Síndrome coronario agudo

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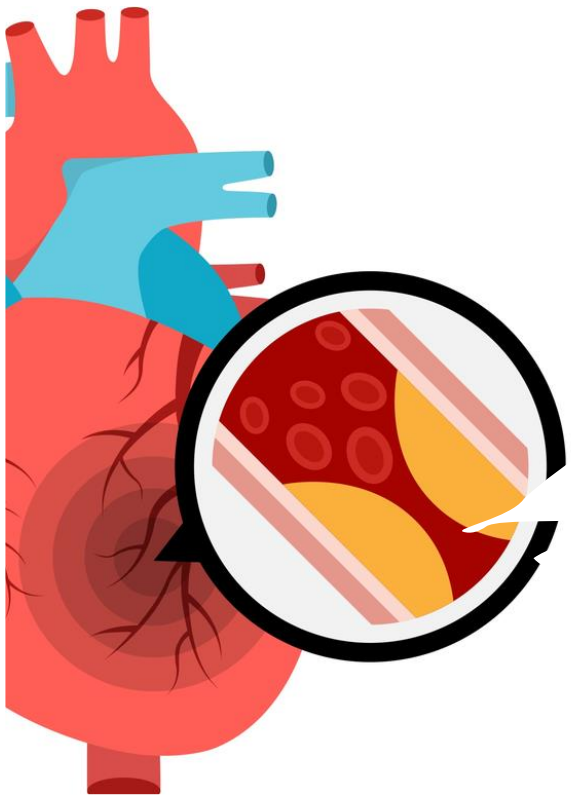
Objetivos

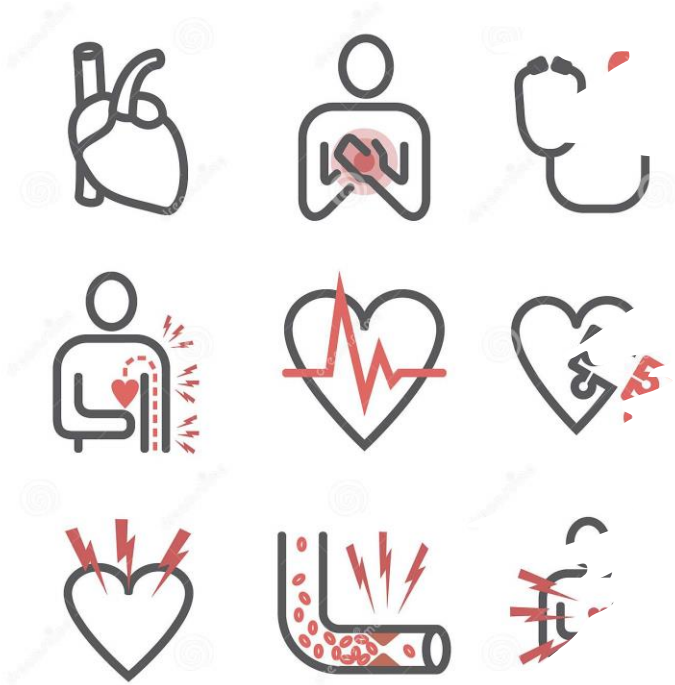
- Contexto histórico del síndrome coronario agudo.
- Aproximación diagnóstica del paciente con síndrome coronario en urgencias.
- Enfoque terapéutico.
- Ideas para llevar a casa.

Contexto de la enfermedad coronaria



- **Continúa siendo una de las principales causas de mortalidad y morbilidad alrededor del mundo.**
- **En Europa, se presentaron 5.8 millones de eventos coronarios en el 2019.**
- **Incidencia anual: se estima 293 casos por cada 100.000 habitantes.**

Gaviria S, Ramírez A, Alzate M, Contreras H, Jaramillo N, Muñoz MC. Epidemiología del síndrome coronario agudo. Med UPB. 2020;39(1):49-56. DOI:10.18566/medupb.v39n1.a08



dreamstime.com

- **En países desarrollados, se estima que el síndrome coronario es el responsable del 38% de muertes en mujeres y 44% en hombres.**

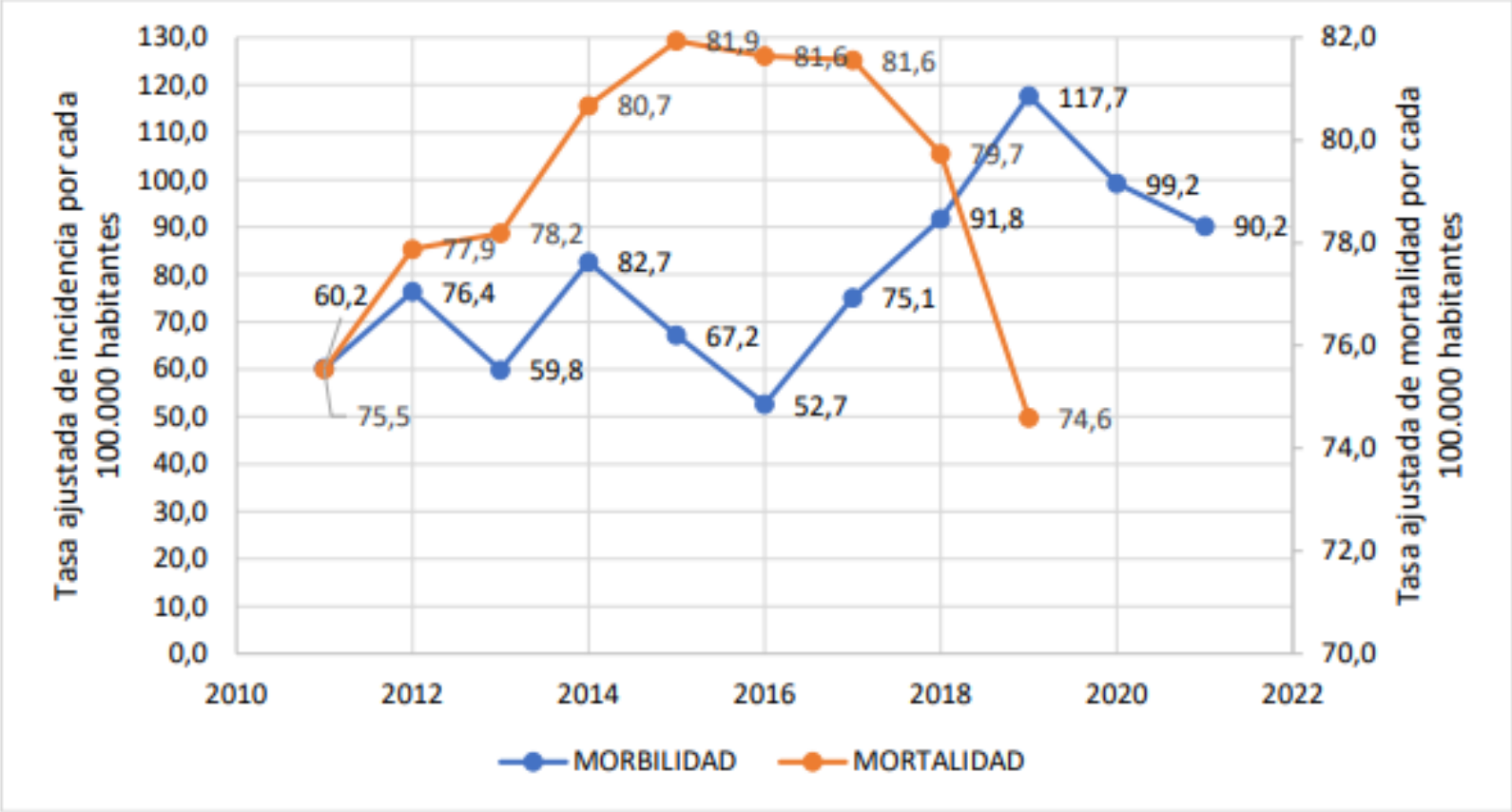
Gaviria S, Ramírez A, Alzate M, Contreras H, Jaramillo N, Muñoz MC. Epidemiología del síndrome coronario agudo. Med UPB. 2020;39(1):49-56. DOI:10.18566/medupb.v39n1.a08

Panorama en Colombia

- **En el 2011 se registaron cerca de 29 mil muertes por síndrome coronario.**
- **La incidencia varia en promedio 80 muertes por cada 100.000 habitantes.**

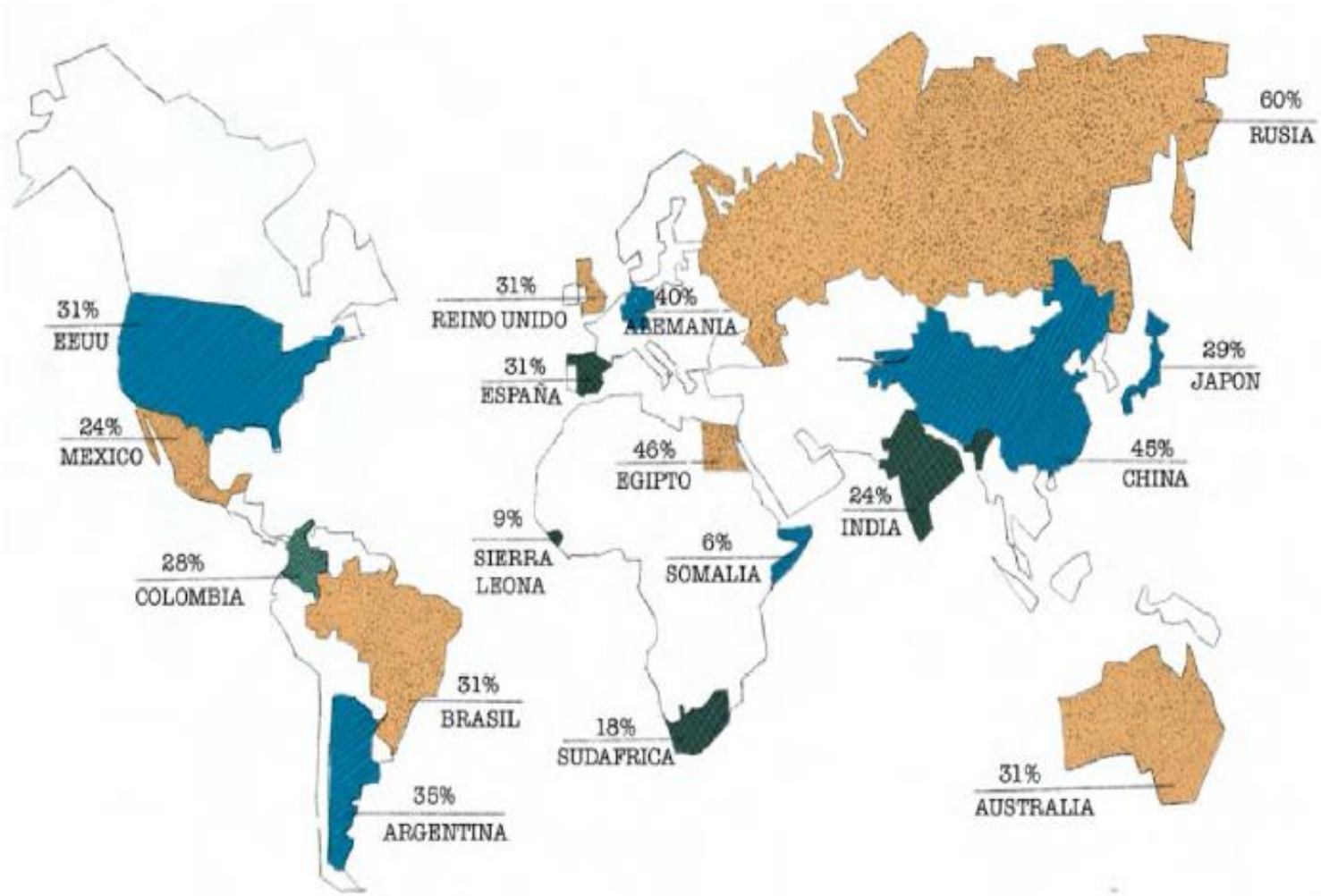
Gaviria S, Ramírez A, Alzate M, Contreras H, Jaramillo N, Muñoz MC. Epidemiología del síndrome coronario agudo. Med UPB. 2020;39(1):49-56. DOI:10.18566/medupb.v39n1.a08

Gráfica 1. Relación de la tasa de incidencia y de mortalidad del IAM en población colombiana 2011-2021



Fuente propia datos tomados de SISPRO y estadísticas vitales del DANE

Figura 1. Porcentaje de mortalidad por enfermedad cardiovascular en varios países durante el año 2014, según datos de la OMS.



Adaptado por Gloria Restrepo S. (2019)

Presentación del síndrome coronario en urgencias

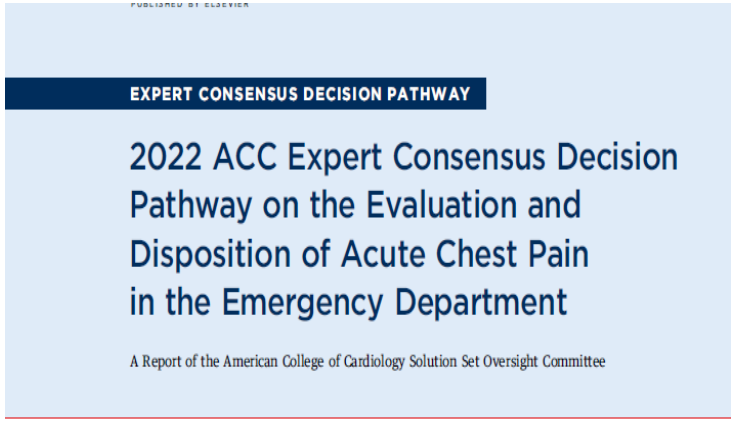
- **Puede representar entre el 5%-20% de los motivos de consulta en el servicio de urgencias.**
- **El síndrome coronario, representa en promedio el 5.4% de los ingresos por dolor torácico en urgencias.**

Principales recomendaciones en el enfoque del paciente con dolor torácico agudo

Recomendaciones para definir el dolor torácico		
Clase de recomendación	Nivel de evidencia	Recomendación
Clase I	B-NA	Se recomienda una evaluación inicial del dolor torácico para clasificar eficazmente a los pacientes en función de la probabilidad de que los síntomas puedan ser atribuibles a una isquemia miocárdica.
Clase I	C-DL	El dolor torácico no debe describirse como atípico, porque no ayuda a determinar la causa y puede interpretarse erróneamente como de naturaleza benigna. En su lugar, el dolor torácico debe describirse como cardíaco, posiblemente cardíaco o no cardíaco porque estos términos son más específicos para el posible diagnóstico subyacente.

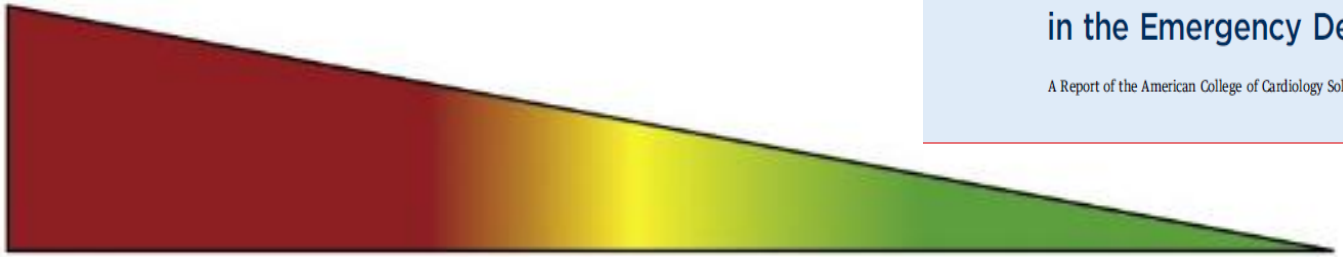
Recomendaciones para centrarse en la singularidad del dolor torácico en las mujeres		
Clase de recomendación	Nivel de evidencia	Recomendación
Clase I	B-NA	Las mujeres que presentan dolor torácico corren el riesgo de ser infradiagnosticadas, y siempre deben considerarse las posibles causas cardíacas.
Clase I	B-NA	En las mujeres que presentan dolor torácico, se recomienda obtener una historia que haga hincapié en los síntomas acompañantes que son más comunes en las mujeres con SCA.
Recomendación de consideraciones para pacientes mayores con dolor torácico		
Clase de recomendación	Nivel de evidencia	Recomendación
Clase I	C-DL	En los pacientes con dolor torácico de más de 75 años de edad, debe considerarse la posibilidad de un SCA cuando se presenten síntomas acompañantes como disnea, síncope o delirio agudo, o cuando se haya producido una caída inexplicable.

