

SCA ST+, quoi de neuf dans les nouvelles recommandations ESC 2017

Samir Ztot

Fabien Picard

Vendredi 6 Octobre 2017

Questions à l'audience

PRISE EN CHARGE PRE HOSPITALIERE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

A- Un bloc de branche droit de novo associé à une douleur thoracique ne peut faire évoquer un infarctus

B- Le traitement de la douleur par opioïdes est recommandé quasi systématiquement pour diminuer la douleur et améliorer la dyspnée

C- La mise sous oxygène est systématique pour améliorer la perfusion coronaire même en l'absence de désaturation

D- Le patient doit être dirigé vers une salle de cathétérisme coronaire si une reperfusion par angioplastie est réalisable dans les 120 minutes

Questions à l'audience

THROMBOLYSE OU ANGIOPLASTIE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

- A- Le traitement par thrombolyse doit être réalisé dans les 10 minutes du diagnostic de l'infarctus, même en dehors d'un milieu hospitalier
- B- Un traitement par thrombolyse doit être préféré dans la première heure de l'infarctus même si la reperfusion par angioplastie peut être réalisée dans les 120 minutes
- C- Le traitement par thrombolyse doit être réalisé à demi-dose chez les patients de >75 ans
- D- Après succès de thrombolyse, la coronarographie peut être réalisée dès la 2^{ème} heure et jusqu'à 24 heures après.
- E- Après 12 heures d'évolution de l'infarctus, la thrombolyse n'a plus sa place

Questions à l'audience

TRAITEMENTS ANTITHROMBOTIQUES

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

A- L'héparine est l'anticoagulant de référence

B- La bivalirudine doit être utilisée lorsqu'elle est disponible et que le risque hémorragique est important

C- Le cangrelor est une alternative fiable lorsqu'il est disponible et que le patient n'a pas reçu de traitement antiP2Y12 au préalable

D- Les antiGpIIb/IIIa peuvent être utilisés en pré-hospitalier pour diminuer la charge thrombotique lors des infarctus antérieurs étendus mal tolérés

Questions à l'audience

ACCES VASCULAIRE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

- A- La voie radiale doit être préférée car elle diminue le risque hémorragique.
- B- La voie fémorale doit être préférée car elle permet une meilleure rapidité et une technique plus simple pour gagner le plus de temps et donc sauver le plus de muscle viable.
- C- Les voies radiales et fémorales sont équivalentes pourvu qu'elles soient bien réalisées
- D- La technique utilisée doit être celle utilisée dans la pratique quotidienne de l'opérateur

Questions à l'audience

TECHNIQUE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

- A- Après franchissement de l'occlusion, une thromboaspiration permet de diminuer la taille de l'infarctus par diminution des micro-embols et du phénomène de no-reflow
- B- Lors de lésions pluritronculaires, une revascularisation de l'artère non coupable peut être envisagée même en dehors du choc cardiogénique
- C- Un stent nu doit être privilégié chez les patients à risque hémorragique important
- D- Les antiGpIIb/IIIa peuvent être utilisés en pré-hospitalier pour diminuer la charge thrombotique lors des infarctus antérieurs étendus mal tolérés

Questions à l'audience

MINOC

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

- A- Après franchissement de l'occlusion, une thromboaspiration permet de diminuer la taille de l'infarctus par diminution des micro-embols et du phénomène de no-reflow
- B- Lors de lésions pluritronculaires, une revascularisation de l'artère non coupable peut être envisagée même en dehors du choc cardiogénique
- C- Un stent nu doit être privilégié chez les patients à risque hémorragique important
- D- Les antiGpIIb/IIIa peuvent être utilisés en pré-hospitalier pour diminuer la charge thrombotique lors des infarctus antérieurs étendus mal tolérés

Cas clinique n°1

Cas clinique n°2

Questions à l'audience

PRISE EN CHARGE PRE HOSPITALIERE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

A- Un bloc de branche droit de novo associé à une douleur thoracique ne peut faire évoquer un infarctus

B- Le traitement de la douleur par opioïdes est recommandé quasi systématiquement pour diminuer la douleur et améliorer la dyspnée

C- La mise sous oxygène est systématique pour améliorer la perfusion coronaire même en l'absence de désaturation

D- Le patient doit être dirigé vers une salle de cathétérisme coronaire si une reperfusion par angioplastie est réalisable dans les 120 minutes

Questions à l'audience

THROMBOLYSE OU ANGIOPLASTIE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

A- Le traitement par thrombolyse doit être réalisé dans les 10 minutes du diagnostic de l'infarctus, même en dehors d'un milieu hospitalier

B- Un traitement par thrombolyse doit être préféré dans la première heure de l'infarctus même si la reperfusion par angioplastie peut être réalisée dans les 120 minutes

C- Le traitement par thrombolyse doit être réalisé à demi-dose chez les patients de >75 ans

D- Après succès de thrombolyse, la coronarographie peut être réalisée dès la 2^{ème} heure et jusqu'à 24 heures après.

Questions à l'audience

TRAITEMENTS ANTITHROMBOTIQUES

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

A- L'héparine est l'anticoagulant de référence

B- La bivalirudine doit être utilisée lorsqu'elle est disponible et que le risque hémorragique est important

C- Le cangrelor est une alternative fiable lorsqu'il est disponible et que le patient n'a pas reçu de traitement antiP2Y12 au préalable

D- Les antiGpIIb/IIIa peuvent être utilisés en pré-hospitalier pour diminuer la charge thrombotique lors des infarctus antérieurs étendus mal tolérés

Questions à l'audience

ACCES VASCULAIRE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

A- La voie radiale doit être préférée car elle diminue le risque hémorragique.

B- La voie fémorale doit être préférée car elle permet une meilleure rapidité et une technique plus simple pour gagner le plus de temps et donc sauver le plus de muscle viable.

C- Les voies radiales et fémorales sont équivalentes pourvu qu'elles soient bien réalisées.

D- La technique utilisée doit être celle utilisée dans la pratique quotidienne de l'opérateur.

Questions à l'audience

TECHNIQUE

D'après les recommandations ESC, en cas de syndrome coronaire avec sus-décalage du segment ST:

A- Après franchissement de l'occlusion, une thromboaspiration permet de diminuer la taille de l'infarctus par diminution des micro-embols et du phénomène de no-reflow

B- Lors de lésions pluritronculaires, une revascularisation de l'artère non coupable peut être envisagée même en dehors du choc cardiogénique

C- Un stent nu doit être privilégié chez les patients à risque hémorragique important

D- Les antiGpIIb/IIIa peuvent être utilisés en pré-hospitalier pour diminuer la charge thrombotique lors des infarctus antérieurs étendus mal tolérés



ESC

European Heart Journal (2017) **00**, 1–66
European Society of Cardiology doi:10.1093/eurheartj/ehx393

ESC GUIDELINES



ESC

European Society
of Cardiology

2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

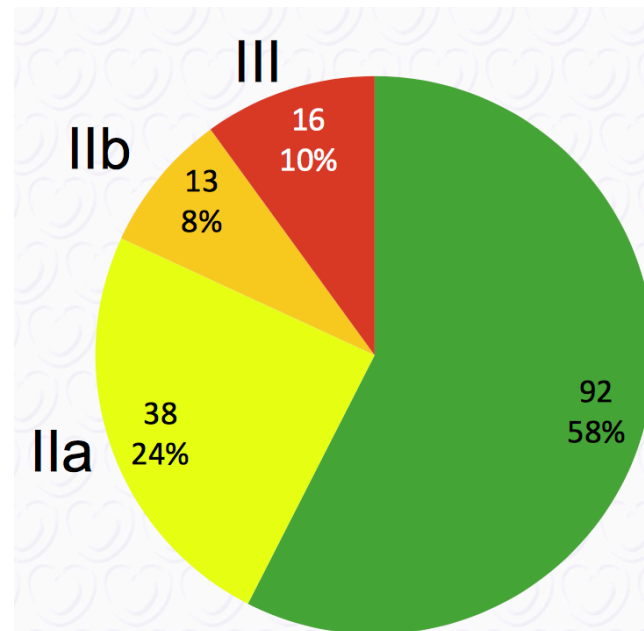
The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC)

Authors/Task Force Members: Borja Ibanez* (Chairperson) (Spain), Stefan James* (Chairperson) (Sweden), Stefan Agewall (Norway), Manuel J. Antunes (Portugal), Chiara Bucciarelli-Ducci (UK), Héctor Bueno (Spain), Alida L. P. Caforio (Italy), Filippo Crea (Italy), John A. Goudevenos (Greece), Sigrun Halvorsen (Norway), Gerhard Hindricks (Germany), Adnan Kastrati (Germany), Mattie J. Lenzen (The Netherlands), Eva Prescott (Denmark), Marco Roffi (Switzerland), Marco Valgimigli (Switzerland), Christoph Varenhorst (Sweden), Pascal Vranckx (Belgium), Petr Widimský (Czech Republic)

Classes de recommandations

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.	
<i>Class IIa</i>	<i>Weight of evidence/opinion is in favour of usefulness/efficacy.</i>	Should be considered
<i>Class IIb</i>	<i>Usefulness/efficacy is less well established by evidence/opinion.</i>	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

159 recommendations



CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

• Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²

• Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

• Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

• Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

• Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

• Use of polypill to increase adherence
FOCUS³²³

• Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Balloon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

- Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

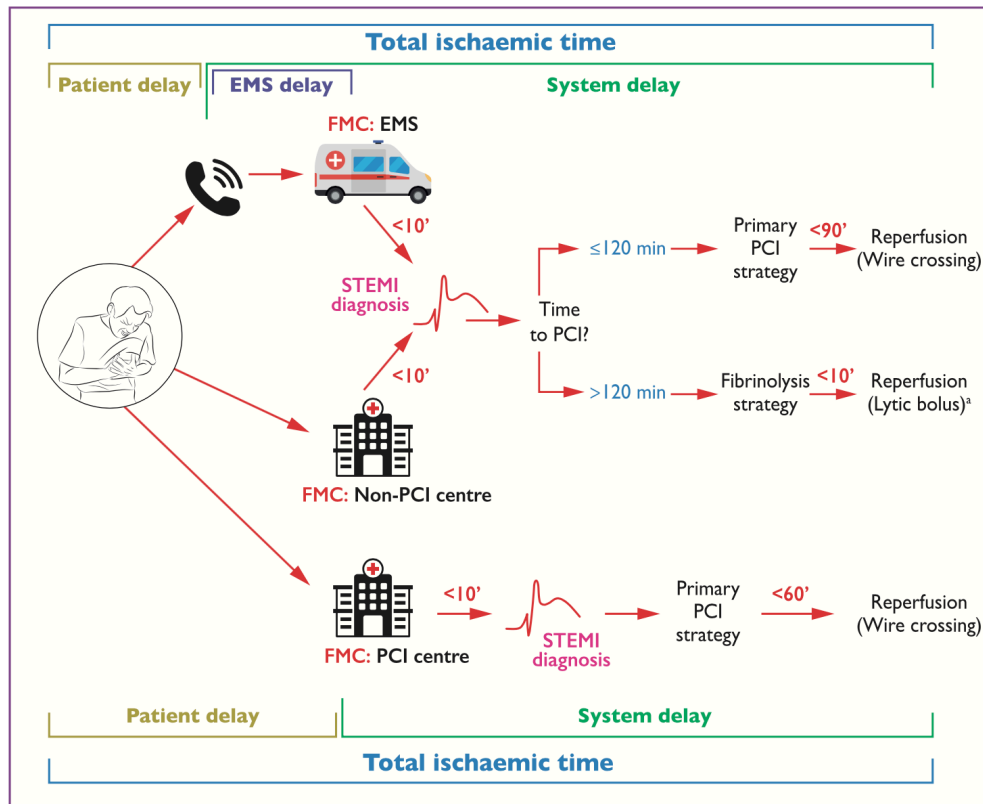
TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

- Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

- Acute and chronic management presented.

Prise en charge en urgence pré-hospitalière



A partir du premier contact médical

- 10 minutes pour le diagnostic
- A partir du diagnostic ECG, décision du type de reperfusion en fonction des délais
- En cas de décision de fibrinolyse, à réaliser dans les 10 minutes

Prise en charge en urgence pré-hospitalière

Bundle branch block

Criteria that can be used to improve the diagnostic accuracy of STEMI in LBBB⁵⁰:

- Concordant ST-segment elevation ≥ 1 mm in leads with a positive QRS complex
- Concordant ST-segment depression ≥ 1 mm in V_1-V_3
- Discordant ST-segment elevation ≥ 5 mm in leads with a negative QRS complex

The presence of RBBB may confound the diagnosis of STEMI

Ventricular paced rhythm

During RV pacing, the ECG also shows LBBB and the above rules also apply for the diagnosis of myocardial infarction during pacing; however, they are less specific

Isolated posterior myocardial infarction

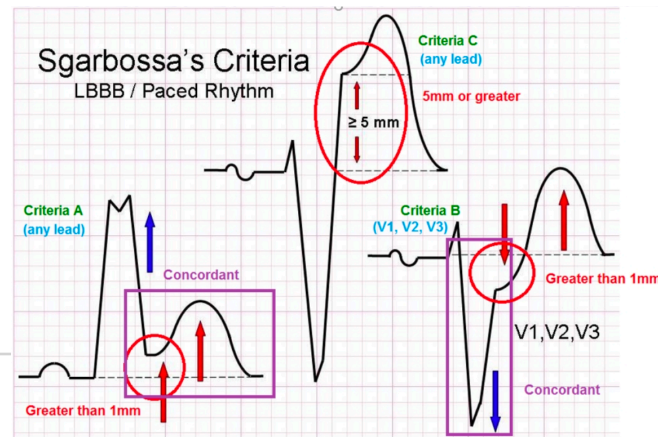
Isolated ST depression ≥ 0.5 mm in leads V_1-V_3 and ST-segment elevation (≥ 0.5 mm) in posterior chest wall leads V_7-V_9

Ischaemia due to left main coronary artery occlusion or multivessel disease

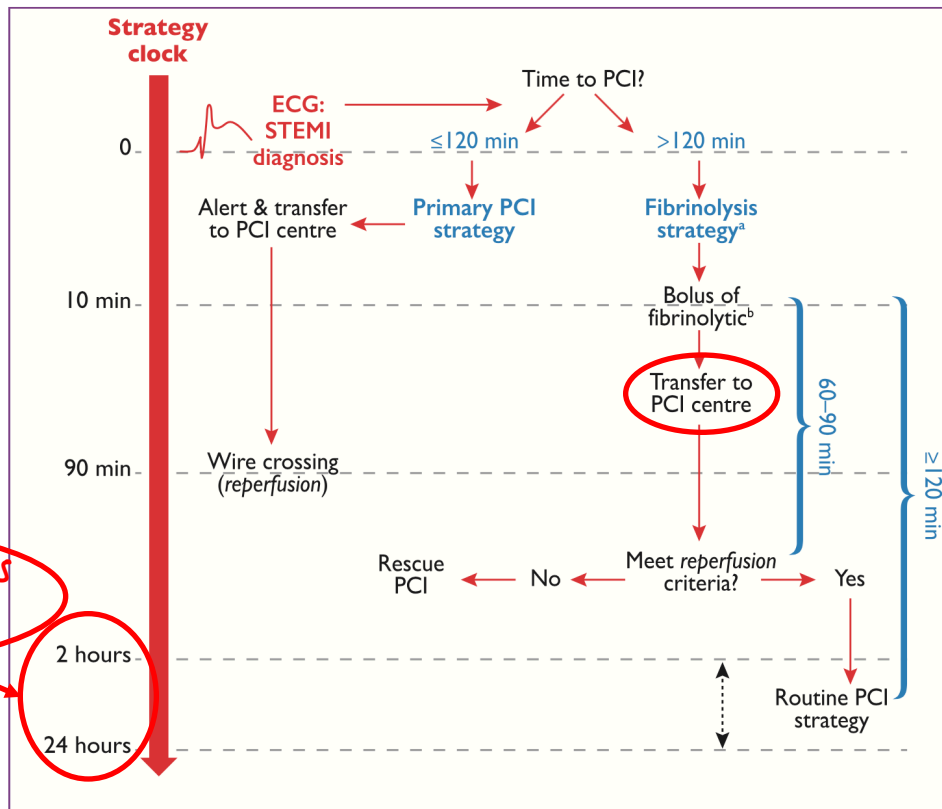
ST depression ≥ 1 mm in eight or more surface leads, coupled with ST-segment elevation in aVR and/or V_1 , suggests left main-, or left main equivalent- coronary obstruction, or severe three vessel ischaemia

Présentations atypiques révisées

- **BBB ou BBDt, de novo ou non relève de la même prise en charge en urgence en cas de suspicion d'IDM**
- **Electro-entrainement ventriculaire**
- **Infarctus postérieur : sous-décalage ST V_1-V_3**
- **Ischémie due à une occlusion du TC ou multivaisseaux: sous-décalage du ST > 8 dérivation associé à un sous-décalage du ST en aVR**



Prise en charge en urgence pré-hospitalière

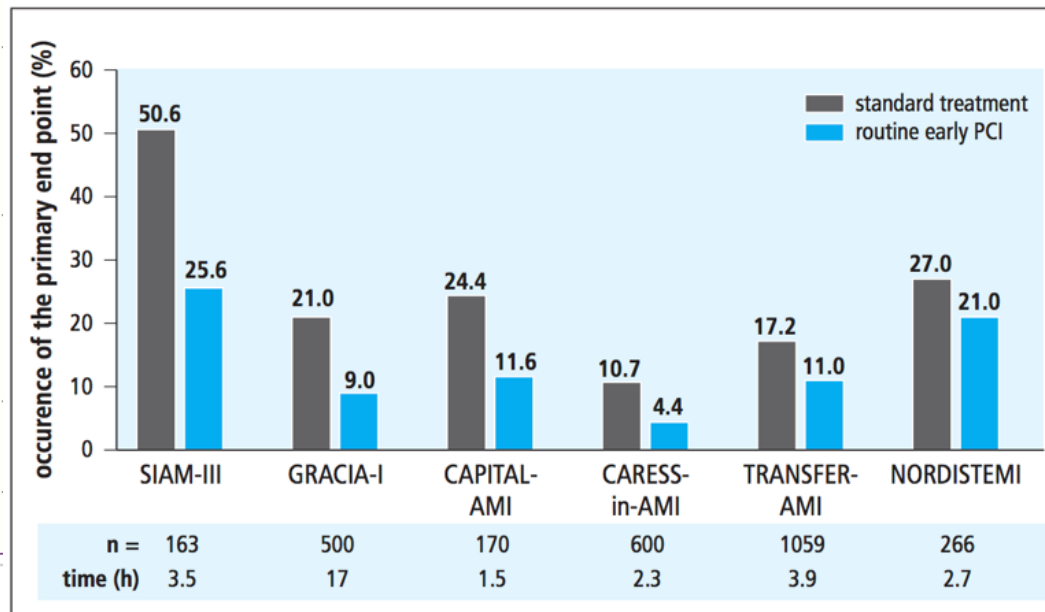


Prise en charge en urgence pré-hospitalière

Fibrinolytic treatment of ST-elevation myocardial infarction

Update 2014

S. Halvorsen¹; K. Huber² Hämostaseologie 1/2014



De 3 à 24 heures
à 2 à 24 heures

Strategy
clock

0

10 min

90 min

2 hours

24 hours

CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

• Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²

• Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

• Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

• Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

• Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

• Use of polypill to increase adherence
FOCUS³²³

• Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Balloon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

• Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

• Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

• Acute and chronic management presented.

Prise en charge en urgence

Relief of hypoxaemia and symptoms

Recommendations	Class ^a	Level ^b
Hypoxia		
Oxygen is indicated in patients with hypoxaemia ($\text{SaO}_2 < 90\%$ or $\text{PaO}_2 < 60$ mmHg).	I	C
Routine oxygen is not recommended in patients with $\text{SaO}_2 \geq 90\%$. ^{64–66}	III	B
Symptoms		
Titrated i.v. opioids should be considered to relieve pain.	IIa	C
A mild tranquillizer (usually a benzodiazepine) should be considered in very anxious patients.	IIa	C

i.v. = intravenous; PaO_2 = partial pressure of oxygen; SaO_2 = arterial oxygen saturation.

