

Tour d'été Lyon Sud 2026

CARDIOLOGIE

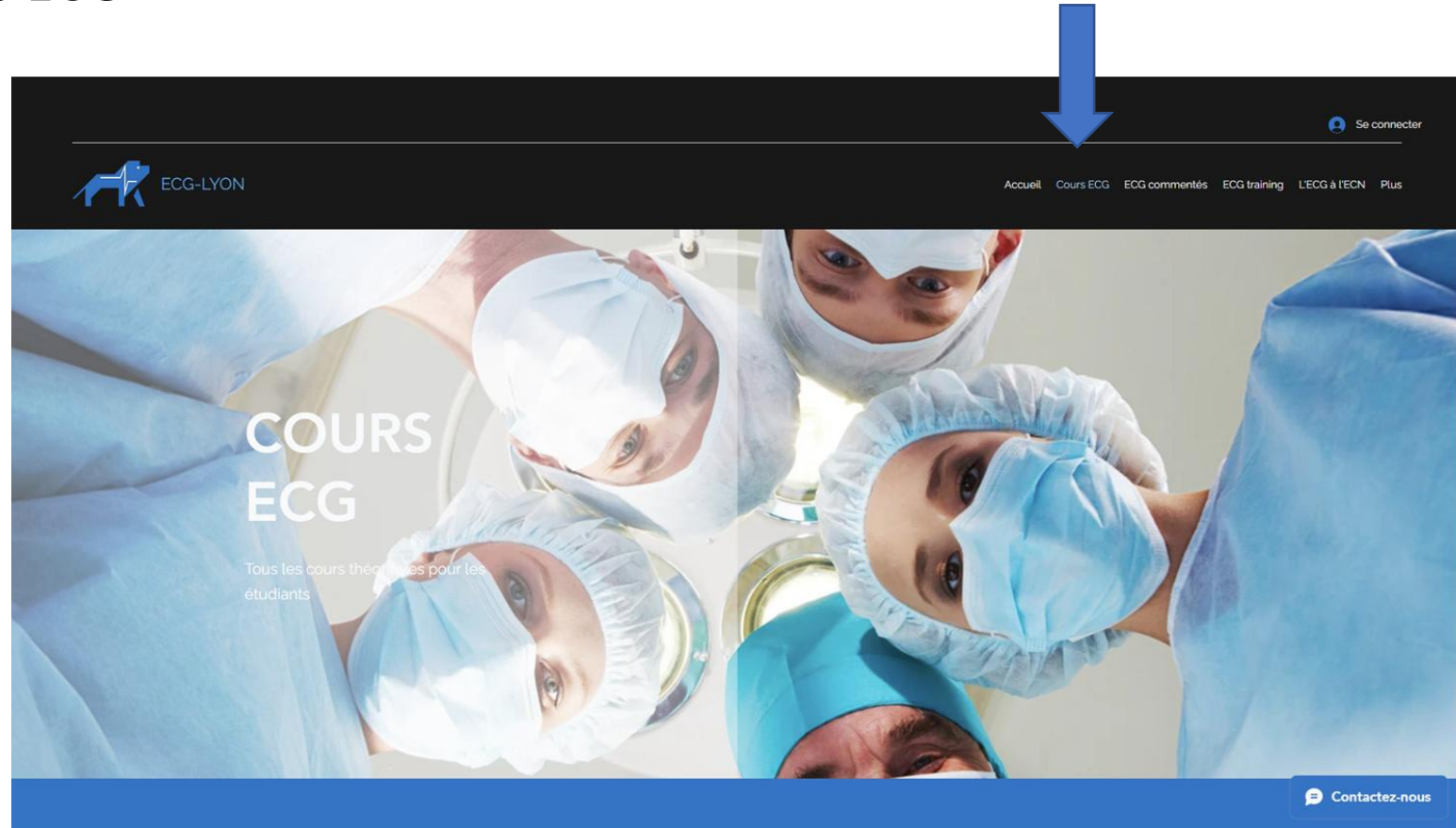
Faculté de Médecine Lyon-Sud – Mise à jour septembre 2026

Dr Thomas BOCHATON

Unité de Soins Intensifs Cardiologique – Hôpital Cardiologique – HCL

Je télécharge le fichier

- ecg-lyon.com
 - Cours ECG



Pour comprendre les diapos

Levels of evidence

Classes of recommendations

Classes of recommendations

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

©ESC 2021

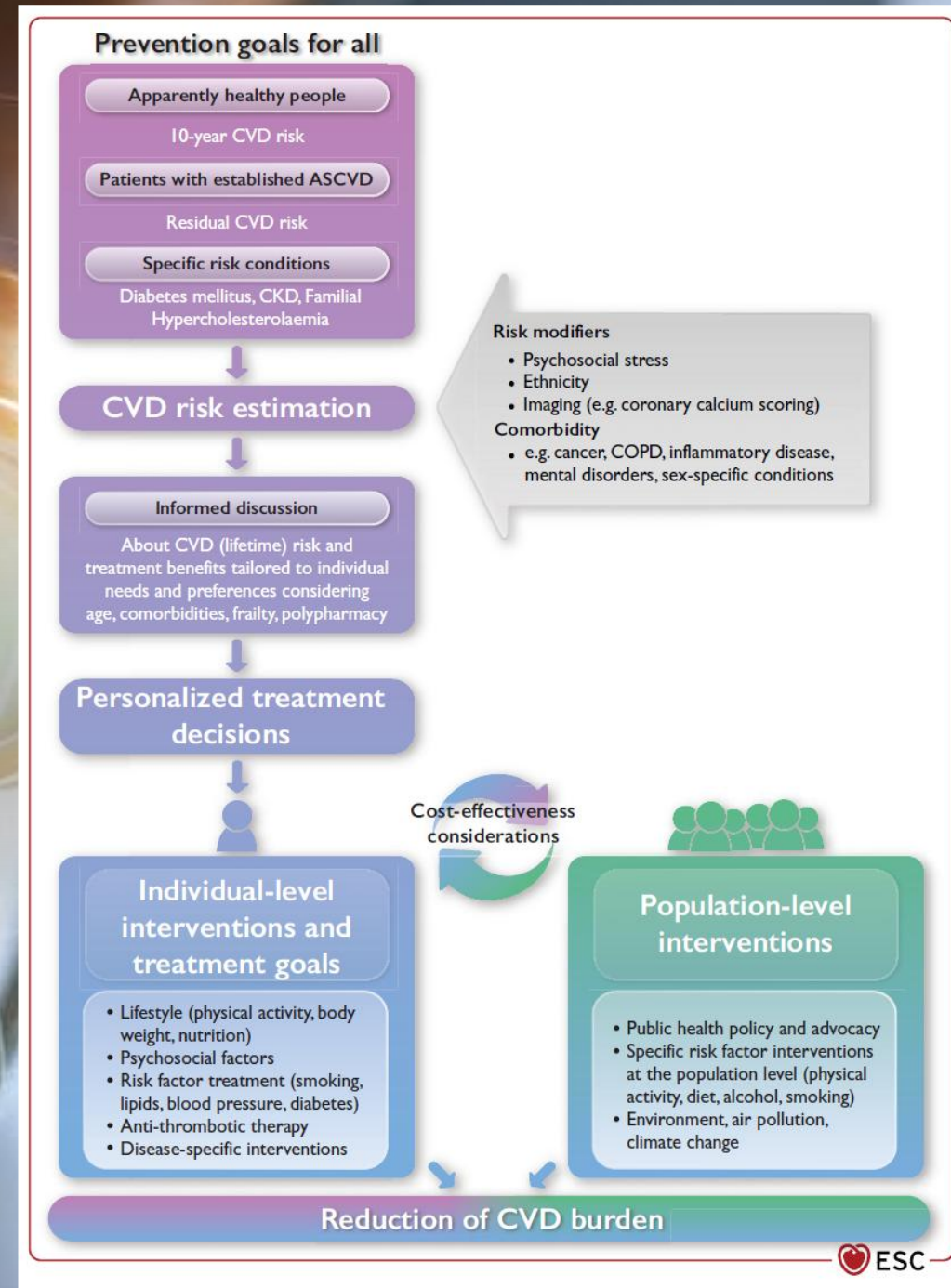
Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

©ESC 2021

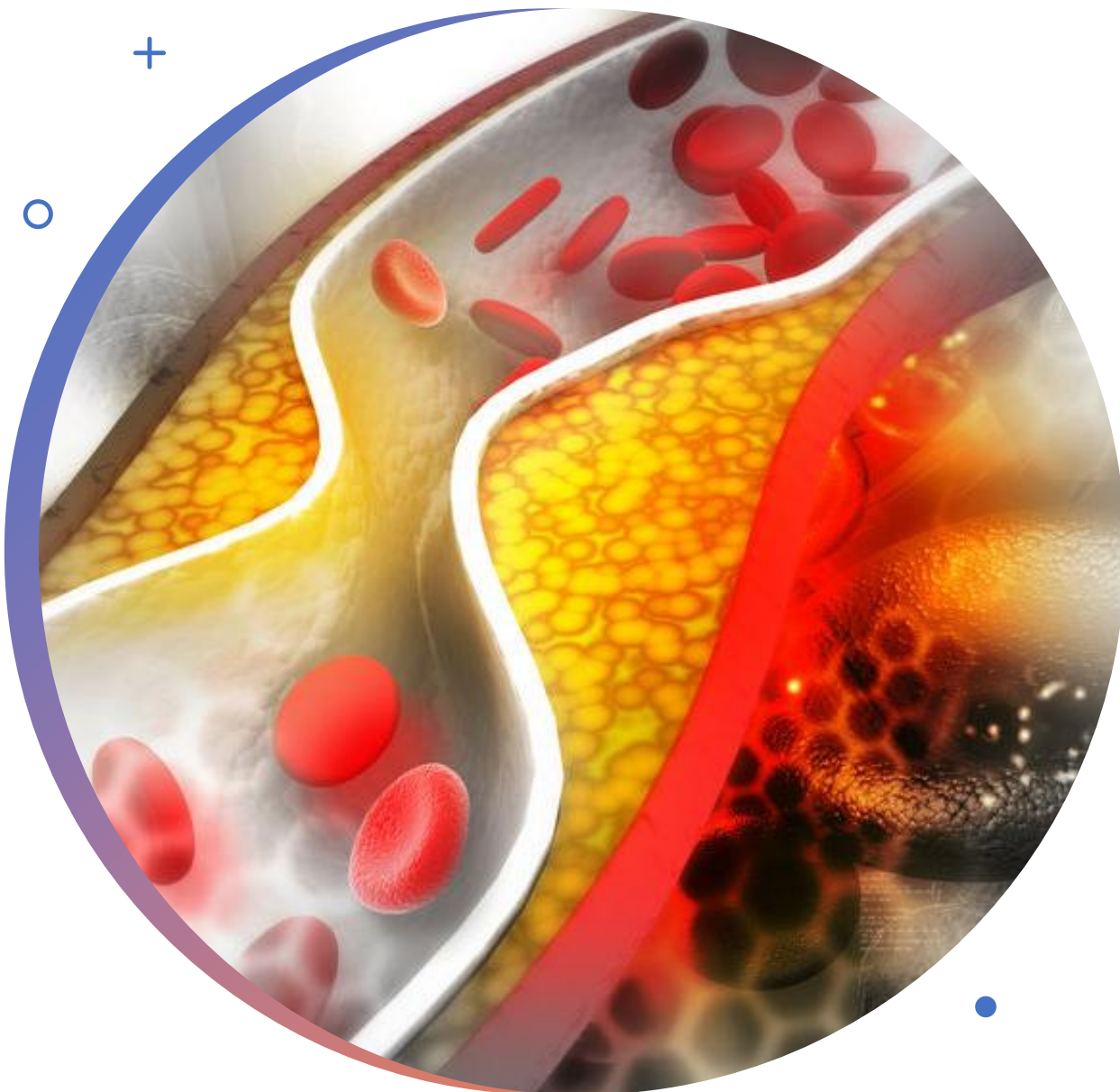
Les choses à la mode



Prévention cardiovasculaire



Syndrome coronarien



ACS encompasses a spectrum



Unstable angina

NSTEMI

STEMI

1

Think 'A.C.S.' at initial assessment



Abnormal ECG?



Clinical context?

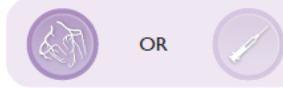


Stable patient?