Probabilidad del dolor


EXPERT CONSENSUS DECISION PATHWAY

2022 ACC Expert Consensus Decision Pathway on the Evaluation and Disposition of Acute Chest Pain in the Emergency Department

A Report of the American College of Cardiology Solution Set Oversight Committee



- Central
- Pressure
- Squeezing
- Gripping
- Heaviness
- Tightness
- Exertional/stress-related
- Retrosternal

- Left-sided
- Dull
- Aching

- Stabbing

- Right-sided
- Tearing
- Ripping
- Burning

- Sharp
- Fleeting
- Shifting
- Pleuritic
- Positional

High ← → Low

Probability of Ischemia

TABLA 50-2 Valor de los datos de la anamnesis del dolor torácico para el diagnóstico del síndrome coronario agudo

ELEMENTO DESCRIPTIVO DEL DOLOR	ÍNDICE DE PROBABILIDAD POSITIVA (IC AL 95%)
Mayor probabilidad de IAM	
Irradiación al hombro o el brazo derechos	4,7 (1,9-12)
Irradiación a ambos brazos u hombros	4,1 (2,5-6,5)
Asociado al esfuerzo	2,4 (1,5-3,8)
Irradiación al brazo izquierdo	2,3 (1,7-3,1)
Asociado a diaforesis	2 (1,9-2,2)
Asociado a náuseas o vómitos	1,9 (1,7-2,3)
Peor que una angina previa o similar a un IM previo	1,8 (1,6-2)
Descrito como una presión	1,3 (1,2-1,5)
Menor probabilidad de IAM	
Descrito como pleurítico	0,2 (0,1-0,3)
Descrito como postural	0,3 (0,2-0,5)
Descrito como agudo	0,3 (0,2-0,5)
Reproducible con la palpación	0,3 (0,2-0,4)
Localización inframamaria	0,8 (0,7-0,9)
Sin relación con el esfuerzo	0,8 (0,6-0,9)

IAM, infarto agudo de miocardio; IC, intervalo de confianza.

Toma de electrocardiograma

Clase I	C-DL	En todos los pacientes que presenten un dolor torácico agudo, independientemente del entorno, debe adquirirse un ECG y revisarse para detectar un SCACEST en los 10 minutos siguientes a su llegada.
Clase I	C-DL	En todos los pacientes que acuden a urgencias con dolor torácico agudo y sospecha de SCA, la cTn debe medirse lo antes posible tras la presentación.

Clase I	C-OE	En los pacientes con dolor torácico en los que un ECG inicial no es diagnóstico, deben realizarse ECGs seriados para detectar posibles cambios isquémicos, especialmente cuando la sospecha clínica de SCA es alta, los síntomas son persistentes o el estado clínico se deteriora.
Clase I	C-OE	Los pacientes con dolor torácico en los que el ECG inicial es compatible con un SCA deben ser tratados de acuerdo con Directrices para el SCACEST y el SCASEST.
Clase IIa	B-NA	En pacientes con dolor torácico y sospecha clínica intermedia-alta de SCA en los que el ECG inicial no es diagnóstico, las derivaciones electrocardiográficas suplementarias V7 a V9 son razonables para descartar un IAM posterior.

¿Cuáles son los cambios electrocardiográficos en el síndrome coronario agudo?

- ✓ Elevación del segmento ST en 2 derivaciones contiguas mayor de 1mm.

En derivación V2 y v3:

- ✓ Si es en mujeres la elevación es mayor a 1.5mm
- ✓ Si es en hombre mayores de 45 años de edad la elevación es de 2mm
- ✓ Si es en hombres menores de 45 años de edad la elevación es de 2.5mm

- ✓ Considere si hay infra desnivel del segmento ST de V1 a V3, realizar V7 a V9 para evaluar infarto de cara posterior. En las derivaciones posteriores y derechas, la elevación es mayor a 0.5mm

- ✓ Considere evaluar los cambios recíprocos de las caras afectadas, aumenta la probabilidad de que se trate de un síndrome coronario agudo.

Hallazgos electrocardiográficos de alto riesgo

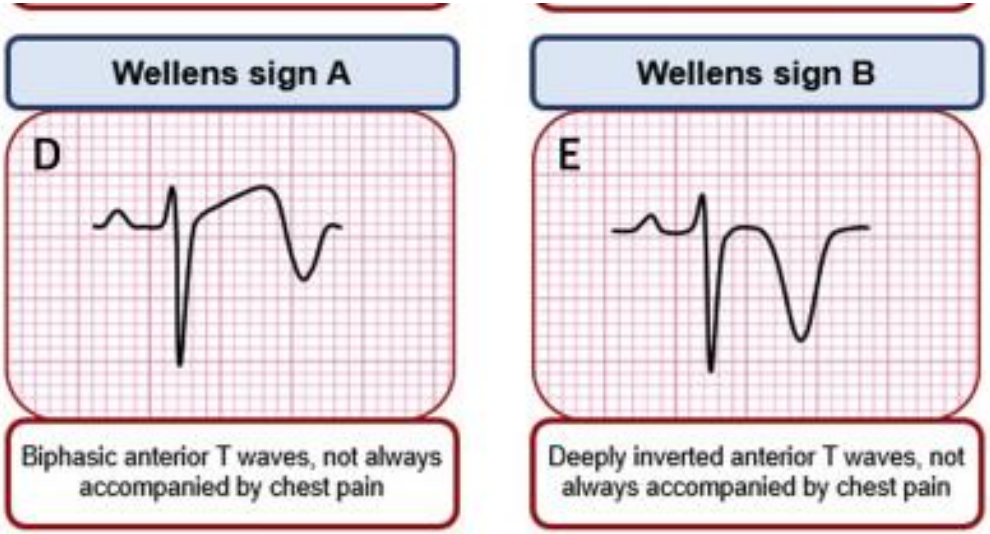
TABLE 1 Electrocardiogram Findings Suggestive of Ischemia

FINDING	CRITERIA
STEMI equivalents	
Posterior STEMI	**Criteria:** ■ Horizontal ST-segment depression in V_1-V_3 ■ Dominant R-wave (R/S ratio >1) in V_2 ■ Upright T waves in anterior leads ■ Prominent and broad R-wave (>30 ms) **Confirmed by:** ■ ST-segment elevation of ≤0.5 mm in at least 1 of leads V_7-V_9*
Left bundle branch block or ventricular paced rhythm with Sgarbossa Criteria	A total score ≥3 points is required: ■ Concordant ST-segment elevation ≥1 mm in leads with a positive QRS complex (5 points) ■ Concordant ST-segment depression ≥1 mm in leads V_1-V_3 (3 points) ■ Discordant ST-segment elevation ≥5 mm in leads with a negative QRS complex (2 points) If there is discordant ST-segment elevation ≥5 mm, consider ST/S ratio <−0.25
Left bundle branch block or ventricular paced rhythm with Smith-modified Sgarbossa Criteria	Positive if any of the following are present: ■ Concordant ST-segment elevation of 1 mm in leads with a positive QRS complex ■ Concordant ST-segment depression of 1 mm in V_1-V_3 ■ ST-segment elevation at the J-point, relative to the QRS onset, is at least 1 mm and has an amplitude of at least 25% of the preceding S-wave
De Winter Sign	■ Tall, prominent, symmetrical T waves arising from upsloping ST-segment depression >1 mm at the J-point in the precordial leads ■ 0.5-1 mm ST-segment elevation may be seen in lead aVR
Hyperacute T waves	Broad, asymmetric, peaked T waves may be seen early in STEMI Serial ECGs over very short intervals are useful to assess for progression to STEMI
ECG findings consistent with acute/subacute myocardial ischemia	
aVR ST-segment elevation	Most often caused by diffuse subendocardial ischemia and usually occurs in the setting of significant left main coronary artery or multivessel coronary artery disease ■ ST-segment elevation in aVR ≤1 mm ■ Multilead ST-segment depression in leads I, II, Val, and/or V_4-V_6 ■ Absence of contiguous ST-segment elevation in other leads
ST-segment depression	Horizontal or downsloping ST-segment depression ≥0.5 mm at the J-point in 2 or more contiguous leads is suggestive of myocardial ischemia
Wellen's syndrome	Clinical syndrome characterized by: ■ Biphasic or deeply inverted and symmetric T waves in leads V_2 and V_3 (may extend to V_6) ■ Recent angina ■ Absence of Q waves
Inverted T waves	May be seen in ischemia (subacute) or infarction (may be fixed and associated with Q waves) in continuous leads

Patrones de alto riesgo

Patrón de Wellens

- **Wellens tipo A: onda T isobifásica en las derivaciones V1-V4.**
- **Wellens tipo B: inversión de onda T de características simétricas.**
- **Se asocia a estenosis de la arteria descendente anterior proximal (ADA) e infarto masivo inminente de la pared anterior del miocardio.**



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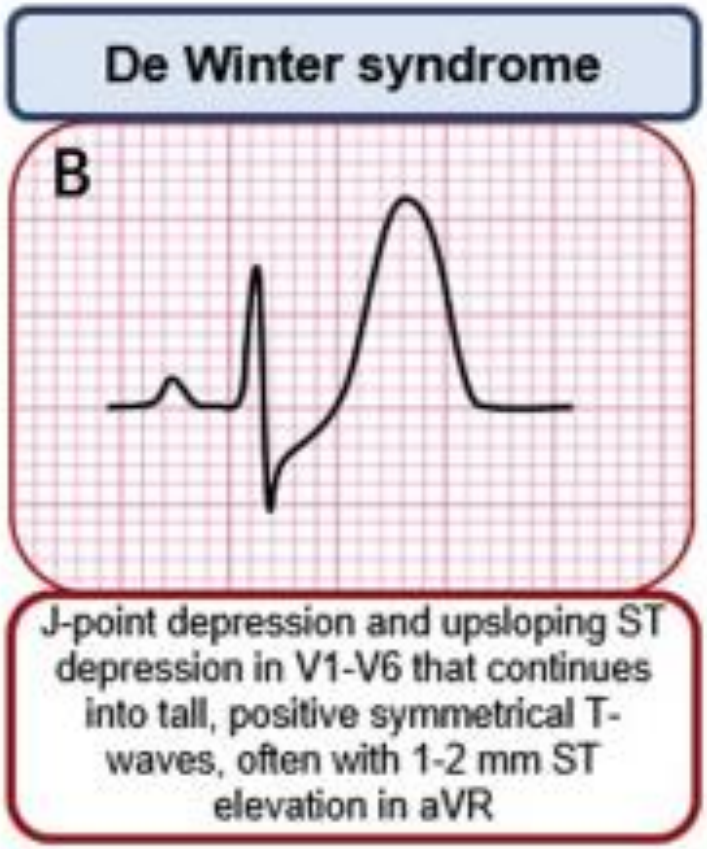
Patrón de Winter

- Se presenta con infradesnivel del segmento ST en las derivaciones precordiales (v1-v6), con ondas T hiperagudas. Puede presentarse también con elevación en avR.
- Este hallazgo se correlaciona clínicamente con oclusión de la coronaria descendente anterior.



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Tronco coronario izquierdo

- **Elevación del segmento ST en avR.**
- **Infra desnivel del segmento ST en al menos 6 derivadas.**

ARTÍCULO ORIGINAL

Diagnóstico electrocardiográfico de la obstrucción del tronco coronario izquierdo mediante el análisis vectorial del segmento ST y el complejo QRS

José A. Prieto-Solís[a], Natividad Benito[b] y Rafael Martín-Durán[b]

[a]Servicio de Cardiología. Unidad Coronaria. Hospital Universitario Marqués de Valdecilla. Santander. Cantabria. España.
[b]Unidad de Bioestadística, Epidemiología e Investigación Metodológica. Instituto de Formación e Investigación Marqués de Valdecilla. Santander. Cantabria. España.

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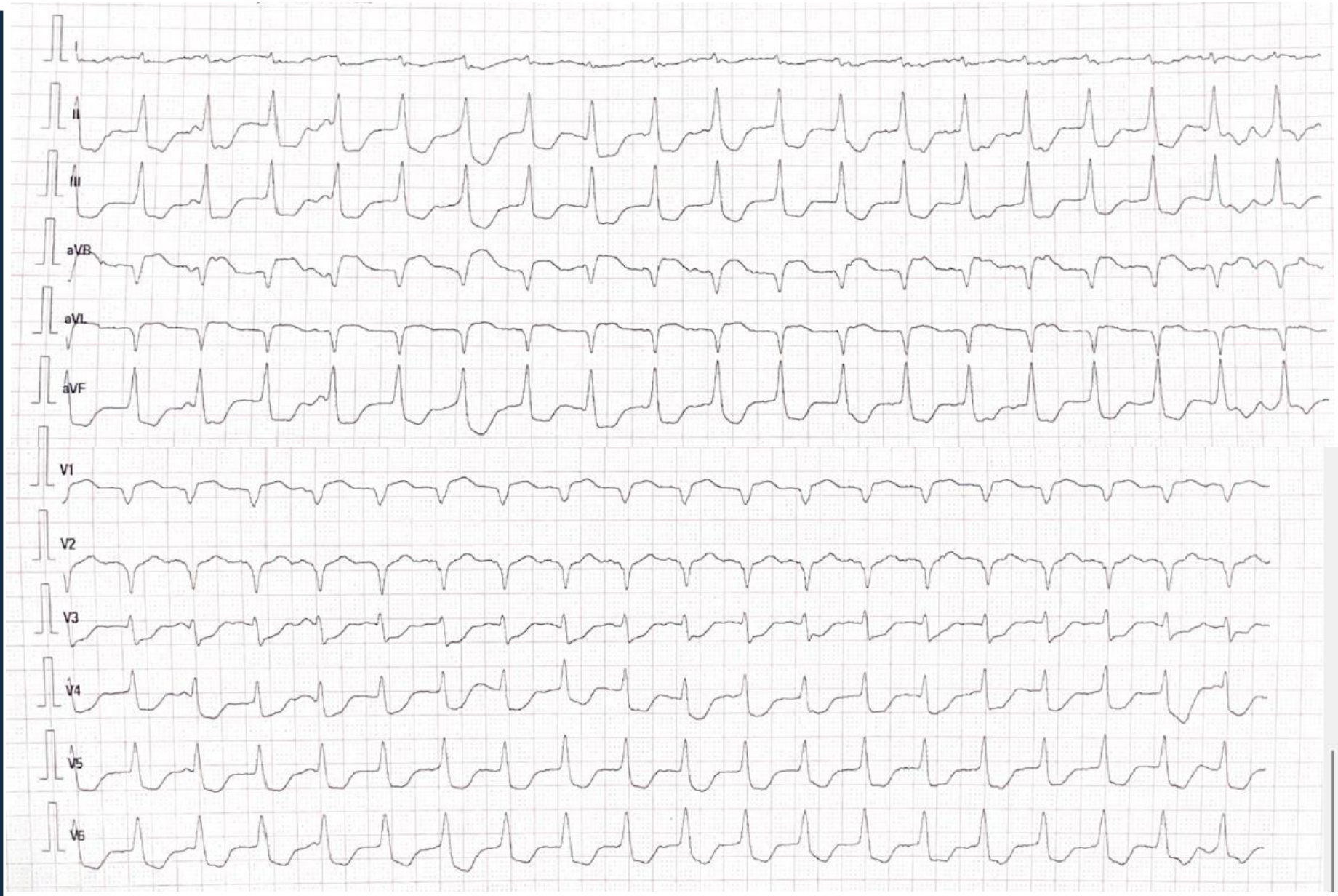

I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6

Bloqueo de rama izquierda de novo o presumiblemente de novo

Criterios de Barcelona (previamente criterios de Sgarbossa).