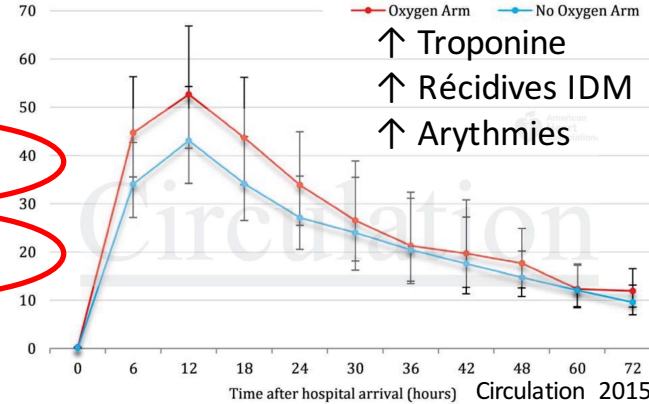
^aClass of recommendation.

^bLevel of evidence.

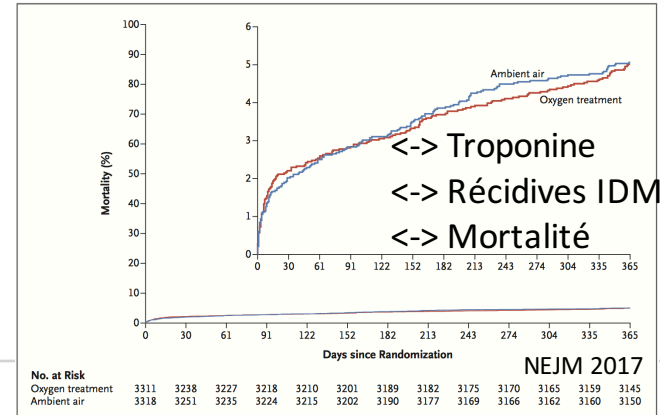
idem

nouveau

AVOID Study, Stub et al.



DETO2X Study, Hofmann et al.



Prise en charge en urgence

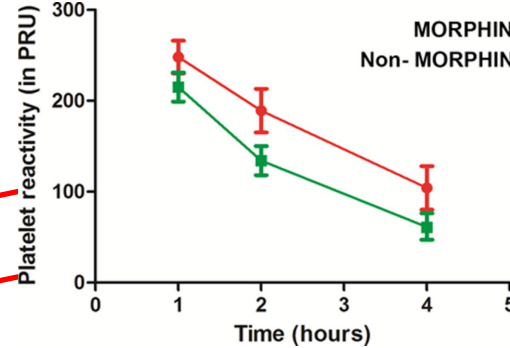
Relief of hypoxaemia and symptoms

Recommendations	Class ^a	Level ^b
Hypoxia		
Oxygen is indicated in patients with hypoxaemia ($\text{SaO}_2 < 90\%$ or $\text{PaO}_2 < 60$ mmHg).	I	C
Routine oxygen is not recommended in patients with $\text{SaO}_2 \geq 90\%$. ^{64–66}	III	B
Symptoms		
Titrated i.v. opioids should be considered to relieve pain.	IIa	C
A mild tranquillizer (usually a benzodiazepine) should be considered in very anxious patients.	IIa	C

i.v. = intravenous; PaO_2 = partial pressure of oxygen; SaO_2 = arterial oxygen saturation.

^aClass of recommendation.

^bLevel of evidence.



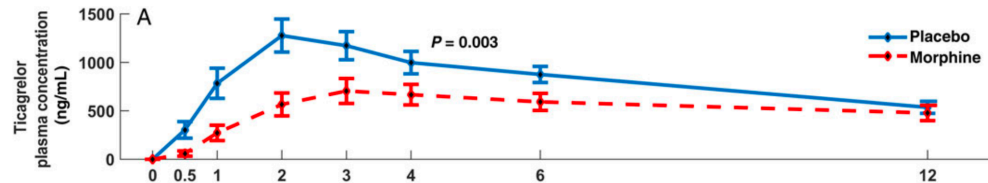
300 patients sous Ticagrelor
et Prasugrel
↓ réactivité plaquettaire
↑ délai action

Parodi et al
Circ Cardiovasc Int 2015

I -> IIa

IMPRESSION trial, Kubica et al., *Eur Heart J* 2016

↓ concentration de Ticagrelor et réactivité plaquettaire
↑ délai action



CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

• Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²

• Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

• Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

• Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

• Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

• Use of polypill to increase adherence
FOCUS³²³

• Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Balloon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

• Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

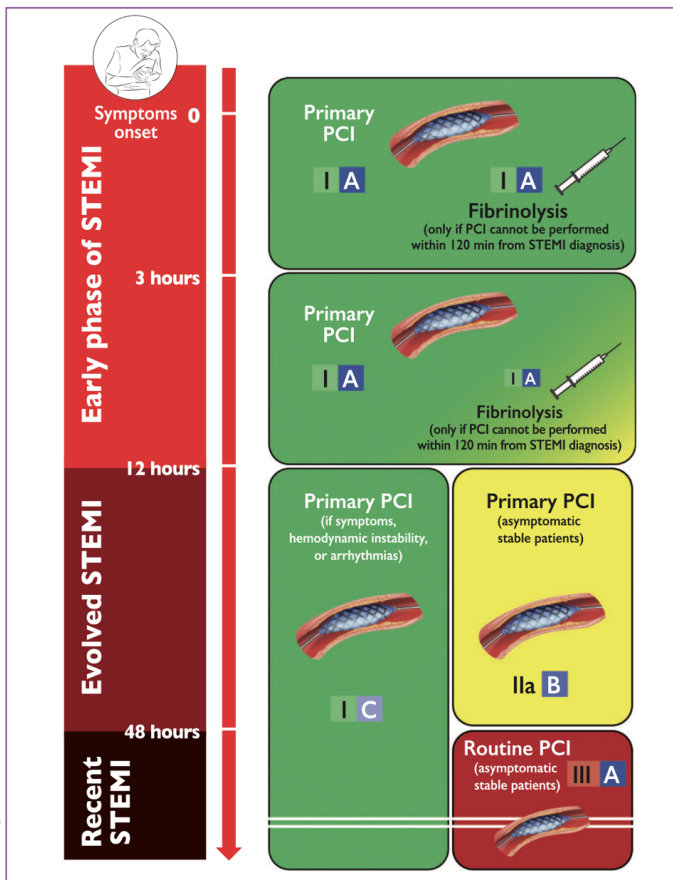
TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

• Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

• Acute and chronic management presented.

Limites de temps pour la réouverture de l'artère coupable



- Dans les 12 premières heures: Angioplastie ou Thrombolyse selon les délais/accessibilité avec une meilleure efficacité de la thrombolyse dans les 6 premières heures.
- Dans les 12 à 48 heures:
 - Classe IC: Angioplastie en cas de symptômes, instabilité hémodynamique ou arythmie
 - Classe IIa B: Angioplastie chez les patients asymptomatiques stables
- Après 48 heures
 - Classe IC: Angioplastie en cas de symptômes, instabilité hémodynamique ou arythmie
 - Classe III si asymptomatiques

CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

• Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²

• Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

• Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

• Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

• Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

• Use of polypill to increase adherence
FOCUS³²³

• Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Ballon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

• Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

• Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

• Acute and chronic management presented.

Fibrinolyse, nouveautés

Recommendations	Class ^a	Level ^b
When fibrinolysis is the reperfusion strategy, it is recommended to initiate this treatment as soon as possible after STEMI diagnosis, preferably in the pre-hospital setting. ^{96,98,123,222}	I	A
A fibrin-specific agent (i.e. tenecteplase, alteplase, or reteplase) is recommended. ^{223,224}	I	B
A half-dose of tenecteplase should be considered in patients ≥ 75 years of age. ¹²¹	IIa	B
Antiplatelet co-therapy with fibrinolysis		
Oral or i.v. aspirin is indicated. ²¹³	I	B
Clopidogrel is indicated in addition to aspirin. ^{225,226}	I	A
DAPT (in the form of aspirin plus a P2Y ₁₂ inhibitor ^c) is indicated for up to 1 year in patients undergoing fibrinolysis and subsequent PCI.	I	C
Anticoagulation co-therapy with fibrinolysis		
Anticoagulation is recommended in patients treated with lytics until revascularization (if performed) or for the duration of hospital stay up to 8 days. ^{199,224,227–233} The anticoagulant can be: • Enoxaparin i.v. followed by s.c. (preferred over UFH).^{227–232} • UFH given as a weight-adjusted i.v. bolus followed by infusion.²²⁴ • In patients treated with streptokinase: fondaparinux i.v. bolus followed by an s.c. dose 24 h later.^{199,233}	I	A
	I	A
	I	B
	IIa	B

IIa A → I A

Nouveau

STREAM

ESC
European Society
of Cardiology

Fibrinolysis or Primary PCI in ST-Segment Elevation Myocardial Infarction

Amstrong et al. 2013  The NEW ENGLAND JOURNAL of MEDICINE

Event	Fibrinolysis (N=944)	Primary PCI (N=948)	P Value
	no./total no. (%)		
Total strokes	15/939 (1.6)	5/946 (0.5)	0.03
Intracranial hemorrhage			
Any	9/939 (1.0)	2/946 (0.2)	0.04
After protocol amendment*	4/747 (0.5)	2/758 (0.3)	0.45

- UFH given as a weight-adjusted i.v. bolus followed by infusion.
- In patients treated with streptokinase: fondaparinux i.v. bolus followed by an s.c. dose 24 h later.^{199,233}

ss ^a	Level ^b
IIa	A
IIa	B
IIa	B
IIa	A
IIa	A
IIa	B
IIa	B

$$11a \text{ A} \rightarrow 1 \text{ A}$$

Nouveau

STREAM

CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

- Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²
- Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

- Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

- Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

- Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

- Use of polypill to increase adherence
FOCUS³²³

- Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

- New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Ballon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

- 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

- Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

- Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

- Acute and chronic management presented.

Traitements anticoagulants

Anticoagulant therapy		
Anticoagulation is recommended for all patients in addition to antiplatelet therapy during primary PCI.	I	C
Routine use of UFH is recommended.	I	C
In patients with heparin-induced thrombocytopenia, bivalirudin is recommended as the anticoagulant agent during primary PCI.	I	C
Routine use of enoxaparin i.v. should be considered. ^{200–202}	IIa	A
Routine use of bivalirudin should be considered. ^{209,215}	IIa	A
Fondaparinux is not recommended for primary PCI. ¹⁹⁹	III	B

IIb B -> IIa A

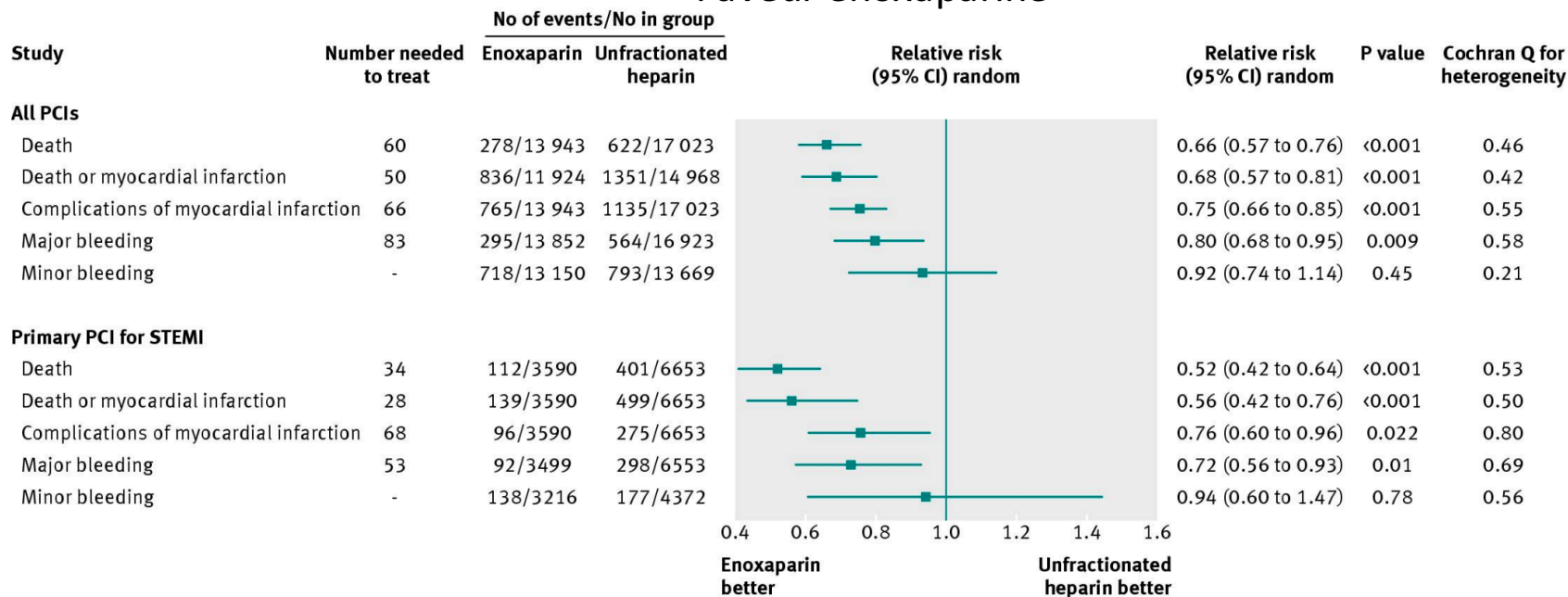
ATOLL, Meta-analysis

Traitements anticoagulants

Méta-analyse Silvain et al, BMJ 2012

- Enoxaparine vs Héparine
- 23 études, 30966 patients
- Faveur enoxaparine

Anticoagulant therapy
Anticoagulation is recommended for all patients in addition to antiplatelet therapy
I C



Traitements anticoagulants

Anticoagulant therapy		
Anticoagulation is recommended for all patients in addition to antiplatelet therapy during primary PCI.	I	C
Routine use of UFH is recommended.	I	C
In patients with heparin-induced thrombocytopenia, bivalirudin is recommended as the anticoagulant agent during primary PCI.	I	C
Routine use of enoxaparin i.v. should be considered. ^{200–202}	IIa	A
Routine use of bivalirudin should be considered. ^{209,215}	IIa	A
Fondaparinux is not recommended for primary PCI. ¹⁹⁹	III	B

Nouveau

IIb B -> IIa A

ATOLL, Meta-analysis

I B -> IIa A

MATRIX, HEAT-PPCI

Traitements anticoagulants

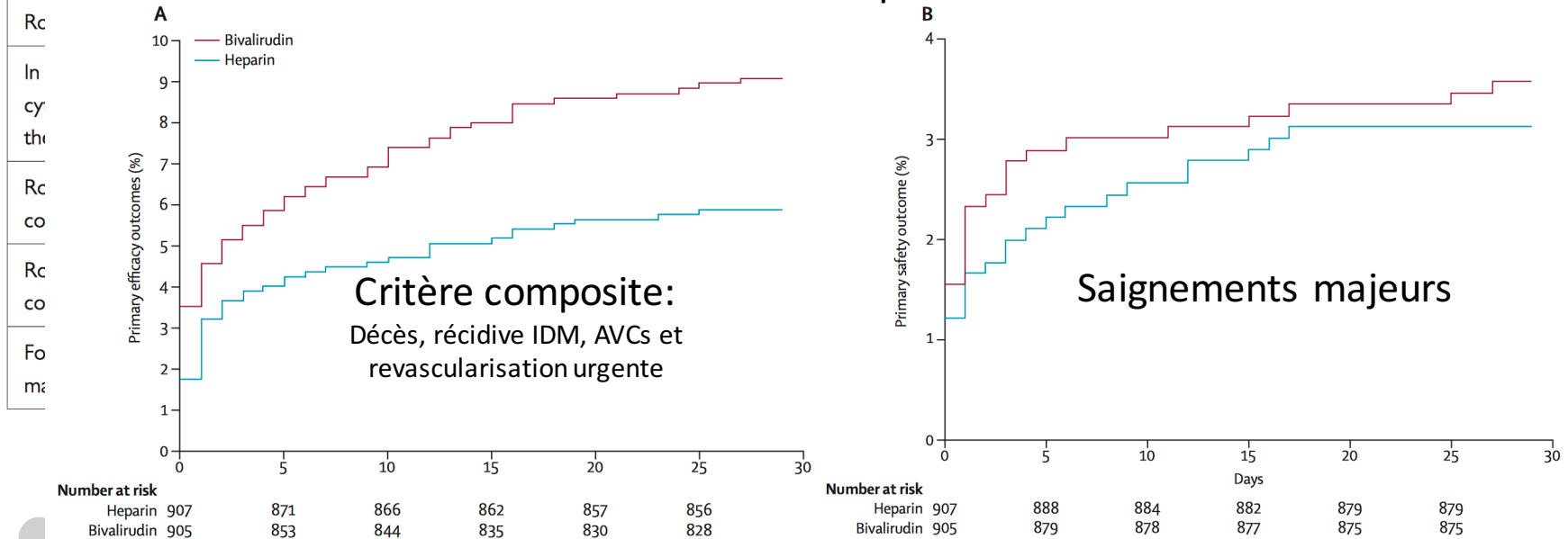
Anticoagulant therapy

Anticoagulation is recommended for all patients in addition to antiplatelet therapy during primary PCI.



HEAT PPCI, Shahzad et al, Lancet 2014

- Bivalirudine vs Héparine
- 1812 patients
- Faveur héparine



Traitements anticoagulants

Anticoagulant therapy		
Anticoagulation is recommended for all patients in addition to antiplatelet therapy during primary PCI.	I	C
Routine use of UFH is recommended.	I	C
In patients with heparin-induced thrombocytopenia, bivalirudin is recommended as the anticoagulant agent during primary PCI.	I	C
Routine use of enoxaparin i.v. should be considered. ^{200–202}	IIa	A
Routine use of bivalirudin should be considered. ^{209,215}	IIa	A
Fondaparinux is not recommended for primary PCI. ¹⁹⁹	III	B

Nouveau

IIb B -> IIa A

ATOLL, Meta-analysis

I B -> IIa A

MATRIX, HEAT-PPCI

Traitements antiagrégants

Recommendations	Class ^b	Level ^c
Antiplatelet therapy		
A potent P2Y ₁₂ inhibitor (prasugrel or ticagrelor), or clopidogrel if these are not available or are contraindicated, is recommended before (or at latest at the time of) PCI and maintained over 12 months, unless there are contraindications such as excessive risk of bleeding. ^{186,187}	I	A
Aspirin (oral or i.v. if unable to swallow) is recommended as soon as possible for all patients without contraindications. ^{213,214}	I	B
GP IIb/IIIa inhibitors should be considered for bailout if there is evidence of no-reflow or a thrombotic complication.	IIa	C
Cangrelor may be considered in patients who have not received P2Y ₁₂ receptor inhibitors. ^{192–194}	IIb	A

Idem

Seulement en bail-out, plus en systématique en cas de forte charge thrombotique

Nouveau

2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS

The Task Force for dual antiplatelet therapy in coronary artery disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS)

Traitements anticoagulants et antiagrégants

Recommendations

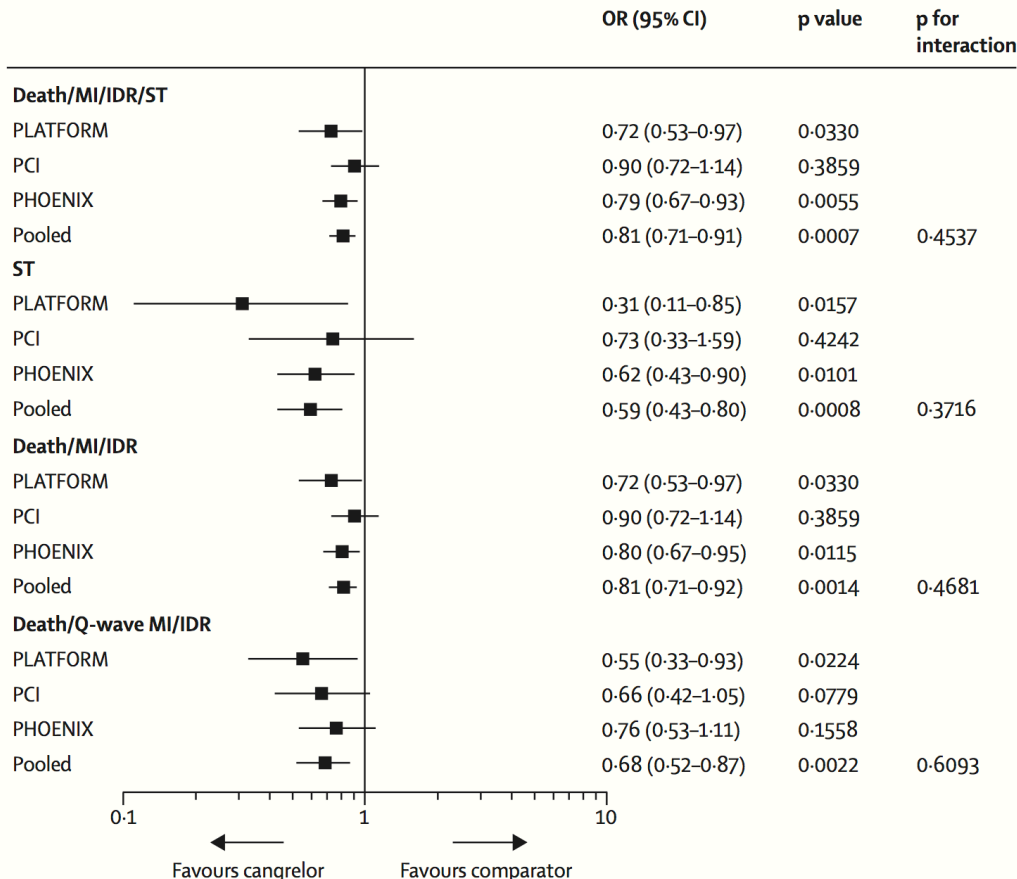
Antiplatelet therapy

A potent P2Y₁₂ inhibitor (cangrelor), or clopidogrel if cangrelor is not available or are contraindicated, should be recommended before (or at the time of) PCI and maintained for 12 months, unless there are contraindications such as excessive bleeding.^{186,187}

Aspirin (oral or i.v. if unavailable) should be recommended as soon as possible for patients without contraindications.

