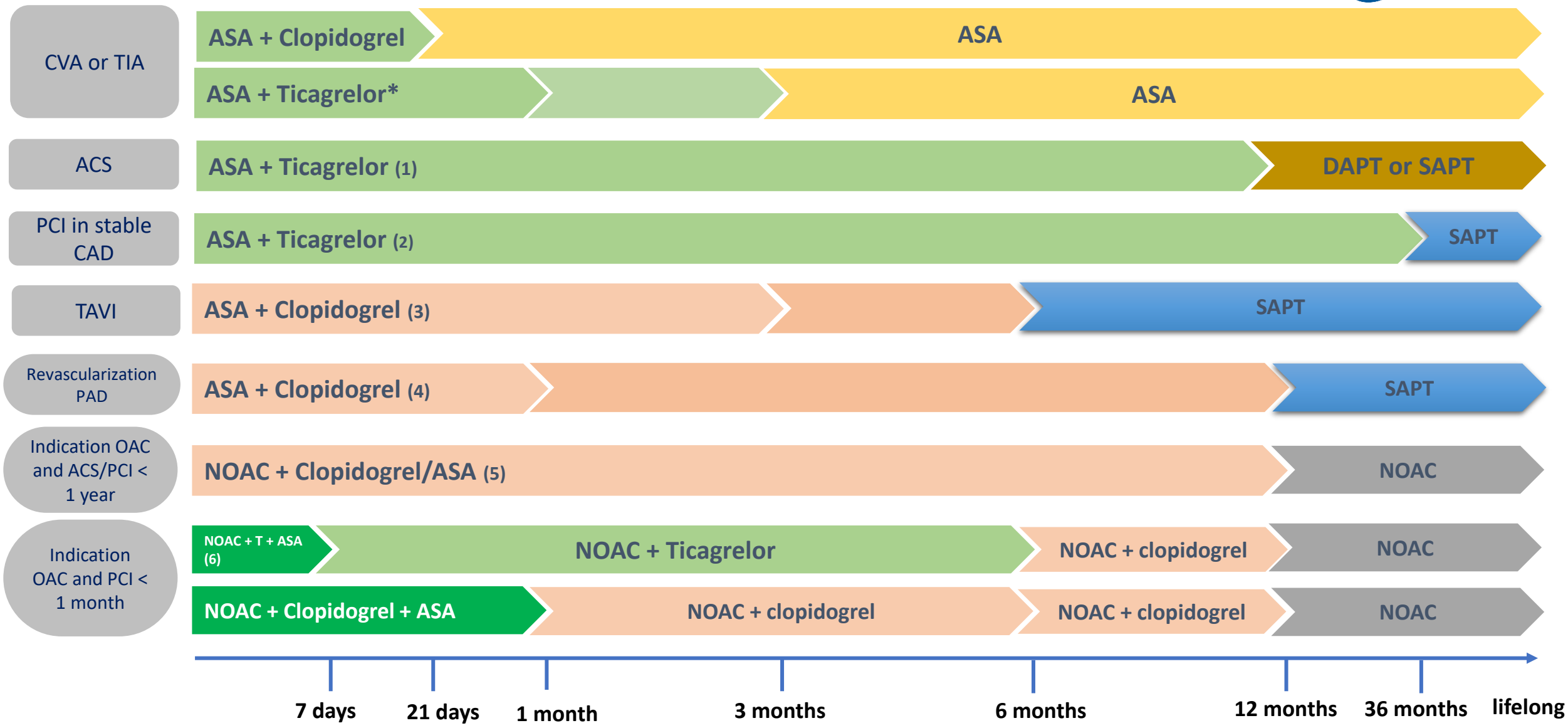
Anticoagulant and Antiplatelet Therapy

In general, the use of "Triple Therapy" (dual antiplatelet therapy plus anticoagulation) is not recommended for most patients due to an increased risk of bleeding.

If triple therapy is needed, a short duration (e.g., no more than 30 days) is recommended. et agent for most patients.