Journal of the American Heart Association

ORIGINAL RESEARCH

New Electrocardiographic Algorithm for the Diagnosis of Acute Myocardial Infarction in Patients With Left Bundle Branch Block

Andrea Di Marco, MD*; Marcos Rodriguez, MD*; Juan Cinca, MD, PhD; Antoni Bayes-Genis, MD, PhD; Jose T. Ortiz-Perez, MD; Albert Ariza-Solé, MD, PhD; Jose Carlos Sanchez-Salado, MD; Alessandro Sionis, MD, PhD; Jany Rodriguez, MD; Beatriz Toledano, MD; Pau Codina, MD; Eduard Solé-González, MD; Monica Masotti, MD; Joan Antoni Gómez-Hospital, MD, PhD; Ángel Cequier, MD, PhD; Ignasi Anguera, MD, PhD

Table 5. Definition of the BARCELONA Algorithm to Diagnose AMI in the Presence of LBBB

The BARCELONA algorithm is positive if any of the following criteria are present:
(1) ST deviation ≥1 mm (0.1 mV) concordant with QRS polarity in any ECG lead, thus including either: • ST depression ≥1 mm (0.1 mV) concordant with QRS polarity, in any ECG lead. • ST elevation ≥1 mm (0.1 mV) concordant with QRS polarity, in any ECG lead (Sgarbossa score 5).
(2) ST deviation ≥1 mm (0.1 mV) discordant with QRS polarity, in any lead with max (R|S) voltage ≤6 mm (0.6 mV).

AMI indicates acute myocardial infarction; and LBBB, left bundle branch block.

Patrón de Aslanger

Oclusión inferior aguda:

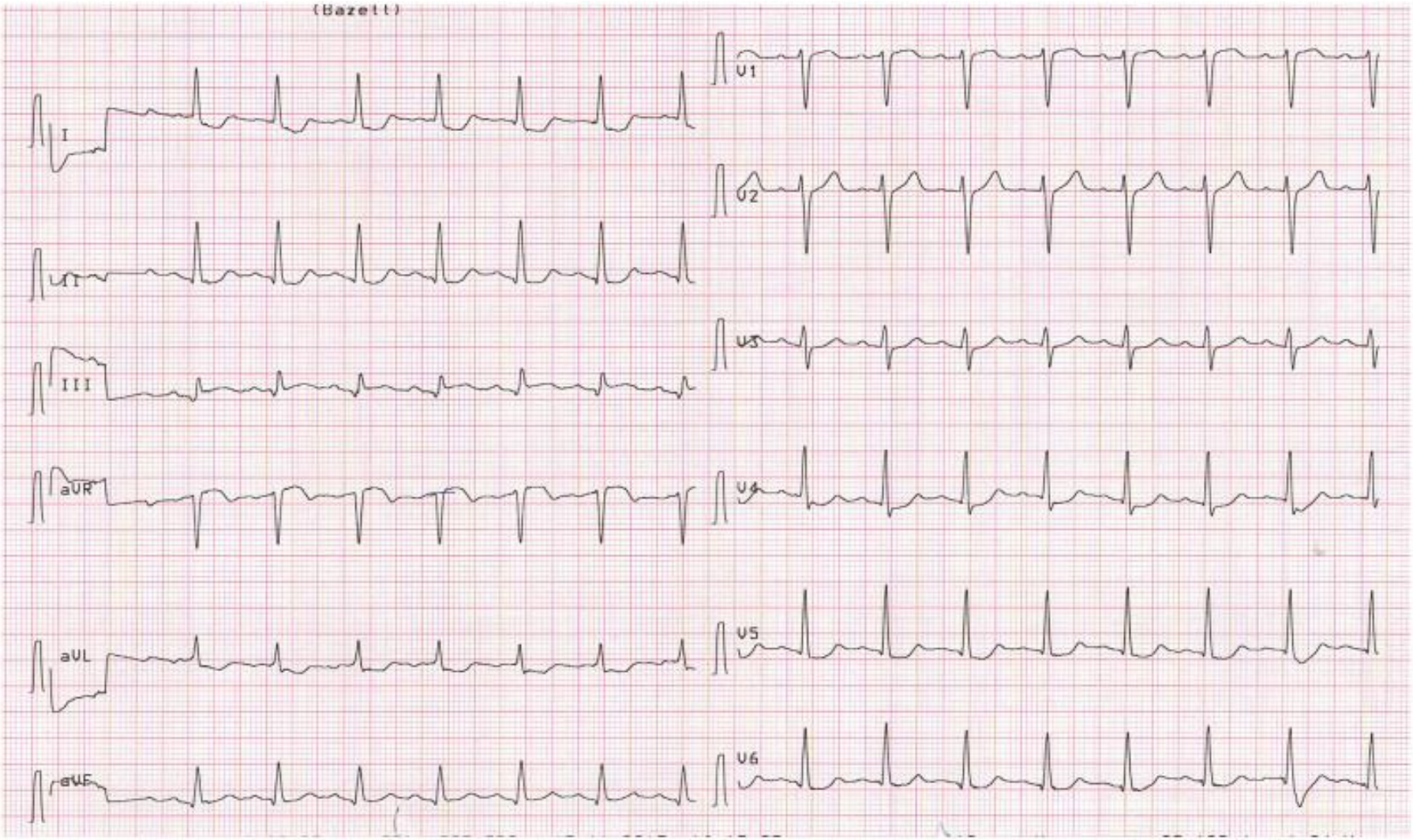
1. STE en III, pero no en ninguna otra derivación inferior.
2. Depresión del ST en cualquiera de las derivaciones V4 a 6 (pero no en V2) con una onda T positiva (al menos terminalmente positiva).
3. ST en la derivación V1 más alto que ST en V2.

A new electrocardiographic pattern indicating inferior myocardial infarction

Emre Aslanger, MD, Assoc. Prof. [a,*], Özlem Yıldırımtürk, MD, Assoc. Prof. [b], Barış Şimşek, MD [c], Azmi Sungur, MD [c], Ayça Türer Cabbar, MD, Assoc. Prof. [a], Emrah Bozbeyoğlu, MD, Assoc. Prof. [c], Can Yücel Karabay, MD, Assoc. Prof. [b], Stephen W. Smith, Prof. [d], Muzaffer Değertekin, MD, Prof [a]

[a] Yeditepe University Hospital, Department of Cardiology, Istanbul, Turkey
[b] Health Sciences University, Dr. Siyami Ersek Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Cardiology, Istanbul, Turkey
[c] Dr. Siyami Ersek Thoracic and Cardiovascular Surgery Training and Research Hospital, Division of Cardiology, Istanbul, Turkey
[d] University of Minnesota, Hennepin County Medical Center, Department of Emergency Medicine, Minneapolis, MN, United States of America

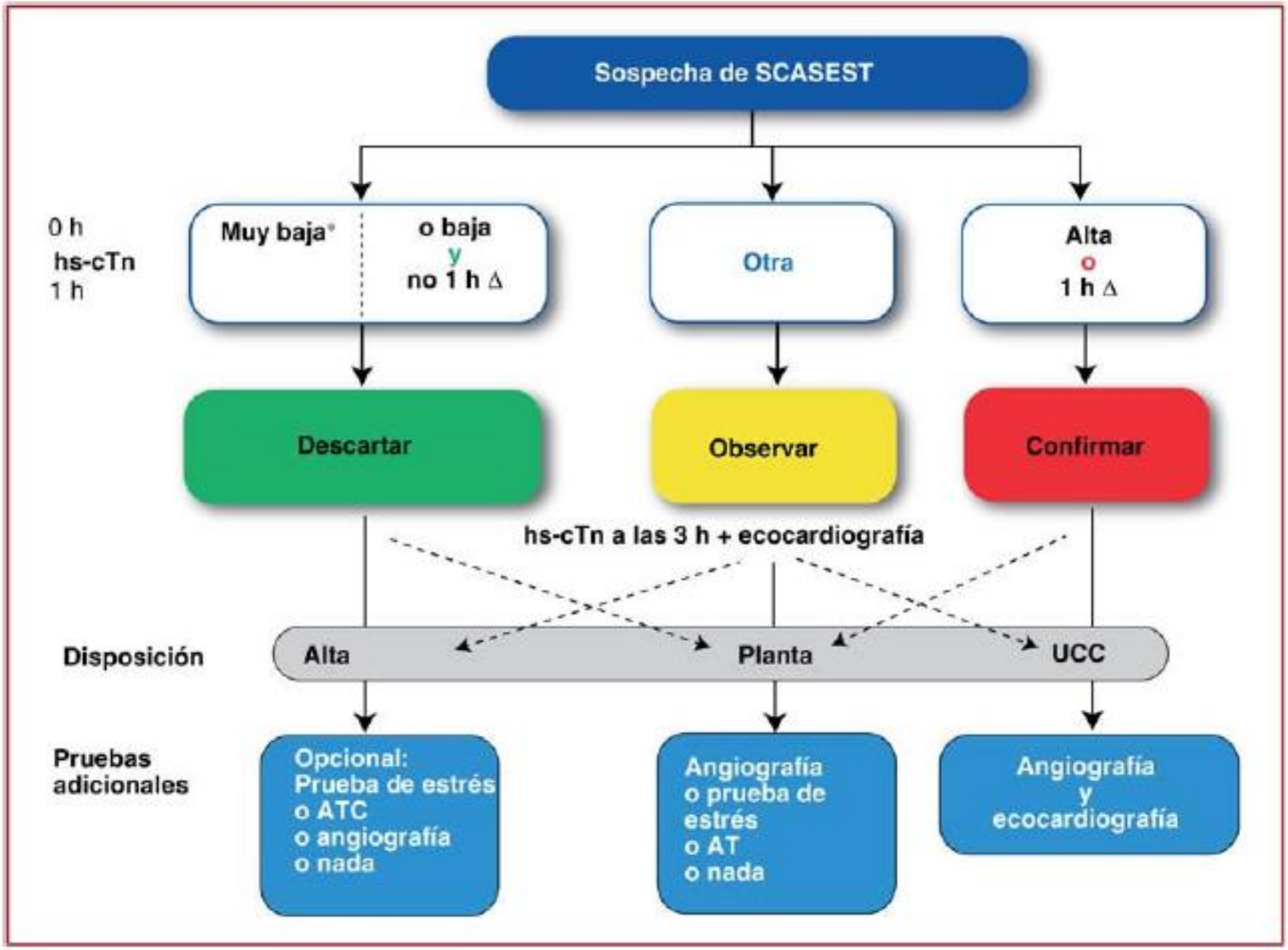
Conclusion: We here define a new ECG pattern indicating inferior MI in patients with concomitant critical lesion (s) in coronary arteries other than the infarct-related artery. Patients with this pattern have multivessel disease and higher mortality.


(Bazett)
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6

Uso de biomarcadores

- **Desde el 2020 se implementaron las troponinas ultrasensibles.**

- **Permite el diagnóstico temprano y realizar adecuada estratificación para intervención de la enfermedad coronaria.**


Sospecha de SCASEST
0 h
hs-cTn
1 h
Muy baja*
o baja
y
no 1 h Δ
Otra
Alta
o
1 h Δ
Descartar
Observar
Confirmar
hs-cTn a las 3 h + ecocardiografía
Disposición
Alta
Planta
UCC
Pruebas adicionales
Opcional:
Prueba de estrés
o ATC
o angiografía
o nada
Angiografía
o prueba de estrés
o AT
o nada
Angiografía
y
ecocardiografía

©ESC 2020

Blood sampling		
It is recommended to measure cardiac troponins with high-sensitivity assays immediately after presentation and to obtain the results within 60 min of blood sampling.[15,25–27]	I	B
It is recommended to use an ESC algorithmic approach with serial hs-cTn measurements (0 h/1 h or 0 h/2 h) to rule in and rule out NSTEMI.[28–44]	I	B
Additional testing after 3 h is recommended if the first two hs-cTn measurements of the 0 h/1 h algorithm are inconclusive and no alternative diagnoses explaining the condition have been made.[45,46]	I	B
The use of established risk scores (e.g. GRACE risk score) for prognosis estimation should be considered.[47–49]	IIa	B
Triage for emergency reperfusion strategy		
It is recommended that patients with suspected STEMI are immediately triaged for an emergency reperfusion strategy.[50–52]	I	A

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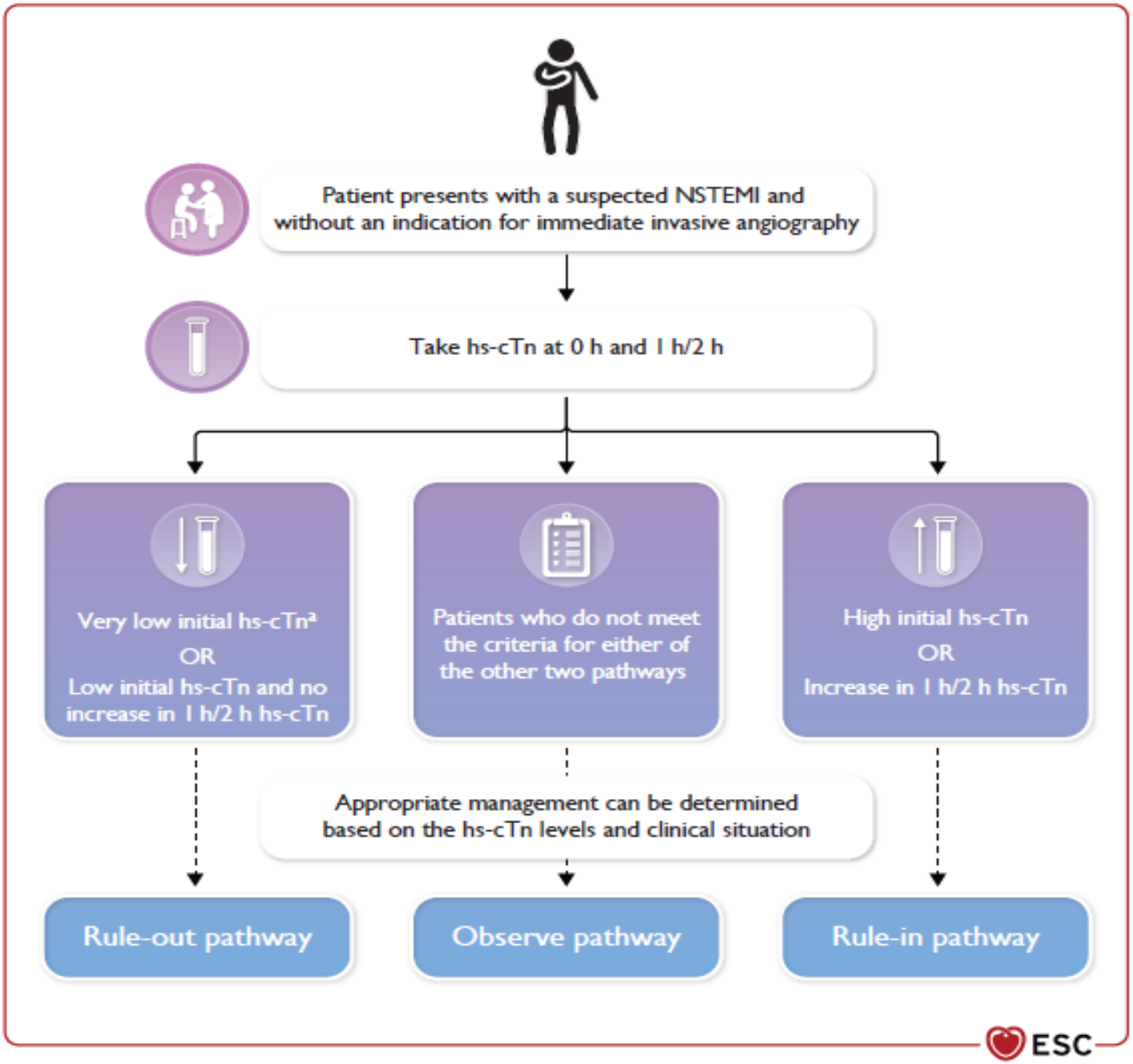
Immunoassay, manufacturer	Highly sensitive troponin concentration indicating a very low probability of NSTEMI, nanograms per liter	Highly sensitive troponin concentration indicating a low probability of NSTEMI, nanograms per liter	Changes in the concentration of highly sensitive troponins after 1 hour that exclude NSTEMI, nanograms per liter	Highly sensitive troponin concentration indicating a high probability of NSTEMI, nanograms per liter	Changes in the concentration of highly sensitive troponins after 1 hour to confirm NSTEMI, nanograms per liter
Diagnostic algorithm 0 → 1 hour					
hs-cTnT (Elecsys; Roche)	< 5	< 12	< 3	≥ 52	≥ 5
hs-cTnI (Architect; Abbott)	< 4	< 5	< 2	≥ 64	≥ 6
hs-cTnI (Centaur; Siemens)	< 3	< 6	< 3	≥ 120	≥ 12
hs-cToni (Access; Beckman Coulter)	< 4	< 5	< 4	≥ 50	≥ 15
hs-cTnI (Clarity; Singulex)	< 1	< 2	< 1	≥ 30	≥ 6
Diagnostic algorithm 0 → 2 hours					
hs-cTnT (Elecsys; Roche)	< 5	< 14	< 4	≥ 52	≥ 10
hs-cTnI (Architect; Abbott)	< 4	< 6	< 2	≥ 64	≥ 15
hs-cTnI (Centaur; Siemens)	< 3	< 8	< 7	≥ 120	≥ 20
hs-cTnI (Access; Beckman Coulter)	< 4	< 5	< 5	≥ 50	≥ 20
hs-cTnI (Clarity; Singulex)	< 1	undefined	undefined	≥ 30	undefined

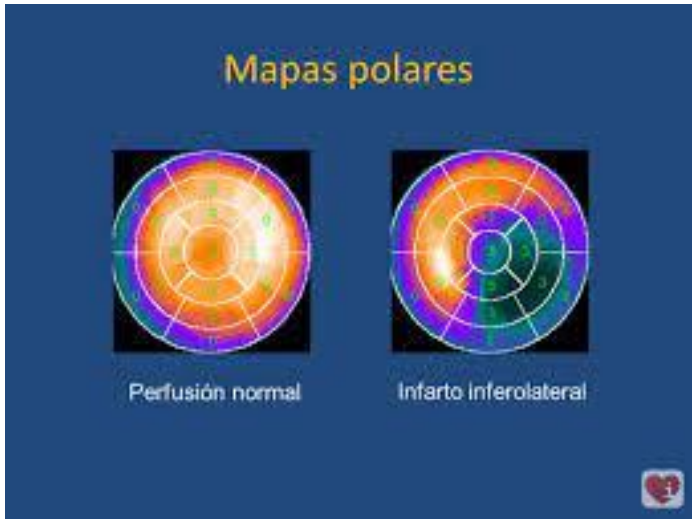
hs-cTnI: troponina I altamente sensible. hs-cTnT: troponina T altamente sensible. NSTEMI: infarto de miocardio sin elevación del segmento ST..