GP IIb/IIIa inhibitors should be considered for bailout if there is evidence of a thrombotic complication.

Cangrelor may be considered for patients who have not received P2Y₁₂ inhibitors.^{192–194}



Analyse poolée Steg et al, Lancet 2013

- Cangrelor vs Clopidogrel/Placebo
- Réduction critère composite et des thromboses de stent

CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

- Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²
- Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

- Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

- Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

- Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

- Use of polypill to increase adherence
FOCUS³²³

- Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

- New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Ballon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

- 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

- Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

- Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

- Acute and chronic management presented.

Angioplastie primaire

IRA technique		
Stenting is recommended (over balloon angioplasty) for primary PCI. ^{146,147}	I	A
Stenting with new-generation DES is recommended over BMS for primary PCI. ^{148–151,178,179}	I	A
Radial access is recommended over femoral access if performed by an experienced radial operator. ^{143–145,180}	I	A
Routine use of thrombus aspiration is not recommended. ^{157,159}	III	A
Routine use of deferred stenting is not recommended. ^{153–155}	III	B

Idem

IIa A -> I A

EXAMINATION, NORSTENT, COMFORTABLE-AMI

Angioplastie primaire

IR

Ste
pla

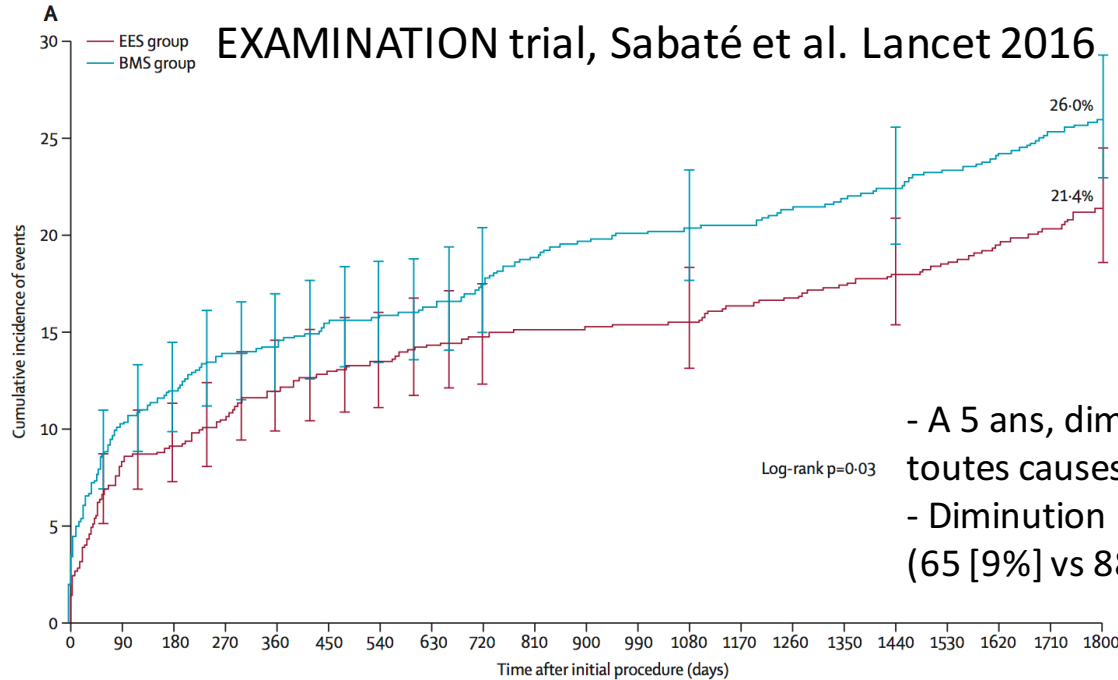
Ste
me

Ra
acc
opi

Ro
rec

Ro
rec

EXAMINATION trial, Sabaté et al. Lancet 2016



- A 5 ans, diminution du critère composite décès toutes causes, IDM et revascularisation
- Diminution mortalité toutes causes (65 [9%] vs 88 [12%]; 0.72, 0.52–0.10; $p=0.047$)

From day	0	1	61	121	181	241	301	361	421	481	541	601	661	721	1081	1441
To day	0	60	120	180	240	300	360	420	480	540	600	660	720	1080	1440	1800
Number at risk																
EES group	751	749	698	683	680	673	662	658	653	648	646	641	638	635	626	604
BMS group	747	741	679	662	654	641	638	635	630	625	623	622	618	611	583	565

Angioplastie primaire

IRA technique	
Stenting is recommended (over balloon angioplasty) for primary PCI. ^{146,147}	I A
Stenting with new-generation DES is recommended over BMS for primary PCI. ^{148–151,178,179}	I A
Radial access is recommended over femoral access if performed by an experienced radial operator. ^{143–145,180}	I A
Routine use of thrombus aspiration is not recommended. ^{157,159}	III A
Routine use of deferred stenting is not recommended. ^{153–155}	III B

Idem

IIa A -> I A

EXAMINATION, NORSTENT, COMFORTABLE-AMI

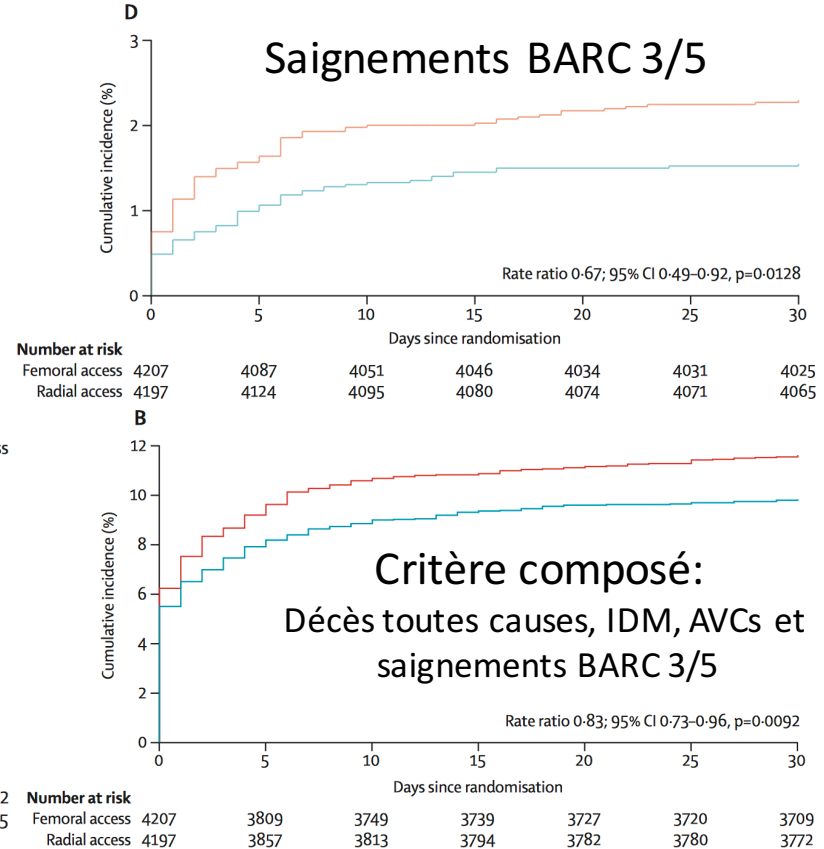
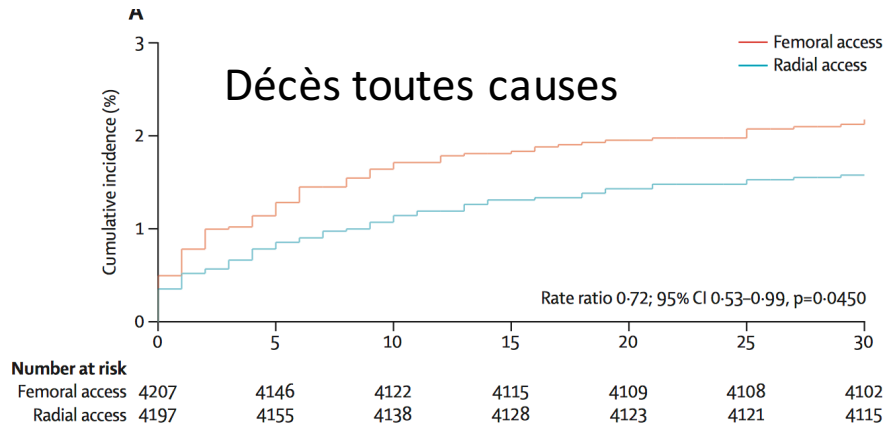
IIa B -> I A

MATRIX

Angioplastie primaire

MATRIX study, Valgimigli et al. **Lancet 2015**

- Voie Radiale vs Fémorale
- 8404 patients
- Bénéfice voie radiale important



Angioplastie primaire

IRA technique	
Stenting is recommended (over balloon angioplasty) for primary PCI. ^{146,147}	I
Stenting with new-generation DES is recommended over BMS for primary PCI. ^{148–151,178,179}	I
Radial access is recommended over femoral access if performed by an experienced radial operator. ^{143–145,180}	I
Routine use of thrombus aspiration is not recommended. ^{157,159}	III
Routine use of deferred stenting is not recommended. ^{153–155}	III

Idem

IIa A -> I A

EXAMINATION, NORSTENT, COMFORTABLE-AMI

IIa B -> I A

MATRIX

IIa B -> III

TOTAL, TASTE

Angioplastie primaire

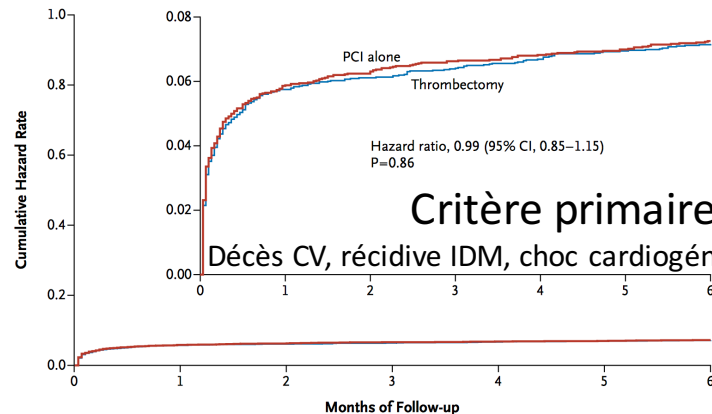
TOTAL study, Jolly et al.
NEJM 2015

- Thromboaspiration vs angioplastie seule
- 5033 patients
- Critère primaire similaire, augmentation du nombre d'AVCs

Routine use of thrombus aspiration is not recommended.^{157,159}

Routine use of deferred stenting is not recommended.^{153–155}

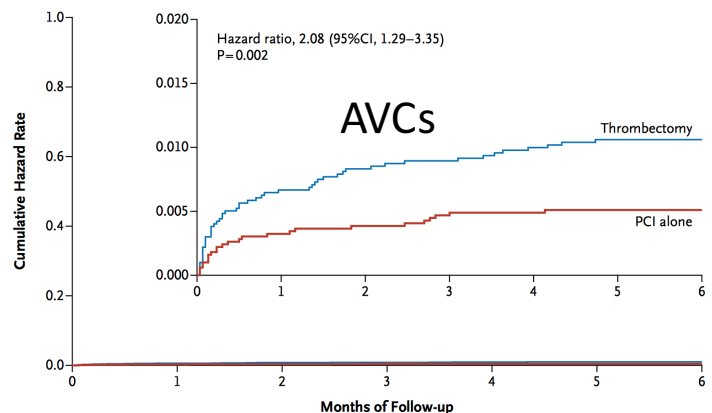
A Primary Outcome



No. at Risk
Thrombectomy
PCI alone

5033	4734	4696	4678	4662	4647	4628
5030	4727	4688	4666	4653	4642	4618

B Stroke



No. at Risk
Thrombectomy
PCI alone

5033	4873	4836	4819	4806	4794	4778
5030	4866	4829	4810	4800	4791	4775

Angioplastie primaire

IRA technique	
Stenting is recommended (over balloon angioplasty) for primary PCI. ^{146,147}	I A
Stenting with new-generation DES is recommended over BMS for primary PCI. ^{148–151,178,179}	I A
Radial access is recommended over femoral access if performed by an experienced radial operator. ^{143–145,180}	I A
Routine use of thrombus aspiration is not recommended. ^{157,159}	III A
Routine use of deferred stenting is not recommended. ^{153–155}	III B

Idem

IIa A → I A

EXAMINATION, NORSTENT, COMFORTABLE-AMI

IIa B → I A

MATRIX

IIa B → III

TOTAL, TASTE

Nouveau

DANAMI-3 DEFER

Angio DANAMI-3 DEFER study, Kelbaek et al. , Lancet 2016

IRA technique

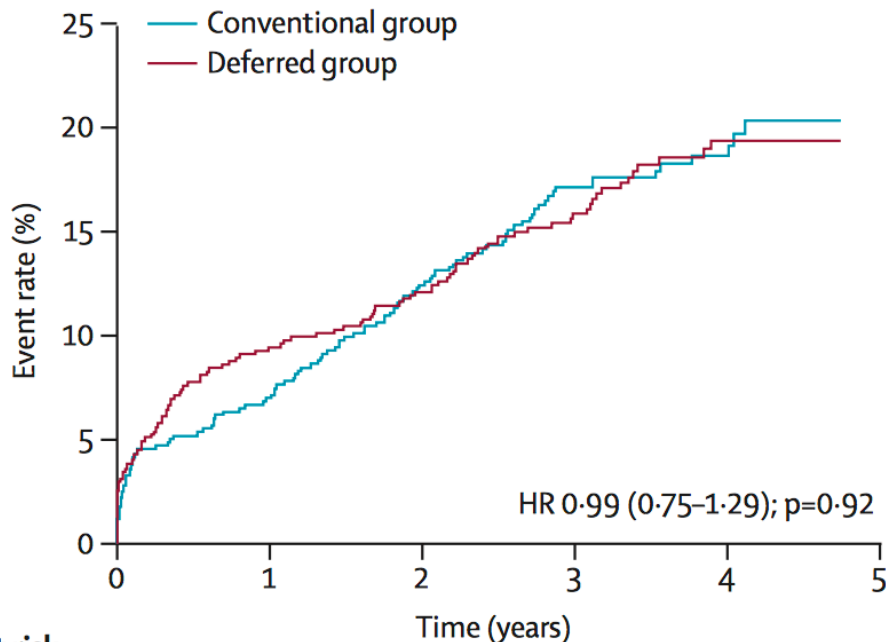
Stenting is recommended for primary

Stenting with covered stents over

Radial access is preferred if performed by an experienced operator.^{143–145}

Routine use of radial access is recommended

Routine use of covered stents is recommended



Number at risk

Conventional group	612	568	533	360	159	0
Deferred group	603	543	526	359	156	0

- Angioplastie immédiate vs différée
- 1215 patients
- Pas de bénéfice sur critère primaire: décès toute cause, hospitalisation pour I. cardiaque, récidence IDM, revascularisation vaisseau traité

CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

• Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²

• Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

• Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

• Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

• Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

• Use of polypill to increase adherence
FOCUS³²³

• Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Ballon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

• Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

• Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

• Acute and chronic management presented.

Revascularisation complémentaire

Non-IRA strategy		
Routine revascularization of non-IRA lesions should be considered in STEMI patients with multivessel disease before hospital discharge. ^{167–173}	IIa	A
Non-IRA PCI during the index procedure should be considered in patients with cardiogenic shock.	IIa	C
CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.	IIa	C

III -> IIa A

PRAMI, DANAMI-3 PRIMULTI, CvLPRIT, COMPARE-ACUTE

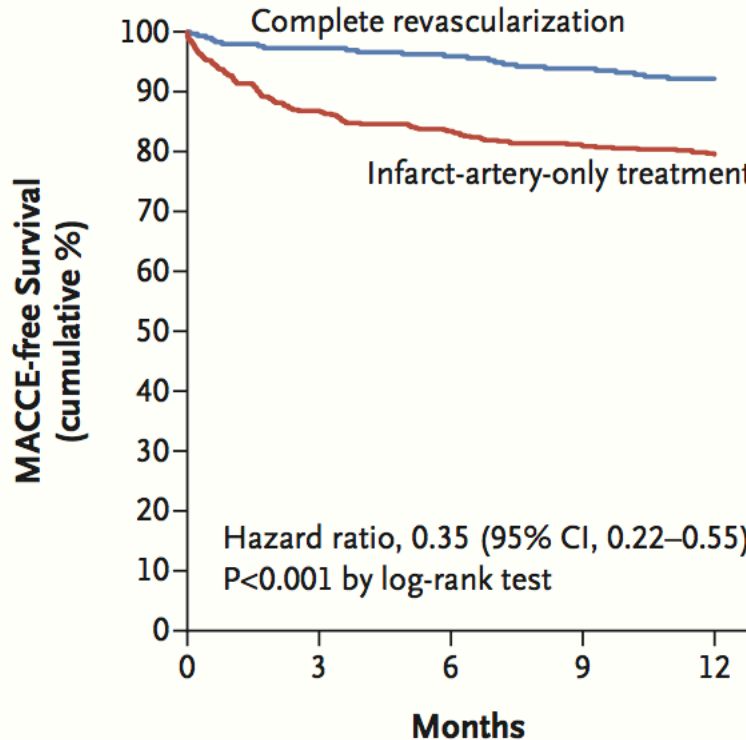
Revascularisation

Non-IRA strategy

Routine revascularization of non-IRA should be considered in STEMI patients with multivessel disease before hospital discharge

Non-IRA PCI during the index procedure should be considered in patients with multivessel disease

CABG should be considered in patients with multivessel disease, ongoing ischaemia and large area of myocardium at risk if PCI of the IRA cannot be performed



- Revascularisation complète vs artère coupable seule
- 885 patients
- Bénéfice sur critère primaire:
décès toute cause, IDM non fatal,
revascularisation et événements cérébrovasculaires à 12 mois

No. at Risk

Complete revascularization	295	286	281	264	215
Infarct artery	590	512	492	457	371

Revascularisation complémentaire

Non-IRA strategy		
Routine revascularization of non-IRA lesions should be considered in STEMI patients with multivessel disease before hospital discharge. ^{167–173}	Ila	A
Non-IRA PCI during the index procedure should be considered in patients with cardiogenic shock.	Ila	C
CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.	Ila	C

III -> Ila A

PRAMI, DANAMI-3 PRIMULTI, CvLPRIT, COMPARE-ACUTE

Idem

CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

• Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²

• Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

• Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

• Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

• Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

• Use of polypill to increase adherence
FOCUS³²³

• Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Ballon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

• Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

• Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:

• Acute and chronic management presented.