2

Think invasive management

STEMI



OR



(If timely primary PCI not feasible)

Very high-risk NSTEMI-ACS



Immediate angiography ± PCI

High-risk NSTEMI-ACS



Early (<24 h) angiography should be considered

3

Think antithrombotic therapy

Antiplatelet therapy



+



Aspirin

P2Y₁₂ inhibitor

AND

Anticoagulant therapy



OR



UFH

OR



LMWH

OR



Bivalirudin

OR

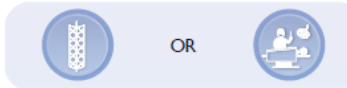


Fondaparinux

4

Think revascularization

Based on clinical status, co-morbidities, and disease complexity



OR



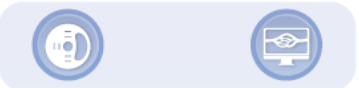
PCI

CABG

Aim for complete revascularization



Consider adjunctive tests to guide revascularization



Intravascular imaging



Intravascular physiology

5

Think secondary prevention



Antithrombotic therapy



Lipid lowering therapy



Smoking cessation



Cardiac rehabilitation

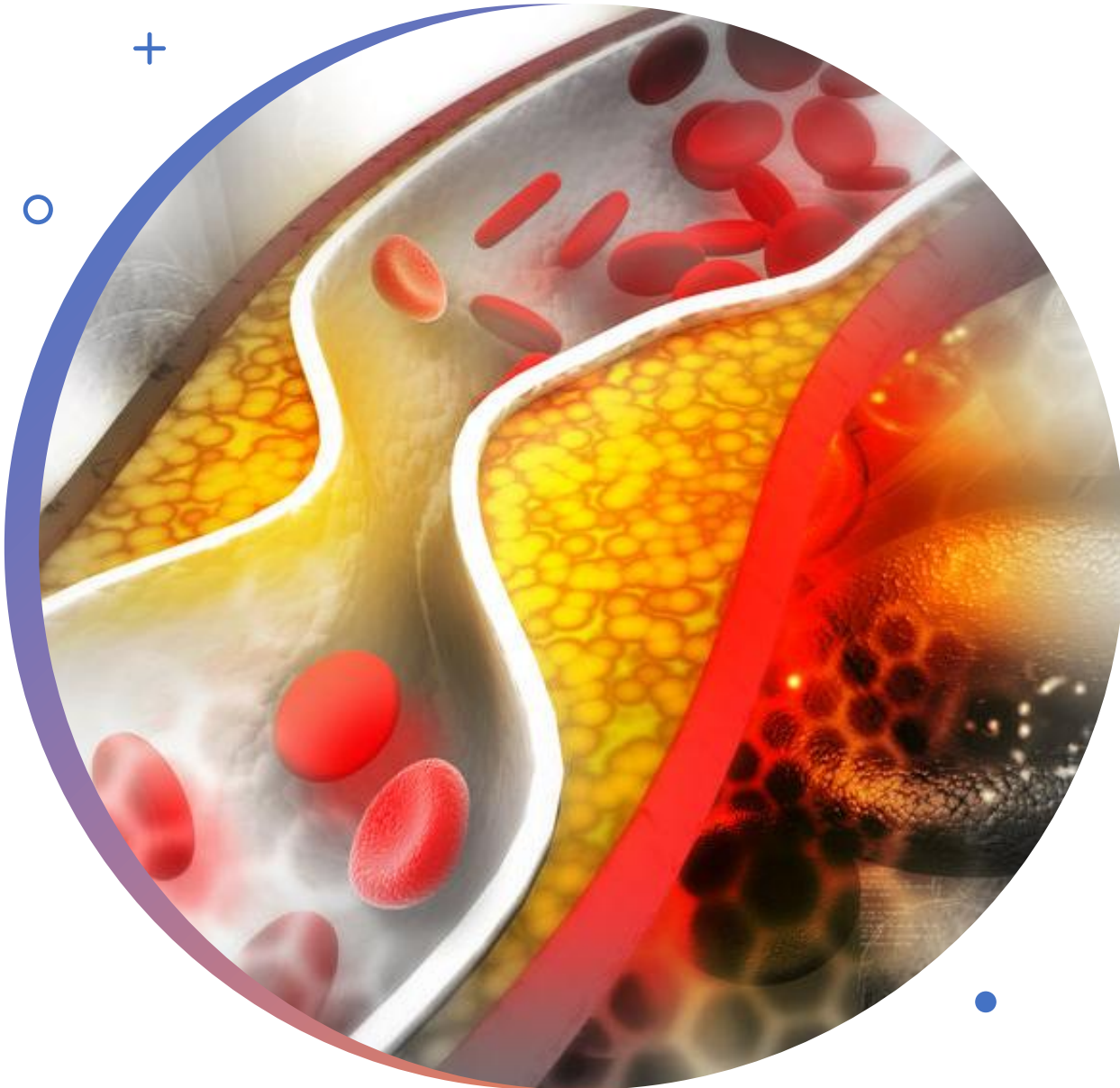


Risk factor management



Psychosocial considerations

Syndrome coronarien



Long term treatment after ACS



Discharge on cardio-protective medications, start lifestyle management and refer to cardiac rehab



Arrange OPD review to manage comorbidities and discuss patient goals and preferences

Treatment goals



Support healthy lifestyle choices



Smoking cessation



Healthy diet



Regular exercise



Healthy weight



Psychosocial management



Continue optimal pharmacological and cardio-protective treatment



Antithrombotic therapy



Lipid-lowering therapy



Annual influenza vaccination



Promote drug adherence and persistence + other treatments as appropriate^a



Reach and sustain risk factor treatment targets



Systolic BP <130 mmHg and diastolic BP <80 mmHg (if tolerated)^b

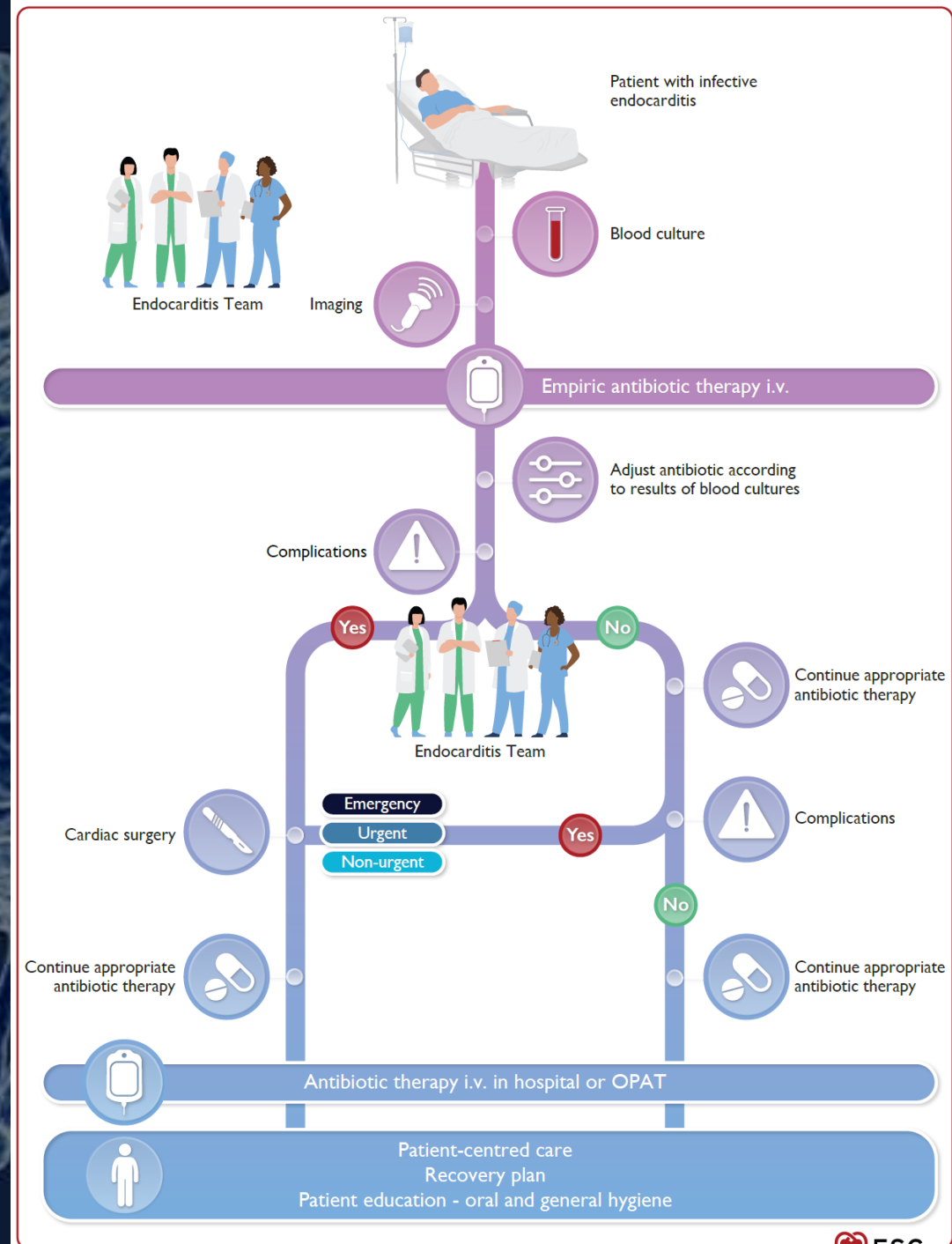


LDL-C <1.4 mmol/L (<55 mg/dL)



HbA1c <53 mmol/mol (<7%)^c

Endocardite infectieuse





Les items de cardiologie

Fibrillation atriale

- Tachycardie irrégulière à QRS fin
- Diagnostic + si épisodes > 30 s sur un tracé de 12 dérivations
- Biologie : Ionogramme sanguin, créat, **TSH**, BNP
- Traitement :
 - ANTICOAGULATION (selon CHA₂DS₂VA)
 - CHA₂DS₂VA = 0 → AUCUN anticoagulant ou antiagrégant
 - CHA₂DS₂VA = 1 → Anticoagulation à considérer
 - CHA₂DS₂VA ≥ 2 → Anticoagulation indiquée
 - Traitement : **AOD** ou AVK
 - FA valvulaire : FA + valve mécanique ou RM → AVK uniquement
 - Si contre-indication stricte à l'anticoagulation et CHA₂DS₂VASc ≥ 2 (♂) ou 3 (♀) : penser à la fermeture d'auricule gauche (HAS 2024)
 - Contrôle de la **fréquence** ou du **rythme**
 - FEVG normale (absence de cardiopathie) : **Bétabloquant** ou **Inhibiteur calcique** / **Flécaïne**
 - FEVG abaissée : **Bétabloquants** ou **Digoxine** / **Cordarone**
 - Cardioversion uniquement si instable (sinon contrôle de la fréquence cardiaque + anticoagulation et cardioversion à distance)
 - Penser à l'**ablation de FA**

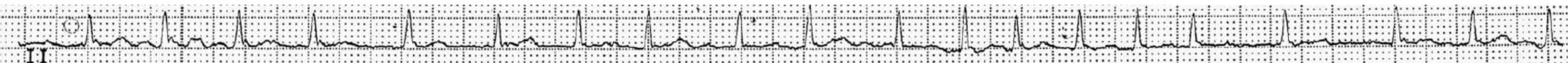
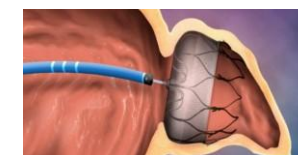
Nouvelles recommandations 2024

Table 10 Updated definitions for the CHA₂DS₂-VA score

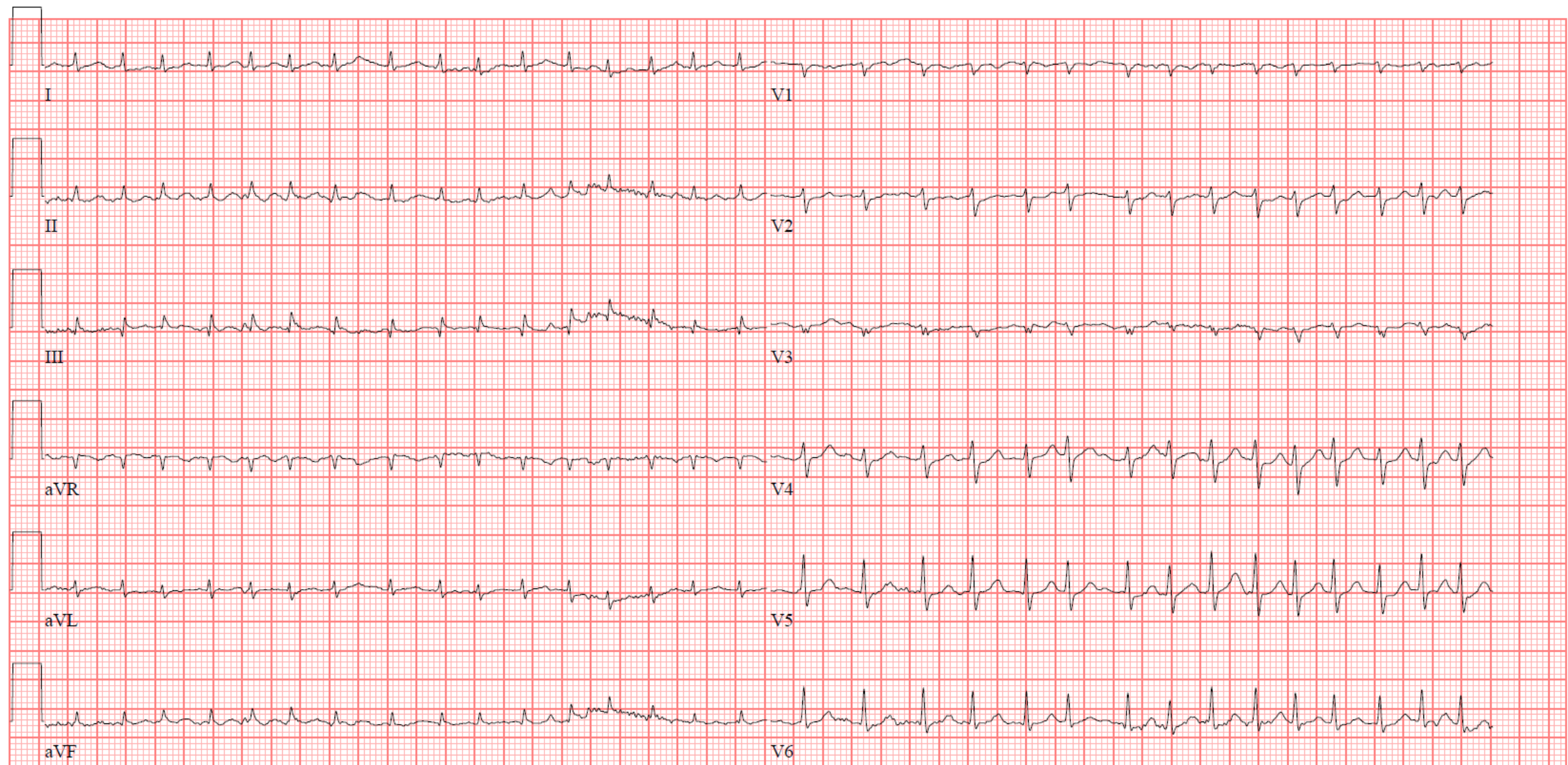
CHA ₂ DS ₂ -VA component		Definition and comments	Points awarded ^a
C	Chronic heart failure	Symptoms and signs of heart failure (irrespective of LVEF, thus including HFpEF, HFmrEF, and HFrEF), or the presence of asymptomatic LVEF ≤40%. ²⁶¹⁻²⁶³	1
H	Hypertension	Resting blood pressure >140/90 mmHg on at least two occasions, or current antihypertensive treatment. The optimal BP target associated with lowest risk of major cardiovascular events is 120-129/70-79 mmHg (or keep as low as reasonably achievable). ^{162,264}	1
A	Age 75 years or above	Age is an independent determinant of ischaemic stroke risk. ²⁶⁵ Age-related risk is a continuum, but for reasons of practicality, two points are given for age ≥75 years.	2
D	Diabetes mellitus	Diabetes mellitus (type 1 or type 2), as defined by currently accepted criteria, ²⁶⁶ or treatment with glucose lowering therapy.	1
S	Prior stroke, TIA, or arterial thromboembolism	Previous thromboembolism is associated with highly elevated risk of recurrence and therefore weighted 2 points.	2
V	Vascular disease	Coronary artery disease, including prior myocardial infarction, angina, history of coronary revascularization (surgical or percutaneous), and significant CAD on angiography or cardiac imaging. ²⁶⁷ OR Peripheral vascular disease, including: intermittent claudication, previous revascularization for PVD, percutaneous or surgical intervention on the abdominal aorta, and complex aortic plaque on imaging (defined as features of mobility, ulceration, pedunculation, or thickness ≥4 mm). ^{268,269}	1
A	Age 65-74 years	1 point is given for age between 65 and 74 years.	1

BP, blood pressure; CAD, coronary artery disease; CHA₂DS₂-VA, chronic heart failure, hypertension, age ≥75 years (2 points), diabetes mellitus, prior stroke/transient ischaemic attack/arterial thromboembolism (2 points), vascular disease, age 65-74 years; HFmrEF, heart failure with mildly reduced ejection fraction; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; LVEF, left ventricular ejection fraction; PVD, peripheral vascular disease.