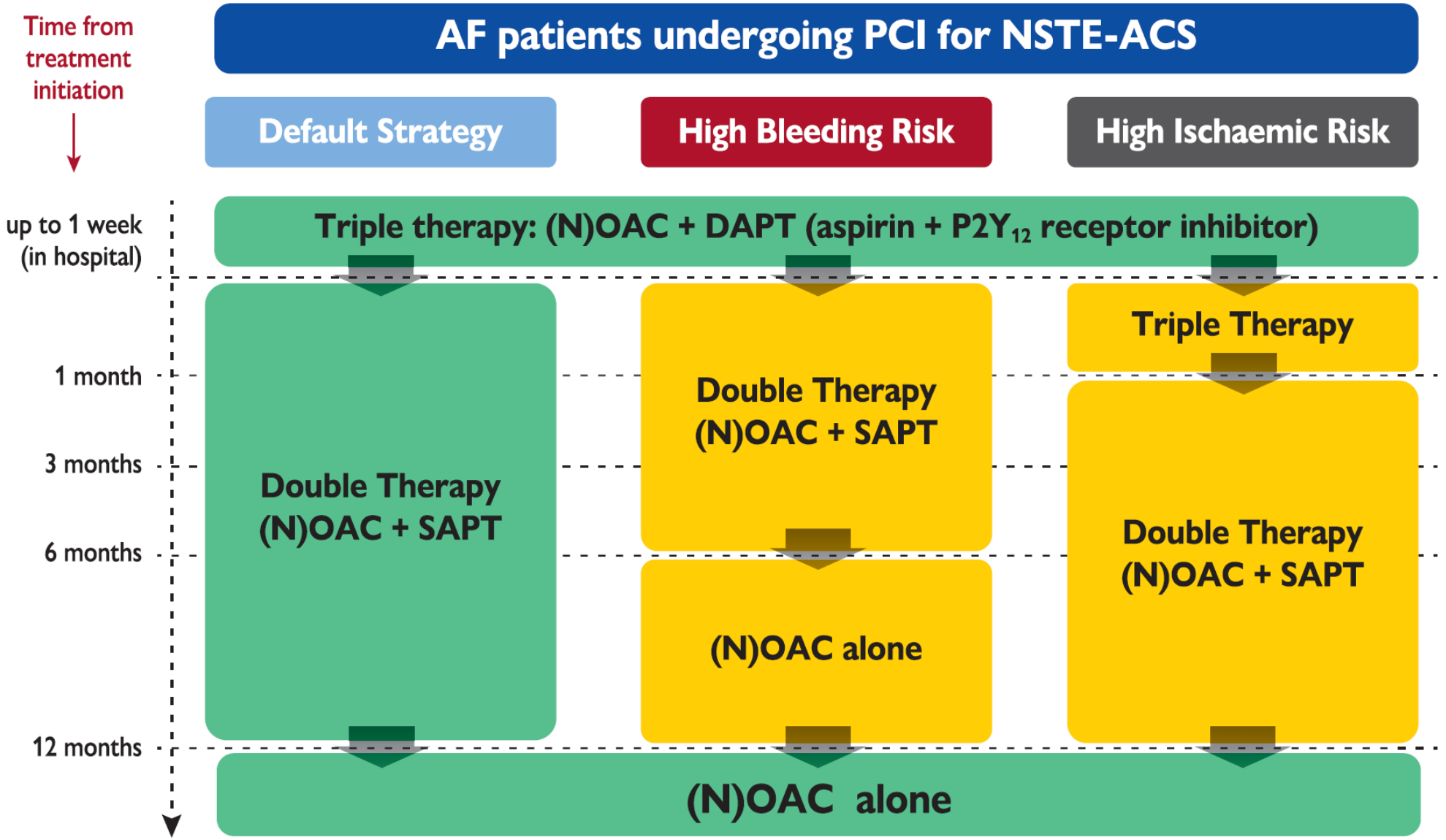
In patients with ACS undergoing PCI, it is reasonable to use Ticagrelor or Prasugrel in preference to Clopidogrel to reduce ischemic events.
However, when combined with an anticoagulant, Clopidogrel is the recommended antiplatelet agent for most patients.

J Am Coll Cardiol. 2021 Feb 9;77(5):629-658.