Après l'infarctus

Hospital discharge

Early discharge (within 48–72 h) should be considered appropriate in selected low-risk patients^c if early rehabilitation and adequate follow-up are arranged.^{257,259–262,264,265}

IIa

A

IIb B -> IIa A

Transfer back to a referring non-PCI hospital

Same day transfer should be considered appropriate in selected patients after successful primary PCI, i.e. those without ongoing myocardial ischaemia, arrhythmia, or haemodynamic instability, not requiring vasoactive or mechanical support, and not needing further early revascularization.²⁶³

IIa

C

IIb C -> IIa C

Après l'infarctus, sevrage tabagique, réadaptation cardiaque et adhérence au traitement

Behavioural aspects after ST-elevation myocardial infarction

Recommendations	Class ^a	Level ^b
It is recommended to identify smokers and provide repeated advice on stopping, with offers to help with the use of follow-up support, nicotine replacement therapies, varenicline, and bupropion individually or in combination. ^{4,302,303,325–327}	I	A
Participation in a cardiac rehabilitation programme is recommended. ^{4,309,328}	I	A
A smoking cessation protocol is indicated for each hospital participating in the care of STEMI patients.	I	C
The use of the polypill and combination therapy to increase adherence to drug therapy may be considered. ^{4,322,323}	IIb	B

1 B -> 1 A

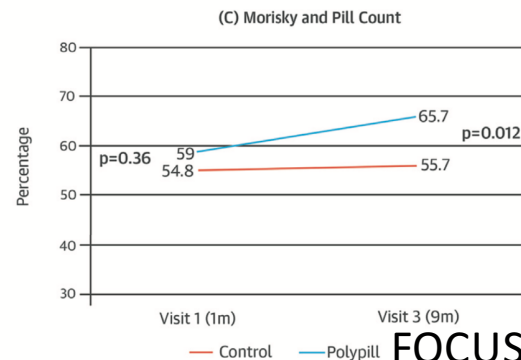
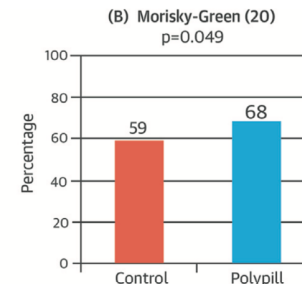
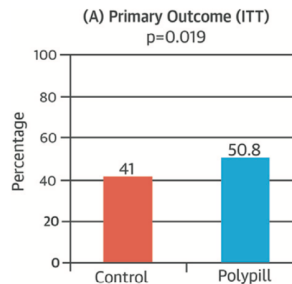
1 B -> 1 A

Nouveau

Après l'infarctus, sevrage tabagique, réadaptation cardiaque et adhérence au traitement

Behavioural aspects after ST-elevation myocardial infarction

Recommendations	Class ^a	Level ^b
It is recommended to identify smokers and provide repeated advice on stopping, with offers to help with the use of follow-up support, nicotine replacement therapies, varenicline, and bupropion individually or in combination. ^{4,302,303,325–327}	I	A
Participation in a cardiac rehabilitation programme is recommended. ^{4,309,328}	I	A
A smoking cessation protocol is indicated for each hospital participating in the care of STEMI patients.	I	C
The use of the polypill and combination therapy to increase adherence to drug therapy may be considered. ^{4,322,323}	IIb	B



Castellano, J.M. et al. J Am Coll Cardiol. 2014; 64(20):2071–82.

FOCUS, amélioration de l'adhérence avec une seule gélule contenant aspirine, statine et IEC

Après l'infarctus, inhibiteurs de PCSK-9 et de l'ézetimibe en cas de LDL>0.7g/L sous ttt maximal

Lipid lowering therapies		
It is recommended to start high-intensity statin therapy ^c as early as possible, unless contraindicated, and maintain it long-term. ^{364,366,368}	I	A
An LDL-C goal of < 1.8 mmol/L (70 mg/dL) or a reduction of at least 50% if the baseline LDL-C is between 1.8–3.5 mmol/L (70–135 mg/dL) is recommended. ^{367,369,376,382}	I	B
It is recommended to obtain a lipid profile in all STEMI patients as soon as possible after presentation. ^{369,406}	I	C
In patients with LDL-C ≥ 1.8 mmol/L (≥ 70 mg/dL) despite a maximally tolerated statin dose who remain at high risk, further therapy to reduce LDL-C should be considered. ^{376,382}	Ila	A

Nouveau

IMPROVE-IT, FOURIER

Après l'infarctus

2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS

The Task Force for dual antiplatelet therapy in coronary artery disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS)

Maintenance antithrombotic strategy after ST-elevation myocardial infarction

Recommendations	Class ^a	Level ^b
Antiplatelet therapy with low-dose aspirin (75–100 mg) is indicated. ³²⁹	I	A
DAPT in the form of aspirin plus ticagrelor or prasugrel (or clopidogrel if ticagrelor or prasugrel are not available or are contraindicated), is recommended for 12 months after PCI, unless there are contraindications such as excessive risk of bleeding. ^{186,187}	I	A
A PPI in combination with DAPT is recommended in patients at high risk of gastrointestinal bleeding. ^{335–337}	I	B
In patients with an indication for oral anticoagulation, oral anticoagulants are indicated in addition to antiplatelet therapy. ⁵	I	C
In patients who are at high risk of severe bleeding complications, discontinuation of P2Y ₁₂ inhibitor therapy after 6 months should be considered. ^{332,339,340}	IIa	B
In STEMI patients with stent implantation and an indication for oral anticoagulation, triple therapy ^d should be considered for 1–6 months (according to a balance between the estimated risk of recurrent coronary events and bleeding). ⁵	IIa	C
DAPT for 12 months in patients who did not undergo PCI should be considered unless there are contraindications such as excessive risk of bleeding.	IIa	C
In patients with LV thrombus, anticoagulation should be administered for up to 6 months guided by repeated imaging. ^{341–343}	IIa	C
In high ischaemic-risk patients ^e who have tolerated DAPT without a bleeding complication, treatment with DAPT in the form of ticagrelor 60 mg twice a day on top of aspirin for longer than 12 months may be considered for up to 3 years. ³³³	IIb	B
In low bleeding-risk patients who receive aspirin and clopidogrel, low-dose rivaroxaban (2.5 mg twice daily) may be considered. ³³⁸	IIb	B
The use of ticagrelor or prasugrel is not recommended as part of triple antithrombotic therapy with aspirin and oral anticoagulation.	III	C

IIa C → I B

Data
limitées

Nouveau

Après l'infarctus

PEGASUS TIMI 54 study,

Bonaca et al.

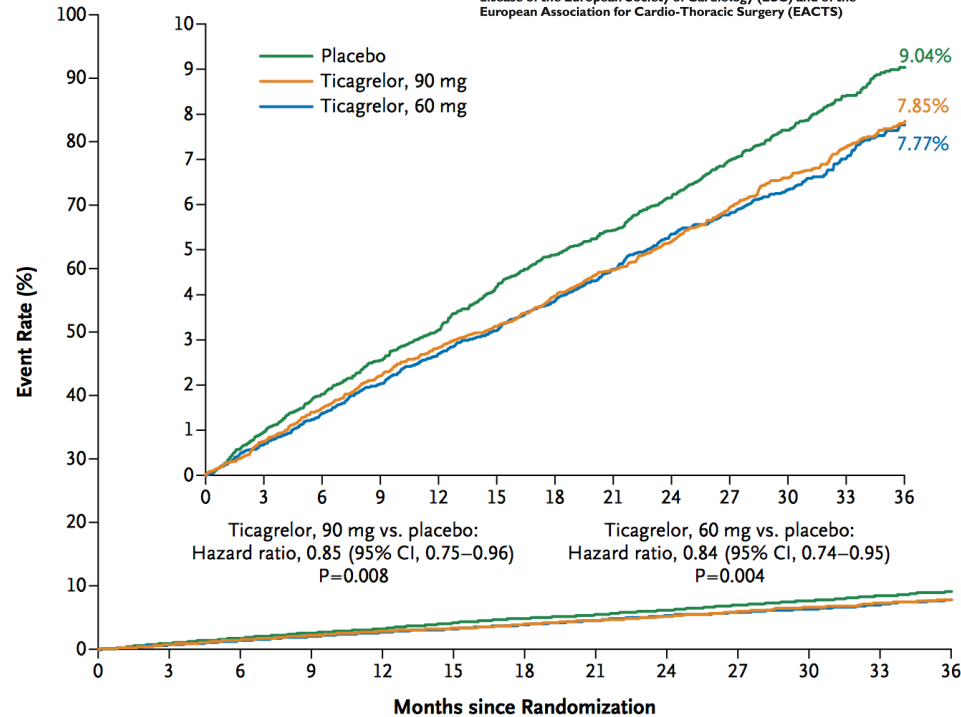
NEJM 2015

- Ticagrelor 90mg x2, vs 60mg x2, vs placebo
- 1 à 3 ans après un IDM
- 21 162 patients
- Bénéfice en terme ischémique
- Augmentation des saignements (moindre à 60mg x2/j



2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS

The Task Force for dual antiplatelet therapy in coronary artery disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS)



No. at Risk

Placebo	7067	6979	6892	6823	6761	6681	6508	6236	5876	5157	4343	3360	2028
Ticagrelor, 90 mg	7050	6973	6899	6827	6769	6719	6550	6272	5921	5243	4401	3368	2038
Ticagrelor, 60 mg	7045	6969	6905	6842	6784	6733	6557	6270	5904	5222	4424	3392	2055

CHANGE IN RECOMMENDATIONS 2012 2017

Radial access^a

MATRIX¹⁴³

DES over BMS

EXAMINATION^{150, 151}

COMFORTABLE-AMI¹⁴⁹, NORSTENT¹⁵²

Complete Revascularization^b

PRAMI¹⁶⁸, DANAMI-3-PRIMULTI¹⁷⁰,
CVLPRIT¹⁶⁹, Compare-Acute¹⁷¹

Thrombus Aspiration^c

TOTAL¹⁵⁹, TASTE¹⁵⁷

Bivalirudin

MATRIX²⁰⁹, HEAT-PPCI²⁰⁵

Enoxaparin

ATOLL^{200,201}, Meta-analysis²⁰²

Early Hospital Discharge^d

Small trials & observational data²⁵⁹⁻²⁶²

Oxygen when
SaO₂ <95%

AVOID⁶⁴,
DETOX⁶⁶

Oxygen when
SaO₂ <90%

Dose i.V. TNK-tPA
same in all patients

STREAM¹²¹

Dose i.V. TNK-tPA
half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

• Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT³⁷⁶, FOURIER³⁸²

• Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

• Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

• Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

• Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

• Use of polypill to increase adherence
FOCUS³²³

• Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:

• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:

- Clear definition of first medical contact (FMC).
- Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
- Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
- Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
- "Door-to-Balloon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:

• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:

• Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:

• Timeframe is set in 2–24h after successful fibrinolysis.

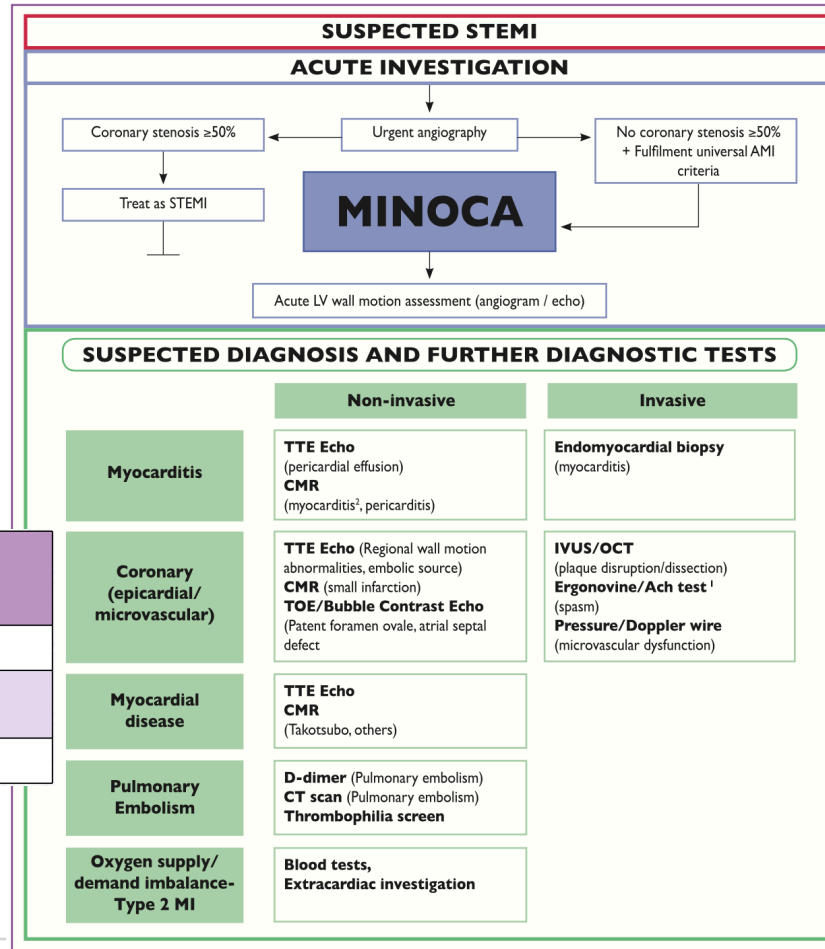
PATIENTS TAKING ANTICOAGULANTS:

• Acute and chronic management presented.

MINOCA

Infarctus à coronaires saines

- 1 à 13% des IDM selon les séries
- Groupe hétérogène avec étiologies multiples
- Examens de routine comportent IRM cardiaque



The diagnosis of MINOCA is made immediately upon coronary angiography in a patient presenting with features consistent with an AMI, as detailed by the following criteria:

- (1) Universal AMI criteria.
- (2) Non-obstructive coronary arteries on angiography, defined as no coronary artery stenosis $\geq 50\%$ in any potential IRA.
- (3) No clinically overt specific cause for the acute presentation.

MINOCA

Infarctus à coronaires saines



European Heart Journal (2017) 38, 143–153
doi:10.1093/eurheartj/ehw149

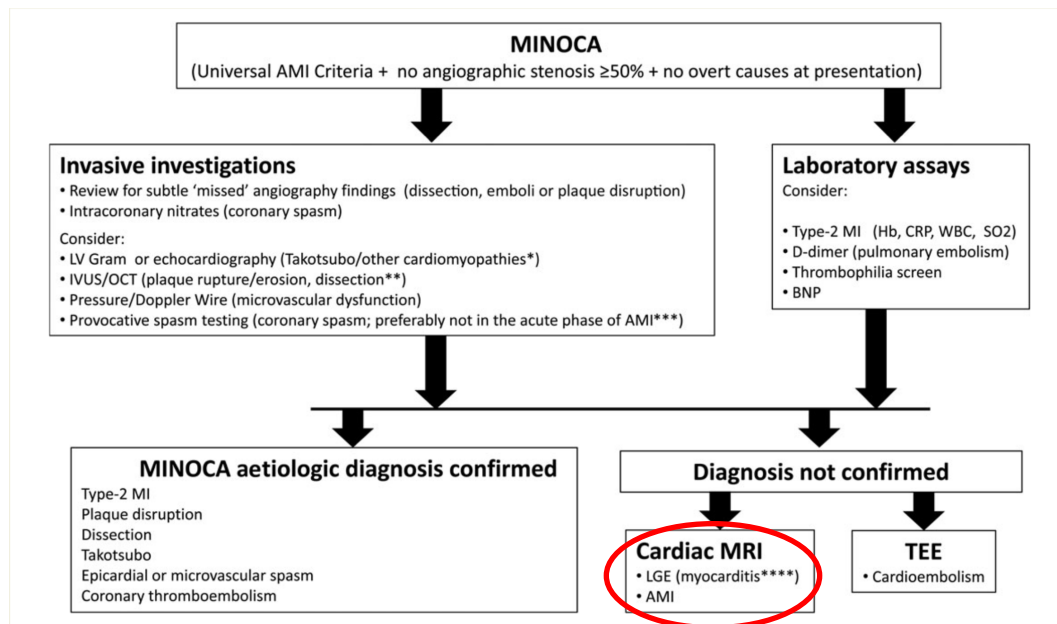
CURRENT OPINION



ESC
European Society
of Cardiology

ESC working group position paper on myocardial infarction with non-obstructive coronary arteries

Stefan Agewall^{1*}, John F. Beltrame², Harmony R. Reynolds³, Alexander Niessner⁴, Giuseppe Rosano^{5,6}, Alida L. P. Caforio⁷, Raffaele De Caterina⁸, Marco Zimarino⁸, Marco Roffi⁹, Keld Kjeldsen¹⁰, Dan Atar¹, Juan C. Kaski⁶, Udo Sechtem¹¹, and Per Tornvall¹², on behalf of the WG on Cardiovascular Pharmacotherapy



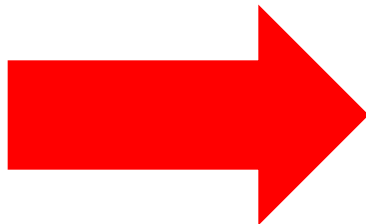
ESC Highlights

En résumé

- **9 demi journées & > 500 sessions**
- **Theme principal:
40 ans de l'angioplastie
coronaire**
- **Recommendations ESC**
 - **SCA & DAPT**
 - **Valves**
 - **AOMI**



De multiples sujets



le fil rouge

Prévention

Coronaropathie

Maladie Vasculaire Périphérique

Valves

Rythmologie

HTA

Insuffisance cardiaque

ETUDE PURE, évaluation des habitudes alimentaires sur la mortalité et les évènements cardiovasculaires

Dehghan et al, Lancet 2017

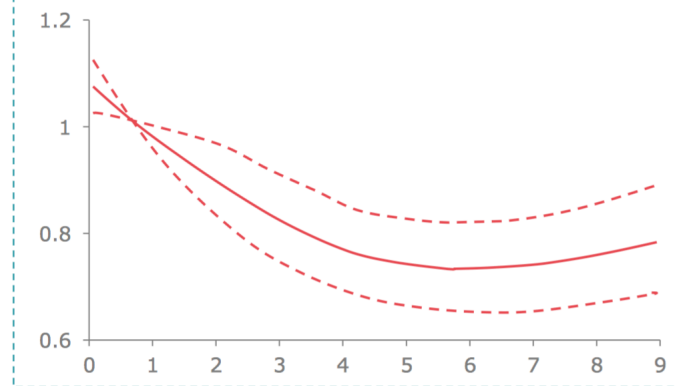
- Etude de cohorte prospective
- Population générale de 667 communautés urbaines/rurales dans 18 pays
- N= 135 335 patients
- Questionnaire alimentaire
- Critère primaire: maladie cardiovasculaire et décès

PURE: fruits et légumes**Major CVD****Intake****HR (95% CI)**

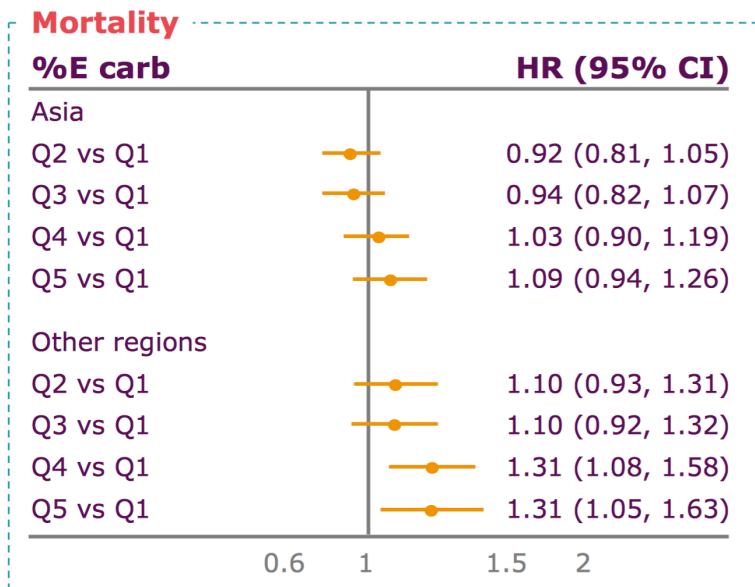
<1/day		1.00 (1.00, 1.00)
1 to <2/day		1.03 (0.89, 1.18)
2 to <3/day		1.09 (0.96, 1.20)
3 to <4/day		1.06 (0.92, 1.22)
4 to <5/day		1.20 (1.02, 1.40)
5 to <6/day		0.95 (0.79, 1.14)
6 to <7/day		0.93 (0.76, 1.14)
7 to <8/day		0.97 (0.77, 1.21)
<8/day		0.90 (0.74, 1.10)

0.6 0.8 1 1.2 1.4 P-trend=0.13

- Diminution modérée de la mortalité mais pas du risque CV
- Effet maximal pour 3-4 prises/ jour

Mortality

PURE: les féculents augmentent la mortalité et les acides gras saturés la diminue



- Diminution de la mortalité avec l'apport de gras saturés mais pas d'effet sur la mortalité CV
- Augmentation de la mortalité avec l'augmentation de la consommation de féculents
- Auteurs concluent que les recommandations actuelles d'une prise d'acides gras saturés <10% ne sont pas supportées par des preuves solides