^aIn addition to these factors, other markers that modify an individual's risk for stroke and thromboembolism should be considered, including cancer, chronic kidney disease, ethnicity (black, Hispanic, Asian), biomarkers (troponin and BNP), and in specific groups, atrial enlargement, hyperlipidaemia, smoking, and obesity.

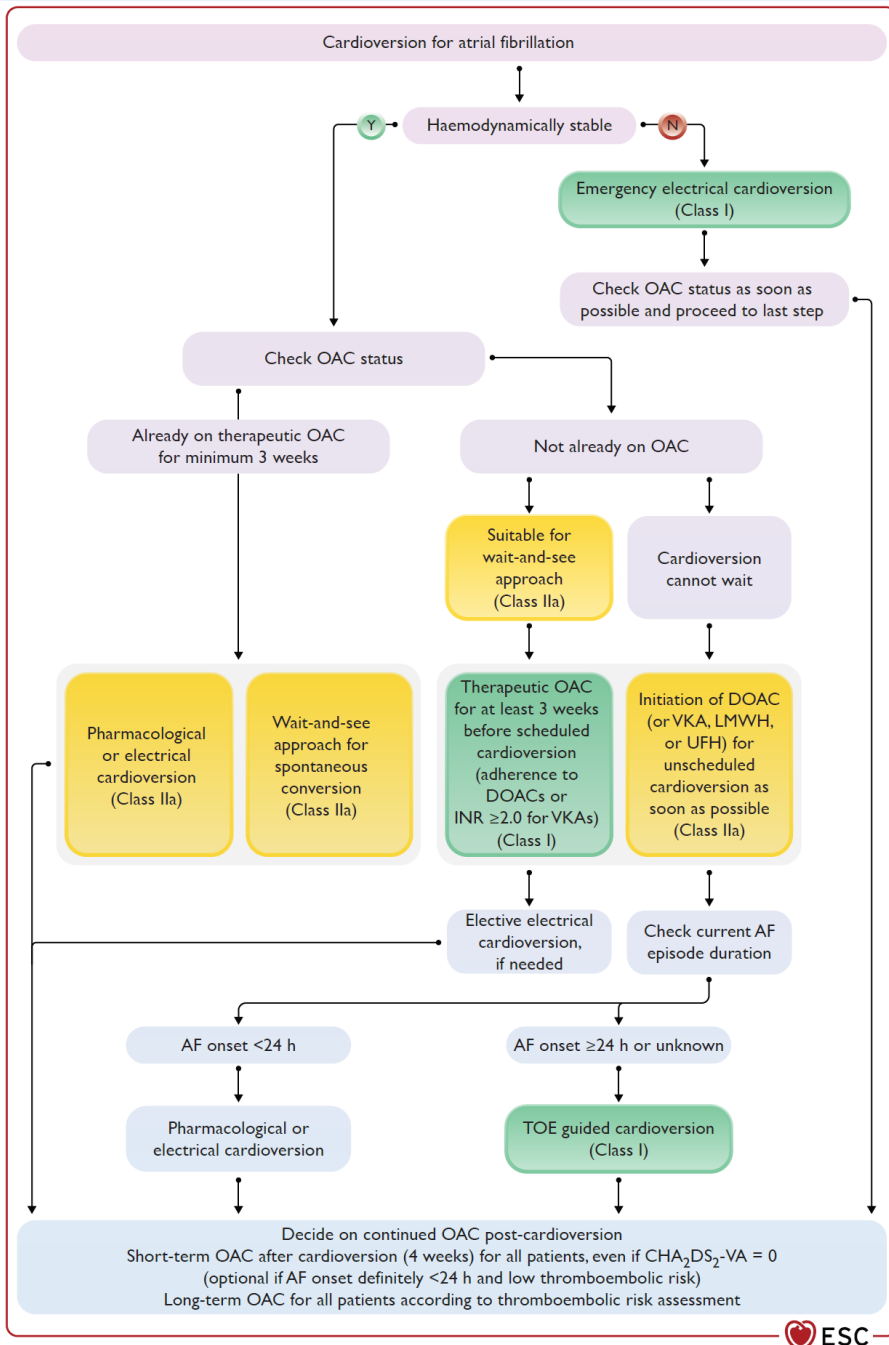


FA rapide



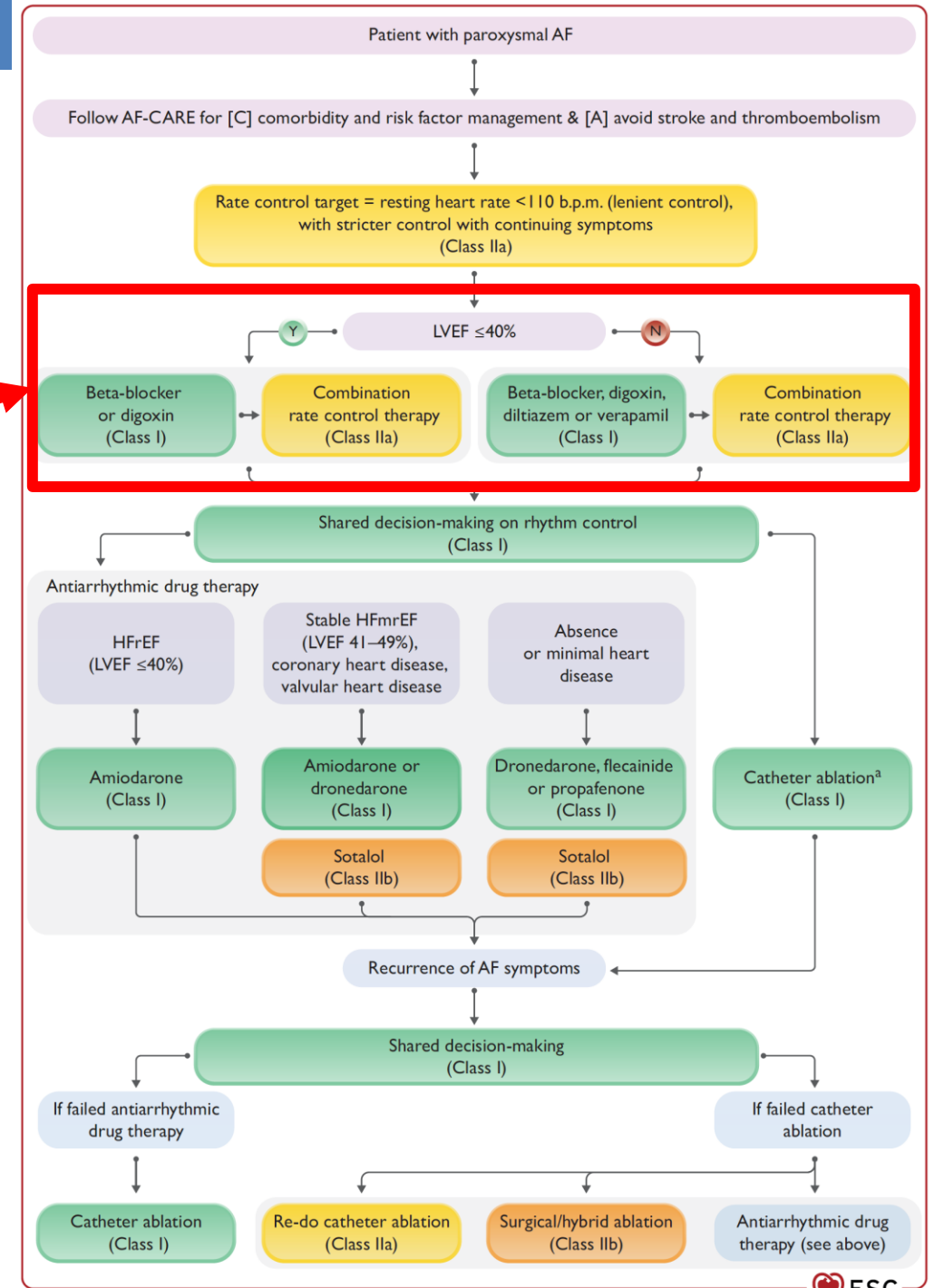
FA et cardioversion

- FA et hémodynamique instable :
Cardioversion obligatoire
 - Cardioversion électrique en urgence
- FA et patient stable :
Cardioversion recommandée si patient symptomatique
Cardioversion électrique ou médicamenteuse
 - Patient déjà anticoagulé : cardioversion possible (immédiate ou à distance)
 - Patient non anticoagulé :
 - FA < 24h : cardioversion possible (on encadre la procédure en anticoagulant)
 - FA ≥ 24h ou date non connue :
 - Cardioversion après ≥ 3 semaines d'anticoagulation
 - Ou ETO + cardioversion (PEC de « confort ») + anticoagulation
 - FA permanente : pas de cardioversion



FA et contrôle de la fréquence cardiaque

- FA rapide :
 - **FEVG normale** : bêtabloquant, inhibiteurs calciques bradycardisants ou digoxine
 - **FEVG altérée** : bêtabloquants ou digoxine
 - En aigu et en chronique

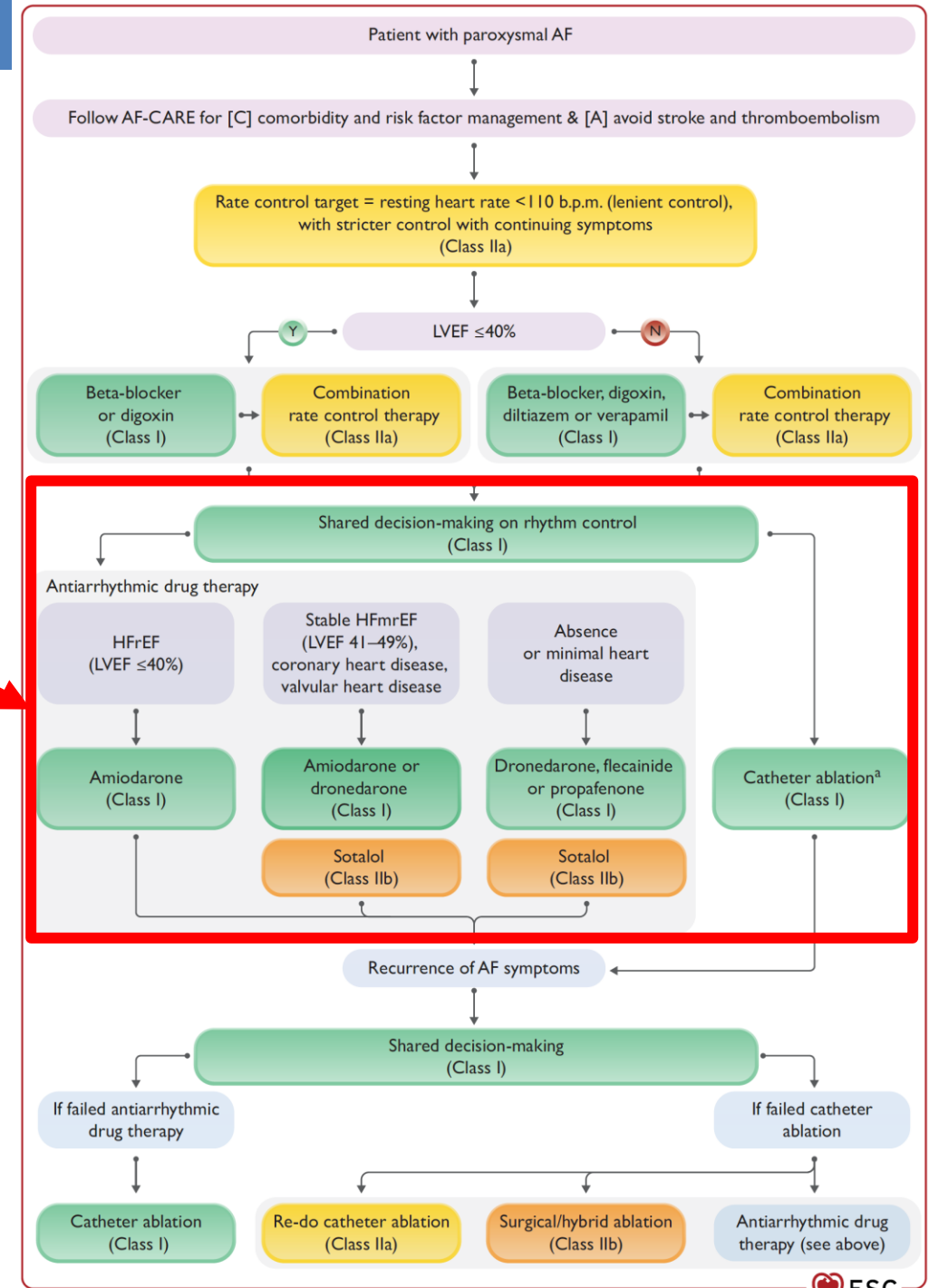


FA et antiarythmiques

- FA paroxystique ou persistante :
 - **Traitement médicamenteux**
 - FEVG normale : Flécaine
 - FEVG altérée : Cordarone
 - **Ablation de FA**
- Penser à respecter le choix du patient
- Si échec du traitement médicamenteux → Orienter vers l'ablation de FA
- Si FEVG altérée → ablation en 1^{ère} intention