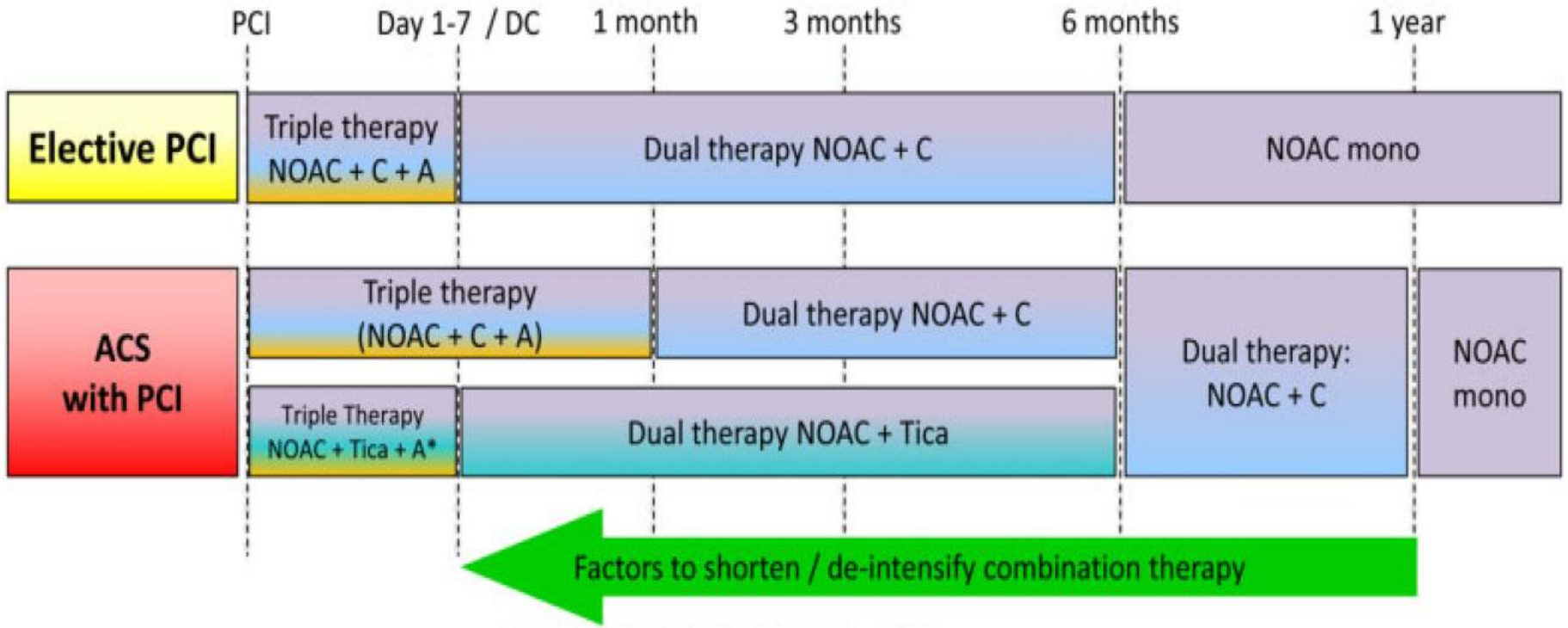


2020 ACC Expert Consensus Decision Pathway

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association of Cardio-Thoracic Surgery (EACTS)



2021 European Heart Rhythm Association Practical Guide on the Use of Non-Vitamin K Antagonist Oral Anticoagulants in Patients with Atrial Fibrillation



- (Uncorrectable) high bleeding risk
- Low atherothrombotic risk (by REACH or SYNTAX score if elective; GRACE < 140 if ACS)

Factors to lengthen / intensify combination therapy

- High atherothrombotic risk (scores as above; stenting of left main, proximal LAD, proximal bifurcation; recurrent MIs; stent thrombosis etc.) and low bleeding risk

Case 1

NOAC in
AF + CAD

Medical History

What is your preferred regimen in this patient after 1 week of triple therapy with Ticagrelor?

- Apixaban 5mg BID + Ticagrelor 90mg BID + Pantoprazole 40mg QD
- Apixaban 5mg BID + Clopidogrel 75mg QD + Pantoprazole 40mg QD
- Rivaroxaban 20mg QD + Clopidogrel 75mg QD
- Rivaroxaban 15mg QD + Ticagrelor 90mg BID
- Rivaroxaban 10mg QD + Clopidogrel 75mg QD + Pantoprazole 40mg QD

Case ١

NOAC in AF + CAD

NOAC dosing in AF patients post-ACS/PCI

	Standard dose	Comments/dose reduction
Apixaban	5 mg BID	Dose reduction as for SPAF
Rivaroxaban	15 mg QD	Dose reduction to 10 mg QD if CrCl 30–49 mL/min
Dabigatran	150 mg BID or 110 mg BID	110mg as for SPAF
Edoxaban	60 mg QD	Dose reduction as for SPAF

EHRA 2021

How to reduce GI bleeding risk?