Conclusion

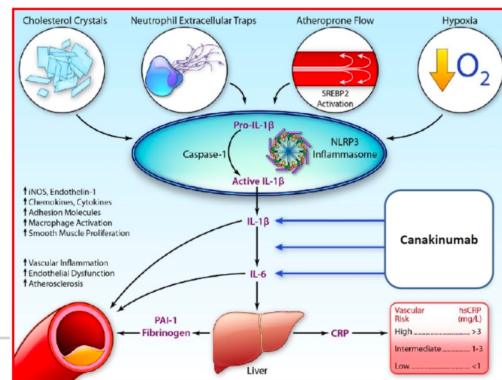
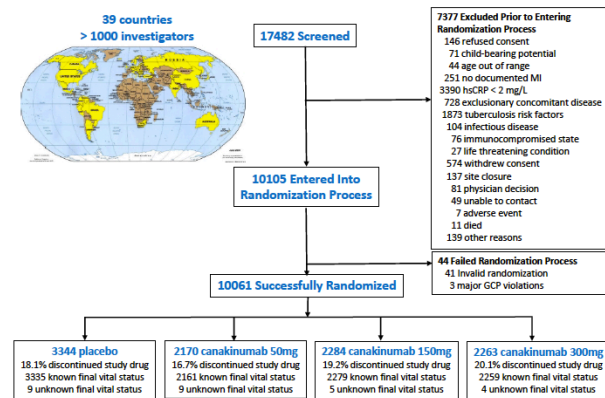
1. Il faut manger 3 à 4 fruits et légumes
2. On peut manger plus gras (saturé)

ETUDE CANTOS, évaluation d'un inhibiteur d'IL1 β

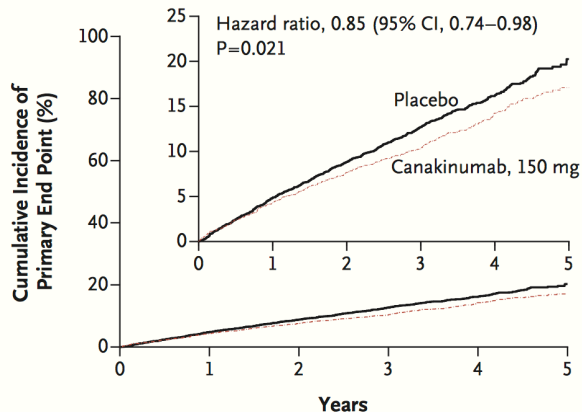
Ridker et al, NEJM 2017

- Etude randomisée, double aveugle évaluant les effets d'un inhibiteur d'IL-1 β , le canakinumab
- 10 061 patients randomisés
- Critères d'inclusion: ATCD d'IDM et CRP > 2mg/L
- 1 bras placebo, 3 bras de doses différentes
- Critère principal composite: IDM, AVC et décès cardiovasculaires

Canakinumab Anti-Inflammatory Thrombosis Outcomes Study (CANTOS)

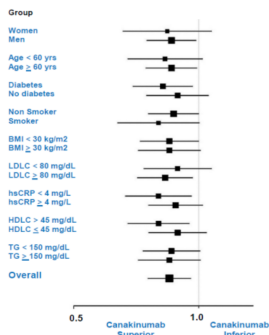


B Primary End Point with Canakinumab, 150 mg, vs. Placebo

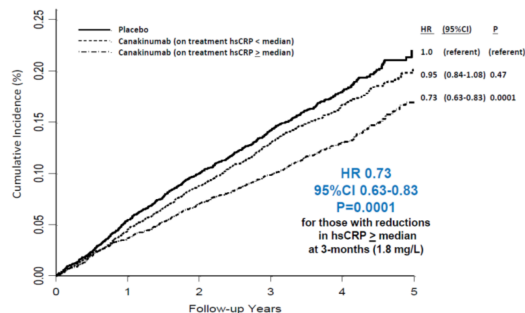


No. at Risk						
Placebo	3344	3141	2973	2632	1266	210
Canakinumab	2284	2151	2057	1849	907	207

MACE

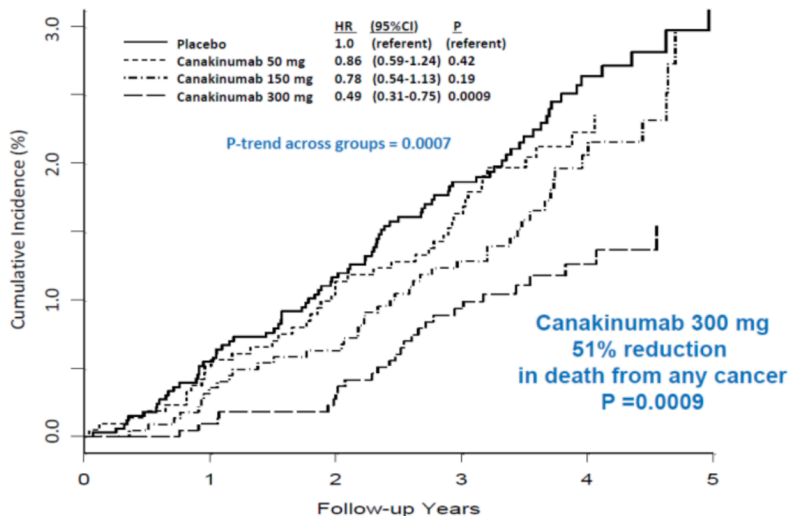


CANTOS: Greater Risk Reduction Among Those With Greater hsCRP Reduction (MACE+)



- Diminution modeste des événements cardiovasculaires à la dose de 150mg (HR 0.85 (95% CI, 0.74 to 0.98; P=0.021)
- Réduction plus importante plus la CRP est diminuée
- Pas de différence sur la mortalité toute cause ou CV (0.94; 95% CI, 0.83 to 1.06; P=0.31)
- Augmentation du risque d'infections

CANTOS: Additional Non-Cardiovascular Clinical Benefits Cancer Mortality



- Preuve du concept que l'athérosclérose est une maladie inflammatoire
- Ouvre la voie à des thérapies ciblant l'inflammation
- Prix prohibitif: environ 60 000 euros par an
- Augmentation du risque d'infections
- Suivi clinique critères de sécurité, notamment infections
- Piste intéressante dans les cancers

2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC)

Authors/Task Force Members: Borja Ibanez* (Chairperson) (Spain), Stefan James* (Chairperson) (Sweden), Stefan Agewall (Norway), Manuel J. Antunes (Portugal), Chiara Bucciarelli-Ducci (UK), Héctor Bueno (Spain), Alida L. P. Caforio (Italy), Filippo Crea (Italy), John A. Goudevenos (Greece), Sigrun Halvorsen (Norway), Gerhard Hindricks (Germany), Adnan Kastrati (Germany), Mattie J. Lenzen (The Netherlands), Eva Prescott (Denmark), Marco Roffi (Switzerland), Marco Valgimigli (Switzerland), Christoph Varenhorst (Sweden), Pascal Vranckx (Belgium), Petr Widimský (Czech Republic)

CHANGE IN RECOMMENDATIONS		2012	2017
Radial access^a			MATRIX ¹⁴³
DES over BMS			EXAMINATION ^{150, 151} COMFORTABLE-AMI ¹⁴⁹ , NORSTENT ¹⁵²
Complete Revascularization^b			PRAMI ¹⁶⁸ , DANAMI-3-PRIMULTI ¹⁷⁰ , CVLPRIT ¹⁶⁹ , Compare-Acute ¹⁷¹
Thrombus Aspiration^c			TOTAL ¹⁵⁹ , TASTE ¹⁵⁷
Bivalirudin			MATRIX ²⁰⁹ , HEAT-PPCI ²⁰⁵
Enoxaparin			ATOLL ^{200, 201} , Meta-analysis ²⁰²
Early Hospital Discharge^d			Small trials & observational data ^{259–262}
Oxygen when SaO ₂ <95%	AVOID ⁴⁴ , DETO2X ⁴⁶	Oxygen when SaO ₂ <90%	
Dose i.V. TNK-tPA same in all patients		STREAM ¹²¹	Dose i.V. TNK-tPA half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

- Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins IMPROVE-IT³⁷⁶, FOURIER³⁸²

- Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion

- Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹⁹³

- Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion

- Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54³³³

- Use of poly pill to increase adherence
FOCUS³²³

- Routine use of deferred stenting
DANAMI 3-DEFER¹⁵⁵

I

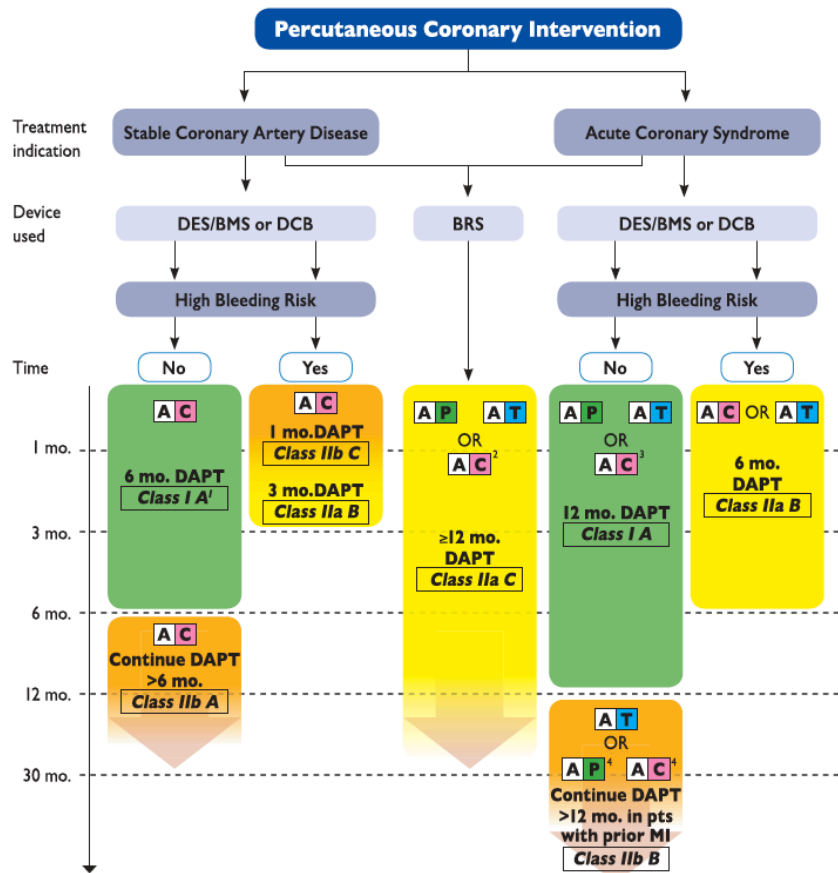
IIa

IIb

III

2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS

The Task Force for dual antiplatelet therapy in coronary artery disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS)



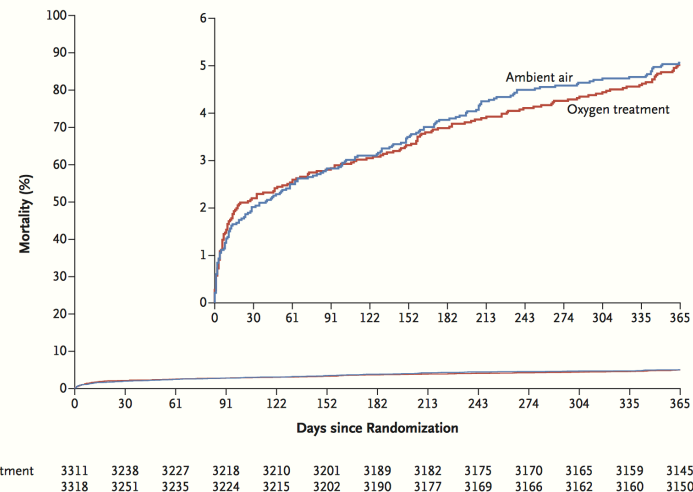
ETUDE DETO2X-AMI, évaluation de l'oxygénothérapie systématique chez les patients présentant un IDM

Hofmann et al, NEJM 2017

- Etude prospective, randomisée
- Patients avec suspicion d'IDM évolutif et SpO₂>90%, randomisé O₂ 6L/min 12-24h vs air ambiant
- N= 6629 patients

Table 3. End Points during and after Hospitalization.

Timing and End Point	Oxygen Group (N=3311)	Ambient-Air Group (N=3318)	Hazard Ratio (95% CI)	P Value
365 Days after randomization				
Death from any cause — no. (%)	166 (5.0)	168 (5.1)	0.97 (0.79–1.21)	0.80
Rehospitalization with myocardial infarction — no. (%)	126 (3.8)	111 (3.3)	1.13 (0.88–1.46)	0.33
Composite of death from any cause or rehospitalization with myocardial infarction — no. (%)	275 (8.3)	264 (8.0)	1.03 (0.87–1.22)	0.70
30 Days after randomization				
Death from any cause — no. (%)	73 (2.2)	67 (2.0)	1.07 (0.77–1.50)	0.67
Rehospitalization with myocardial infarction — no. (%)	45 (1.4)	31 (0.9)	1.46 (0.92–2.31)	0.11
Composite of death from any cause or rehospitalization with myocardial infarction — no. (%)	114 (3.4)	95 (2.9)	1.19 (0.91–1.56)	0.21
During hospital stay				
Median highest measured level of highly sensitive troponin T (IQR) — ng/liter*	946.5 (243.0–2884.0)	983.0 (225.0–2931.0)	—	0.97

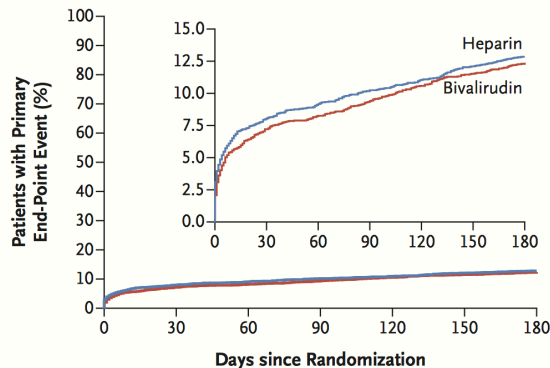


ETUDE VALIDATE, évaluation bivalirudine vs héparine dans les SCA ST- et ST+

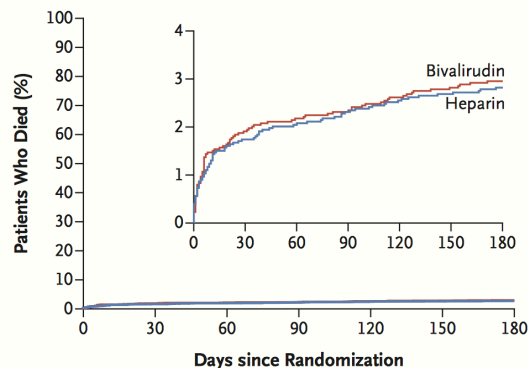
Erlinge et al, NEJM 2017

- Etude randomisée, multicentrique
- Patients pris en charge pour SCA ST- ou ST+, traités de manière concomitante avec des nouveaux antiP2Y12, sans antiGpIIb/IIIa
- N= 6006 patients (50% ST-, 50% ST+)
- Critère primaire: décès, IDM, saignements majeurs à 180 jours

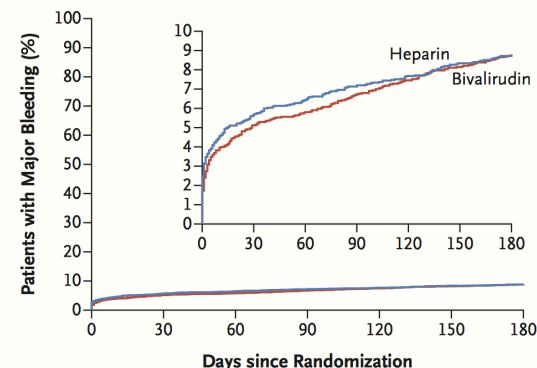
A Primary End Point



B Death



D Major Bleeding



No. at Risk

Bivalirudin	3004	2758	2727	2693	2656	2628	2605
Heparin	3002	2733	2698	2665	2639	2607	2585

No. at Risk

Bivalirudin	3004	2915	2906	2901	2892	2886	2882
Heparin	3002	2920	2909	2900	2892	2888	2884

No. at Risk

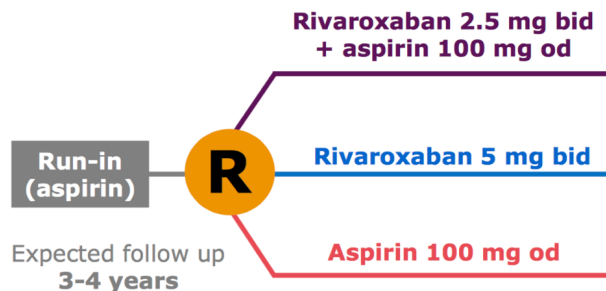
Bivalirudin	3004	2775	2748	2717	2688	2664	2644
Heparin	3002	2759	2727	2699	2676	2653	2638

ETUDE COMPASS, évaluation Rivaroxaban chez le patient athérosclérotique stable

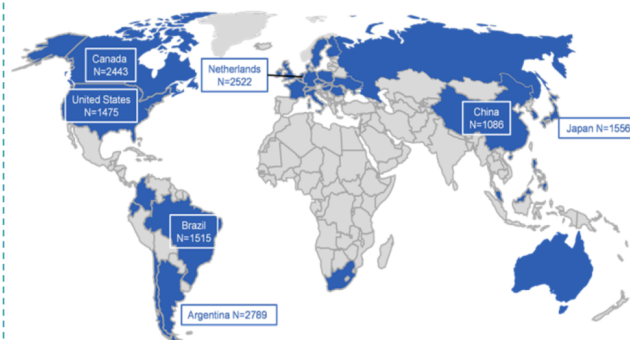
Eikelboom et al, NEJM 2017

- Etude randomisée, multicentrique
- Maladie athérosclérotique stable (coronaropathie ou AOMI)
- N= 27 395 patients
- Critère primaire: décès CV, IDM, AVC

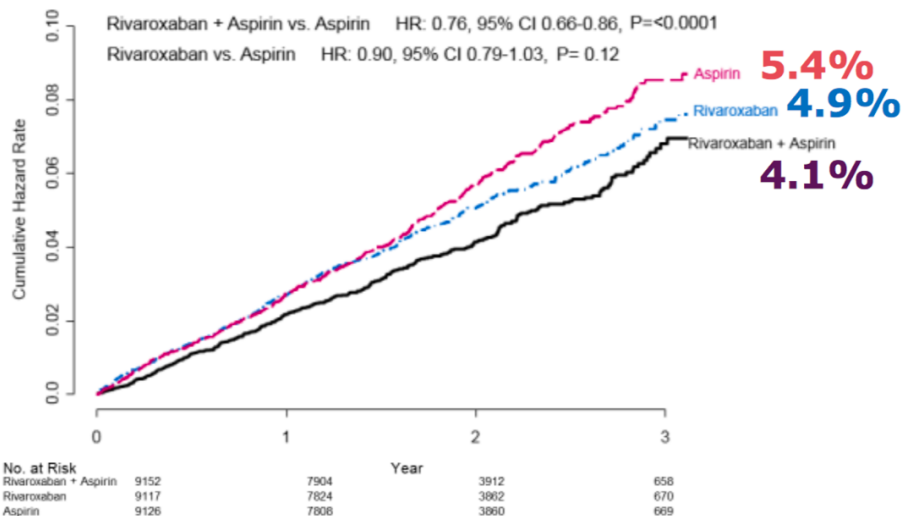
Stable CAD or PAD
2,200 with a primary outcome event



602 sites, 33 countries



CRITERE PRIMAIRE DE JUGEMENT: DECES CV, IDM, AVC



Primary components

Outcome	R + A N=9, 152	A N=9, 126	Rivaroxaban + Aspirin vs. Aspirin	
			HR (95% CI)	p
CV death	1.7%	2.2%	0.78 (0.64-0.96)	0.02
Stroke	0.9%	1.6%	0.58 (0.44-0.76)	<0.0001
MI	178 1.9%	2.2%	0.86 (0.70-1.05)	0.14

SAIGNEMENTS MAJEURS

Outcome	R + A N=9,152	R N=9,117	A N=9,126	Rivaroxaban + Aspirin vs. Aspirin		Rivaroxaban vs. Aspirin	
	N (%)	N (%)	N (%)	HR (95% CI)	P	HR (95% CI)	P
Major bleeding	(3.1%)	(2.8%)	(1.9%)	1.70 (1.40-2.05)	<0.0001	1.51 (1.25-1.84)	<0.0001
Fatal	(0.2%)	(0.2%)	(0.1%)	1.49 (0.67-3.33)	0.32	1.40 (0.62-3.15)	0.41
Non fatal ICH*	(0.2%)	(0.4%)	(0.2%)	1.10 (0.59-2.04)	0.77	1.69 (0.96-2.98)	0.07
Non-fatal other critical organ*	(0.5%)	(0.5%)	(0.3%)	1.43 (0.89-2.29)	0.14	1.57 (0.98-2.50)	0.06