Fibrillation atriale – Recommandations 2024



Syndrome coronarien chronique

- Anciennement appelé **angor chronique stable ou angine de poitrine**
- Douleur thoracique angineuse apparaissant à l'effort et disparaissant à l'arrêt de celui-ci. **Classification CCS**
- **Explorations fonctionnelles** :
 - Epreuve d'effort
 - Scintigraphie myocardique (Critère pronostique : ischémie > 10%)
 - ETT d'effort ou ETT dobutamine (Critère pronostique > 3 segments akinétiques ou hypokinétiques /16)
- **Coronarographie** selon explorations fonctionnelles
- Le traitement repose sur :
 - **Antiagrégant plaquettaire** : Aspirine
 - **Anti-ischémiques** :
 - **Bétabloquants en 1^{er} intention +++**
 - Inhibiteurs calciques si insuffisant si contre-indication
 - Dérivés nitrés
 - **Statines**
 - **IEC** (indication large)
- Règles hygiéno-diététiques : arrêt du tabac, exercice régulier, alimentation
- Le traitement médical est très efficace +++

Table 5 Grading of effort angina severity according to the Canadian Cardiovascular Society

Grade	Description of angina severity ⁶⁶	
I	Angina only with strenuous exertion	Presence of angina during strenuous, rapid, or prolonged ordinary activity (walking or climbing the stairs)
II	Angina with moderate exertion	Slight limitation of ordinary activities when they are performed rapidly, after meals, in the cold, in the wind, under emotional stress, or during the first few hours after waking up, but also walking uphill, climbing more than one flight of ordinary stairs at a normal pace, and in normal conditions
III	Angina with mild exertion	Having difficulties walking one or two blocks or climbing one flight of stairs at a normal pace and conditions
IV	Angina at rest	No exertion is needed to trigger angina

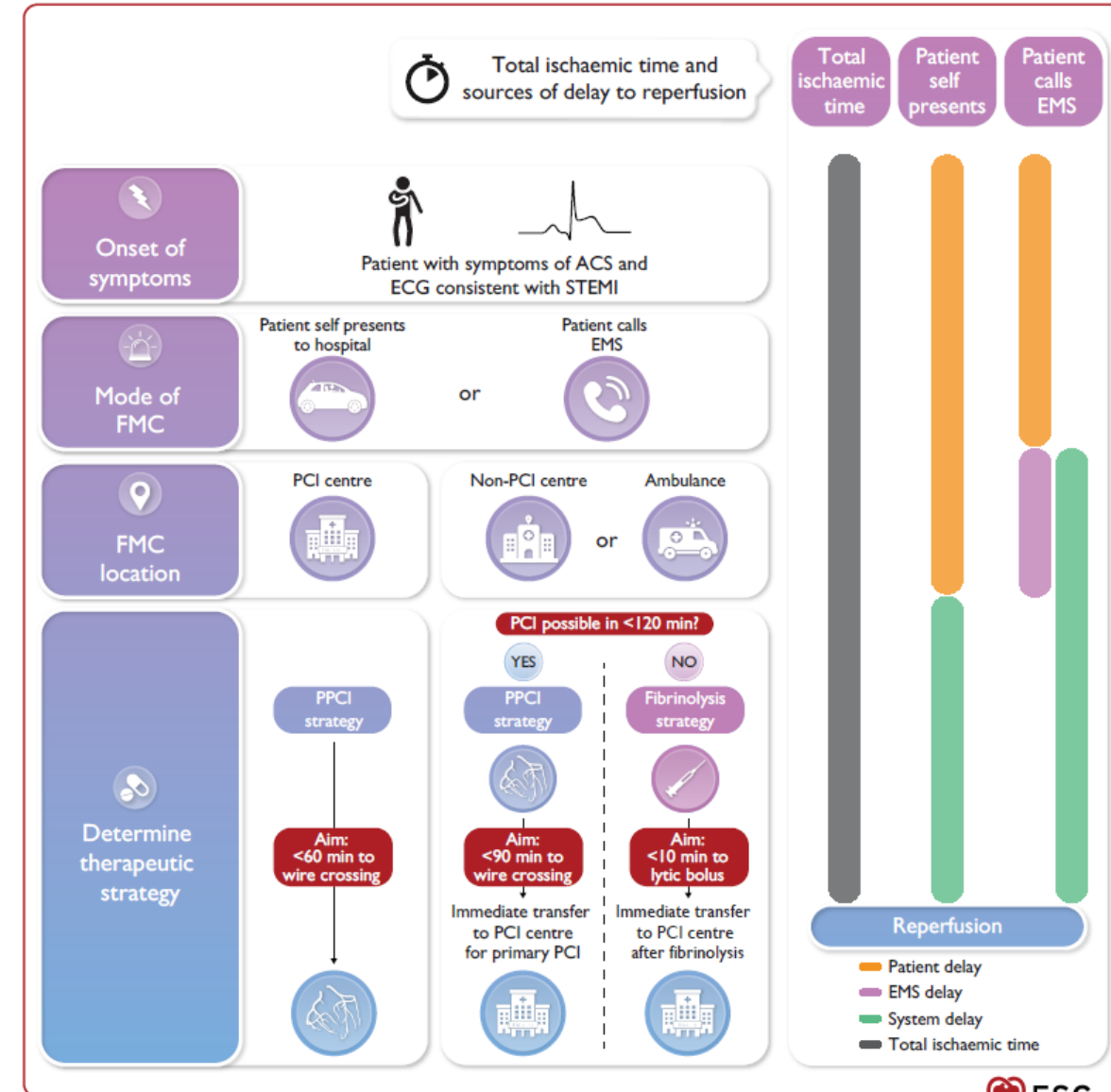
© ESC 2024

Lipid-lowering drugs	Class ^a	Level ^b
Statins are recommended in all patients with CCS. ^{c 341,342}	I	A
If a patient's goal ^c is not achieved with the maximum tolerated dose of statin, combination with ezetimibe is recommended. ^{317,320}	I	B
For patients at very high risk who do not achieve their goal ^c on a maximum tolerated dose of statin and ezetimibe, combination with a PCSK9 inhibitor is recommended. ^{320,323}	I	A
ACE inhibitors		
ACE inhibitors (or ARBs) are recommended if a patient has other conditions (e.g. heart failure, hypertension, or diabetes). ^{328–330}	I	A
ACE inhibitors should be considered in CCS patients at very high risk of cardiovascular events. ^{331,332,335,336}	IIa	A
Other drugs		
Beta-blockers are recommended in patients with LV dysfunction or systolic HF. ^{211,212,214}	I	A
In patients with a previous STEMI, long-term oral treatment with a beta-blocker should be considered. ^{213,220–222,225,343}	IIa	B

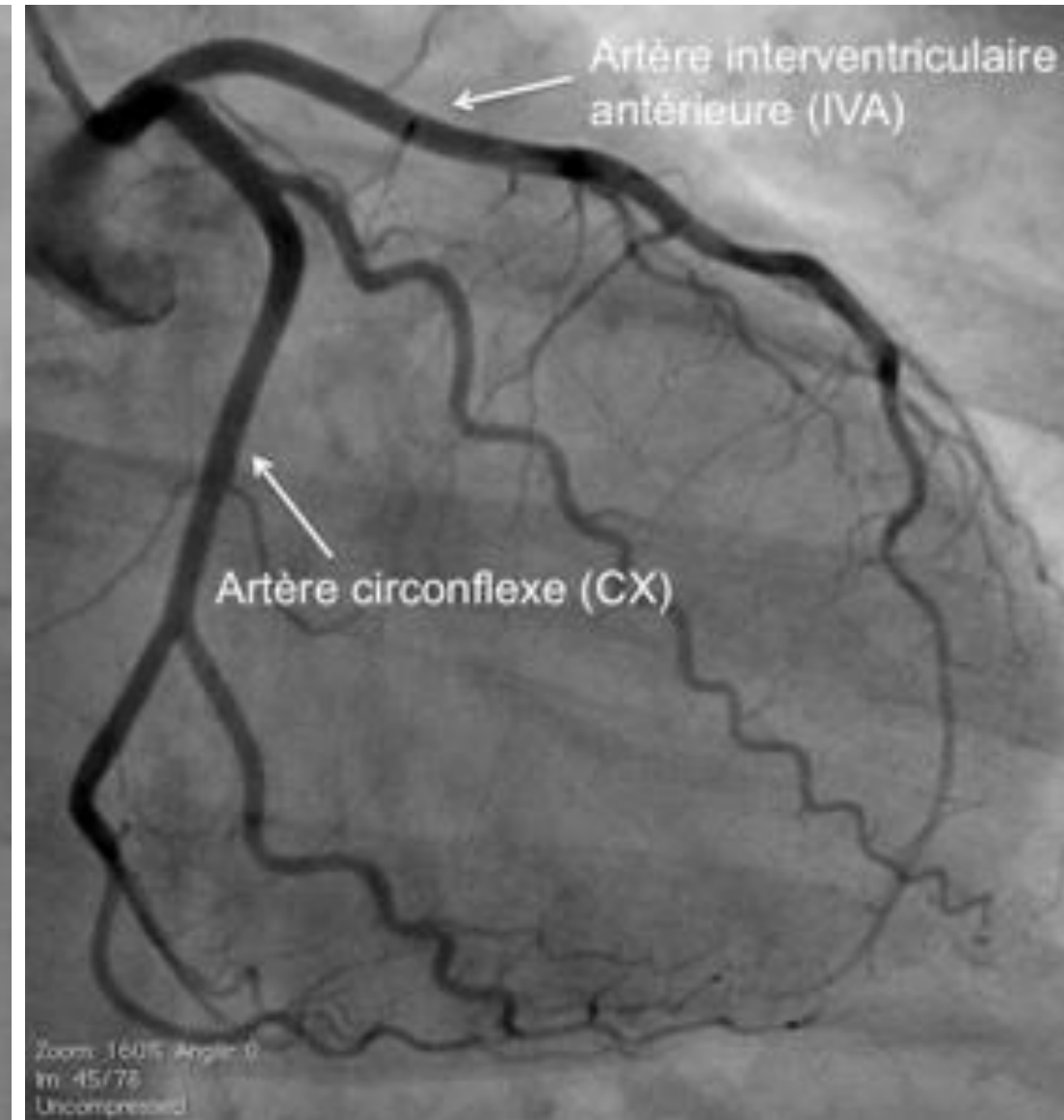
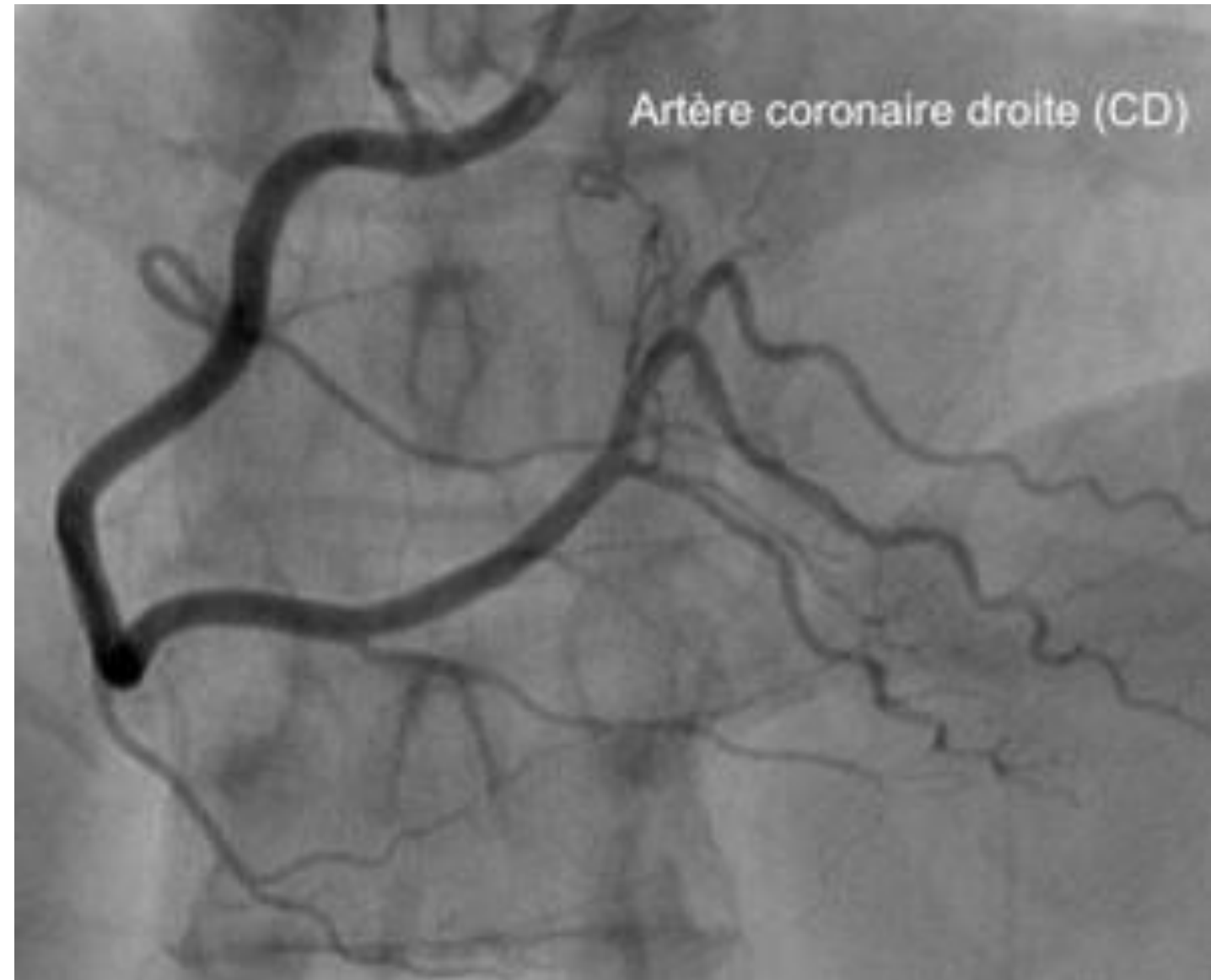
SCA ST+