Starting or continuing a Proton Pump Inhibitor

and

Avoiding other anti-inflammatory medications

Should be employed For patients taking **≥2 antithrombotic agents** to reduce gastrointestinal bleeding risk.

J Am Coll Cardiol. 2021 Feb 9;77(5):629-658.

abidi Cardio Thrombosis

Arrhythmia Center Since 2000

Grey Zones in NOAC prescription

IR-0522-XLR-6661-SP

Case 2

NOAC eligibility: RHD

Medical History

42 years old lady

Known case of rheumatic heart disease

Admitted to CCU with complaint of sudden onset palpitation since 5 hours ago.

Case 2

NOAC eligibility: RHD

Medical History

LD & Fefol QD

AF rhythm with RVR in ECG
Weight 65 Kg
BP 120/80 mmHg

EF 55%
Thick & dome-shape MV (rheumatic changes) with moderate to severe stenosis (MVA 1.5 cm2)
No visible clot

Case 2

NOAC eligibility: RHD

The patient lives in a far away village without laboratory facilities. What is your recommendation regarding the stroke prevention strategy in this patient?

- **No OAC is indicated due to low CHA_2DS_2-VASc Score (1)**
- **ASA + clopidogrel**
- **Warfarin with TTR > 70%**
- **Apixaban 5mg BID**

Rheumatic Mitral Stenosis

Condition	Eligibility for NOAC therapy
Mechanical prosthetic valve	Contraindicated
Moderate to severe mitral stenosis (usually of rheumatic origin)	Contraindicated
Mild to moderate other native valvular disease (e.g., mild-moderate aortic stenosis or regurgitation, degenerative mitral regurgitation etc.)	Included in NOAC trials
Severe aortic stenosis	Limited data (excluded in RE-LY) Most will undergo intervention
Bioprosthetic valve (after > 3 months post operatively)	Not advised if for rheumatic mitral stenosis
	Acceptable if for degenerative mitral regurgitation or in the aortic position
Mitral valve repair (after > 3 months post operatively)	Some patients included in some NOAC trials
PTAV and TAVI	No prospective data yet May require combination with single or dual antiplatelet therapy
Hypertrophic cardiomyopathy	Few data, but patients may be eligible for NOACs

2018

Rheumatic Mitral Stenosis

Condition	Eligibility for NOAC	Comment
Mechanical prosthetic valve	Contraindicated	Excluded from pivotal RCTs Data indicating worse outcome[15,16]
Moderate to severe mitral stenosis (usually rheumatic)	Contraindicated	Excluded from pivotal RCTs Little rationale for less efficacy and safety vs. VKA
Other mild to moderate valvular disease (e.g. degenerative aortic stenosis, mitral regurgitation etc.) Bioprosthetic valve/valve repair (after >3 months postoperative)	Included in NOAC trials Acceptable	Data regarding efficacy and safety overall consistent with patients without valvular heart disease[12,17–22] Some data from NOAC RCTs Single RCT indicating non-inferiority to VKA[24] Patients without AF usually on ASA after 3–6 months post-surgery, hence NOAC therapy acceptable for stroke prevention if diagnosed with AF
Severe aortic stenosis	Limited data (excluded in RE-LY)	No pathophysiological rationale for less efficacy and safety Most will undergo intervention
Transcatheter aortic valve implantation	Acceptable	Single RCT + observational data May require combination with APT[25,26]
Percutaneous transluminal aortic valvuloplasty	With caution	No prospective data May require combination with APT
Hypertrophic cardiomyopathy	Acceptable	No rational for less efficacy and safety vs. VKA Observational data positive for NOACs[33–36]

2021

Case 2

NOAC eligibility: RHD

The patient lives in a far away village without laboratory facilities. What is your recommendation regarding the stroke prevention strategy in this patient?

- **No OAC is indicated due to low CHA_2DS_2-VASc Score (1)**
- **ASA + clopidogrel**
- **Warfarin with TTR > 70%**
- **Apixaban 5mg BID**

Case 3

NOAC eligibility:

LV Clot

Medical History

63 years old man

Cigarette smoker
Opium abuser
Anterior STEMI with successful primary PCI for LAD (40 days ago)

Referred due to finding of an immobile LV apical clot in TTE performed for decision regarding the need for ICD implantation

Case 3

NOAC eligibility:

LV Clot

Medical History

ASA 80mg QD
Ticagrelor 90mg BID
Rosuvastatin 20mg QD
Bisoprolol 2.5 mg QD
Losartan 12.5mg BID
Pantoprazole 40mg QD

Normal sinus rhythm

EF 30%
Apical aneurysm formation with a fresh mid-size and immobile apical clot

Left Ventricular Thrombus

The incidence of LV thrombi in the pre-reperfusion era was reported to be as high as **40 percent** in patients with anterior infarction.