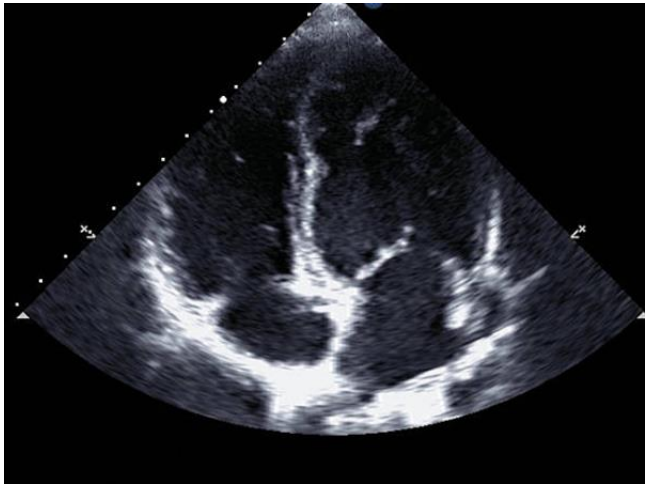
Datos válidos para algunos inmunoensayos de diferentes fabricantes.

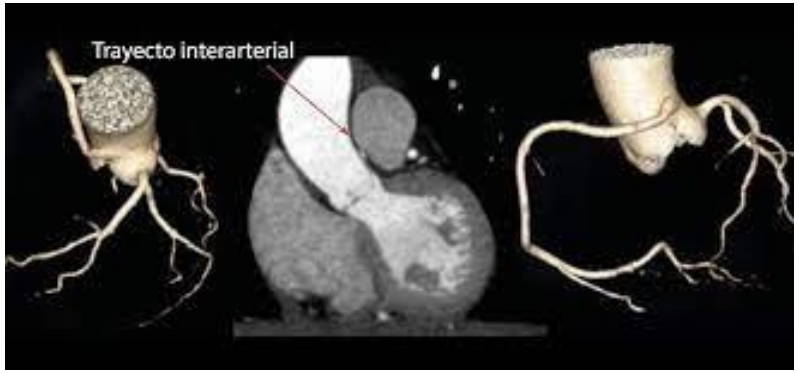
Fuente, adaptado de las recomendaciones de la Sociedad Europea de Cardiología [17].


Patient presents with a suspected NSTEMI and without an indication for immediate invasive angiography
Take hs-cTn at 0 h and 1 h/2 h
Very low initial hs-cTn[a]
OR
Low initial hs-cTn and no increase in 1 h/2 h hs-cTn
Patients who do not meet the criteria for either of the other two pathways
High initial hs-cTn
OR
Increase in 1 h/2 h hs-cTn
Appropriate management can be determined based on the hs-cTn levels and clinical situation
Rule-out pathway
Observe pathway
Rule-in pathway
ESC

In patients with suspected ACS, non-elevated (or uncertain) hs-cTn levels, no ECG changes and no recurrence of pain, incorporating CCTA or a non-invasive stress imaging test as part of the initial workup should be considered.[116,122–127]	IIa	A







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Estratificación del riesgo en el paciente con dolor torácico de probable origen coronario

TABLE 3 Modified HEART Scores and EDACS Data Components

HEART Score Components Low risk: 0-3 points; non-low risk: ≥4 points		EDACS Components Low risk: 0-15 points; non-low risk: ≥16 points	
History		Age, y	
High suspicion	2	18-45	2
Moderate suspicion	1	46-50	4
Low suspicion	0	51-55	6
Electrocardiogram		56-60	8
ST-segment deviation	2	61-65	10
Paced, LBBB, RBBB, or LVH	1	66-70	12
Normal or nonspecific changes	0	71-75	14
Age, y		76-80	16
>65	2	81-85	18
45-65	1	86+	20
<45	0	Male sex	6
Cardiac risk factors		Age 18-15 and either ≥3 cardiac risk factors or known CAD	4
≥3 or known CAD	2	Diaphoresis	3
1-2	1	Pain radiating to arm or shoulder	5
0	0	Pain worsened with inspiration	−4
		Pain reproduced by palpation	−6

CAD = coronary artery disease; EDACS = Emergency Department Assessment of Chest Pain; HEART = History, ECG, Age, Risk Factors, and Troponin; LBBB = left bundle branch block; LVH = left ventricular hypertrophy; RBBB = right bundle branch block.

EXPERT CONSENSUS DECISION PATHWAY

2022 ACC Expert Consensus Decision Pathway on the Evaluation and Disposition of Acute Chest Pain in the Emergency Department

A Report of the American College of Cardiology Solution Set Oversight Committee

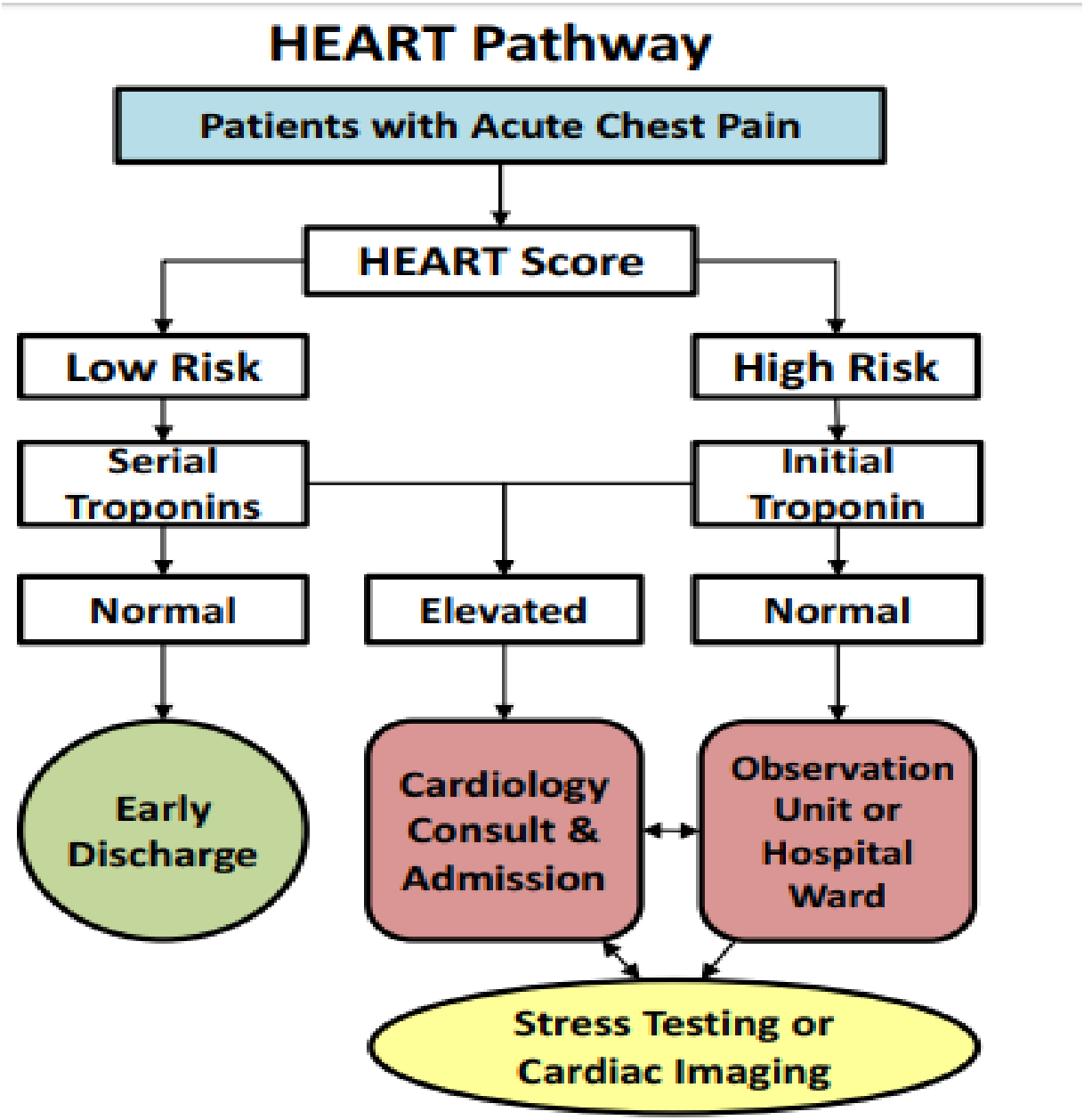


Figure 1. HEART Pathway algorithm. This figure was corrected on 2018-09-17 after initial online publication to correct the spelling of the label "HEART Score."

EDACS score

-5 points

Low risk by the EDACS Score.

If the patient also has: (1) EKG without new ischemic changes and (2) negative initial and 2-hour troponins, then this patient is safe for discharge to early outpatient follow-up investigation (or proceed to earlier inpatient testing). If EKG with ischemic changes or positive troponin, they are not low risk and require normal risk stratification.

Copy Results | Next Steps

20 points

Not low risk. This patient is not a candidate for early discharge and should receive a standard chest pain evaluation with delayed troponin testing.

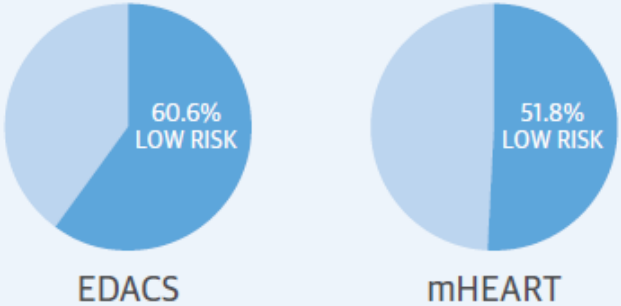
Copy Results | Next Steps

Performance of Coronary Risk Scores Among Patients With Chest Pain in the Emergency Department

Dustin G. Mark, MD,[a,b] Jie Huang, PhD,[a] Uli Chettipally, MD, MPH,[c] Mamata V. Kene, MD, MPH,[d] Megan L. Anderson, MD,[e] Erik P. Hess, MD, MSc,[f] Dustin W. Ballard, MD, MBE,[a,g] David R. Vinson, MD,[a,e] Mary E. Reed, DrPH,[a] on behalf of the Kaiser Permanente CREST Network Investigators

CENTRAL ILLUSTRATION **Performance of the EDACS Versus Modified HEART Score Among Emergency Department Patients With Chest Pain**

EDACS & mHEART perform similarly in terms of NPV



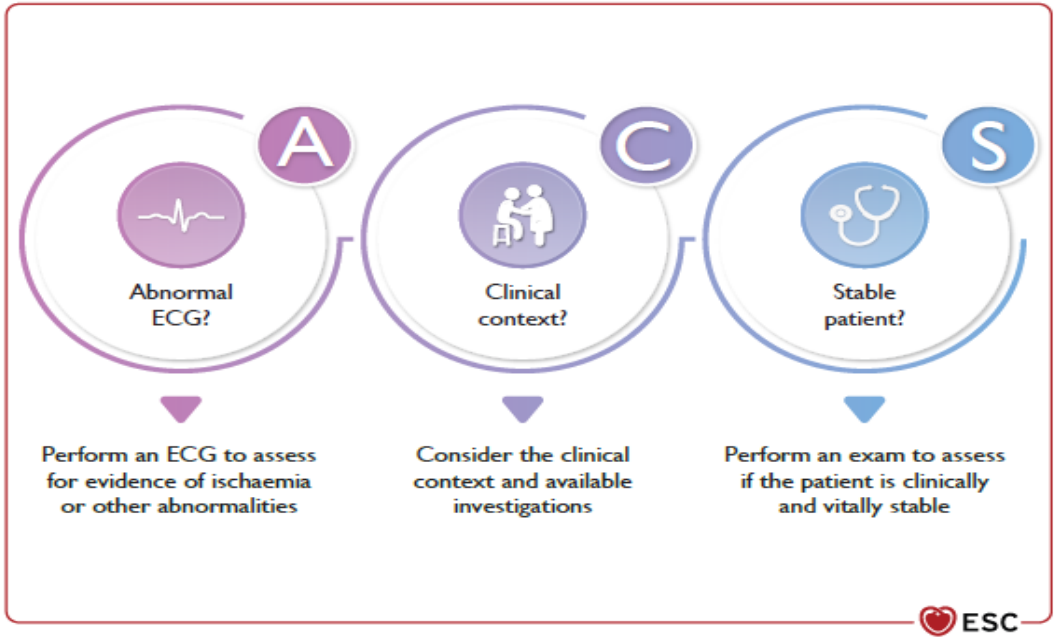
EDACS categorizes more patients as low risk

ESC European Society of Cardiology
European Heart Journal (2023) 44, 3720–3826
https://doi.org/10.1093/eurheartj/ehad191