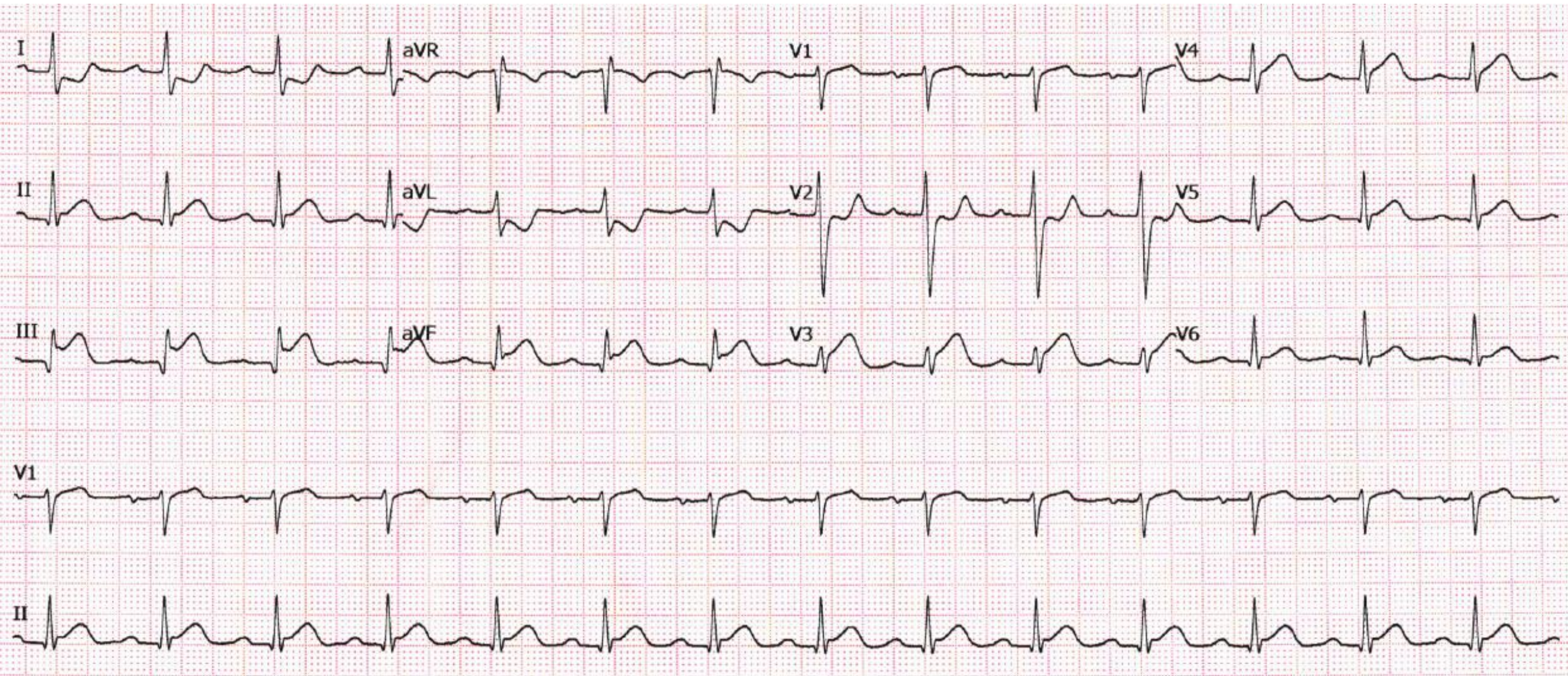
- Reconnaître le ST+, chercher le miroir dans le territoire opposé
- **Les territoires :**
 - Antérieur : V1-V2, septal : V3, apical : V4,
 - Inférieur : DII, DIII et aVF
 - Latéral : V5, V6 (latéral bas), DI et aVL (latéral haut)
- Traitements :
 - En urgence :
 - Aspirine 250 mg,
 - Ticagrelor ou Prasugrel dose de charge,
 - Héparine IVSE (HNF) ou IV + SC (Enoxaparine)
 - **CORONAROGRAPHIE IMMEDIATE :**
 - Si délai PEC médicale / salle de coro < 2h => Coro
 - Si délai PEC médicale / salle de coro > 2h => Fibrinolyse puis transfert vers un centre d'angioplastie



Coronarographie

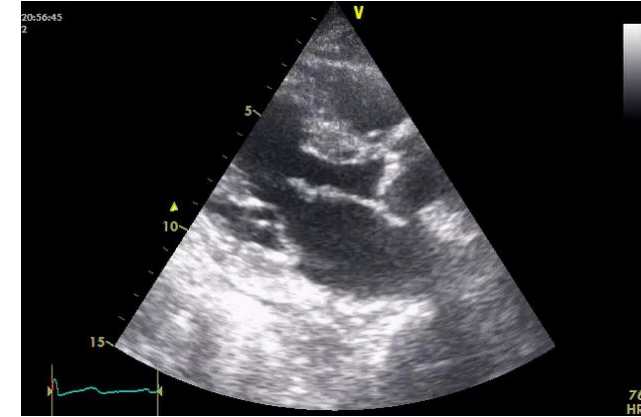


SCA ST+ inférieur

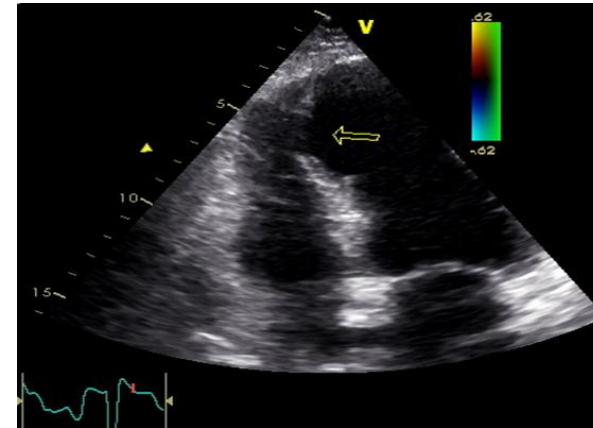


Complications mécaniques de l'IDM

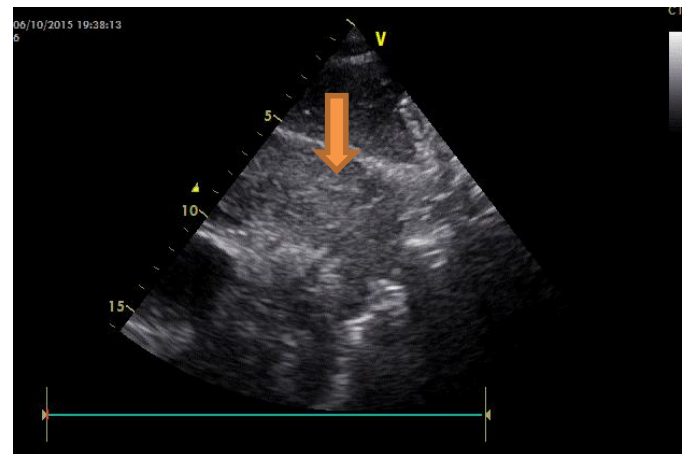
- **Insuffisance mitrale aiguë** (rupture de cordage, rupture de pilier)