BENEFICE CLINIQUE NET

Rivaroxaban 2.5mgx2/j en plus de
l'aspirine 100mg/j

- Diminue la mortalité CV, les AVCs et les IDMs
- Augmente les saignements majeurs sans augmentation des saignements fatals, intracranien ou critiques
- Présente un bénéfice clinique net favorable
- **Aucun bénéfice du rivaroxaban seul**

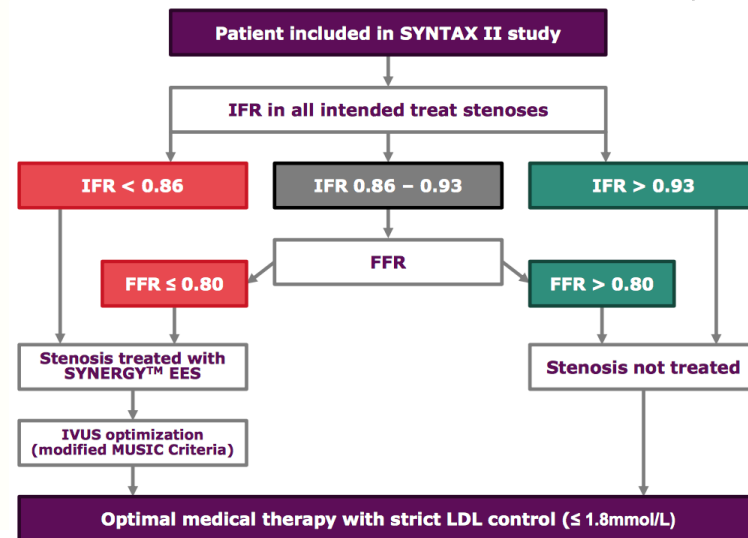
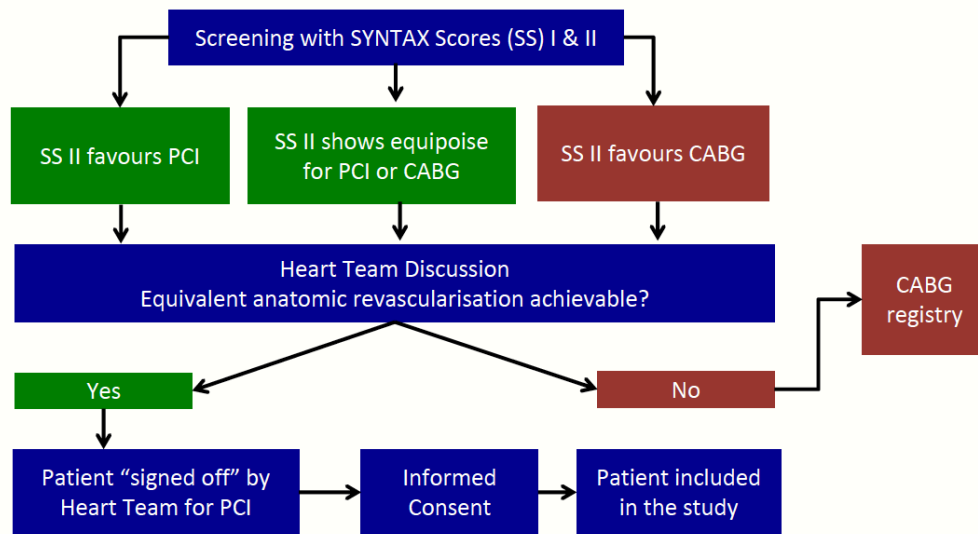
Outcome	R + A N=9,1 52	A N=9,1 26	Rivaroxaban + Aspirin vs. Aspirin	
	N (%)	N (%)	HR (95% CI)	P
Net clinical benefit (Primary + Severe bleeding events)	431 (4.7%)	534 (5.9%)	0.80 (0.70- 0.91)	0.0005

ETUDE SYNTAX II, évaluation d'une stratégie contemporaine de revascularisation des patients pluri tronculaires

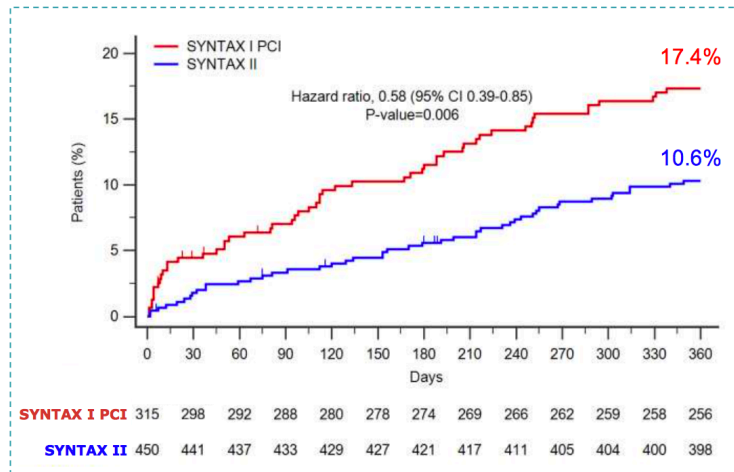
Escaned et al, EHJ 2017

- Etude multicentrique (22 centres européens), un seul bras
- Stratégie SYNTAX II: Décision de revascularisation Heart-Team selon les résultats du score SYNTAX II, revascularisation guidée par la physiologie (iFR, FFR), stents dernière génération (struts fines, polymère résorbable), imagerie endocoronaire, désocclusion de CTO et ttt médical optimal basé sur les guidelines
- N= 708patients screenés, 454 éligibles à ATL
- Critère primaire: MACCE (décès toutes causes, evts cérébraux vasculaires IDM, revascularisations à 1 an.
- Comparaison: 1)à la cohorte ATL SYNTAX I, 2) à la cohorte pontages SYNTAX I

DESIGN



CRITERE PRIMAIRE

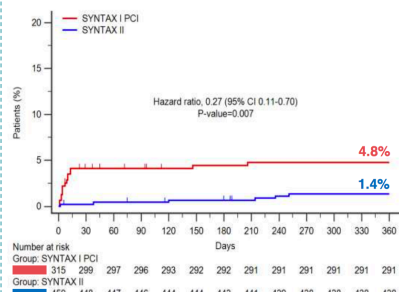


⇒ Utilisation d'une stratégie SYNTAX II de revascularisation des patients pluritronculaires améliore le pronostic à 1 an comparé à une stratégie SYNTAX I.

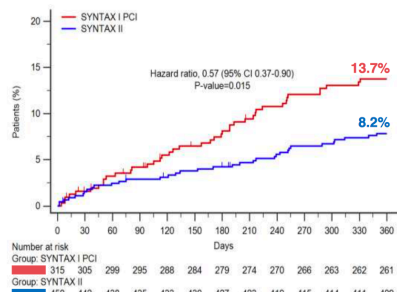
⇒ Réduction revascularisations et réduction IDM

⇒ Pas de différence sur la mortalité toutes causes et AVCs

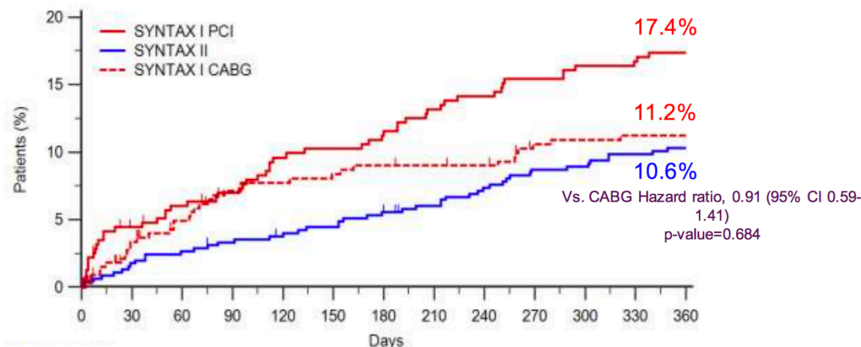
Myocardial infarction



All revascularisation



CRITERE PRIMAIRE



SYNTAX I PCI	315	298	292	288	280	278	274	269	266	262	259	258	256
SYNTAX II	450	441	437	433	429	427	421	417	411	405	404	400	398
SYNTAX I CABG	334	313	304	295	293	291	289	288	287	279	278	277	277

⇒ En utilisant une stratégie SYNTAX II pour l'angioplastie, celle-ci était non-inférieure à la cohorte de patients pontés SYNTAX I sur le critère primaire

RECOMMENDATIONS

2017 ESC/EACTS Guidelines for the management of valvular heart disease

The Task Force for the Management of Valvular Heart Disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

What is new in the 2017 Valvular Heart Disease Guidelines?	
Changes in recommendations	
2012	2017
Indications for intervention in symptomatic aortic stenosis	
IIb C TAVI resection may be considered in asymptomatic patients with low-flow, low-gradient aortic stenosis and reduced ejection fraction without flow-limiting aortic regurgitation.	IIa C TAVI resection may be considered in asymptomatic patients with low-flow, low-gradient aortic stenosis and reduced ejection fraction without flow-limiting aortic regurgitation, particularly when CT calcium scoring confirms severe aortic stenosis.
Choice of intervention in symptomatic aortic stenosis	
Recommendations for the use of TAVI (Table on "Contraindications for TAVI" and Table on "Recommendations for the choice of intervention" (Section 3.3, and Table 7)	Replaced by recommendations for the choice of intervention See Section 3.3, "Indications for intervention in aortic stenosis and recommendations for the choice of intervention" (Section 3.3, and Table 7) "Aortic" to be considered for the heart team for the decision between SAVR and TAVI in patients at increased surgical risk.
Indications for surgery in asymptomatic aortic stenosis	
IIb C Mildly elevated BNP levels.	IIa C Mildly elevated BNP levels (≥100 ng/l and age-corrected normal range) confirmed by repeated measurements without other explanations.
IIb C Increase of mean pressure gradient with exercise by >20 mmHg.	Taken out
IIb C Excessive LV hypertrophy in the absence of hypertension.	Taken out
Indications for intervention in asymptomatic severe primary mitral regurgitation	
IIb C Surgery may be considered in asymptomatic patients with preserved LV function, high likelihood of durable repair, low surgical risk, and: • Left atrial dilatation (volume index ≥40 ml/m ² BSA) and sinus rhythm.	IIa C (conditional) Surgery should be considered in asymptomatic patients with preserved LVFV (LVH) and LVESV ≤40 ml/m ² BSA, the repair is performed in heart valve centres, and the following findings in present patients of significant LA dilatation (volume index ≥40 ml/m ² BSA) in sinus rhythm.
IIb C Pulmonary hypertension on exercise (RVP ≥40 mmHg at exercise).	Taken out
Indications for mitral valve intervention in secondary mitral regurgitation	
IIa C Surgery should be considered in patients with moderate secondary mitral regurgitation undergoing CABG.	Taken out
IIa C When revascularisation is not indicated, surgery may be considered in patients with severe secondary mitral regurgitation and LVFV >30%, who remain symptomatic despite optimal medical management (including CRT if indicated).	IIb C (conditional) When revascularisation is not indicated, surgery may be considered in patients with severe secondary mitral regurgitation and LVFV >30%, who remain symptomatic despite optimal medical management (including CRT if indicated) and who have a suitable valve morphology by echocardiography awaiting therapy. In patients with severe secondary mitral regurgitation and LVFV >30% who remain symptomatic despite optimal medical management (including CRT if indicated) and who have no options for revascularisation, the Heart Team may consider percutaneous edge-to-edge procedures or valve surgery after careful evaluation for ventricular assist device or heart transplant according to individual patient characteristics.
Additional statements The lower thresholds defining severe PMR compared to primary PMR are based on their association with prognosis. However, it is unclear if prognosis is independently affected by PMR compared to LV dysfunction. For isolated mitral valve treatment in secondary PMR, thresholds of severity of PMR for intervention and need to be validated at clinical risk. So far, no second benefit has been confirmed for reduction of secondary PMR.	
Indications for antithrombotic therapy in patients with a prosthetic heart valve or valve repair	
IIa C The addition of low-dose aspirin (75–100 mg/day) to VKA should be considered in the case of concomitant atherosclerotic disease.	IIb C The addition of low-dose aspirin (75–100 mg/day) to VKA may be considered in the case of concomitant atherosclerotic disease.

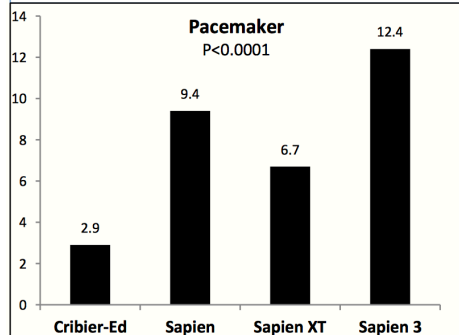
What is new in the 2017 Valvular Heart Disease Guidelines? (continued)	
2017 New recommendations	
Management of CAD in patients with VHD	
New IIa C recommendations: • CT angiography should be considered as an alternative to coronary angiography before valve surgery in patients with severe VHD and low probability of CAD, or in whom conventional coronary angiography is technically not feasible or who are at high risk. • PCI should be considered in patients with a primary indication to undergo TAVI and coronary artery diameter stenosis >70% in proximal segments. • PCI should be considered in patients with a primary indication to undergo transcatheter aortic valve interventions and coronary artery diameter stenosis >70% in proximal segments.	
Management of atrial fibrillation in VHD	
New additional recommendations: See new Table "Management of atrial fibrillation in patients with VHD" Section 3.7.2.	
Indications for surgery in severe aortic regurgitation and aortic root disease	
New I C recommendations: • Heart Team discussion is recommended in selected patients in whom aortic root disease may be a feasible alternative to valve replacement. • Aortic valve repair, using the reimplantation or remodeling with aortic annuloplasty technique, is recommended in young patients with aortic root dilation and bicuspid aortic valve, when performed by experienced surgeons.	
New IIa C recommendation: Surgery should be considered in patients who have aortic root disease with maximal ascending aortic diameter ≥45 mm in patients with a TGFBI or TGFBI extension (including Loeys-Dietz syndrome).	
Diagnosis of severe aortic stenosis See new recommendations for the diagnosis of severe aortic stenosis in Figure 2 and Table 6.	
Indications for surgery in asymptomatic aortic stenosis	
New IIa C recommendation: Severe pulmonary hypertension (systemic pulmonary artery pressure at rest ≥40 mmHg confirmed by invasive measurement) without other explanation.	
Indications for intervention in asymptomatic severe primary mitral regurgitation	
New additional statements: • If pulmonary hypertension (RVP ≥40 mmHg at rest) is the only indication for surgery, the value should be confirmed by invasive measurement.	
Management after valve intervention	
New recommendation: • After transcatheter as well as surgical implantation of a bioprosthetic valve, echocardiography – including the measurement of transcatheter gradients – should be performed within 30 days (preferably around 30 days) after valve implantation (as baseline imaging at 1 year after implantation, and annually thereafter).	
Indications for antithrombotic therapy in patients with a prosthetic heart valve or valve repair	
New recommendations: • P2Y ₁₂ antiplatelet and recommended provided appropriate training and quality control are performed.	
IIb B When revascularisation is not indicated and surgical risk is not low, a percutaneous edge-to-edge procedure may be considered in patients with severe secondary mitral regurgitation and LVFV >30%, who remain symptomatic despite optimal medical management (including CRT if indicated) and who have a suitable valve morphology by echocardiography awaiting therapy.	
IIa A Dual therapy comprising VKA and clopidogrel (75 mg/day) should be considered as an alternative to 1-month triple antithrombotic therapy in patients in whom the bleeding risk outweighs the ischaemic risk.	
IIa B In patients treated with coronary stent implantation, triple therapy with aspirin (75–100 mg/day), clopidogrel (75 mg/day), and VKA should be considered for 1 month, irrespective of the type of stent used and the clinical presentation (i.e. ACS or stable CAD).	
IIa B Triple therapy comprising aspirin (75–100 mg/day), clopidogrel (75 mg/day), and VKA for larger 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 that outweigh the bleeding risk.	
IIa B Dual therapy comprising VKA and clopidogrel (75 mg/day) should be considered as an alternative to 1-month triple antithrombotic therapy in patients in whom the bleeding risk outweighs the ischaemic risk.	
IIa B In patients who have undergone PCI, discontinuation of antiplatelet treatment should be considered at 12 months.	
IIa B In patients requiring aspirin after clopidogrel in addition to VKA, 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 therapeutic range >45–70%.	
IIa C Dual antiplatelet therapy should be considered for the first 3–4 months after TAVI, followed by lifelong single antiplatelet therapy in patients who do not need oral anticoagulation for other reasons.	
IIb B Single antiplatelet therapy may be considered after TAVI in the case of high bleeding risk.	
IIb C The use of NOACs is contraindicated in mechanical valves.	

What is new in the 2017 Valvular Heart Disease Guidelines? (continued)	
2017 New recommendations (continued)	
Management of prosthetic valve dysfunction	
New recommendations:	
I C	
Anticoagulation using a VKA and/or UFH is recommended in bioprosthetic valve thrombosis before considering reintervention.	
I C	
Reoperation is recommended if paravalvular leak is related to endocarditis or causes haemolysis requiring repeated blood transfusions or leading to severe symptoms.	
IIb C	
Transcatheter closure may be considered for paravalvular leaks with clinically significant regurgitation in surgical high-risk patients (Heart Team decision).	
IIa C	
Transcatheter valve-in-valve implantation in aortic position should be considered by the Heart Team depending on the risk of reoperation and the type and size of prosthesis.	
2017 NEW/REVISED CONCEPTS	
New concept	
• Condense guideline document linked to ESC Textbook for more background information.	
• Key points and gaps in evidence after each section.	
Heart valve centres and Heart Team	
New concept	
• See new Table 5 "Recommended requirements of a heart valve centre", see Section 3.6.	
Class I	Class IIa
Class IIb	Class III

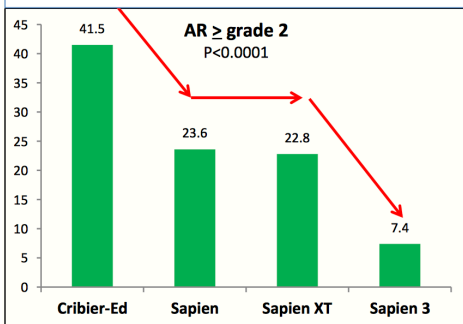
TAVI: 15 ans d'expérience dans le centre d'Alain Cribier