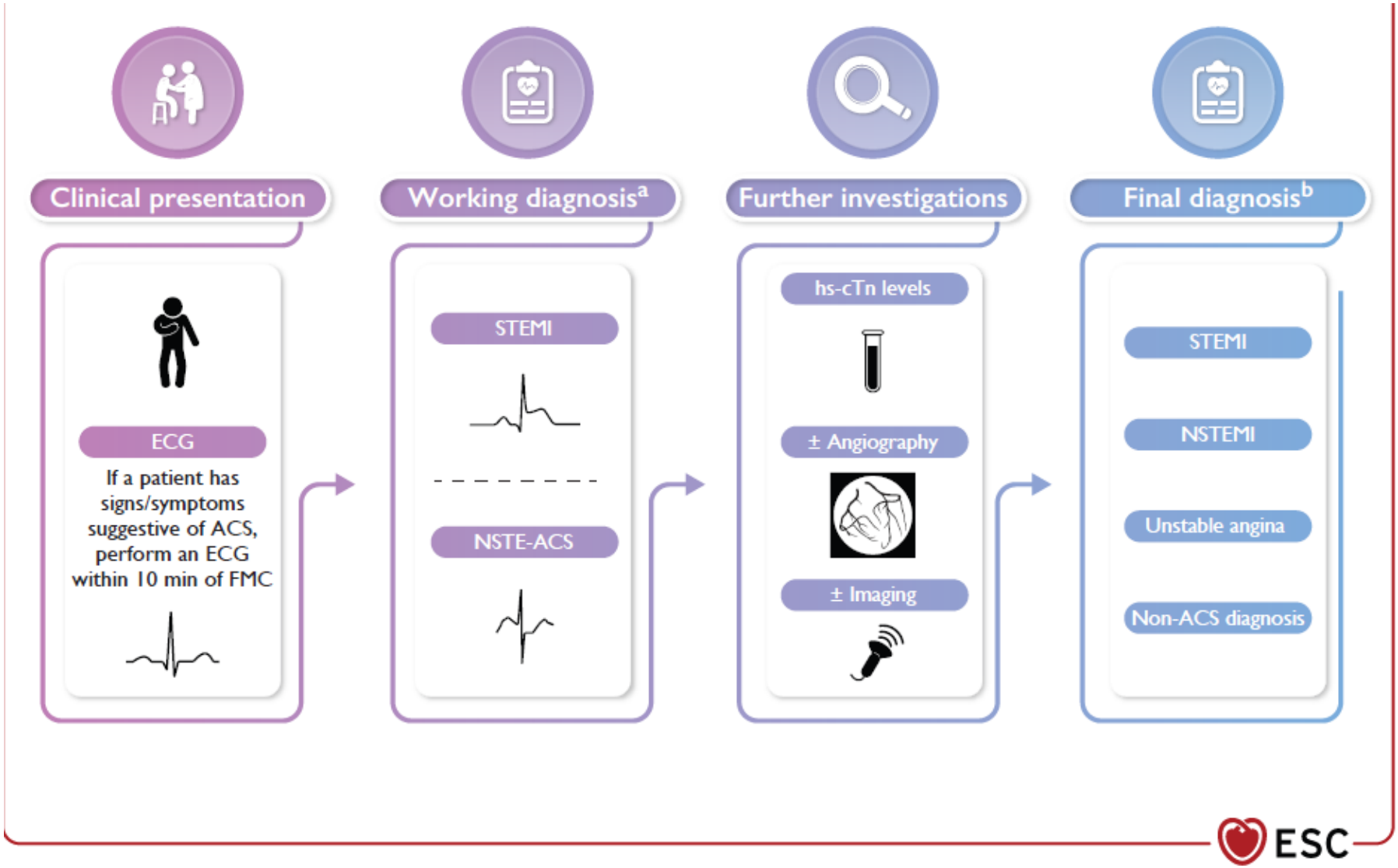
ESC GUIDELINES

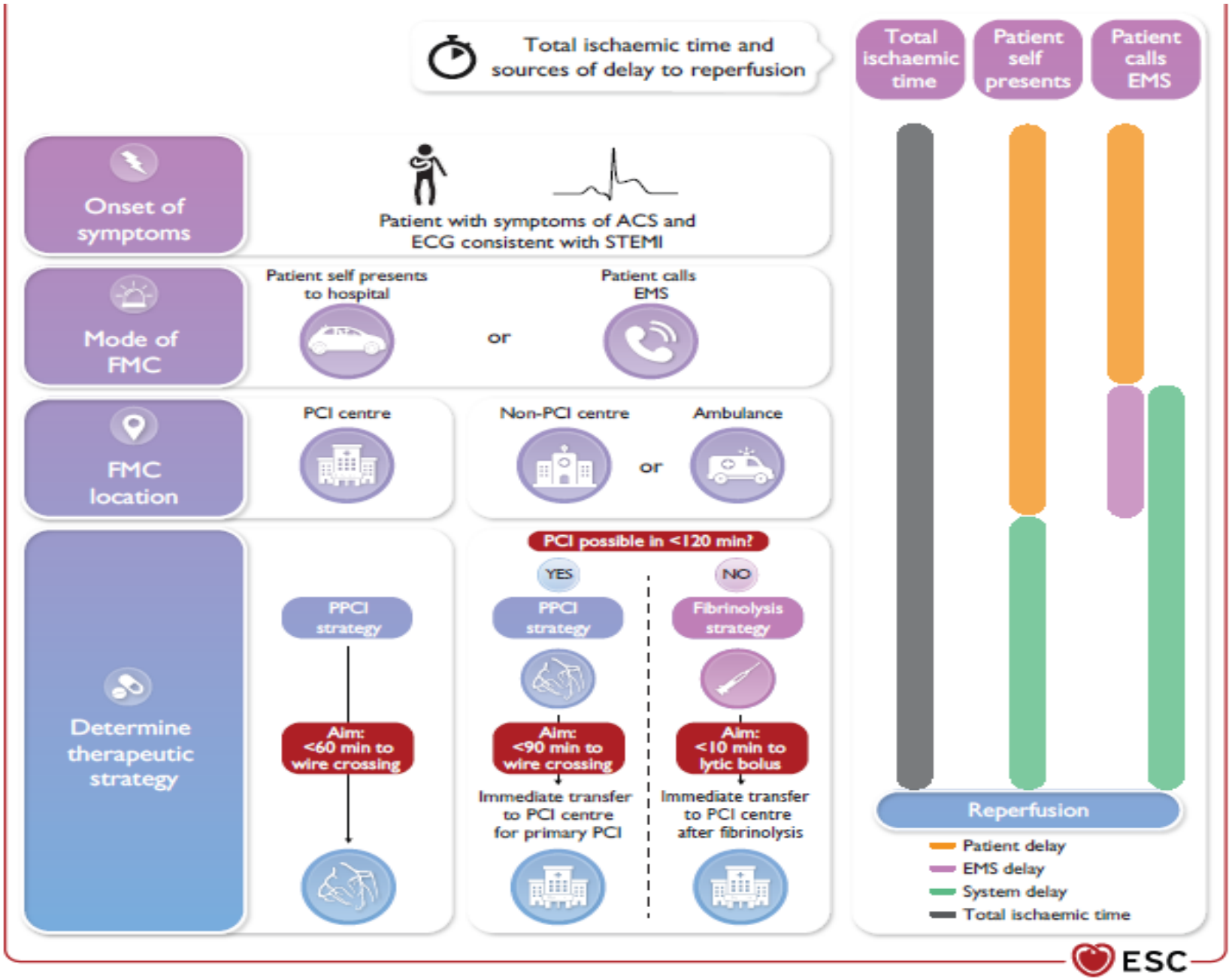
2023 ESC Guidelines for the management of acute coronary syndromes

Developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC)



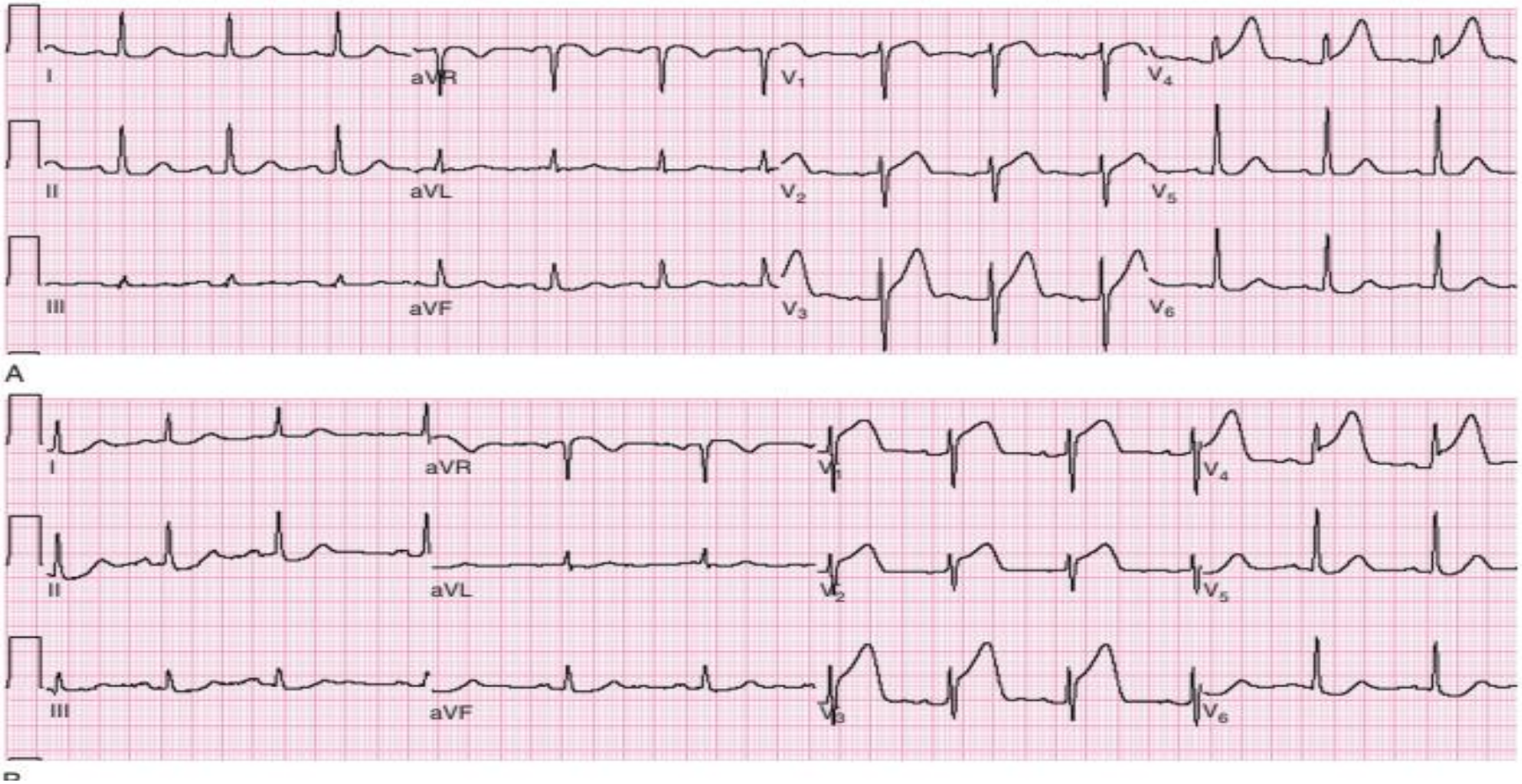
2023 ESC Guidelines for the management of acute coronary syndromes: Developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC)


Clinical presentation
ECG
If a patient has signs/symptoms suggestive of ACS, perform an ECG within 10 min of FMC
Working diagnosis[a]
STEMI
NSTE-ACS
Further investigations
hs-cTn levels
± Angiography
± Imaging
Final diagnosis[b]
STEMI
NSTEMI
Unstable angina
Non-ACS diagnosis
ESC



2023 ESC Guidelines for the management of acute coronary syndromes: Developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC)

Infarto con elevación del segmento ST



Recomendaciones iniciales en el enfoque terapéutico

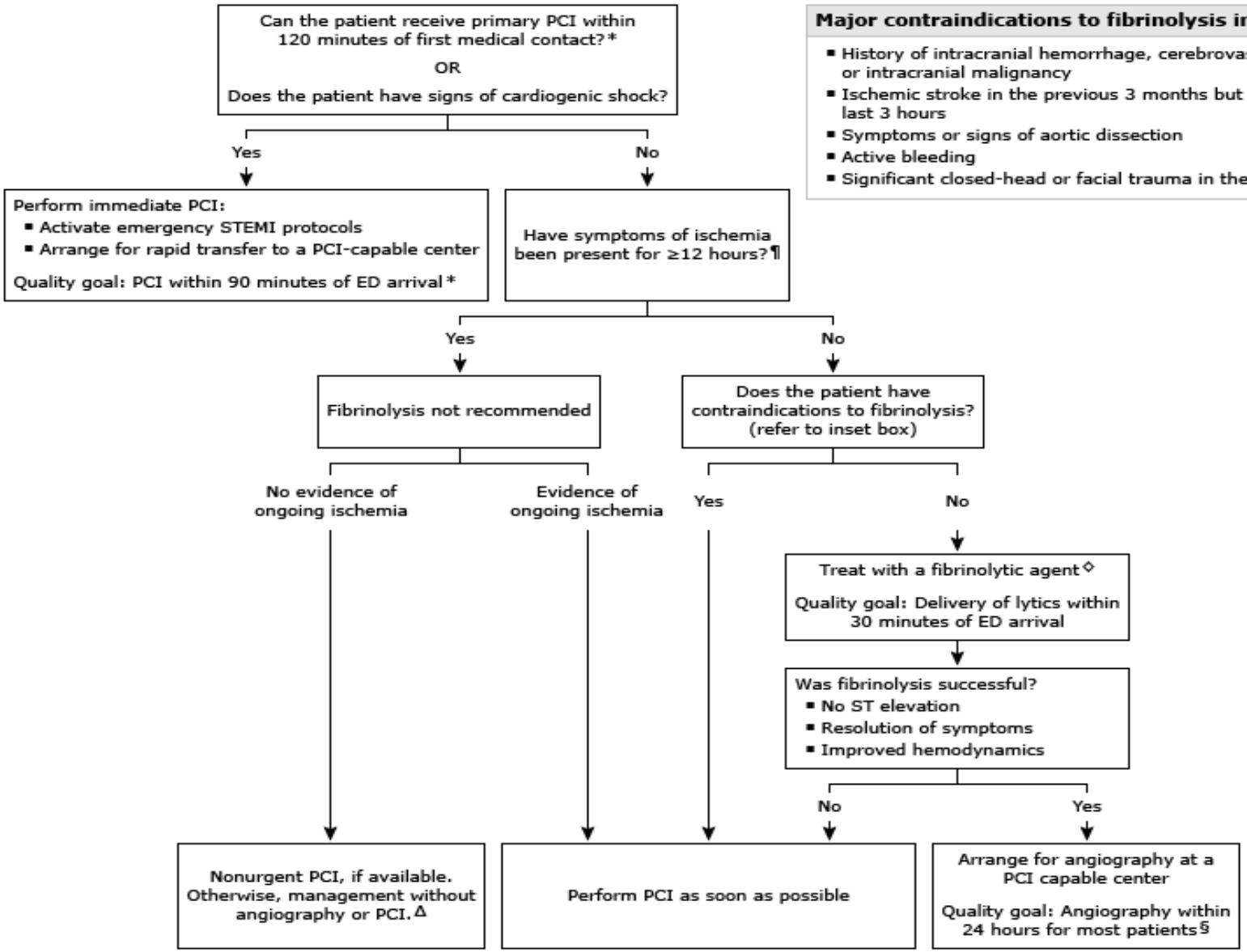
Recommendations	Class[a]	Level[b]
Hypoxia		
Oxygen is recommended in patients with hypoxaemia (SaO_2 <90%).	I	C
Routine oxygen is not recommended in patients without hypoxaemia (SaO_2 >90%).[148,172]	III	A
Symptoms		
Intravenous opioids should be considered to relieve pain.	IIa	C
A mild tranquilizer should be considered in very anxious patients.	IIa	C
Intravenous beta-blockers		
Intravenous beta-blockers (preferably metoprolol) should be considered at the time of presentation in patients undergoing PPCI with no signs of acute heart failure, an SBP >120 mmHg, and no other contraindications.[163–167,169]	IIa	A

2023 ESC Guidelines for the management of acute coronary syndromes: Developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC)

Estrategia de reperfusión sistémica (trombolíticos)

- ¿Quiénes van a ser llevados?
- Pacientes quienes lleven menos de 12 horas de inicio de los síntomas.
- No se tenga la disponibilidad de reperfusión coronaria percutánea (PCI) en los primeros 120 minutos.