- **Communication interventriculaire (CIV)**



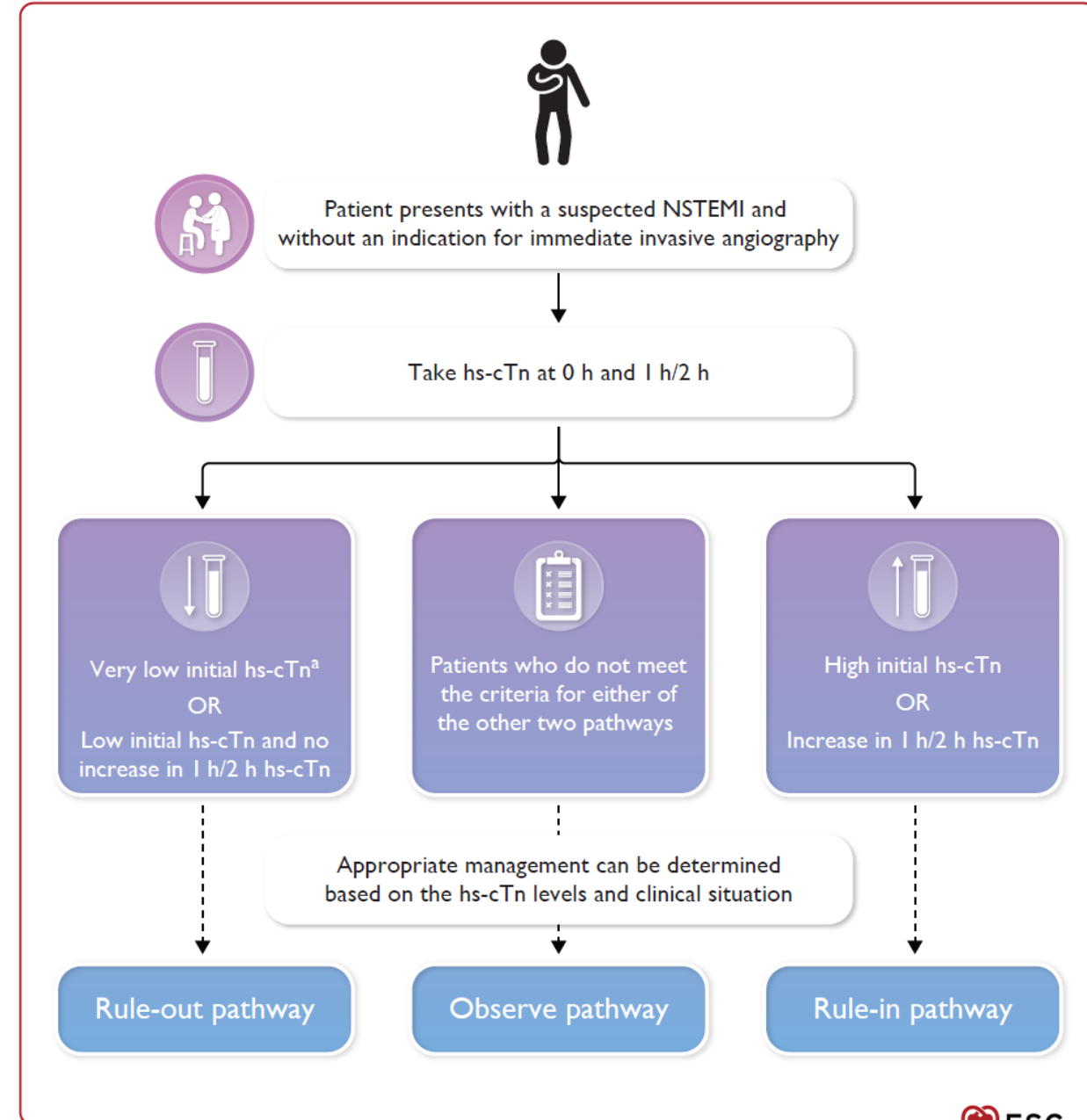
- **Rupture myocardique**



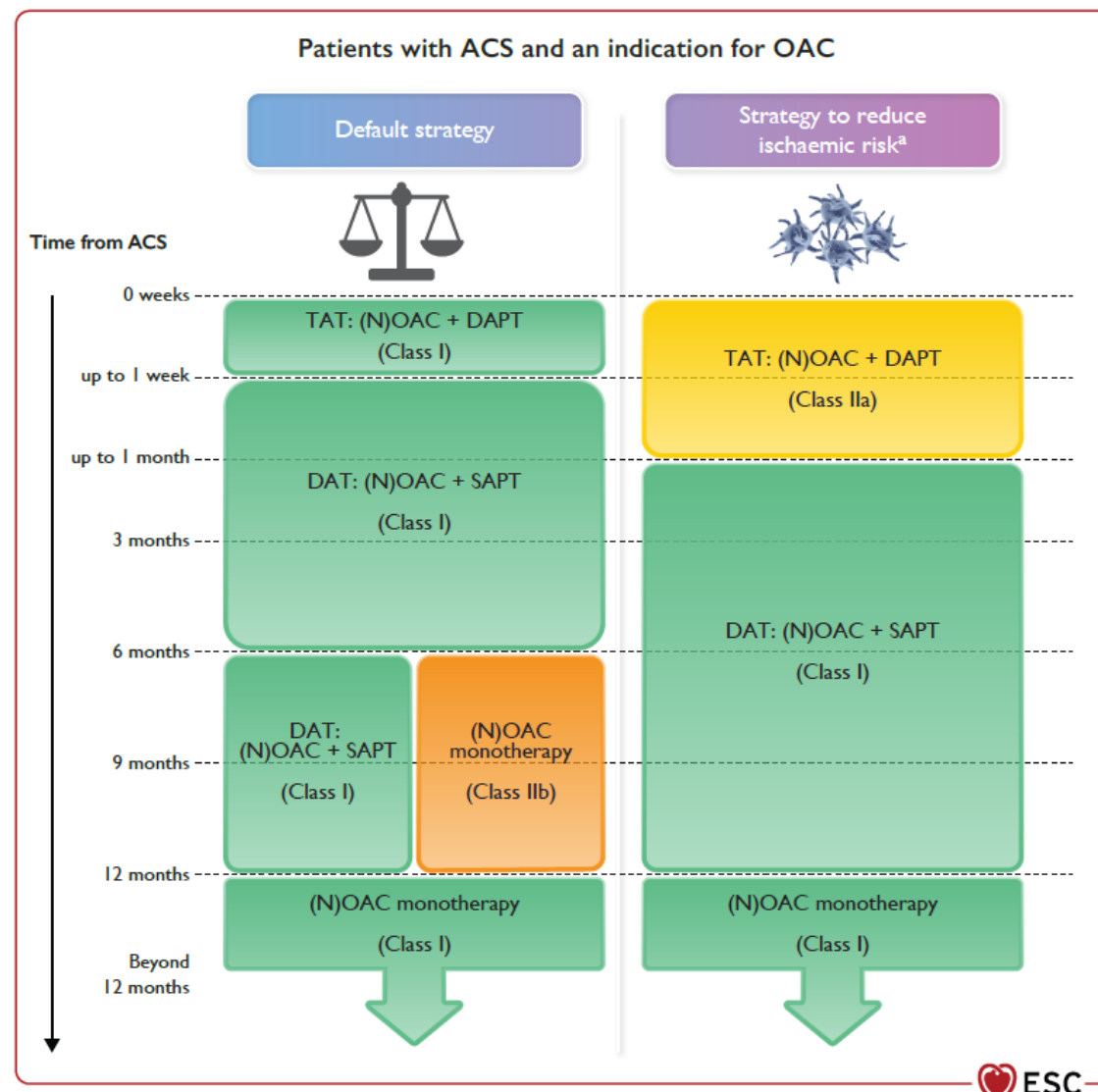
SCA ST-



- Un ECG normal n'élimine pas un SCA ST-
- **Anticoagulation** :
 - HNF (ACT < 24h) ou Fondaparinux (ACT > 24h)
- **Délai de coronarographie**
 - < 2h si instabilité **ischémique, rythmique** ou **hémodynamique**
 - 24-72 h pour des SCA ST- de haut risque ou de risque intermédiaire
- Antiagrégants :
 - Aspirine
 - Ticagrelor ou Prasugrel (une fois le réseau coronaire connu)
 - Durée 1 an (même en l'absence de stent)
- Traitement au long cours (idem SCA ST+ / ST-) :
 - DAPT
 - IEC
 - Bêtabloquants
 - Statines => Objectif LDL cholestérol < 0.55 g/L



SCA ST- et anticoagulation



Péricardite aiguë

(ESC 2025)

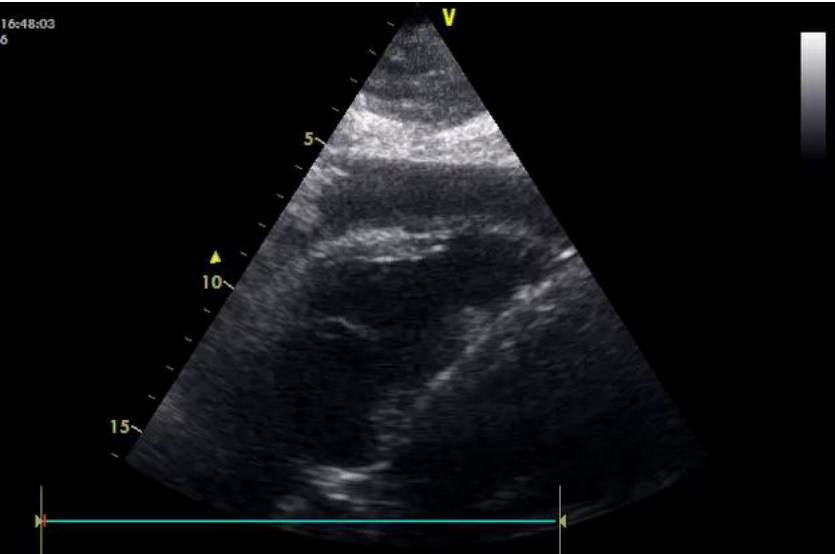
- Etiologie virale = la plus fréquente (mais nombreuses étiologies), sujet jeune en général
- Episode viral précédant la péricardite (angine, gastro-entérite...)
- Clinique typique (**douleur augmentée à l'inspiration profonde, majorée par le décubitus, intense, soulagée par l'antéflexion**)
- ECG : Sus-ST diffus, concave vers le haut, absence de miroir, sous-décalage du PQ

- Critères diagnostiques :**

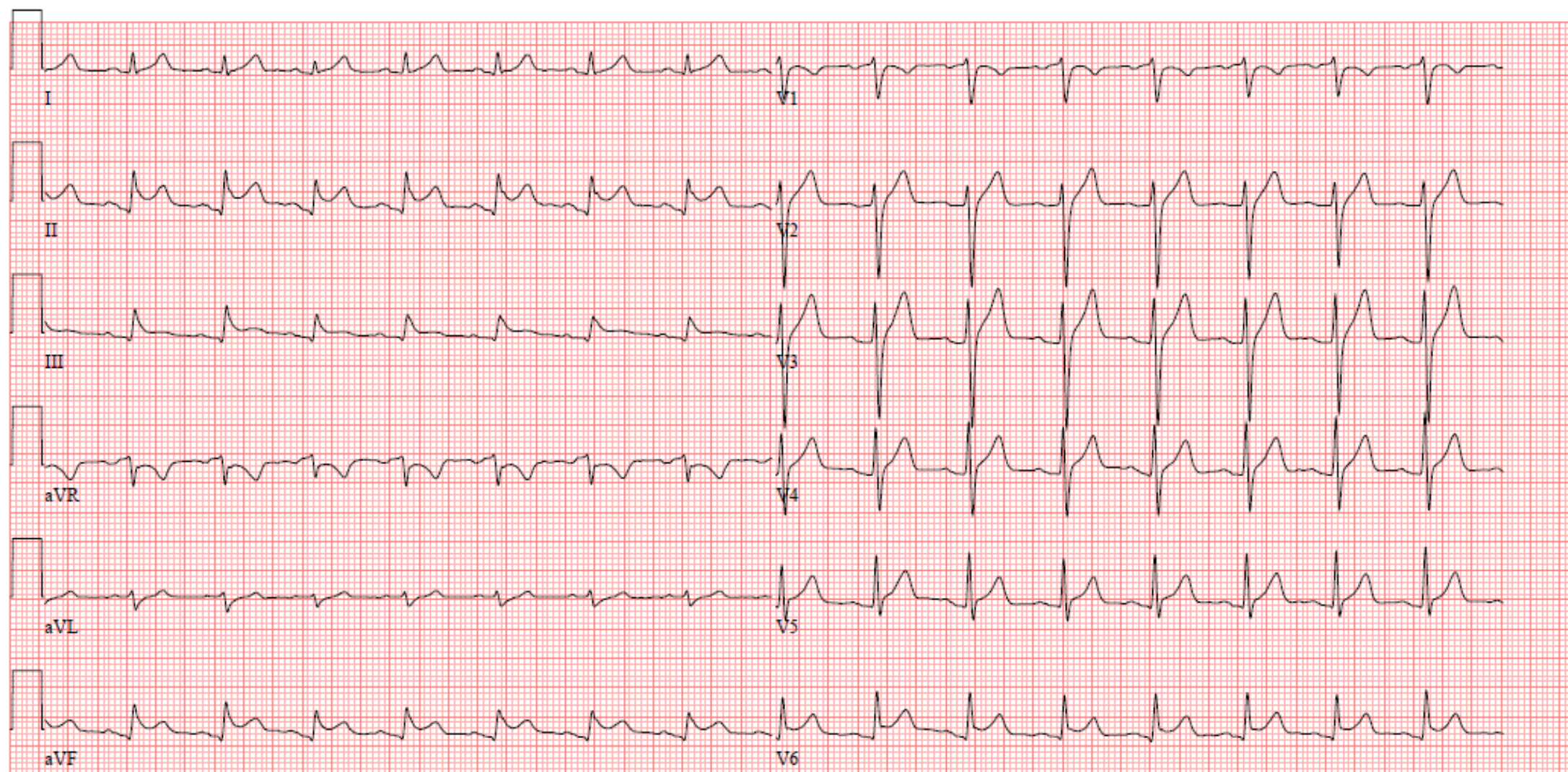
 - Douleur péricarditique typique + 1 critère parmi :**
 - Frottement péricardique à l'auscultation
 - ECG : sus-ST diffus ou sous-PQ
 - ETT : épanchement péricardique
- Critère d'hospitalisations à connaitre :**
- Fièvre > 38 °C ;
 - Symptômes présents depuis plusieurs jours ou semaines ;
 - Epanchement péricardique abondant (> 20 mm) ou tamponnade ;
 - Résistance au TTT anti-inflammatoire (aspirine ou AINS) prescrit depuis 7 j
 - Patient immunodéprimé ;
 - Patient sous AVK ;
 - Après un traumatisme thoracique ;
 - Présence d'une myocardite associée.
- ETT :**
- Recherche d'un épanchement péricardique, d'une tamponnade
- TTT :**
- ASPIRINE ou AINS** dose anti-inflammatoire (3 semaines à 1 mois)
 - + **Colchicine** 0,5 mg x 2 (poids > 70 kg) ou 0,5 mg x 1 (poids < 70 kg)
 - et **REPOS (arrêt de travail)**
 - Contrôle ETT à 1 mois
- Toujours penser à la **tamponnade**, complication grave
- Rechercher la myocardite associée (augmentation de troponine)

A. Infectious causes:
Viral (common): Enteroviruses (coxsackieviruses, echoviruses), herpesviruses (EBV, CMV, HHV-6), adenoviruses, parvovirus B19 (possible overlap with aetiological viral agents of myocarditis).
Bacterial: <i>Mycobacterium tuberculosis</i> (common, other bacterial rare), <i>Coxiella burnetii</i> , <i>Borrelia burgdorferi</i> , rarely: <i>Pneumococcus</i> spp., <i>Meningococcus</i> spp., <i>Gonococcus</i> spp., <i>Streptococcus</i> spp., <i>Staphylococcus</i> spp., <i>Haemophilus</i> spp., <i>Chlamydia</i> spp., <i>Mycoplasma</i> spp., <i>Legionella</i> spp., <i>Leptospira</i> spp., <i>Listeria</i> spp., <i>Providencia stuartii</i> .
Fungal (very rare): <i>Histoplasma</i> spp (more likely in immunocompetent patients), <i>Aspergillus</i> spp, <i>Blastomyces</i> spp, <i>Candida</i> spp (more likely in immunocompromised host).
Parasitic (very rare): <i>Echinococcus</i> spp, <i>Toxoplasma</i> spp
B. Non-infectious causes:
Autoimmune (common): Systemic autoimmune and auto-inflammatory diseases (systemic lupus erythematosus, Sjögren syndrome, rheumatoid arthritis, scleroderma, systemic vasculitides (i.e. eosinophilic granulomatosis with polyangiitis or allergic granulomatosis, previously named Churg-Strauss syndrome, Horton disease, Takayasu disease, Behçet syndrome), sarcoidosis, familial Mediterranean fever, inflammatory bowel diseases, Still disease).
Neoplastic: Primary tumours (rare, involve all pericardial mesothelium). Secondary metastatic tumours (rare), above all lymphoma and cancer lymphoma.
Metabolic: Hypothyroidism, myxoedema, uremia, neurosis, other rare.
Trauma (rare): Direct injury (penetrating thoracic injury, aesophageal perforation). Indirect injury (non-penetrating thoracic injury, radiation injury). Delayed onset pericardial injury syndromes (common) such as postmyocardial infarction syndrome, postpericardiectomy syndrome, posttraumatic, including forms after iatrogenic trauma (e.g. coronary percutaneous intervention, pacemaker lead insertion and radiofrequency ablation).
Drug-related (rare): Lupus-like syndrome (procainamide, hydralazine, methylgluta, isoniazid, phenytoin); antineoplastic drugs (often associated with a cardiomyopathy, may cause a pericardopathy): doxorubicin, daunorubicin, cytosine arabinoside, 5-fluorouracil, cyclophosphamide; penicillins as hypersensitivity pericarditis with eosinophilia; amiodarone, methysergide, mesalazine, clozapine, minoxidil, dantrolene, prazosin, phenylbutazone, thiazides, streptomycin, thiouracil, streptokinase, p-aminosalicylic acid, sulfa-drugs, cyclosporine, bromocriptine, several vaccines, GM-CSF, anti-TNF agents.
Other (common): Amyloidosis, aortic dissection, pulmonary arterial hypertension and chronic heart failure.
Other (uncommon): congenital partial and complete absence of the pericardium.