Data are more limited on the incidence of LV thrombus in the reperfusion era. In two series of STEMI patients treated with primary PCI, the incidence of LV thrombus was about **4 percent**.

The risk of embolization in patients with a documented LV thrombus who are not treated with anticoagulant therapy has been reported to be **10 to 15 percent**.

UpToDate 2021

Case 3

NOAC eligibility:

LV Clot

What is your recommendation for overall antiplatelet/antithrombotic management in this patient?

- **ASA 80mg QD + ticagrelor 90mg BID + warfarin for 3 months**
- **ASA 80mg QD + ticagrelor 90mg BID + rivaroxaban 15mg QD for 3 months**
- **Ticagrelor 90mg BID + warfarin for 3 months**
- **Ticagrelor 90mg BID + Rivaroxaban 20mg QD for 3 months**

Left Ventricular Thrombus

One observational study suggests that NOACs were associated with a higher incidence of thromboembolic events compared to VKA in (mostly non-AF) patients with a left ventricular thrombus, while others showed a similar rate of thrombus resolution.

VKA should be viewed as standard of care for the treatment of patients with LV thrombus until more data are available.

Case 3

NOAC eligibility:

LV Clot

What is your recommendation for overall antiplatelet/antithrombotic management in this patient?

- **ASA 80mg QD + ticagrelor 90mg BID + warfarin for 3 months**
- **ASA 80mg QD + ticagrelor 90mg BID + rivaroxaban 15mg QD for 3 months**
- **Ticagrelor 90mg BID + warfarin for 3 months**
- **Ticagrelor 90mg BID + Rivaroxaban 20mg QD for 3 months**

Case 4

NOAC eligibility:

Bioprosthetic Valve and AF

Medical History

۴7 years old lady

Permanent AF
Severe rhematic MS & severe MR
Underwent MVR with bioprosthetic valve

Cardiology consultation after surgery regarding the possibility of prescribing NOAC in the patient

Case 4

NOAC eligibility:

Bioprosthetic Valve and AF

Medical History

ASA 80mg QD

UFH infusion 1100 IU/h

Bisoprolol 2.5 mg BID

Furosemide 20mg BID

Losartan 12.5 mg QD

EF 45%, NL bioprosthesis findings

Case 5

NOAC eligibility:

Bioprosthetic Valve and AF

What would be your recommendation?

- **ASA 80mg QD + warfarin**
- **Warfarin for 3 months, then NOAC**
- **Just NOAC**

Rheumatic Mitral Stenosis

Arrhythmia Center Since 2000

2021

Condition	Eligibility for NOAC	Comment
Mechanical prosthetic valve	Contraindicated	Excluded from pivotal RCTs Data indicating worse outcome[15,16]
Moderate to severe mitral stenosis (usually rheumatic)	Contraindicated	Excluded from pivotal RCTs Little rationale for less efficacy and safety vs. VKA
Other mild to moderate valvular disease (e.g. degenerative aortic stenosis, mitral regurgitation etc.)	Included in NOAC trials	Data regarding efficacy and safety overall consistent with patients without valvular heart disease[12,17–22]
Bioprosthetic valve/valve repair (after >3 months postoperative)	Acceptable	Some data from NOAC RCTs Single RCT indicating non-inferiority to VKA[24] Patients without AF usually on ASA after 3–6 months post-surgery, hence NOAC therapy acceptable for stroke prevention if diagnosed with AF
Severe aortic stenosis	Limited data (excluded in RE-LY)	No pathophysiological rationale for less efficacy and safety Most will undergo intervention
Transcatheter aortic valve implantation	Acceptable	Single RCT + observational data May require combination with APT[25,26]
Percutaneous transluminal aortic valvuloplasty	With caution	No prospective data May require combination with APT
Hypertrophic cardiomyopathy	Acceptable	No rational for less efficacy and safety vs. VKA Observational data positive for NOACs[33–36]