COMPLICATIONS A 30 JOURS

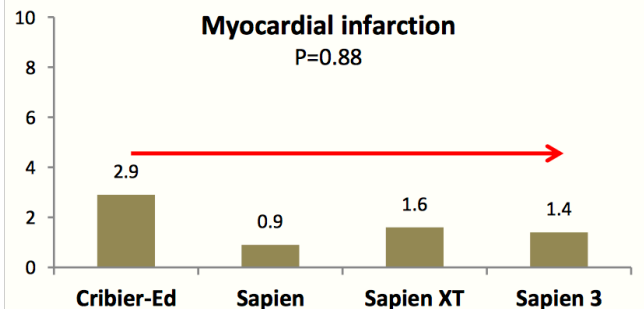
Pacemaker



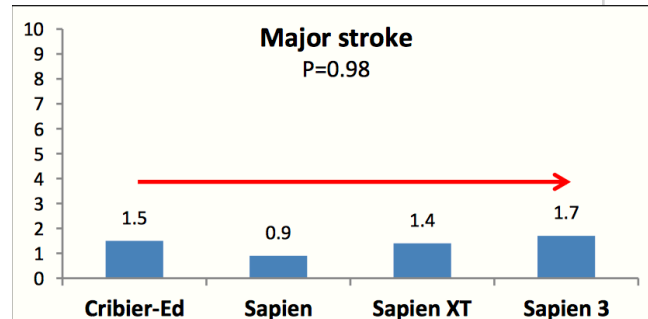
Para-valvular aortic regurgitation



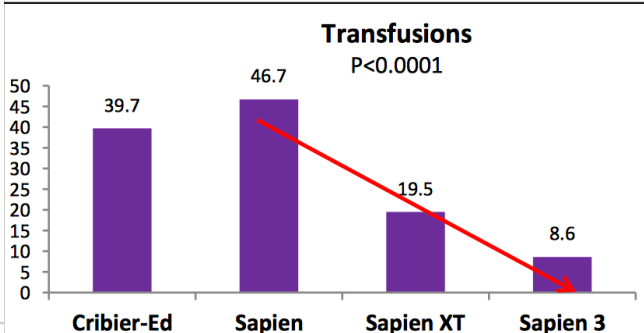
Myocardial infarction



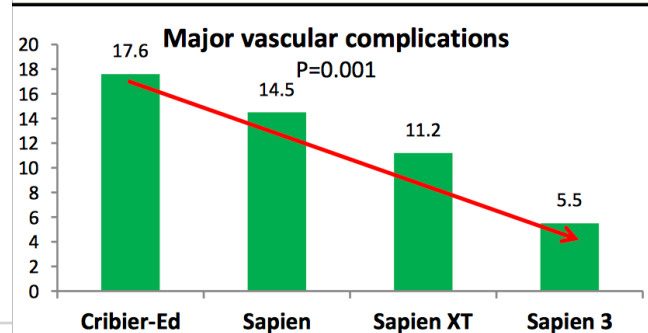
Major stroke



Transfusions

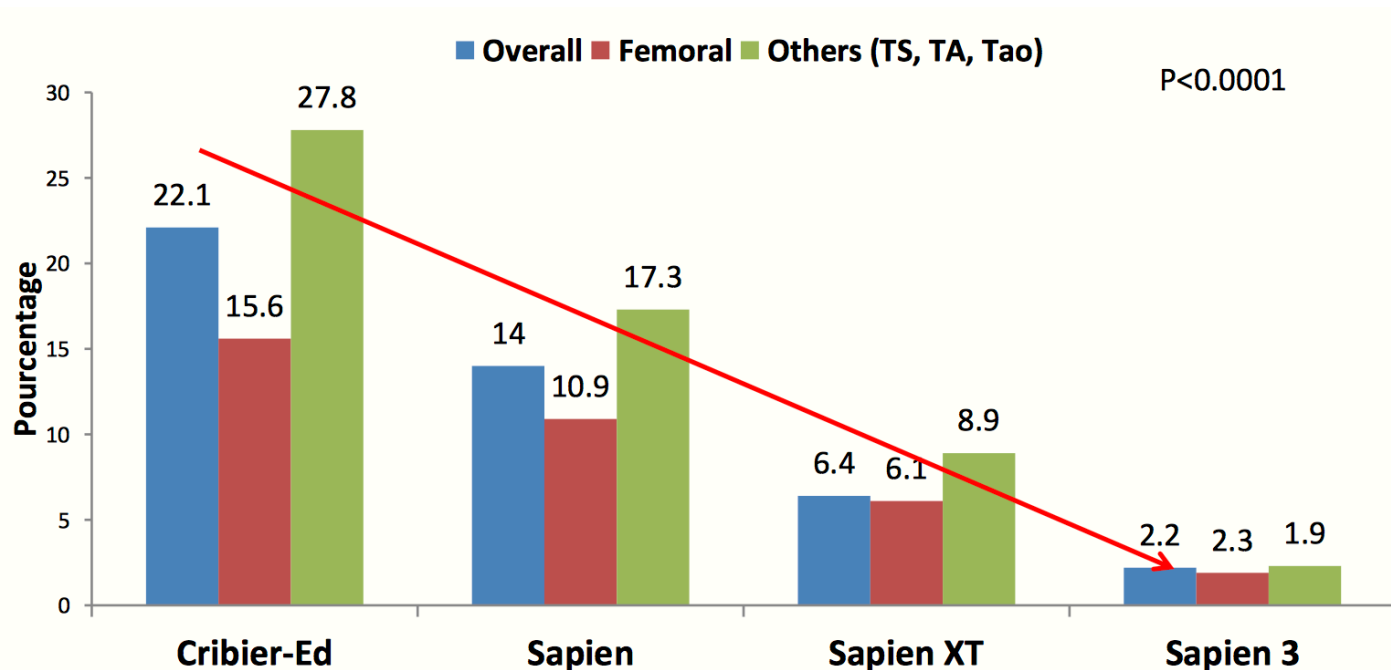


Major vascular complications



TAVI: 15 ans d'expérience dans le centre d'Alain Cribier

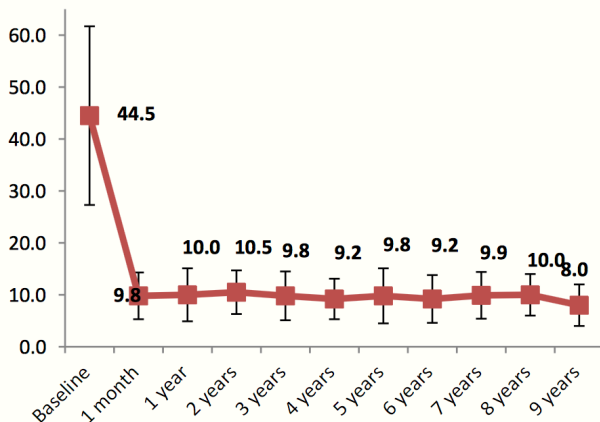
DIMINUTION MAJEURE DE LA MORTALITE A 30 JOURS



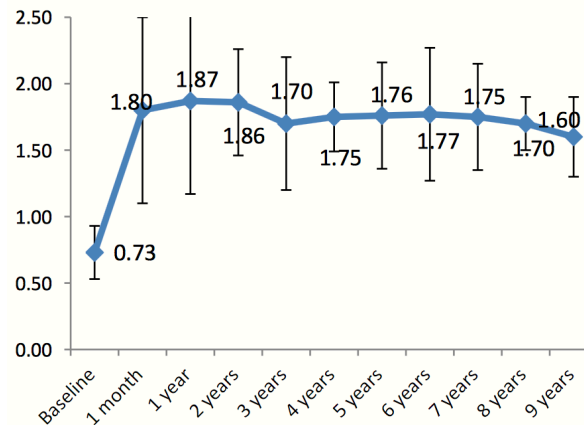
TAVI: 15 ans d'expérience dans le centre d'Alain Cribier

FOLLOW-UP ECHOGRAPHIQUE A LONG TERME

Mean Aortic Gradient (mmHg)



Aortic Valve Area (mm²)

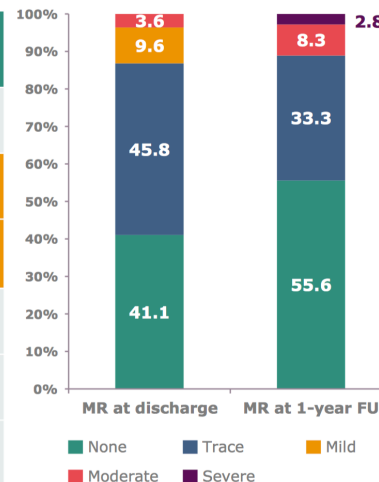


Etude multicentrique évaluant le TMVI

Himbert et al, ESC presentation 2017

- Registre multicentrique
- Suivi 91 patients
- Valve in valve (ViV), dégénérescence bioprothèse: 34 patients
- Valve in ring (ViR), échec d'annuloplastie: 30 patients
- Valve in mitral annulus calcification (ViMAC), VM calcifiée: 27 patients

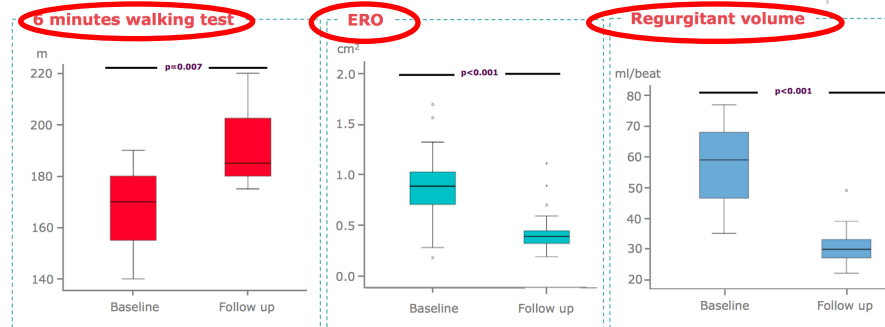
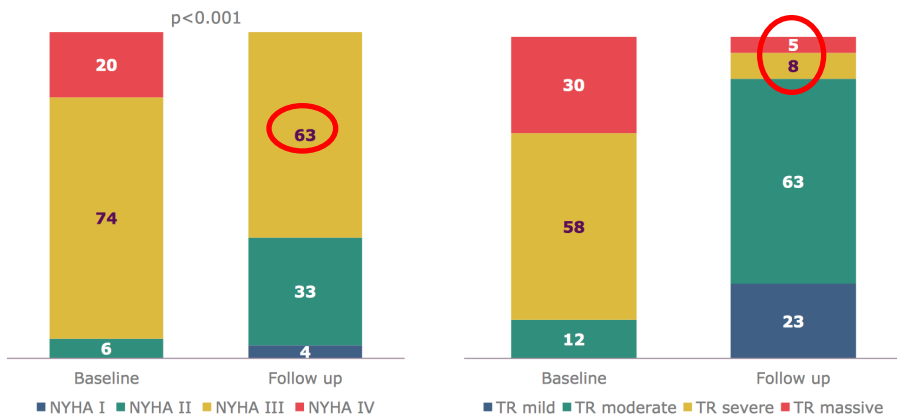
Late Outcomes	All patients (n=91)	ViV (n=34)	ViR (n=30)	ViMAC (n=27)	p value
Death	30 (33.0)	8 (23.5)	10 (33.3)	12 (44.4)	0.219
Cardiovascular death	24 (26.4)	5 (14.7)	10 (33.3)	9 (33.3)	0.162
Surgical mitral valve replacement	7 (7.7)	0	7 (23.3)	0	<0.001
Re-intervention	6 (6.6)	1 (2.9)	4 (10)	2 (7.4)	0.505
Device thrombosis	9 (10.0)	3 (8.8)	3 (10.0)	3 (11.5)	0.999
NYHA class I or II	45/72 (62.5)	19/28 (67.9)	12/24 (50.0)	14/20 (70.0)	0.311



Etude évaluant le MitraClip dans les insuffisances tricuspides sévères

Schueler et al, ESC presentation 2017

- Pour rappel, 80% des IT sévères sont fonctionnelles, mortalité opératoire 20%
- Approches interventionnelles sont nécessaires
- Evaluation du MitraClip pour réparation tricuspide chez 64 patients, registre multicentrique, suivi à 30 jours



Etude SIOVAC: Sildénafil chez les patients porteurs d'une valvulopathie corrigée avec HTAP

Bermejo et al, ESC presentation 2017

- **Rationnel** : Les valvulopathies du cœur gauche sont une cause fréquente d'HTAP et la régression de l'HTAP n'est pas systématique après correction de la valvulopathie

- **But** : Évaluer l'impact du sildénafil sur le devenir clinique de patients avec une valvulopathie corrigée et une HTAP résiduelle

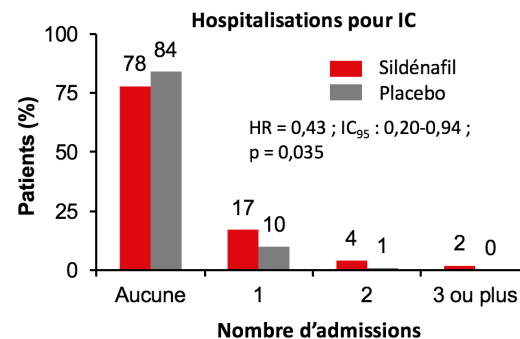
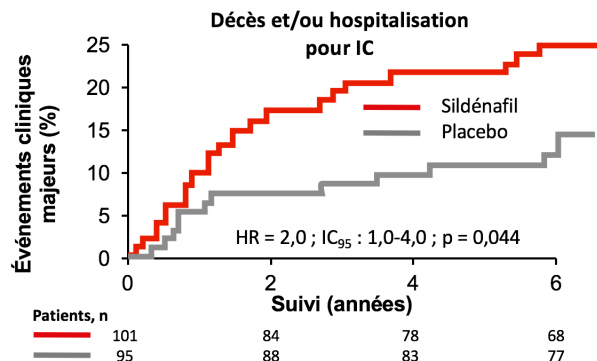
- **Méthodes**

- Étude multicentrique (18 centres espagnols), randomisée, double aveugle, sildénafil 40 mg × 3/j (n = 104) vs placebo (n = 96)
- Critères d'inclusion : valvulopathie corrigée, PAPM ≥ 30 mmHg au cathétérisme, situation clinique stable depuis 1 mois
- Critère principal : score clinique composite
- Critères secondaires essentiels : survenue du décès ou d'une hospitalisation pour IC, et n d'hospitalisations pour IC

Résultats : aggravation du score clinique plus fréquente (OR placebo = 0,39 [0,22-0,67]), augmentation du risque d'événements cliniques et augmentation du nombre d'hospitalisations pour IC chez les patients sous sildénafil vs placebo

Etude SIOVAC: Sildénafil chez les patients porteurs d'une valvulopathie corrigée avec HTAP

Bermejo et al, ESC presentation 2017



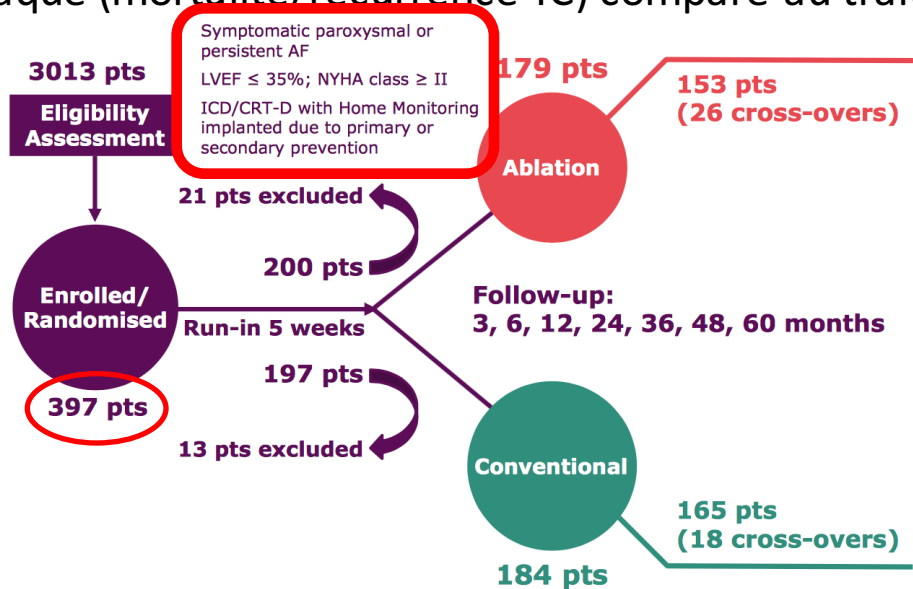
Résultats : aggravation du score clinique plus fréquente (OR placebo = 0,39 [0,22-0,67]), augmentation du risque d'événements cliniques et augmentation du nombre d'hospitalisations pour IC chez les patients sous sildénafil vs placebo

=> Le traitement par sildénafil est associé à un moins bon devenir clinique en comparaison avec le placebo en cas d'HTP liée à une valvulopathie corrigée

ETUDE CASTLE-AF, évaluation de l'ablation de FA chez des patients en IC à FE altérée sous traitement médical maximal vs traitement médical seul

Marrouche et al, ESC 2017

- Multicentrique (31 sites, 9 pays), randomisé, contrôlé
- Evaluation efficacité de l'ablation de FA chez les patients en insuffisance cardiaque (mortalité/récurrence IC) comparé au traitement standard



Primary Endpoint

**All-cause mortality
+
Worsening heart failure admissions**



- Bénéfice sur le critère composite, la mortalité toutes causes et les hospitalisations pour IC à 60 mois
- Egalement bénéfice sur la FEVG, 8% en moyenne à 60 mois vs 0% dans groupe contrôle
- Divergence des courbes dès 6 mois

ETUDE EMANATE, évaluation de la cardioversion de FA sous apixaban vs héparine et AVK

Ezekowitz et al, ESC 2017

- Puissance non suffisante pré-spécifiée
- Dose de charge de 10 mg
- FA < 48 heures

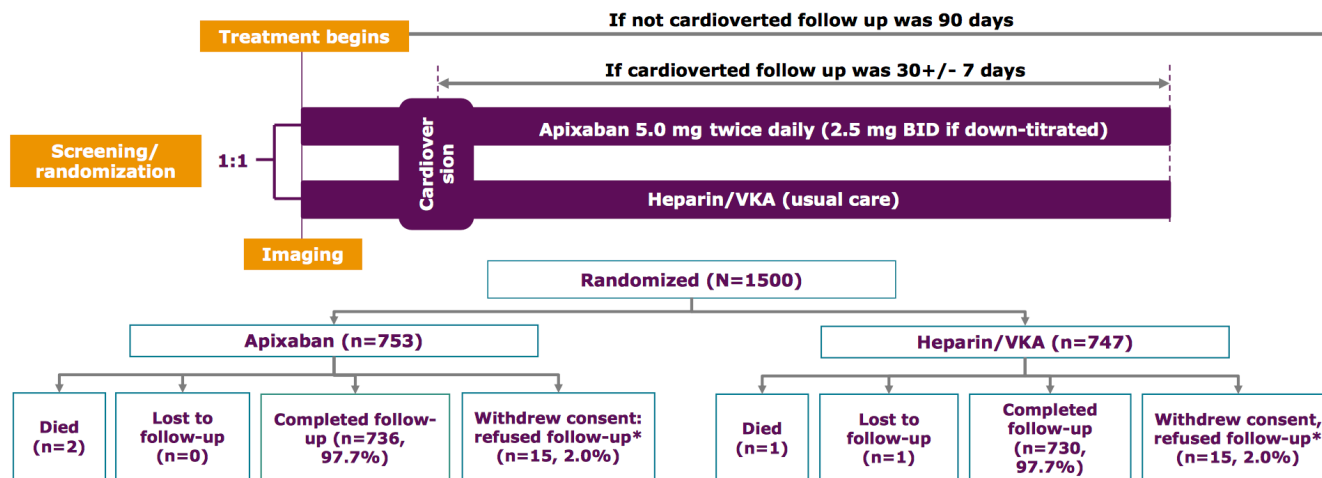
Key Eligibility Criteria

Key Inclusion Criteria

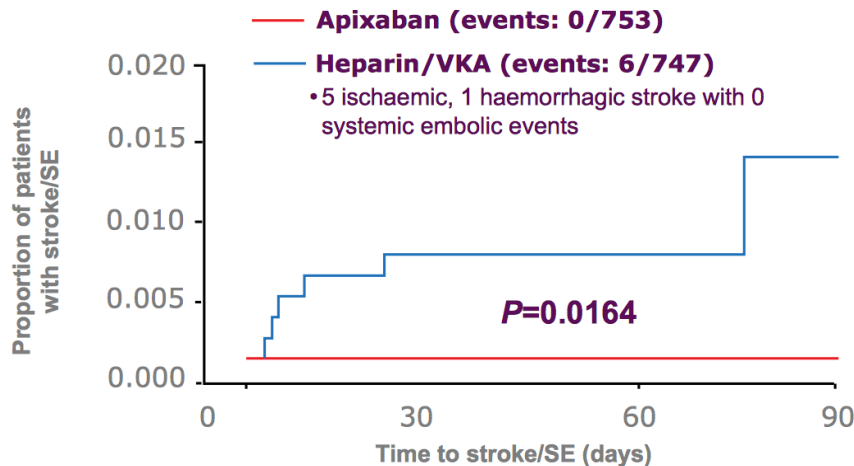
- Anticoagulation-naïve patients with AF (<48 hours of parenteral and/or oral anticoagulation) indicated for cardioversion.