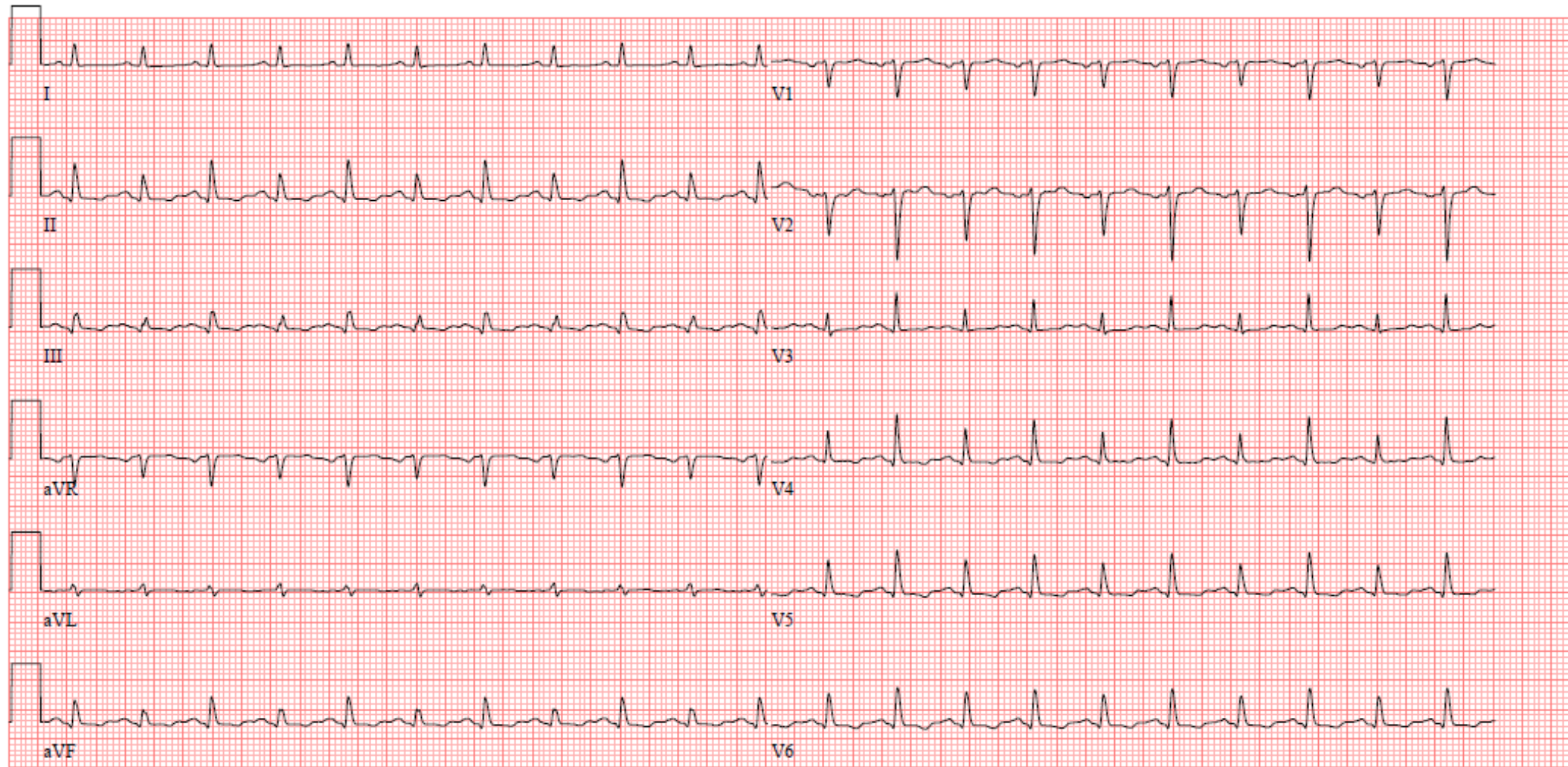
IMPS	
If diagnostic criteria for myocar	
	Pericarditis
Definite	Clinical presentation ^b with >1 additional criterion
Possible	Clinical presentation ^b with 1 additional criterion
Unlikely/rejected	Only clinical presentation ^b without additional criteria
Additional criteria beyond clinical presentations ^b	
	Pericarditis
Clinical ^b	Pericardial rubs
ECG ^c	PR depression, widespread ST-segment elevation
Biomarkers	C-reactive protein elevation
Imaging ^d	New or worsening pericardial effusion Pericardial oedema and/or LGE (CMR findings)



ECG de péricardite aiguë



ECG swinging heart (= épanchement abondant)

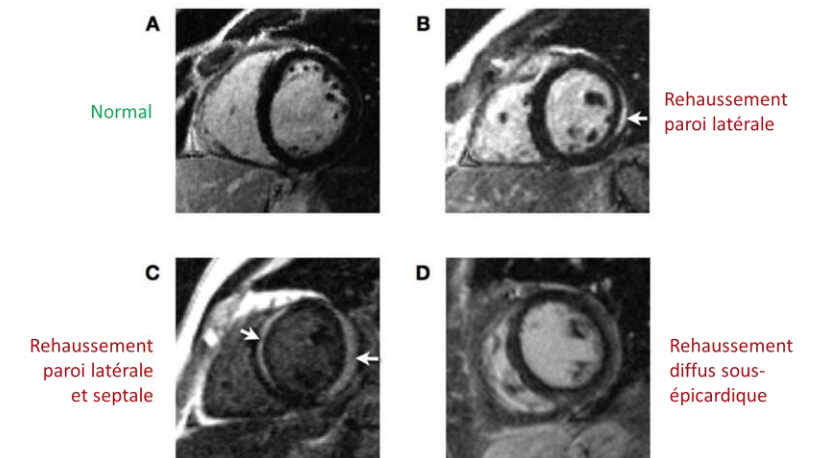
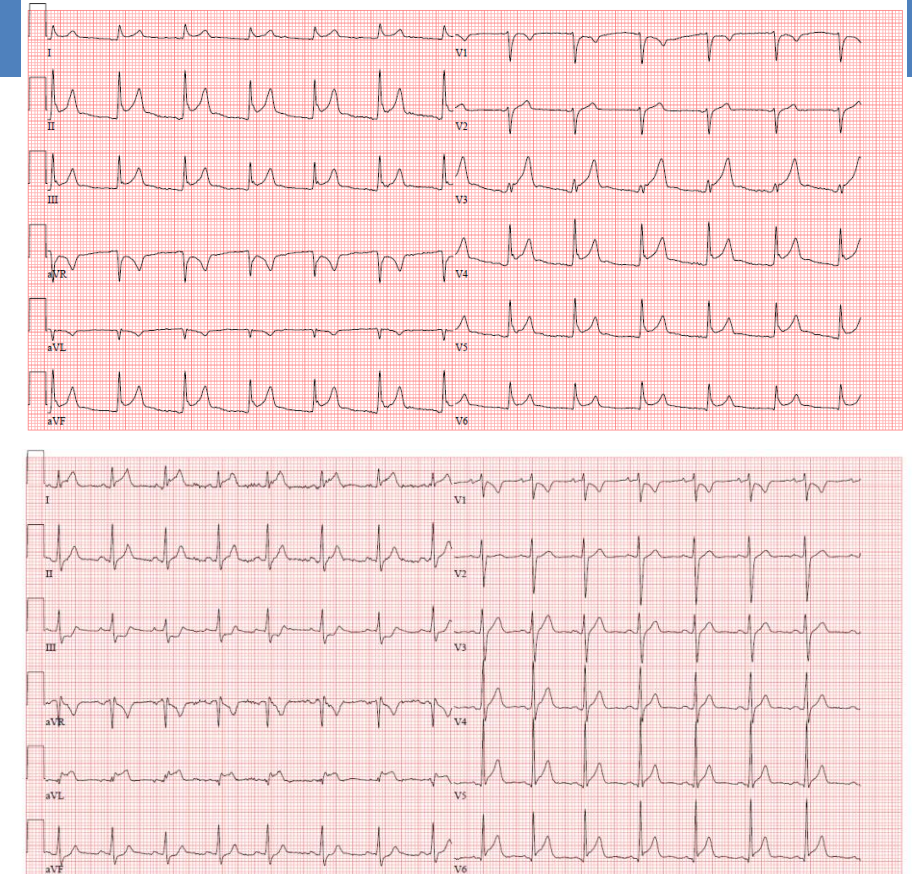


Myocardite aiguë

- Continuum de la péricardite aiguë, **inflammation myocardique** avec lyse myocardique
- 10 à 20 cas pour 100000 habitants/an
- **Etiologies similaires à la péricardite** (virale ++) + 2 étiologies à connaître :
 - Induites par le vaccin anti-COVID-19 (rare)
 - Induites par les biothérapies anticancéreuses (inhibiteurs check point : environ 1,1% des patients)
- **Symptômes : 2 grands types de symptômes :**
 - Douleur thoracique péricardique
 - Ou douleur de type SCA
- Episode viral précédant la myocardite très fréquent (angine, gastro-entérite...)
- **Gravité variable :**
 - Résolution spontanée
 - Choc cardiogénique (= myocardites fulminantes)
 - Mort subite
- Critère diagnostique de référence = biopsie myocardique (mais non réalisable à tous en pratique, uniquement pour les myocardites fulminantes)
- **Biologie :**
 - ↗ **des marqueurs de nécrose myocardique** : troponine
 - Syndrome inflammatoire
- **ECG :**
 - Normal
 - Signes de péricardite
 - Signes ECG mimant un SCA
- **ETT :**
 - Normal
 - Trouble de la cinétique
 - Altération de la FEVG (myocardites graves)
- **IRM :**
 - Permet le diagnostic (en l'absence de biopsie myocardique)
 - Rehaussement tardif
- **Traitement :**
 - Hospitalisation (surveillance télémétrée)
 - Repos, arrêt du sport (6 mois)
 - Traitement de l'insuffisance si FEVG altérée

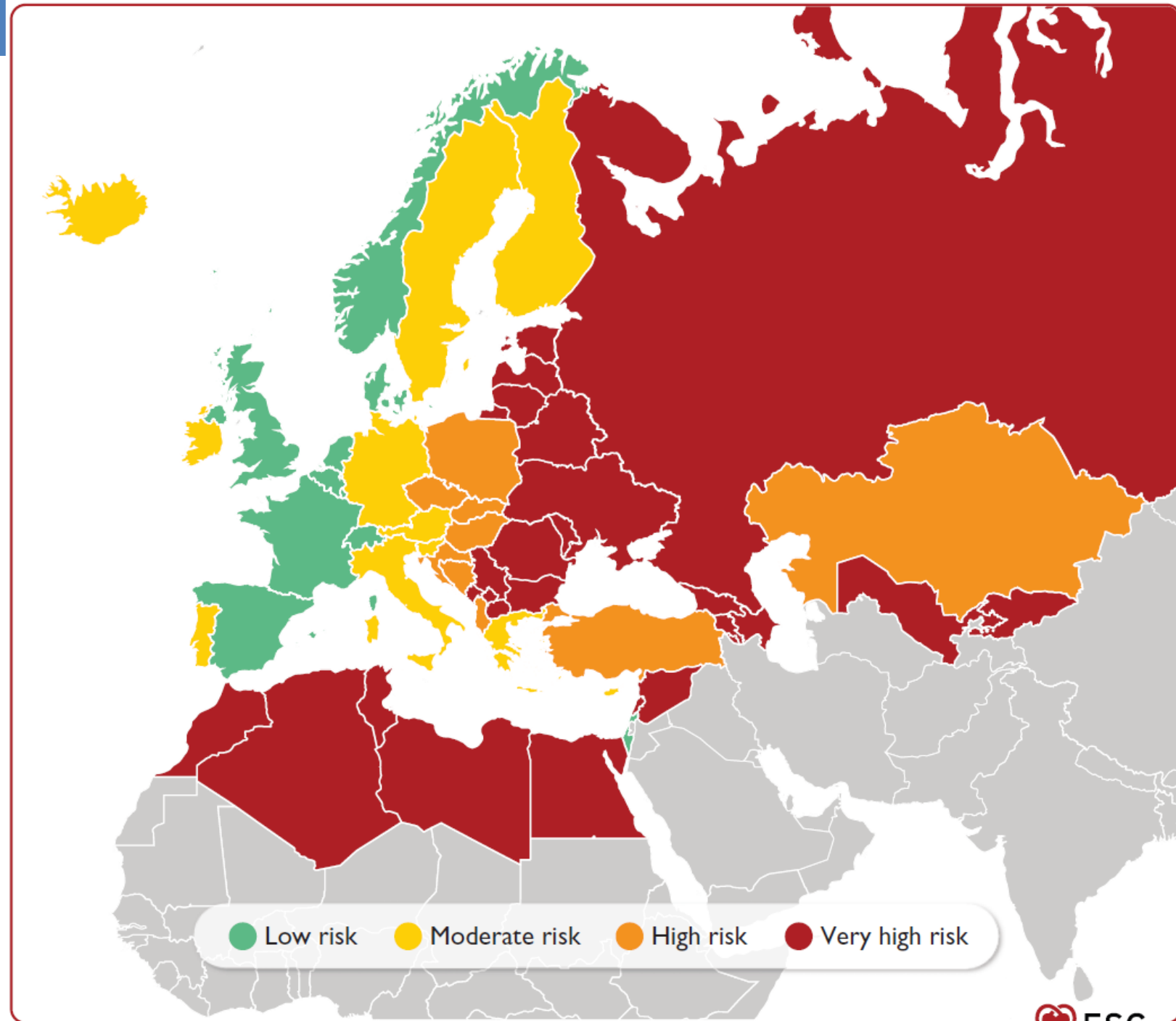
Recommendations for the diagnosis and management of pericarditis associated with myocarditis

Recommendations	Class ^a	Level ^b	Ref. ^c
In cases of pericarditis with suspected associated myocarditis, coronary angiography (according to clinical presentation and risk factor assessment) is recommended in order to rule out acute coronary syndromes	I	C	
Cardiac magnetic resonance is recommended for the confirmation of myocardial involvement	I	C	
Hospitalization is recommended for diagnosis and monitoring in patients with myocardial involvement	I	C	
Rest and avoidance of physical activity beyond normal sedentary activities is recommended in non-athletes and athletes with myopericarditis for a period of 6 months	I	C	
Empirical anti-inflammatory therapies (lowest efficacious doses) should be considered to control chest pain	IIa	C	