2023 ESC Guidelines for the management of acute coronary syndromes: Developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC)



Major contraindications to fibrinolysis include:¥

- History of intracranial hemorrhage, cerebrovascular malformation, or intracranial malignancy
- Ischemic stroke in the previous 3 months but not within the last 3 hours
- Symptoms or signs of aortic dissection
- Active bleeding
- Significant closed-head or facial trauma in the preceding 3 months

Recommendation Table 7 — Recommendations for fibrinolytic therapy

Recommendations	Class[a]	Level[b]
Fibrinolytic therapy		
When fibrinolysis is the reperfusion strategy, it is recommended to initiate this treatment as soon as possible after diagnosis in the pre-hospital setting (aim for target of <10 min to lytic bolus).[206,353–355]	I	A
A fibrin-specific agent (i.e. tenecteplase, alteplase, or reteplase) is recommended.[356,357]	I	B
A half-dose of tenecteplase should be considered in patients >75 years of age.[184]	IIa	B
Antiplatelet co-therapy with fibrinolysis		
Aspirin and clopidogrel are recommended.[340–342]	I	A
Anticoagulation co-therapy with fibrinolysis		
Anticoagulation is recommended in patients treated with fibrinolysis until revascularization (if performed) or for the duration of hospital stay (up to 8 days).[260,347,348,350,357–360]	I	A
Enoxaparin i.v. followed by s.c. is recommended as the preferred anticoagulant.[347,348,357–360]	I	A
When enoxaparin is not available, UFH is recommended as a weight-adjusted i.v. bolus, followed by infusion.[357]	I	B
In patients treated with streptokinase, an i.v. bolus of fondaparinux followed by an s.c. dose 24 h later should be considered.[260]	IIa	B

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Fibrinolíticos

- **Tenecteplase:**
  - **<60kg: 30mg.**
  - **60-70kg: 35mg.**
  - **70 a 80kg: 40mg.**
  - **80-90kg: 45mg.**
  - **>90kg: 50mg.**
  - **Mayores de 75 años, se recomienda la mitad de la dosis.**
- **Alteplase:**
  - **15mg IV en bolo, seguido de 30mg en 30 minutos, y 35mg para la siguiente hora.**
  - **Si pesa <67kg: 15mg IV en bolo, seguido de 0.75mg/kg en 30 minutos y luego 0.5mg/kg para la siguiente hora.**

¿Qué debe incluir el pre-tratamiento antes de administrar el trombolítico?

- **Ácido acetilsalicílico → dosis carga 300mg vía oral → recomendación fuerte a favor.**
- **IP2Y2:**
  - **Clopidogrel: 300mg vía oral cada 24 horas → en adultos mayores de 75 años de edad 75mg.**
  - **Se desaconseja el uso de prasugrel y ticagrelor si se usa la terapia fibrinolítica.**

TREAT trial. J Am Coll Cardiol. 2019;73(22):2819-2828. doi:10.1016/j.jacc.2019.03.011

Manejo anticoagulante

Enoxaparina

- **Menores de 75 años:**
  - **Dosis carga: 30mg de forma intravenosa.**
  - **Dosis: se indica de forma subcutánea 1mg/kg (máximo 100mg) cada 12 horas.**
- **Mayores de 75 años:**
  - **Se omite la dosis de carga intravenosa.**
  - **Dosis: se indica 0.75mg subcutánea cada 12 horas.**

- **Tener en cuenta: usar en conjunto con la terapia antiplaquetaria.**
- **Se debe indicar 15 minutos antes de la terapia fibrinolítica, hasta 30 minutos después.**

Manejo anticoagulante

Heparina no fracciónada (UFH)

- **Dosis de carga: se inicia con 60UI/kg en bolo de forma intravenosa (máximo 4000UI).**

- **Dosis de sostenimiento: se deja en infusión a 12 UI/kg /hora (máximo 1000UI /hora) y se ajusta según INR (protocolos institucionales).**

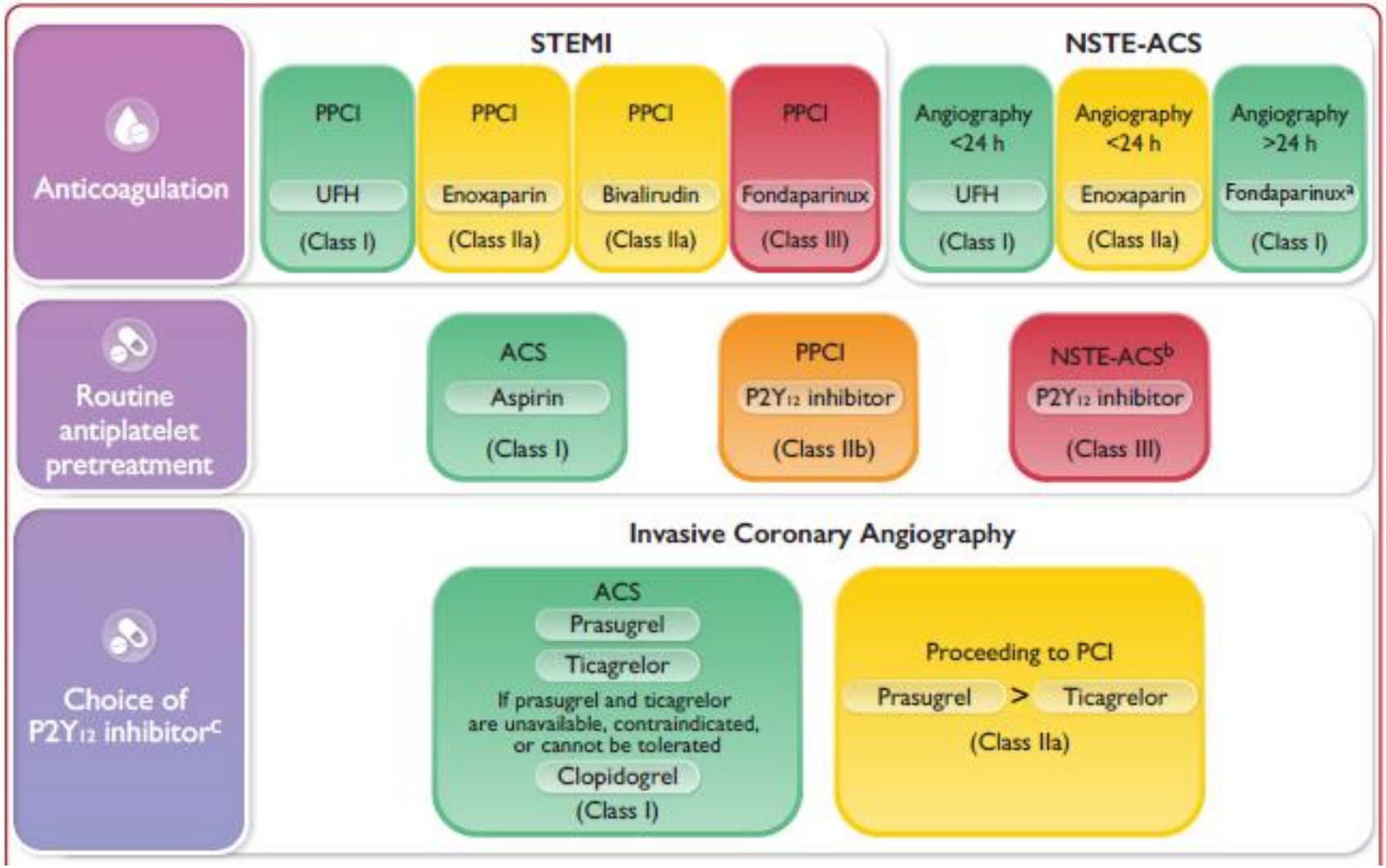
- **Al igual que la enoxaparina, se deja hasta la PCI o hasta 48hrs post-trombolisis.**

- **Evaluar los cambios post-reperfusión en la primera hora → alivio del dolor, descenso del ST >50%.**

- **Asegurar coronariografía para buscar vaso culpable en las primeras 24 horas.**

- **Debe ser llevados a coronariografía de rescate urgente:**
  - **Si continua inestable.**
  - **Si no hay un descenso en el ST y continua con dolor.**

Síndrome coronario con elevación del segmento ST



Infarto agudo al miocardio con elevación del segmento ST

Actualizaciones importantes de la guía:

- **Uso de ASA → recomendación grado I.**
- **Uso de IP2Y2 → recomendación IIb (antes recomendación grado I).**
- **Anticoagulación.**

Tratamiento antiagregante

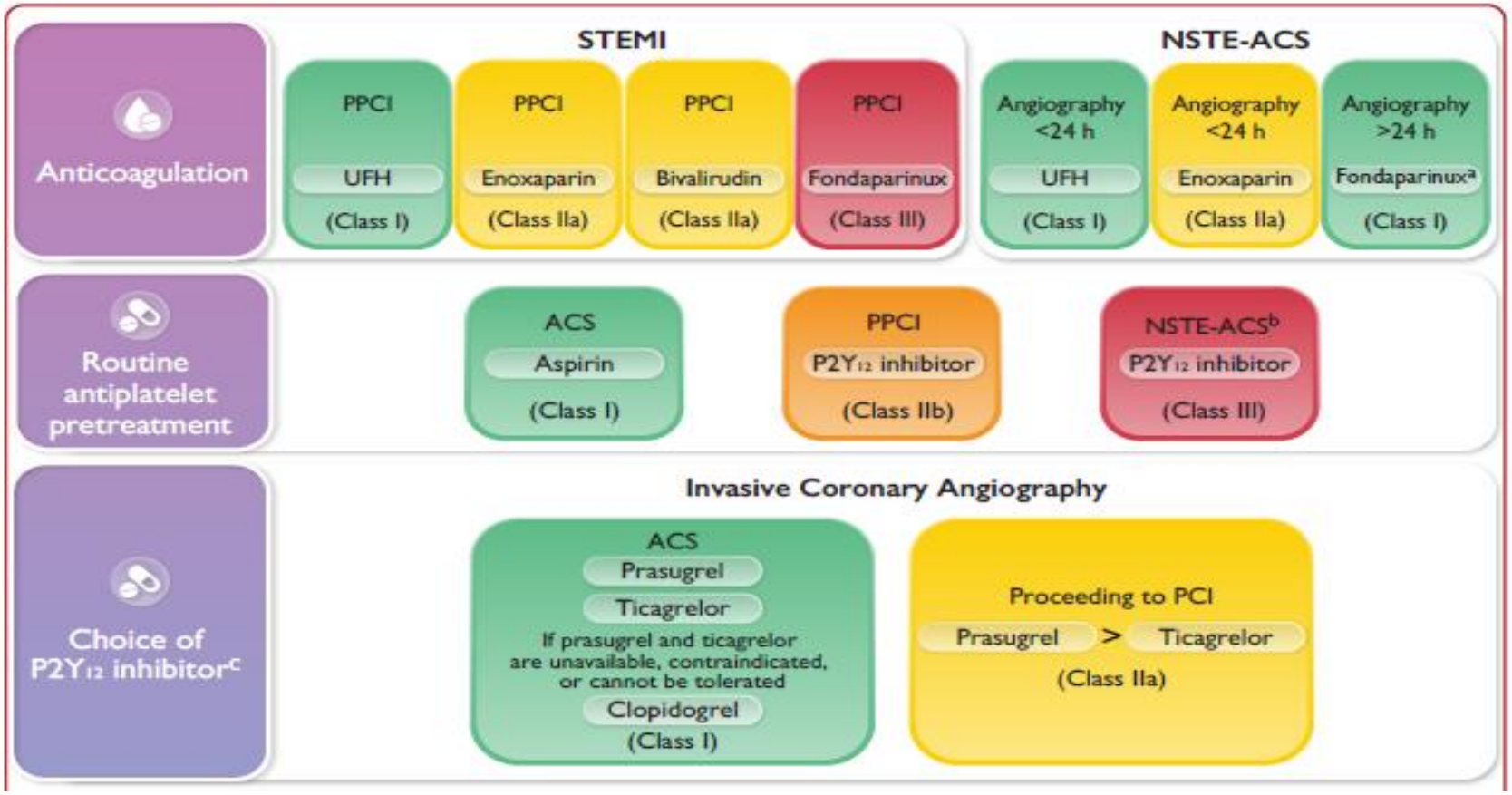
- **Ácido acetilsalicílico: dosis carga 300mg en todos los escenarios (recomendación I).**
- **Inhibidores IP2Y2: evaluar según protocolo institucional y hemodinamia (recomendación IIb).**
- **Prasugrel: habitualmente no recomendado en los mayores de 75 años o <60kg por el alto riesgo de sangrado:**
  - **Dosis carga de 60mg.**
  - **>60kg: dosis de mantenimiento de 10mg diarios.**
  - **<60kg: dosis de mantenimiento de 5mg diarios.**

Manejo antiagregante

- **Ticagleror:**
  - **Dosis carga de 180mg.**
  - **Luego dosis de mantenimiento de 90mg cada 12 horas el primer año.**
  - **Si requiere DAPT extendida: 60mg cada 12 horas.**

- **Clopidogrel:**
  - **Población especial con alto riesgo de sangrado.**
  - **600mg dosis carga seguido de 75mg diarios.**
  - **Importante: interacción medicamentosa con IBP (omeprazol y esomeprazol).**

Infarto sin elevación del segmento ST



Consideraciones en el tratamiento

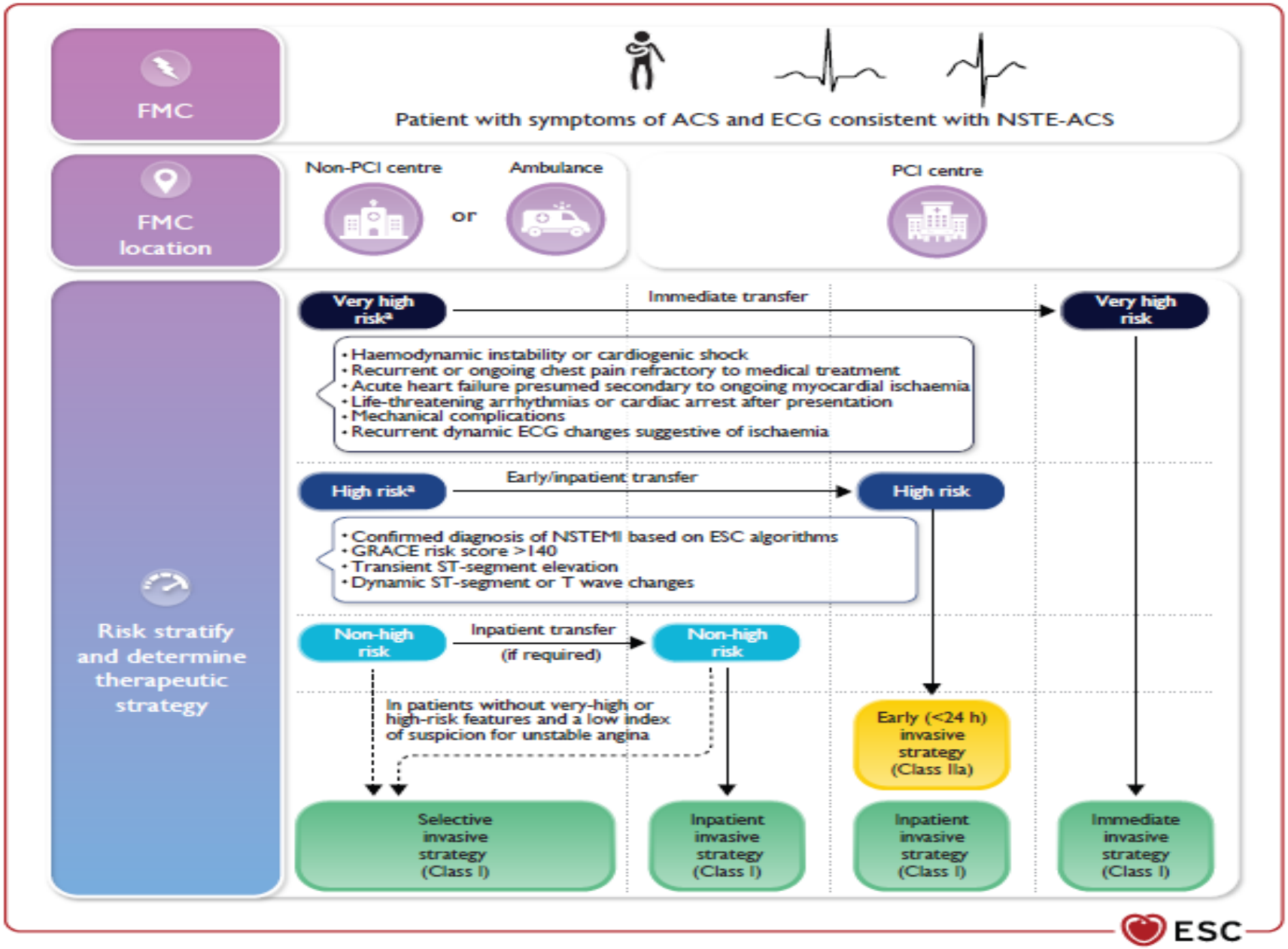
Recomendación fuerte:

- **Iniciar ácido acetilsalicílico en todos los escenarios.**
- **Dosis de 300mg vía oral seguido de dosis de 100mg diarios.**

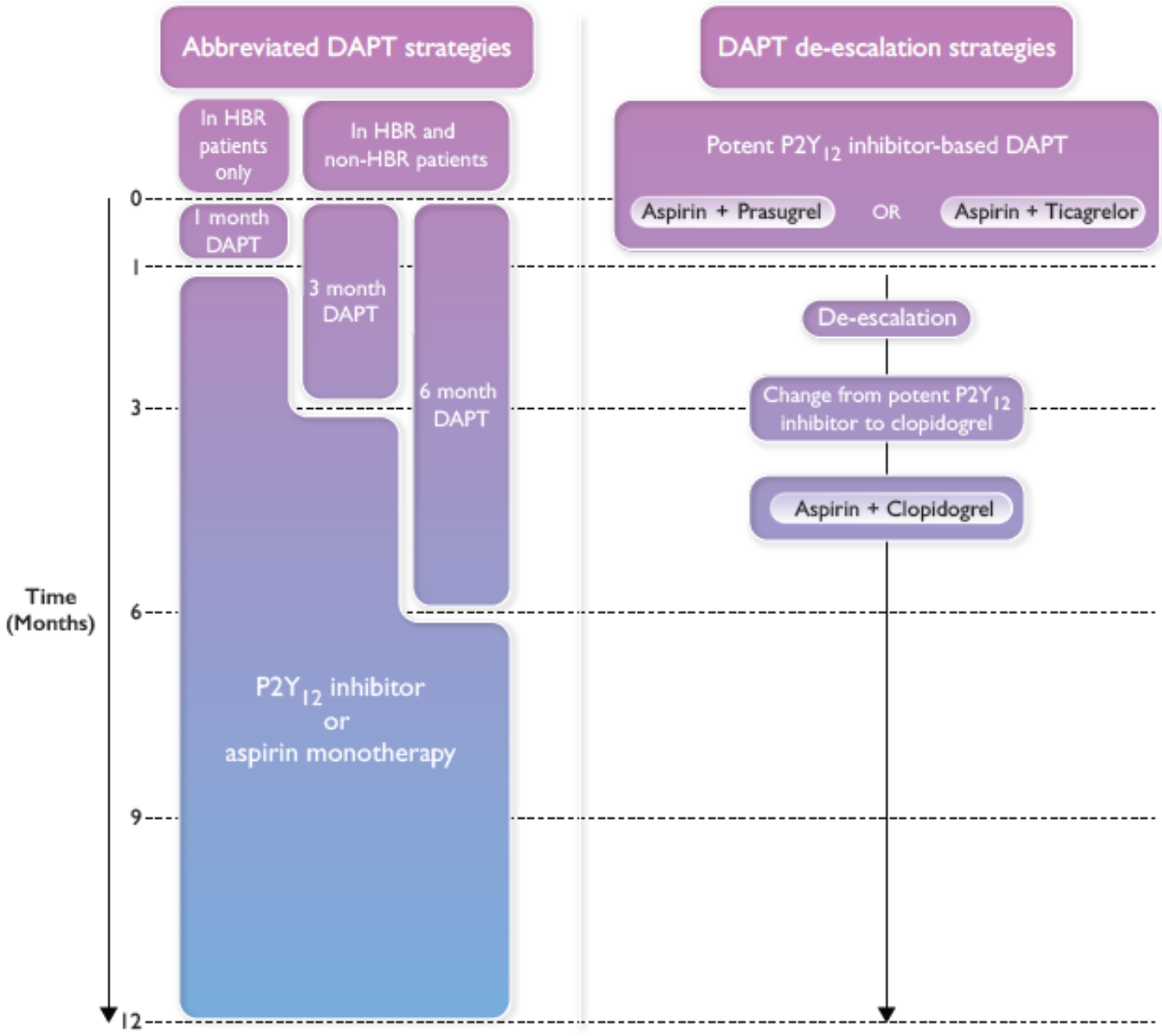
Nuevas consideraciones

- **Se desaconseja el uso de IP2Y2 en el contexto de IAMI NO ST (clase III).**

- **Paciente con enfermedad multivaso, se retrasa la revascularización quirúrgica.**


FMC
Patient with symptoms of ACS and ECG consistent with NSTE-ACS
FMC location
Non-PCI centre
or
Ambulance
PCI centre
Risk stratify and determine therapeutic strategy
Very high risk[a]
Immediate transfer
Very high risk
• Haemodynamic instability or cardiogenic shock
• Recurrent or ongoing chest pain refractory to medical treatment
• Acute heart failure presumed secondary to ongoing myocardial ischaemia
• Life-threatening arrhythmias or cardiac arrest after presentation
• Mechanical complications
• Recurrent dynamic ECG changes suggestive of ischaemia
High risk[a]
Early/inpatient transfer
High risk
• Confirmed diagnosis of NSTEMI based on ESC algorithms
• GRACE risk score >140
• Transient ST-segment elevation
• Dynamic ST-segment or T wave changes
Non-high risk
Inpatient transfer
(if required)
Non-high risk
In patients without very-high or high-risk features and a low index of suspicion for unstable angina
Early (<24 h) invasive strategy (Class IIa)
Selective invasive strategy (Class I)
Inpatient invasive strategy (Class I)
Inpatient invasive strategy (Class I)
Immediate invasive strategy (Class I)
ESC

Recommendations	Class[a]	Level[b]
Antiplatelet therapy		
Aspirin is recommended for all patients without contraindications at an initial oral LD of 150–300 mg (or 75–250 mg i.v.) and an MD of 75–100 mg o.d. for long-term treatment.[284,285]	I	A
In all ACS patients, a $P2Y_{12}$ receptor inhibitor is recommended in addition to aspirin, given as an initial oral LD followed by an MD for 12 months unless there is HBR[c].[238,239,263,286]	I	A
A proton pump inhibitor in combination with DAPT is recommended in patients at high risk of gastrointestinal bleeding.[287,288]	I	A
Prasugrel is recommended in $P2Y_{12}$ receptor inhibitor-naïve patients proceeding to PCI (60 mg LD, 10 mg o.d. MD, 5 mg o.d. MD for patients aged ≥75 years or with a body weight <60 kg).[239]	I	B
Ticagrelor is recommended irrespective of the treatment strategy (invasive or conservative) (180 mg LD, 90 mg b.i.d. MD).[238]	I	B
Clopidogrel (300–600 mg LD, 75 mg o.d. MD) is recommended when prasugrel or ticagrelor are not available, cannot be tolerated, or are contraindicated.[263,289]	I	C
If patients presenting with ACS stop DAPT to undergo CABG, it is recommended they resume DAPT after surgery for at least 12 months.	I	C
Prasugrel should be considered in preference to ticagrelor for ACS patients who proceed to PCI.[244,290]	IIa	B
Pre-treatment with a $P2Y_{12}$ receptor inhibitor may be considered in patients undergoing a primary PCI strategy.[244,245]	IIb	B
Pre-treatment with a $P2Y_{12}$ receptor inhibitor may be considered in NSTE-ACS patients who are not expected to undergo an early invasive strategy (<24 h) and do not have HBR[c].[263]	IIb	C
Pre-treatment with a GP IIb/IIIa receptor antagonist is not recommended.[292]	III	A
Routine pre-treatment with a $P2Y_{12}$ receptor inhibitor in NSTE-ACS patients in whom coronary anatomy is not known and early invasive management (<24 h) is planned is not recommended.[244,247,248,293–295]	III	A
Anticoagulant therapy		
Parenteral anticoagulation is recommended for all patients with ACS at the time of diagnosis.[255,296]	I	A
Routine use of a UFH bolus (weight-adjusted i.v. bolus during PCI of 70–100 IU/kg) is recommended in patients undergoing PCI.	I	C
Intravenous enoxaparin at the time of PCI should be considered in patients pre-treated with subcutaneous enoxaparin.[256,261,297]	IIa	B
Discontinuation of parenteral anticoagulation should be considered immediately after an invasive procedure.	IIa	C

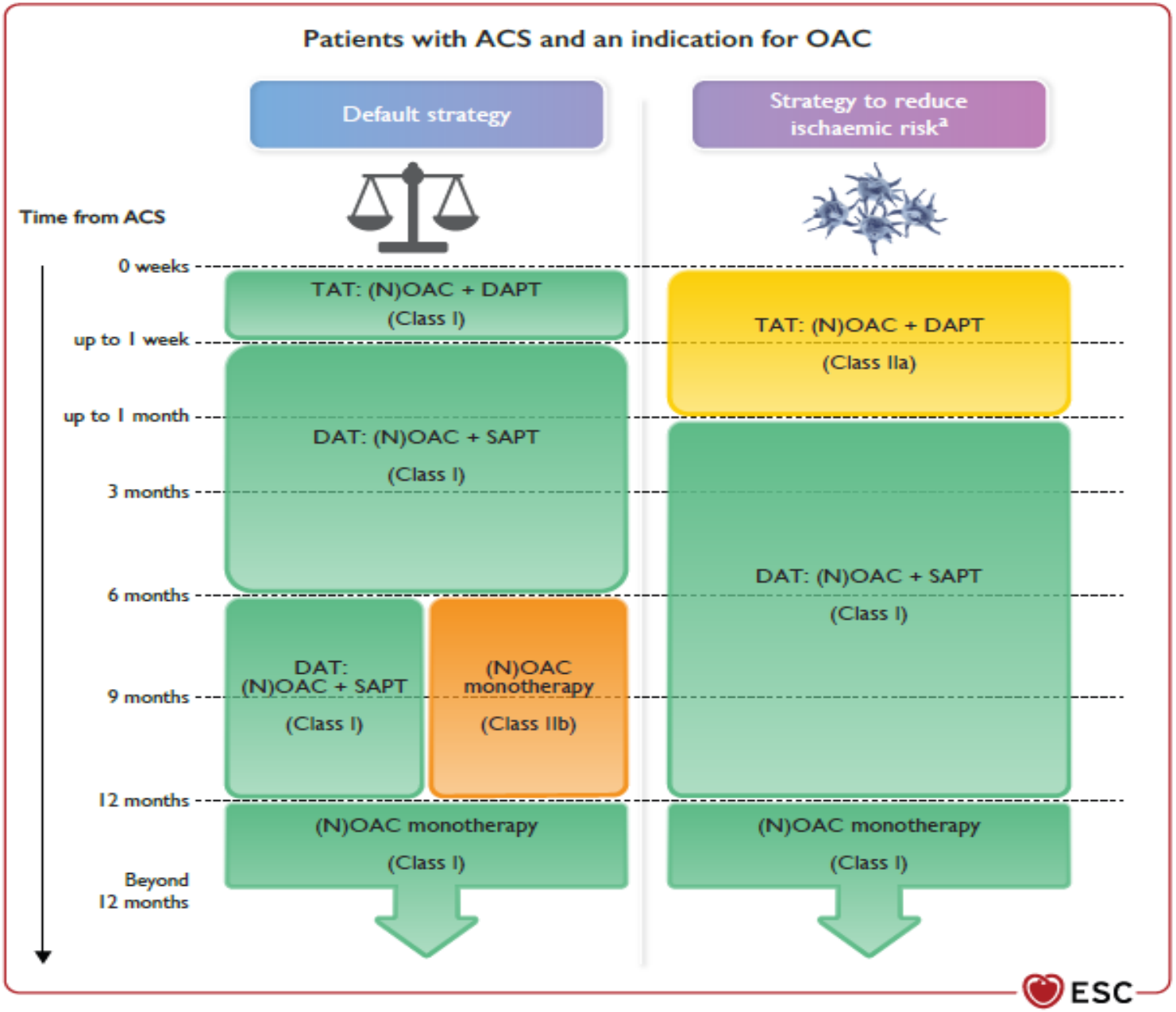

Abbreviated DAPT strategies
DAPT de-escalation strategies
In HBR patients only
In HBR and non-HBR patients
Potent P2Y12 inhibitor-based DAPT
Aspirin + Prasugrel
OR
Aspirin + Ticagrelor
1 month DAPT
3 month DAPT
6 month DAPT
De-escalation
Change from potent P2Y12 inhibitor to clopidogrel
Aspirin + Clopidogrel
P2Y12 inhibitor or aspirin monotherapy
Time (Months)
0
1
3
6
9
12

Escenarios especiales

- Escenarios de anticoagulación indicada previamente → prótesis valvular mecánica (fibrilación auricular).

- En pacientes anticoagulados:
  - La PCI está indicada sin interrumpir warfarina o DOAC.
  - Si tiene INR >2,5 no administrar UFH.

- En los pacientes con DOAC, se sugiere de acuerdo a última dosis de anticoagulación, bajas dosis de HBPM → enoxaparina 0.5mg/kg IV → deben llevar asa, pero no se recomienda pretratamiento IP2Y2.



2023 ESC Guidelines for the management of acute coronary syndromes: Developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC)

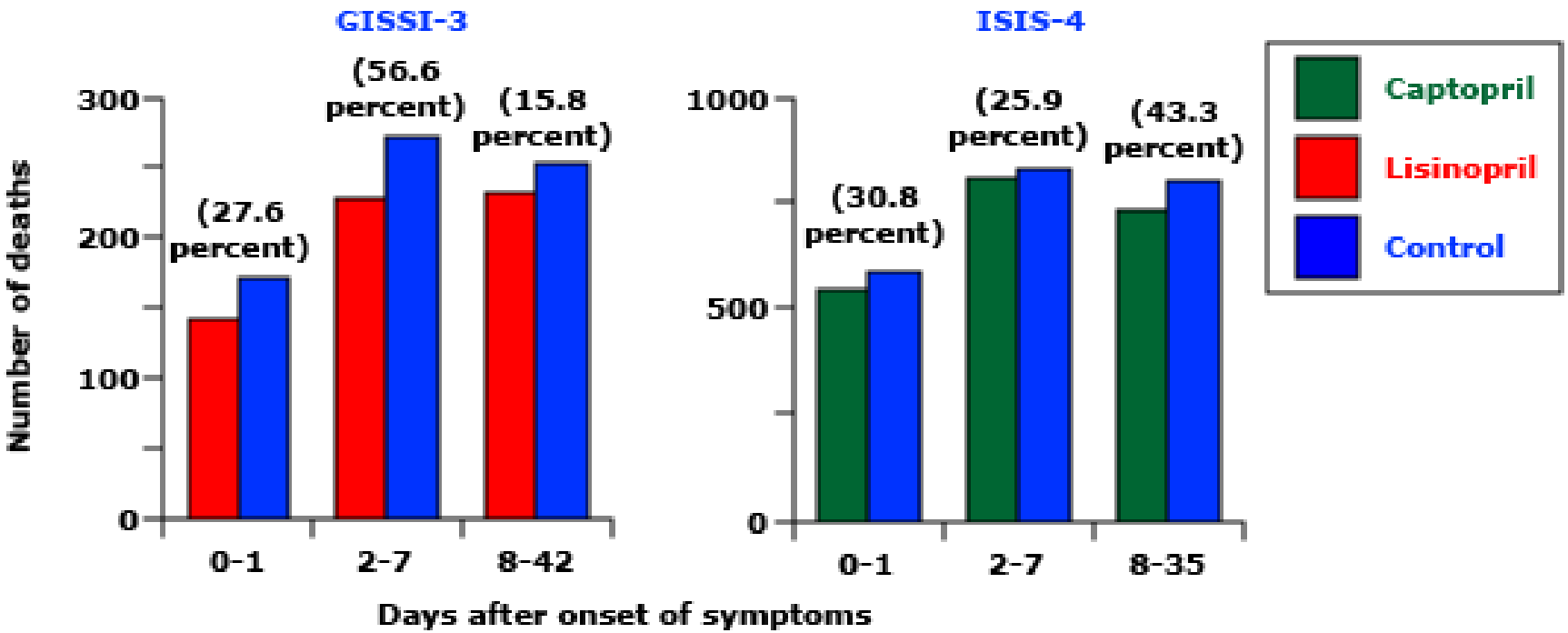
Evaluación del riesgo de sangrado

- Estimación del riesgo de sangrado.
- No contraindica la antiagregación dual.
- Nos orienta sobre el tiempo que puede requerir la terapia de antiagregación dual.
- Scores validadores:
  - CRUSADE bleeding score.
  - ARC-HBR.