Key Exclusion Criteria

- Contraindications to apixaban or heparin/VKA
- Mitral stenosis or previous valve surgery
- Other conditions requiring anticoagulation
- Dual antiplatelet therapy



Stroke/SE



Number at risk

Apixaban	752	614	199	55
Heparin/VKA	747	565	231	88

Safety outcomes N = 1456

	Apixaban Total (n=735)	Apixaban Loading Dose Subset (n=342)	Heparin/ VKA Total (n=721)
Major bleeds	3	(1)	6
Clinically relevant non -major bleeds	11	(4)	13

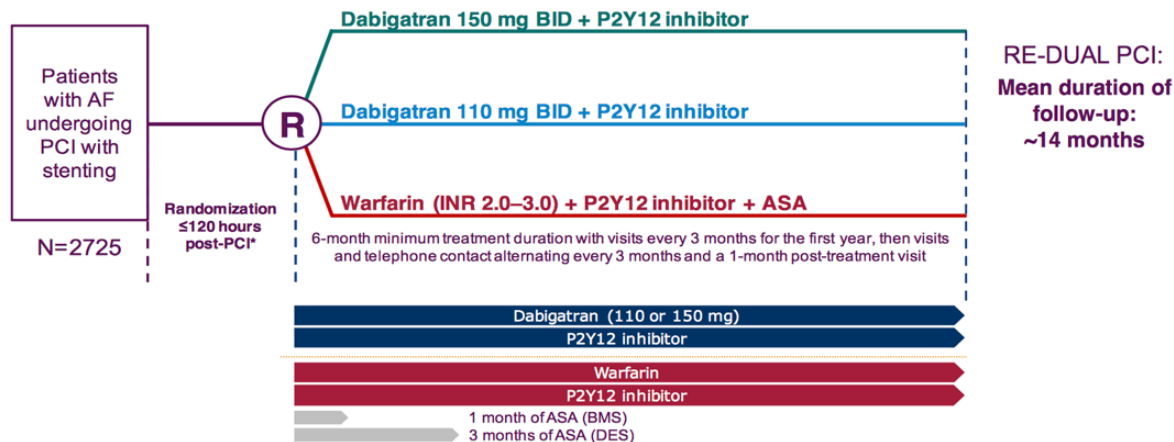
*Randomised and received ≥ 1 dose of study medication (by treatment received)

Loading dose for Apixaban: 10 mg
Imaging guided cardioversion

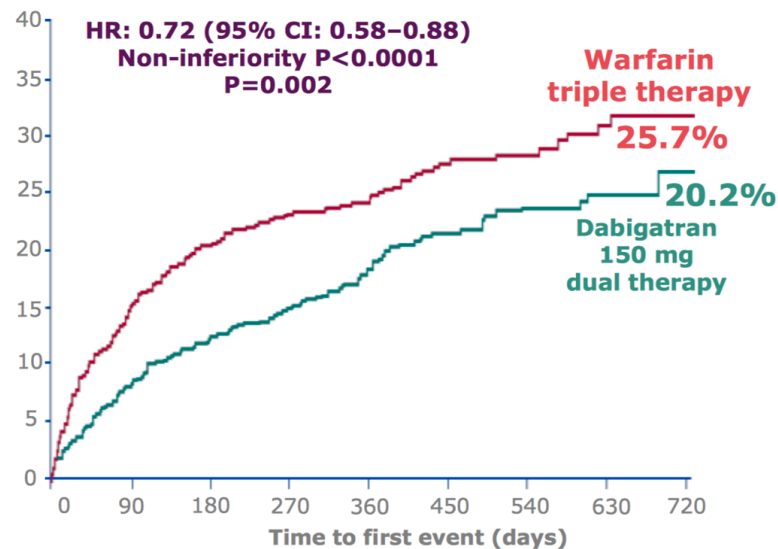
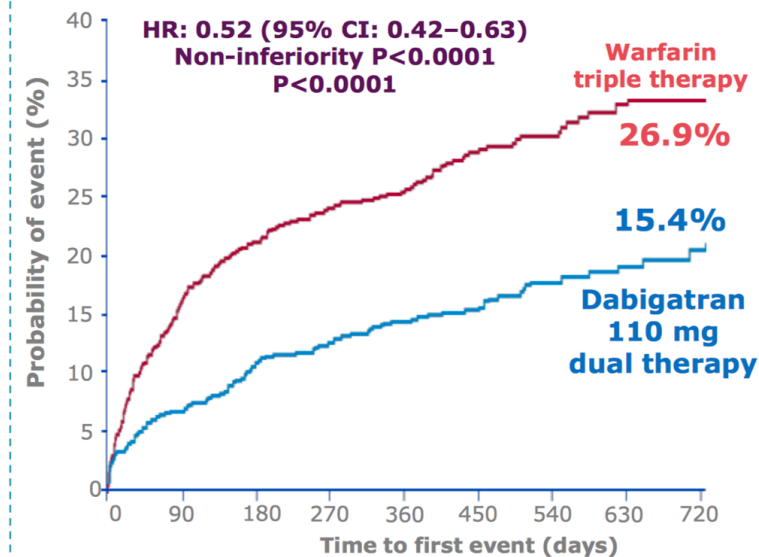
**ETUDE RE-DUAL PCI, évaluation de patients en FA traités par angioplastie:
dabigatran + anti P2Y12 vs triple thérapie conventionnelle**

Connon et al, NEJM 2017

- Essai multicentrique, randomisé, contrôlé
- 3 bras, anti P2Y12 (clopidogrel ou ticagrelor)
- Critère primaire: saignement majeur
- 2nd critère: critère composite non-infériorité sur les paramètres ischémiques: IDM, AVC, décès toutes causes



Time to first major bleeding event or clinically relevant non-major bleeding event

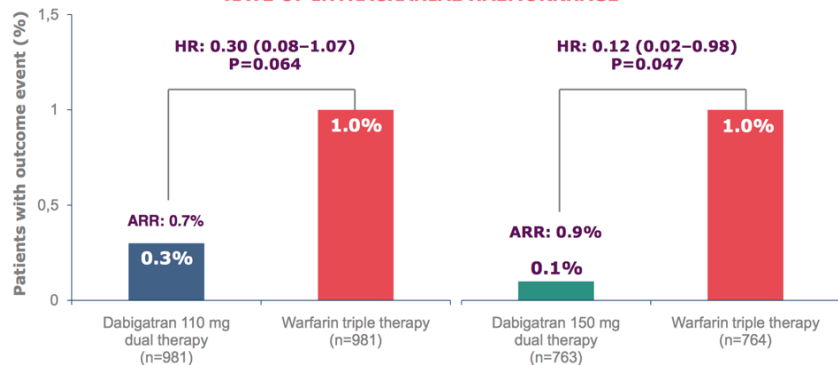


- Plus de saignements avec triple thérapie comparé au bras double thérapie dabigatran 110 et 150mg + anti P2Y12

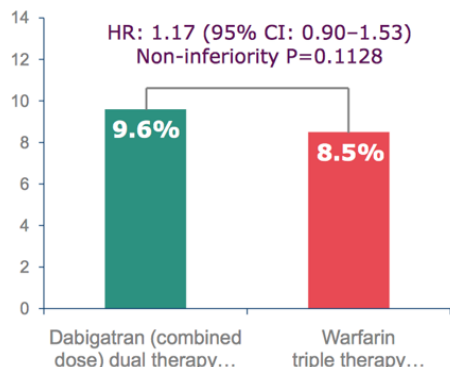
ANTICOAGULANTS TRIPLE THERAPIE

Rythmologie

RATE OF INTRACRANIAL HAEMORRHAGE



All-cause death, MI, stroke or systemic embolism



- Après traitement par angioplastie chez un patient en FA
- Traitement par bithérapie dabigatran+antiP2Y12 est supérieur à triple thérapie sur saignements
- Non-inférieur sur les événements ischémiques comparé à triple thérapie conventionnelle

ETUDE REHEARSE-AF, intérêt du diagnostic de la FA par des ECG séquentiels via un dispositif adapté pour smartphone

Système de i-monitoring – AliveCor™ Kardia

Halcox et al, ESC 2017

Introduction

Les conséquences de la FA sont lourdes en terme de santé publique

La détection de la FA par 2 ECG/sem. coûterait 9 000 €/diagnostic

Ce coût est acceptable dans la population avec un CHA₂DS₂VASc ≥ 2

Méthode

1 001 pts ≥ 65 ans + un autre FD RCV

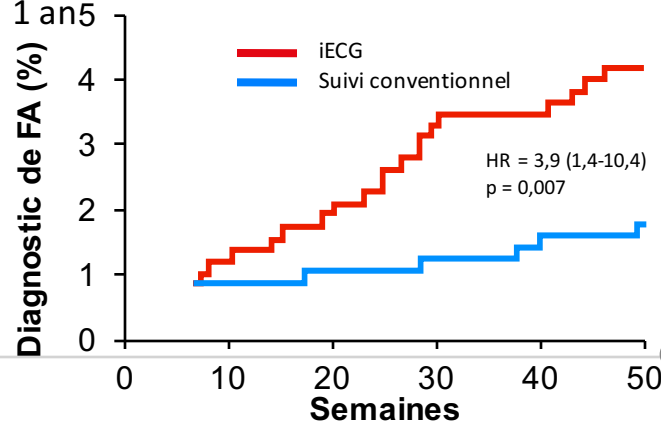
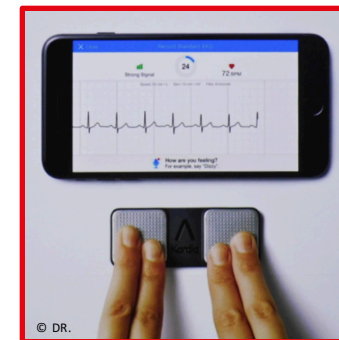
i-monitoring vs routine pour diagnostiquer la FA pendant 1 an

Résultats

Meilleur diagnostic pour le i-monitoring

Bonne tolérance / bonne observance

L'utilisation des nouvelles technologies permet un diagnostic anticipé de la FA dans une population à risque de complications



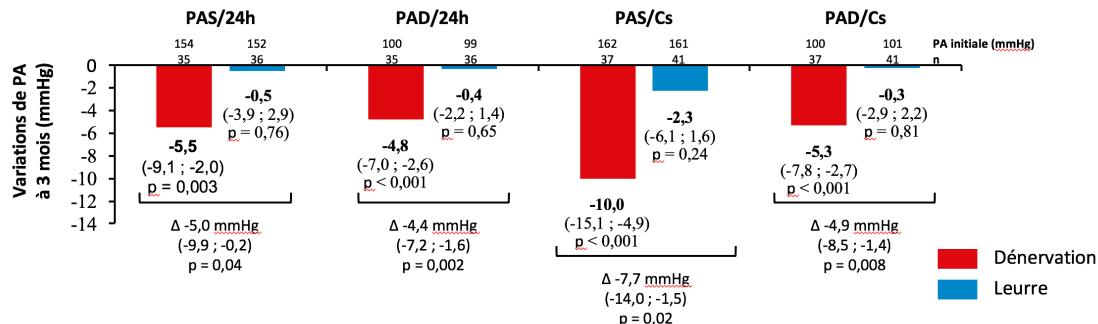
SPYRAL HTN – OFF MED, nouvel essai sur la dénervation rénale...

Townsend et al, Lancet 2017

Rationnel : Après la déception de SIMPLICITY, la dénervation des artères rénales par radiofréquence est ici testée pour le traitement de l'HTA légère à modérée en alternative au traitement médical avec une technologie améliorée (cathéter d'ablation à 4 électrodes permettant de naviguer dans les artères rénales principales et ses branches)

Méthode : - Étude randomisée, avec leurre (Sham), simple aveugle avec critère principal = variation PA à 3 mois
- Critères d'inclusion : $150 \leq \text{PAS} < 180$ mmHg, $\text{PAD} \geq 90$ mmHg (consultation) ou $140 \leq \text{PAS} < 170$ mmHg (MAPA)

Résultats : n = 80, PA moyenne = 161 ± 7 mmHg. Aucun traitement anti-HTA à l'inclusion



Baisse de PA obtenue chez 75 % des patients mais souvent sans atteindre les objectifs actuels de PA
Aucune complication

=> Un nouveau matériel plus performant pour l'ablation de l'innervation sympathique des artères rénales, mais toujours pas la panacée de l'HTA

REGISTRE QUALIFY: Suivi des recommandations et pronostic des patients ambulatoires en IC à FEVG altérée

Komadja et al, ESC 2017

Rationnel : Après publication des résultats à 6 mois, présentation des résultats de l'impact du suivi des recommandations à 18 mois

Méthodes : Registre prospectif, multicentrique, 547 centres participants entre sept. 2013 et déc. 2014

Résultats : 6 744 patients âgés de 18 ans et plus ambulatoires avec IC à FEVG altérée (< 40 %) hospitalisés pour aggravation de l'IC entre 1 et 15 mois

Calcul du score de prescription*

Pour chaque classe : IEC, ARA II, bêta-bloquant, antialdostérone, ivabradine

0 : Si aucun traitement recommandé n'est prescrit (en l'absence de contre-indication)

1 : si plus de 50 % des traitements sont prescrits

0,5 : si < 50 % des traitements sont prescrits

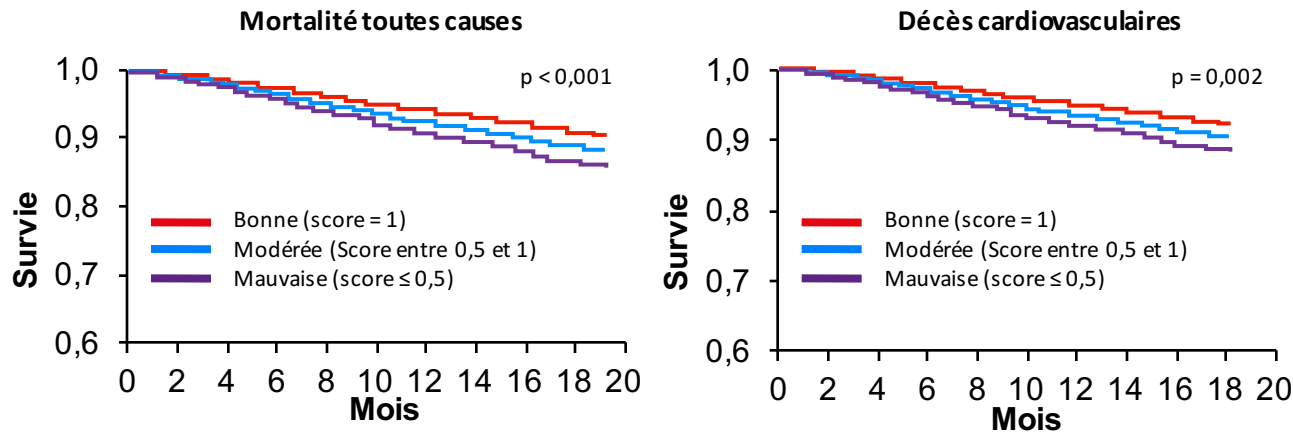
Définition du taux de prescription

Score = ratio somme des scores pour chaque classe / score théorique (prescription selon les recommandations)

Définition de la classe de prescription

Bonne	Score = 1
Modérée	$0,5 < \text{score} < 1$
Mauvaise	$\leq 0,5$

Relation entre score de prescription et mortalité



- Le pronostic était directement lié au score de prescription des médicaments recommandés dans l'IC
- **Suivre les recommandations est donc important pour améliorer le pronostic des patients en IC à FEVG réduite**

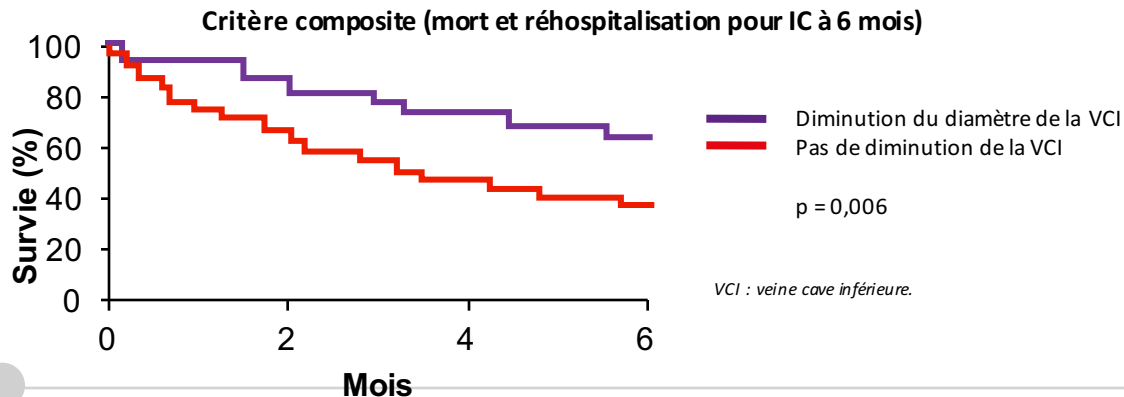
Valeur pronostique des paramètres de congestion chez les patients hospitalisés pour IC aiguë

Oehman et al, ESC 2017

101 patients hospitalisés pour ICA ont été suivis par échographie cardiaque et pulmonaire.
Le devenir était évalué à 6 mois

- Poids et diurèse
- Écho pulmonaire (Lignes B)
- Écho cardiaque (VCI + E/e')
- BNP

Mesurés à l'entrée
+ 24 h + 48 h + à la sortie



E/e' est le marqueur le plus précoce de décongestion évalué par le suivi des lignes B mais la normalisation du diamètre de la VCI à la sortie est le meilleur indicateur pronostique à 6 mois

Efficacité des bêtabloquants dans l'insuffisance cardiaque selon l'éjection ventriculaire gauche

Kotecha et al, ESC 2017

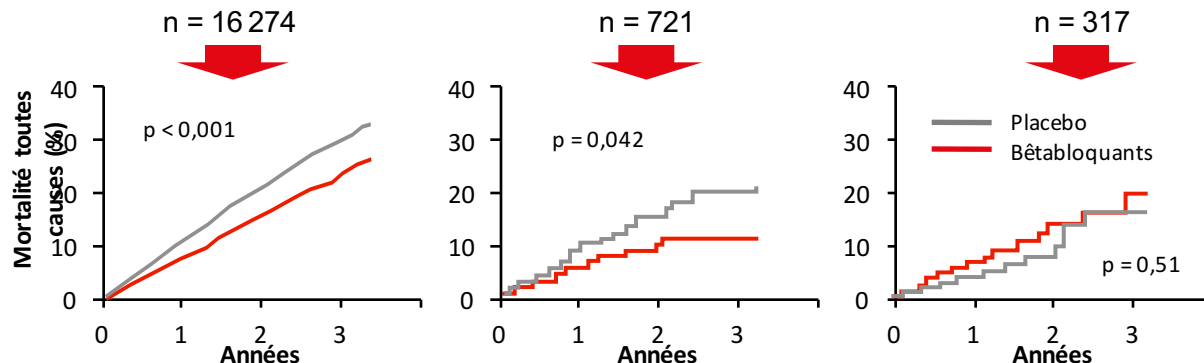
Pas d'essai thérapeutique spécifique dans ces 2 groupes

FEVG < 40 %

FEVG 40-49 %

FEVG ≥ 50 %

17 312 patients avec **données individuelles** disponibles dans les études : MDC, CIBIS, US-HF, ANZ, CIBIS-II, MERIT-HF, COPERNICUS, CAPRICORN, BEST, CHRISTMAS, SENIORS



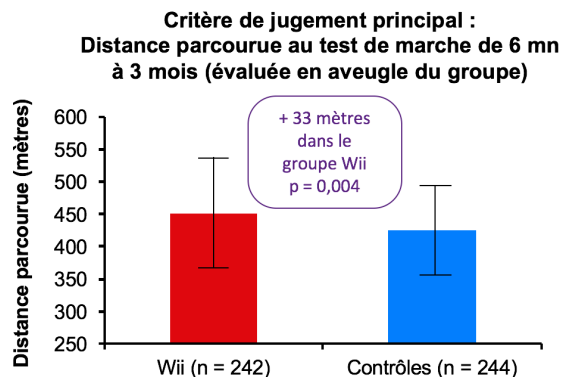
Les bêtabloquants améliorent la survie chez les patients en rythme sinusal avec une FEVG < 40 % et aussi dans l'IC à FEVG intermédiaire

Amélioration de la capacité à l'effort et exercice physique sur console Wii — Faut-il recommander l'exercice "gaming"?

Jaarsma et al, ESC 2017



Données Basales	Wii n = 301	Contrôles n = 304
Âge (ans)	66	67
Femme (%)	28	30
NYHA II (%)	63	53
NYHA III	27	31
FEVG < 40 % (%)	41	38



**=> La pratique régulière
d'un exercice physique par
la Wii permet
une amélioration
significative de la capacité
à l'effort à 3 mois**

En résumé

le fil rouge

On peut manger
des frites si on
mange 3 fruits/J

Un traitement
existe pour
prevenir le SCA et
le cancer si on est
riche

Prévention

Le percutané
pour toutes les
valves?

Syntax II la FFR c'est
extra
Rivaroxaban pour tous?

Coronaropathie

Valves

Ablation pour les patients en IC?
Toujours plus de NOAC?

La dénervation
rénale, c'est
toujours pas ça...

Rythmologie

HTA

En cas d'IC, il faut:
- Suivre les recos
- Surveiller le E/E' et la VCI
- Jouer aux jeux vidéos

Insuffisance cardiaque