abidi Cardio Thrombosis

Rheumatic Mitral Stenosis

Condition	Eligibility for NOAC therapy
Mechanical prosthetic valve	Contraindicated
Moderate to severe mitral stenosis (usually of rheumatic origin)	Contraindicated
Mild to moderate other native valvular disease (e.g., mild-moderate aortic stenosis or regurgitation, degenerative mitral regurgitation etc.)	Included in NOAC trials
Severe aortic stenosis	Limited data (excluded in RE-LY) Most will undergo intervention
Bioprosthetic valve (after > 3 months post operatively)	Not advised if for rheumatic mitral stenosis Acceptable if for degenerative mitral regurgitation or in the aortic position
Mitral valve repair (after > 3 months post operatively)	Some patients included in some NOAC trials
PTAV and TAVI	No prospective data yet May require combination with single or dual antiplatelet therapy
Hypertrophic cardiomyopathy	Few data, but patients may be eligible for NOACs

2018

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Rivaroxaban in Patients with Atrial Fibrillation and a Bioprosthetic Mitral Valve

H.P. Guimarães, R.D. Lopes, P.G.M. de Barros e Silva, I.L. Liporace, R.O. Sampaio, F. Tarasoutchi, C.R. Hoffmann-Filho, R. de Lemos Soares Patriota, T.L.L. Leiria, D. Lamprea, D.B. Precoma, F.A. Atik, F.S. Silveira, F.R. Farias, D.O. Barreto, A.P. Almeida, A.C. Zilli, J.D. de Souza Neto, M.A. Cavalcante, F.A.M.S. Figueira, F.C.S. Kojima, L. Damiani, R.H.N. Santos, N. Valeis, V.B. Campos, J.F.K. Saraiva, F.H. Fonseca, I.M. Pinto, C.C. Magalhães, J.F.M. Ferreira, J.H. Alexander, R. Pavanello, A.B. Cavalcanti, and O. Berwanger, for the RIVER Trial Investigators*

In patients with atrial fibrillation and a bioprosthetic mitral valve, rivaroxaban was noninferior to warfarin with respect to the mean time until the primary outcome of death, major cardiovascular events, or major bleeding at 12 months.

N Engl J Med 2020; 383:2117-2126

Case 5

NOAC eligibility:

Bioprosthetic Valve and AF

What would be your recommendation?

- **ASA 80mg QD + warfarin**
- **Warfarin for 3 months, then NOAC**
- **Just NOAC**

abidi Cardio Thrombosis

Arrhythmia Center Since 2000

NOAC and Surgery

Case 5

Surgery in AF patients

Medical History

65 years old gentleman

Paroxysmal AF
TIA 4 months ago
Scheduled for ESWL

Apixaban 5mg BD

Case 5

Surgery in AF patients

Medical History

EF 55%
Mild MR, Mild TR

CBC : NL
Cr 2.0 (CrCl 39 ml/min)
LFT NL

Case 5

Surgery in AF patients

What is your recommendation regarding the timing of holding NOAC and possible bridging therapy before surgery?

- **Hold apixaban at least 48h before surgery w/o bridging therapy**
- **Hold apixaban at least 48h before surgery and start bridging therapy**
- **Hold apixaban at least 72h before surgery and start bridging therapy**
- **Hold apixaban at least 96h before surgery and start bridging therapy**

Case 5

Surgery in AF patients

Classification of elective surgical interventions according to bleeding risk

Minor risk interventions (i.e. infrequent bleeding and with low clinical impact)
Dental extractions (1–3 teeth), paradental surgery, implant positioning, subgingival scaling/cleaning
Cataract or glaucoma intervention
Endoscopy without biopsy or resection
Superficial surgery (e.g. abscess incision; small dermatologic excisions, skin biopsy)
Pacemaker or ICD implantation (except complex procedures)
Electrophysiological study or catheter ablation (except complex procedures)
Routine elective coronary/peripheral artery intervention (except complex procedures)
Intramuscular injection (e.g. vaccination)
Low-risk interventions (i.e. infrequent bleeding or with non-severe clinical impact)
Complex dental procedures
Endoscopy with simple biopsy
Small orthopedic surgery (foot, hand, arthroscopy, …)

Case 5

Surgery in AF patients

Classification of elective surgical interventions according to bleeding risk

High-risk interventions (i.e. frequent bleeding and/or with important clinical impact)
Cardiac surgery
Peripheral arterial revascularization surgery (e.g. aortic aneurysm repair, vascular bypass)
Complex invasive cardiological interventions, including lead extraction, (epicardial) VT ablation, chronic total occlusion PCI etc.
Neurosurgery
Spinal or epidural anesthesia; lumbar diagnostic puncture
Complex endoscopy (e.g. multiple/large polypectomy, ERCP with sphincterotomy etc.)
Abdominal surgery (incl. liver biopsy)
Thoracic surgery
Major urologic surgery/biopsy (incl. kidney)
Extracorporeal shockwave lithotripsy
Major orthopedic surgery