Otras medidas

- **Uso de los IECA.**
- **Estudio ISIS y GISSI-3.**
- **Enalapril, captopril, lisinopril:**
  - **Sin claro beneficio en IAMI no ST.**
  - **Se iniciaba a las 48 horas post-reperfusión.**

Benefit of ACE inhibitors in all patients with acute MI



Betabloqueadores:

- Usar dentro de las primeras 24 horas.
- No hay claro beneficio entre oral vs intravenoso.

- Angina refractaria.
- Hipertensión.
- Estabilidad hemodinámica.

Intravenous beta-blockers		
Intravenous beta-blockers (preferably metoprolol) should be considered at the time of presentation in patients undergoing PPCI with no signs of acute heart failure, an SBP >120 mmHg, and no other contraindications.[163–167,169]	IIa	A

- **Betabloqueadores en el escenario agudo; indicados después de la terapia de la PCI.**

  En la trombolisis farmacológica, no se recomienda metoprolol oral.

Colchicina

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 DECEMBER 26, 2019 VOL. 381 NO. 26

Efficacy and Safety of Low-Dose Colchicine after Myocardial Infarction

Jean-Claude Tardif, M.D., Simon Kouz, M.D., David D. Waters, M.D., Olivier F. Bertrand, M.D., Ph.D., Rafael Diaz, M.D., Aldo P. Maggioni, M.D., Fausto J. Pinto, M.D., Ph.D., Reda Ibrahim, M.D., Habib Gamra, M.D., Ghassan S. Kiwan, M.D., Colin Berry, M.D., Ph.D., José López-Sendón, M.D., Petr Ostadal, M.D., Ph.D., Wolfgang Koenig, M.D., Denis Angoulvant, M.D., Jean C. Grégoire, M.D., Marc-André Lavoie, M.D., Marie-Pierre Dubé, Ph.D., David Rhainds, Ph.D., Mylène Provencher, Ph.D., Lucie Blondeau, M.Sc., Andreas Orfanos, M.B., B.Ch., Philippe L. L'Allier, M.D., Marie-Claude Guertin, Ph.D., and François Roubille, M.D., Ph.D.

RESULTS

A total of 4745 patients were enrolled; 2366 patients were assigned to the colchicine group, and 2379 to the placebo group. Patients were followed for a median of 22.6 months. The primary end point occurred in 5.5% of the patients in the colchicine group, as compared with 7.1% of those in the placebo group (hazard ratio, 0.77; 95% confidence interval [CI], 0.61 to 0.96; P=0.02). The hazard ratios were 0.84 (95% CI, 0.46 to 1.52) for death from cardiovascular causes, 0.83 (95% CI, 0.25 to 2.73) for resuscitated cardiac arrest, 0.91 (95% CI, 0.68 to 1.21) for myocardial infarction, 0.26 (95% CI, 0.10 to 0.70) for stroke, and 0.50 (95% CI, 0.31 to 0.81) for urgent hospitalization for angina leading to coronary revascularization. Diarrhea was reported in 9.7% of the patients in the colchicine group and in 8.9% of those in the placebo group (P=0.35). Pneumonia was reported as a serious adverse event in 0.9% of the patients in the colchicine group and in 0.4% of those in the placebo group (P=0.03).

CONCLUSIONS

Among patients with a recent myocardial infarction, colchicine at a dose of 0.5 mg daily led to a significantly lower risk of ischemic cardiovascular events than placebo. (Funded by the Government of Quebec and others; COLCOT ClinicalTrials.gov number, NCT02551094.)

ESC European Society of Cardiology
European Heart Journal (2020) **41**, 4092–4099
doi:10.1093/eurheartj/ehaa659

Time-to-treatment initiation of colchicine and cardiovascular outcomes after myocardial infarction in the Colchicine Cardiovascular Outcomes Trial (COLCOT)

Conclusions

Early initiation of low-dose colchicine after MI greatly reduced the risk of ischaemic CV events compared with placebo. These results support in-hospital initiation of adjunctive anti-inflammatory therapy with colchicine for post-MI prevention.

Table 3 **Efficacy endpoints according to time-to-treatment initiation (*N* = 4661, colchicine vs. placebo)**

Endpoints	TTI 0–3 days, *N* = 1193 Colchicine vs. placebo, no. (%) HR (95% CI); *P*	TTI 4–7 days, *N* = 720 Colchicine vs. placebo, no. (%) HR (95% CI); *P*	TTI ≥ 8 days, *N* = 2748 Colchicine vs. placebo, no. (%) HR (95% CI); *P*
Primary composite endpoint	26 (4.3%) vs. 49 (8.3%) 0.52 (0.32–0.84); *P* = 0.007	22 (6.0%) vs. 21 (5.9%) 0.96 (0.53–1.75); *P* = 0.896	77 (5.7%) vs. 99 (7.1%) 0.82 (0.61–1.11); *P* = 0.200
CV death	2 (0.3%) vs. 2 (0.3%) 1.04 (0.15–7.37); *P* = 0.970	2 (0.5%) vs. 4 (1.1%) 0.45 (0.08–2.46); *P* = 0.356	15 (1.1%) vs. 18 (1.3%) 0.89 (0.45–1.76); *P* = 0.734
Resuscitated cardiac arrest	1 (0.2%) vs. 3 (0.5%) 0.33 (0.03–3.20); *P* = 0.340	2 (0.5%) vs. 1 (0.3%) 1.90 (0.17–20.95); *P* = 0.600	2 (0.1%) vs. 2 (0.1%) 1.02 (0.14–7.22); *P* = 0.986
MI	17 (2.8%) vs. 29 (4.9%) 0.58 (0.32–1.05); *P* = 0.071	16 (4.4%) vs. 9 (2.5%) 1.67 (0.74–3.78); *P* = 0.218	52 (3.8%) vs. 59 (4.2%) 0.93 (0.64–1.35); *P* = 0.710
Stroke	1 (0.2%) vs. 5 (0.8%) 0.21 (0.02–1.81); *P* = 0.156	1 (0.3%) vs. 3 (0.8%) 0.28 (0.03–2.71); *P* = 0.272	2 (0.1%) vs. 11 (0.8%) 0.19 (0.04–0.84); *P* = 0.029
Urgent hospitalization for angina requiring coronary revascularization	6 (1.0%) vs. 17 (2.9%) 0.35 (0.14–0.88); *P* = 0.026	4 (1.1%) vs. 6 (1.7%) 0.63 (0.18–2.24); *P* = 0.476	15 (1.1%) vs. 26 (1.9%) 0.61 (0.32–1.16); *P* = 0.131
Secondary composite endpoint	20 (3.3%) vs. 36 (6.1%) 0.55 (0.32–0.95); *P* = 0.031	18 (4.9%) vs. 16 (4.5%) 1.04 (0.53–2.03); *P* = 0.919	67 (4.9%) vs. 77 (5.5%) 0.92 (0.66–1.28); *P* = 0.629
All-cause death	6 (1.0%) vs. 6 (1.0%) 1.03 (0.33–3.19); *P* = 0.962	8 (2.2%) vs. 7 (2.0%) 1.03 (0.37–2.84); *P* = 0.957	26 (1.9%) vs. 31 (2.2%) 0.90 (0.53–1.51); *P* = 0.684
All coronary revascularizations	33 (5.5%) vs. 51 (8.7%) 0.63 (0.40–0.97); *P* = 0.037	25 (6.9%) vs. 18 (5.1%) 1.41 (0.76–2.61); *P* = 0.275	72 (5.3%) vs. 94 (6.7%) 0.81 (0.59–1.10); *P* = 0.172

The primary composite endpoint included CV death, resuscitated cardiac arrest, MI, stroke, or urgent hospitalization for angina requiring coronary revascularization. The secondary composite endpoint included CV death, resuscitated cardiac arrest, MI, and stroke. Only the initial event was counted in the analyses of time to first event for the primary composite endpoint and for the secondary composite endpoint.

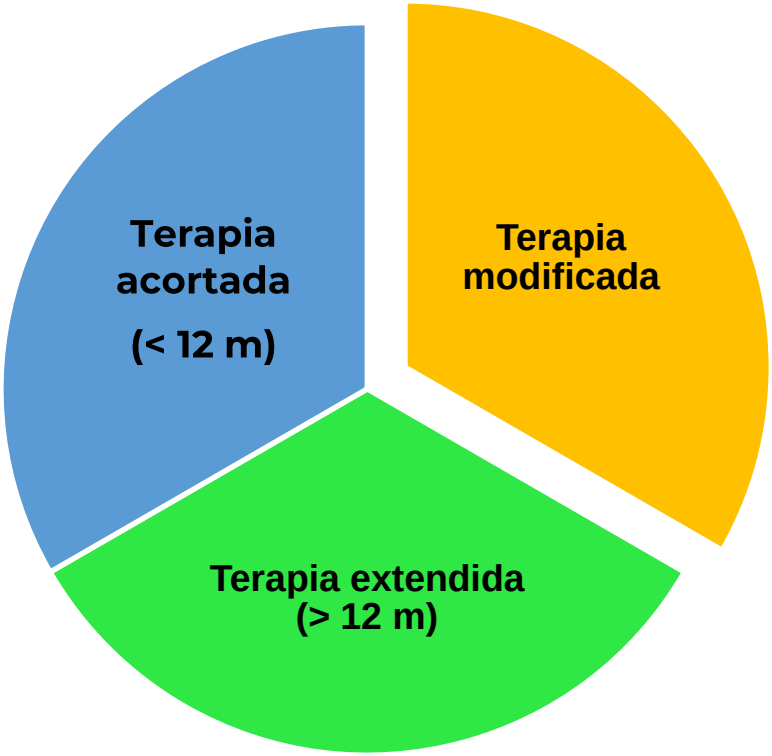
Covariates included in the stepwise multivariable Cox regression models are: age; sex; BMI; smoking status; history of diabetes; history of hypertension; history of dyslipidaemia; prior MI; prior coronary revascularization (prior PCI or prior CABG); prior heart failure. All models also included TTI, group and the interaction between group and TTI.

CI, confidence interval; CV, cardiovascular; MI, myocardial infarction; HR, hazard ratio; PCI, percutaneous coronary intervention; TTI, time-to-treatment initiation.

Estatinas

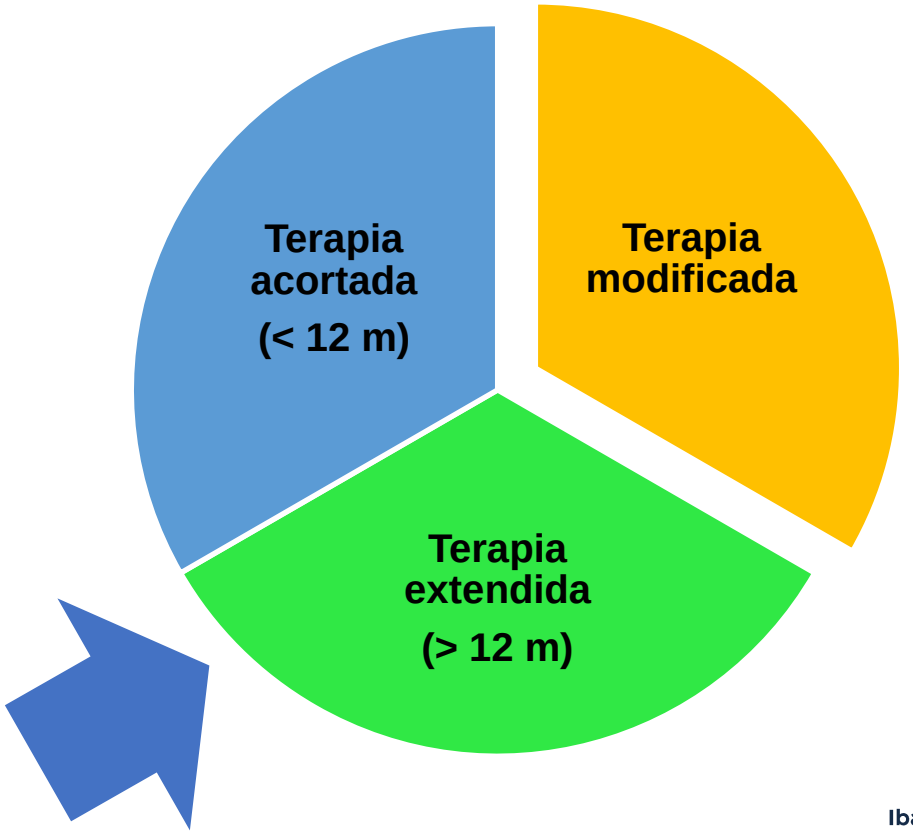
- Siempre dar en todos los escenarios de síndrome coronario.
- Se debe dar lo más pronto posible, una vez se hizo el diagnóstico de síndrome coronario agudo.
- Perfil lipídico de base.
- Evaluar metas en el escenario ambulatorio.

Terapia de mantenimiento



Ibanez B, et al. Eur Heart J. 2018;39:119-77.
Collet JP, et al. Eur Heart J. 2021;42:1289-367.

Terapia de mantenimiento



Ibanez B, et al. Eur Heart J. 2018;39:119-77.
Collet JP, et al. Eur Heart J. 2021;42:1289-367.

Recommendation Table 4 — Recommendations for reperfusion therapy and timing of invasive strategy

Recommendations	Class[a]	Level[b]
Recommendations for reperfusion therapy for patients with STEMI		
Reperfusion therapy is recommended in all patients with a working diagnosis of STEMI (persistent ST-segment elevation or equivalents[c]) and symptoms of ischaemia of ≤12 h duration.[51,182]	I	A
A PPCI strategy is recommended over fibrinolysis if the anticipated time from diagnosis to PCI is <120 min.[52,218,219]	I	A
If timely PPCI (<120 min) cannot be performed in patients with a working diagnosis of STEMI, fibrinolytic therapy is recommended within 12 h of symptom onset in patients without contraindications.[176,183]	I	A
Rescue PCI is recommended for failed fibrinolysis (i.e. ST-segment resolution <50% within 60–90 min of fibrinolytic administration) or in the presence of haemodynamic or electrical instability, worsening ischaemia, or persistent chest pain.[184,185]	I	A

In patients with a working diagnosis of STEMI and a time from symptom onset >12 h, a PPCI strategy is recommended in the presence of ongoing symptoms suggestive of ischaemia, haemodynamic instability, or life-threatening arrhythmias.[220]	I	C
A routine PPCI strategy should be considered in STEMI patients presenting late (12–48 h) after symptom onset.[189–191,221]	IIa	B
Routine PCI of an occluded IRA is not recommended in STEMI patients presenting >48 h after symptom onset and without persistent symptoms.[189,192,193]	III	A

Transfer/interventions after fibrinolysis		
Transfer to a PCI-capable centre is recommended in all patients immediately after fibrinolysis.[184–186,212,213,222–224]	I	A
Emergency angiography and PCI of the IRA, if indicated are recommended in patients with new-onset or persistent heart failure/shock after fibrinolysis.[185,225]	I	A
Angiography and PCI of the IRA, if indicated, is recommended between 2 and 24 h after successful fibrinolysis.[186,212,213,217,224]	I	A

Continued

Invasive strategy in NSTE-ACS		
An invasive strategy during hospital admission is recommended in NSTE-ACS patients with high-risk criteria or a high index of suspicion for unstable angina.[196–200]	I	A
A selective invasive approach is recommended in patients without very high- or high-risk NSTE-ACS criteria and with a low index of suspicion for NSTE-ACS.[196–200]	I	A

An immediate invasive strategy is recommended in patients with a working diagnosis of NSTE-ACS and with at least one of the following very high-risk criteria: • Haemodynamic instability or cardiogenic shock • Recurrent or refractory chest pain despite medical treatment • In-hospital life-threatening arrhythmias • Mechanical complications of MI • Acute heart failure presumed secondary to ongoing myocardial ischaemia • *Recurrent* dynamic ST-segment or T wave changes, particularly intermittent ST-segment elevation.	**I**	**C**
An early invasive strategy within 24 h should be considered in patients with at least one of the following high-risk criteria: • Confirmed diagnosis of NSTEMI based on current recommended ESC hs-cTn algorithms • Dynamic ST-segment or T wave changes • Transient ST-segment elevation • GRACE risk score >140[202,226–230]	**IIa**	**A**

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Gracias