Case 5

Surgery in AF patients

Timing of last NOAC intake before an elective intervention

	Dabigatran		Apixaban - Edoxaban - Rivaroxaban	
No perioperative bridging with LMWH / UFH				
Minor risk procedures: - Perform procedure at NOAC trough level (i.e., 12 h / 24 h after last intake). - Resume same day or latest next day.				
	Low risk	**High risk**	**Low risk**	**High risk**
CrCl ≥80 ml/min	≥ 24 h	≥ 48 h	≥ 24 h	≥ 48 h
CrCl 50-79 ml/min	**≥ 36 h**	**≥ 72 h**		
CrCl 30-49 ml/min	**≥ 48 h**	**≥ 96 h**		
CrCl 15-29 ml/min	Not indicated	Not indicated	**≥ 36 h**	
CrCl <15 ml/min	No official indication for use			

Important:

- Timing of interruption may require adaptation based on individual patient characteristics (Fig. 13)
- In patients / situations with risk of NOAC accumulation (renal insufficiency, older age, concomitant medication, see Fig. 6) pausing the NOAC 12-24 hours earlier may be considered.[207,208]
- Resume full dose of NOAC 24h after low-risk- and 48 (-72) h after high-risk interventions

Heparin Bridging

Pre-operative bridging with heparin is not recommended in NOAC-treated patients since the predictable waning of the anticoagulation effect allows for properly timed short-term cessation of NOAC therapy before surgery.

The very few very high-risk situations in which bridging may be discussed include urgent surgery with a high bleeding risk in patients with a recent (≤3 months) thromboembolic event (including stroke, systemic embolism or venous thrombosis/pulmonary embolism) or who suffered an event during previous adequate interruption of NOAC therapy.

In these instances, in addition to 'timed' NOAC interruption, switching to UFH or low-dose dabigatran—both with the possibility of rapid reversal—around the operation may be evaluated.

2021 EHRA Practical Guide on the Use of NOACs in Patients with Atrial Fibrillation

Case 5

Surgery in AF patients

What is your recommendation regarding the timing of holding NOAC and possible bridging therapy before surgery?

- **Hold apixaban at least 48h before surgery w/o bridging therapy**
- **Hold apixaban at least 48h before surgery and start bridging therapy**
- **Hold apixaban at least 72h before surgery and start bridging therapy**
- **Hold apixaban at least 96h before surgery and start bridging therapy**

Case 6

NOAC eligibility:

TAVI

Medical History

88 years old man

HTN
Known case of severe AS & porcelain aorta
TAVI procedure 1 months ago

In routine post-procedure visit at clinic, de novo AF rhythm was detected.

Case 6

NOAC eligibility:

TAVI

Medical History

ASA 80mg QD
Plavix 75mg QD
Pantoprazole 40mg QD
Valsartan 80mg QD

AF rhythm in ECG
Weight 78 Kg
BP 165/115 mmHg

CBC NL
Cr 1.3 (CrCl 43 ml/min)
LFT NL

Case 6

NOAC eligibility:

TAVI

What is your recommendation regarding stroke prevention strategy in this patient?

- **Apixaban 5mg BID + clopidogrel 75mg QD**
- **Warfarin with TTR > 70%**
- **Apixaban 5mg BID**
- **Clopidogrel monotherapy due to high bleeding risk (HAS-BLED 3)**

The optimal antithrombotic strategy for patients undergoing TAVI

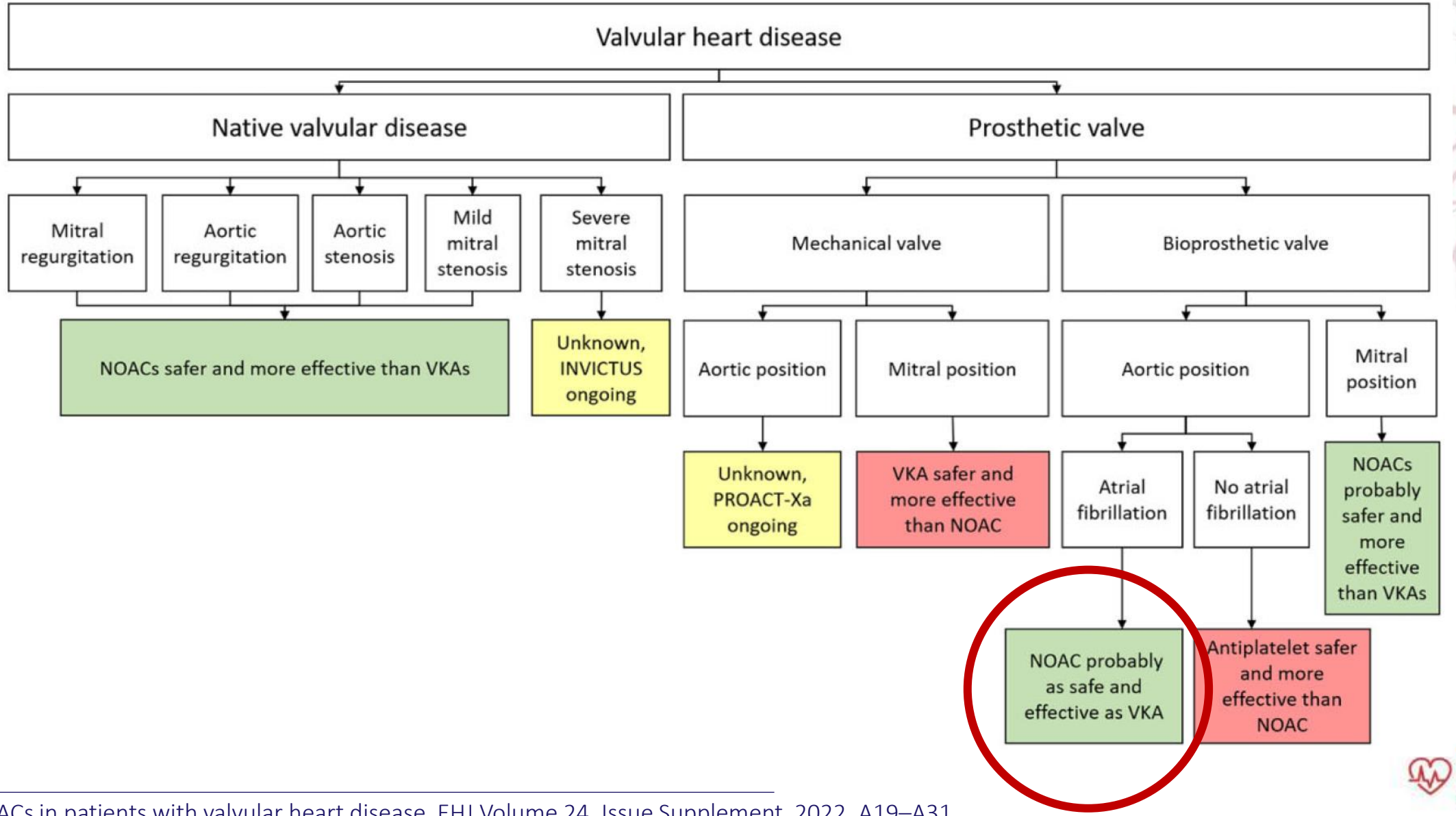
- ACC/AHA guidelines recommend against the routine use of Rivaroxaban, in particular, to prevent subclinical valve thrombosis (Class III, LOE B), and specifically recommend VKAs in patients who develop valve thrombosis (Class IIa, LOE B).

- For patients with an indication for OAC, lifelong OAC is recommended (Class I, LOE B) with no preference expressed for NOAC or VKA, consistent with the results of ENVISAGE-TAVI AF and ATLANTIS stratum.

2021 ESC/EACTS Guidelines for the management of valvular heart disease

2020 ACC/AHA guideline for the management of patients with valvular heart disease

NOACs in Patients with VHD



NOACs in patients with valvular heart disease. EHJ Volume 24, Issue Supplement, 2022, A19–A31

Case 6

NOAC eligibility:

TAVI

What is your recommendation regarding stroke prevention strategy in this patient?

- **Apixaban 5mg BID + clopidogrel 75mg QD**
- **Warfarin with TTR > 70%**
- **Apixaban 5mg BID**
- **Clopidogrel monotherapy due to high bleeding risk (HAS-BLED 3)**

Thank you

Cardio Thrombosis