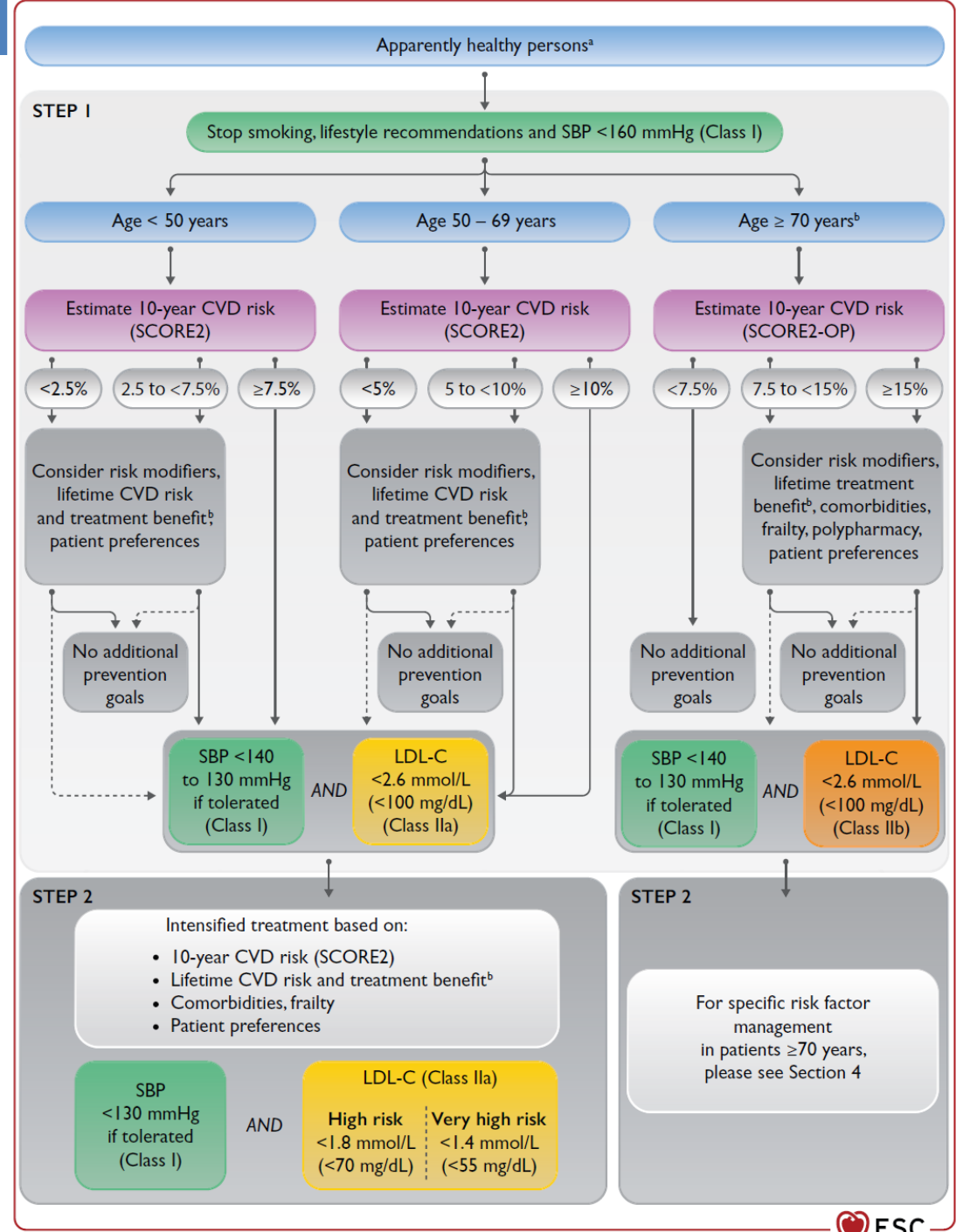
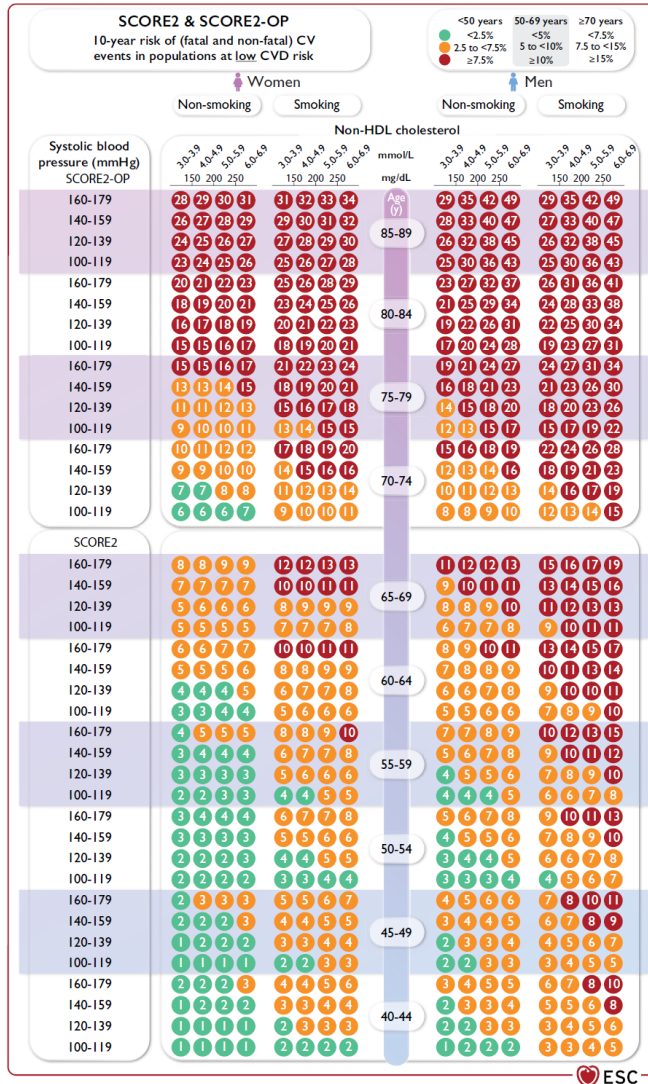
Dyslipidémie

Risque CV en fonction des pays



Dyslipidémie (ESC 2021)

Prévention primaire SCORE2 et SCORE2-OP



Dyslipidémies

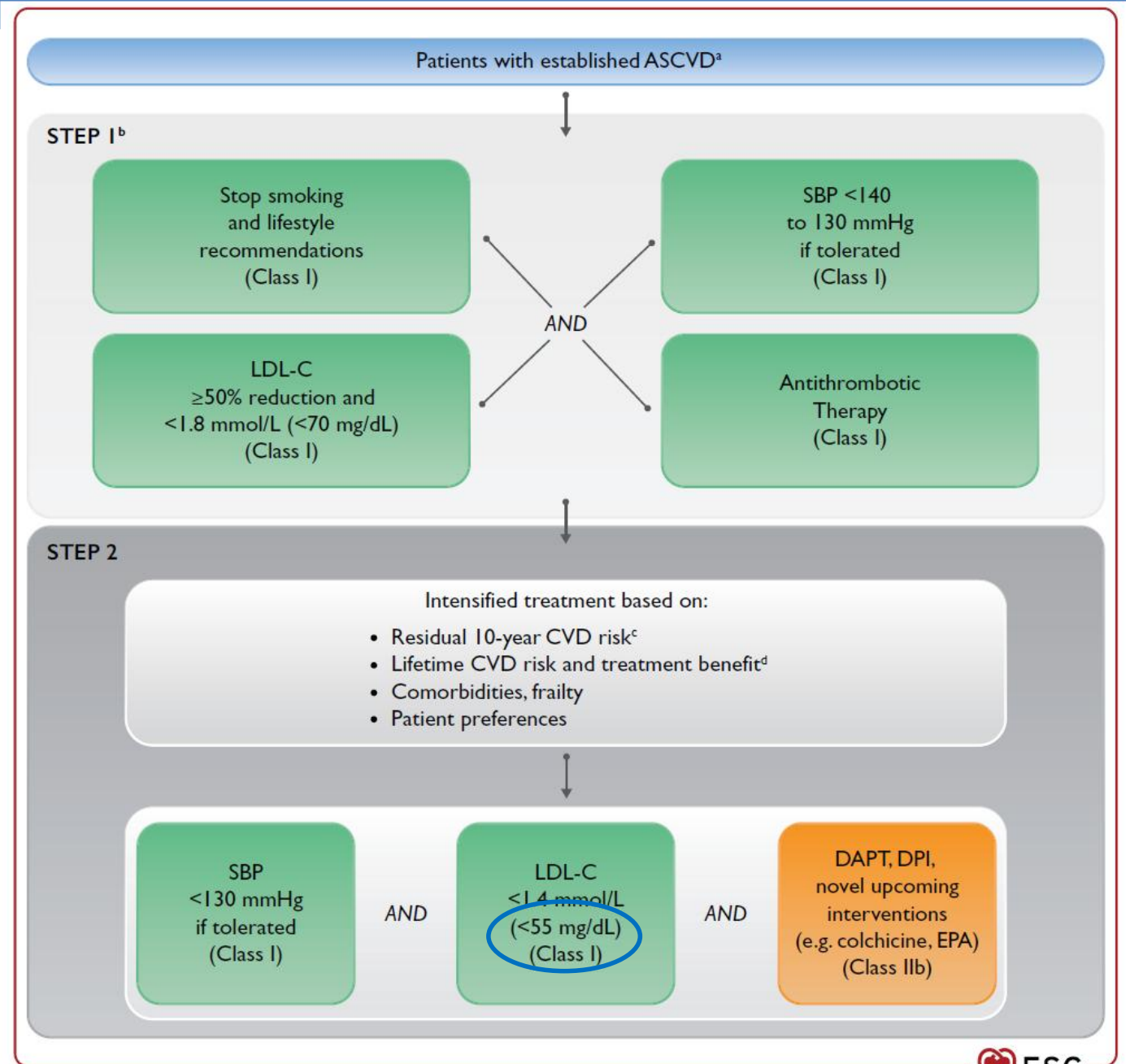
Prévention secondaire
(ESC 2022)

Cible en **prévention secondaire et pour le très haut risque**

< 0,55 g/L

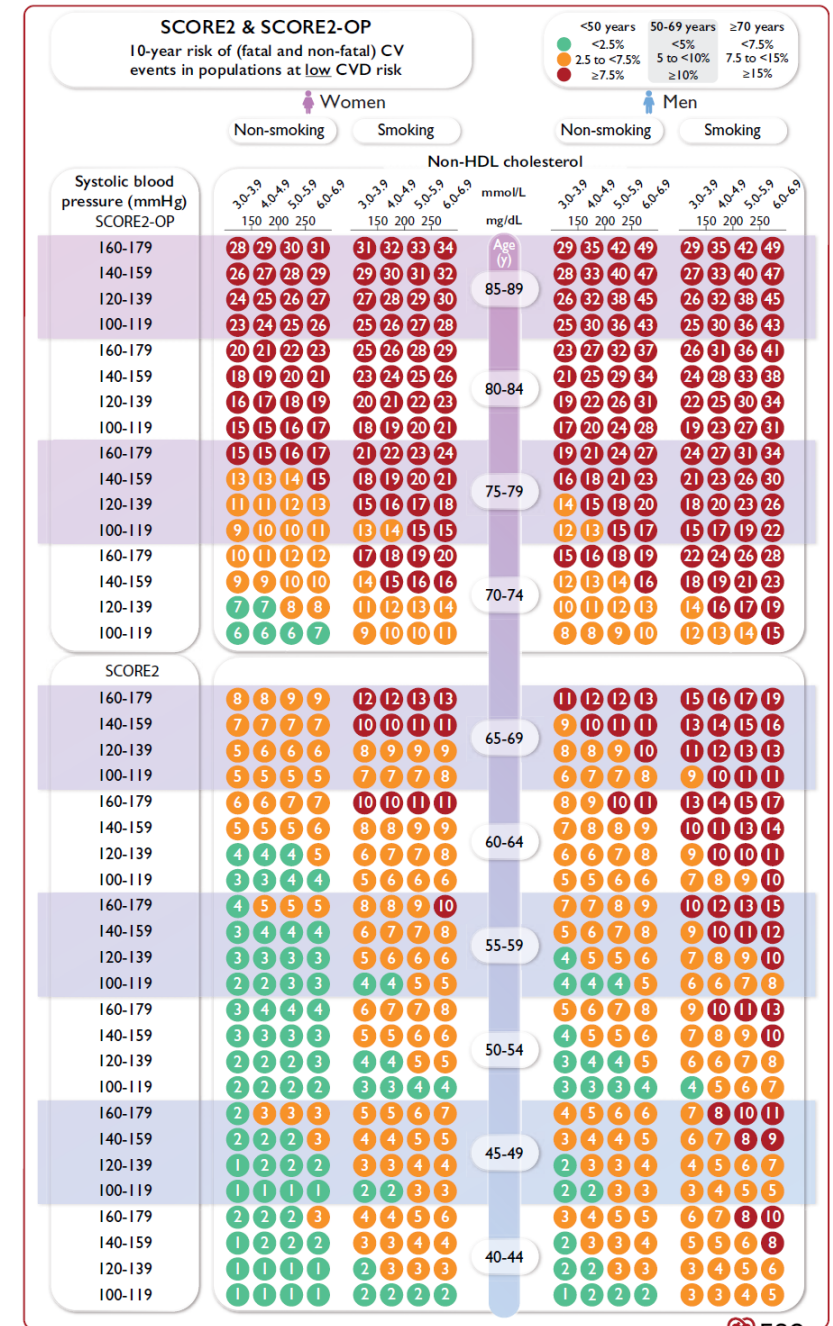
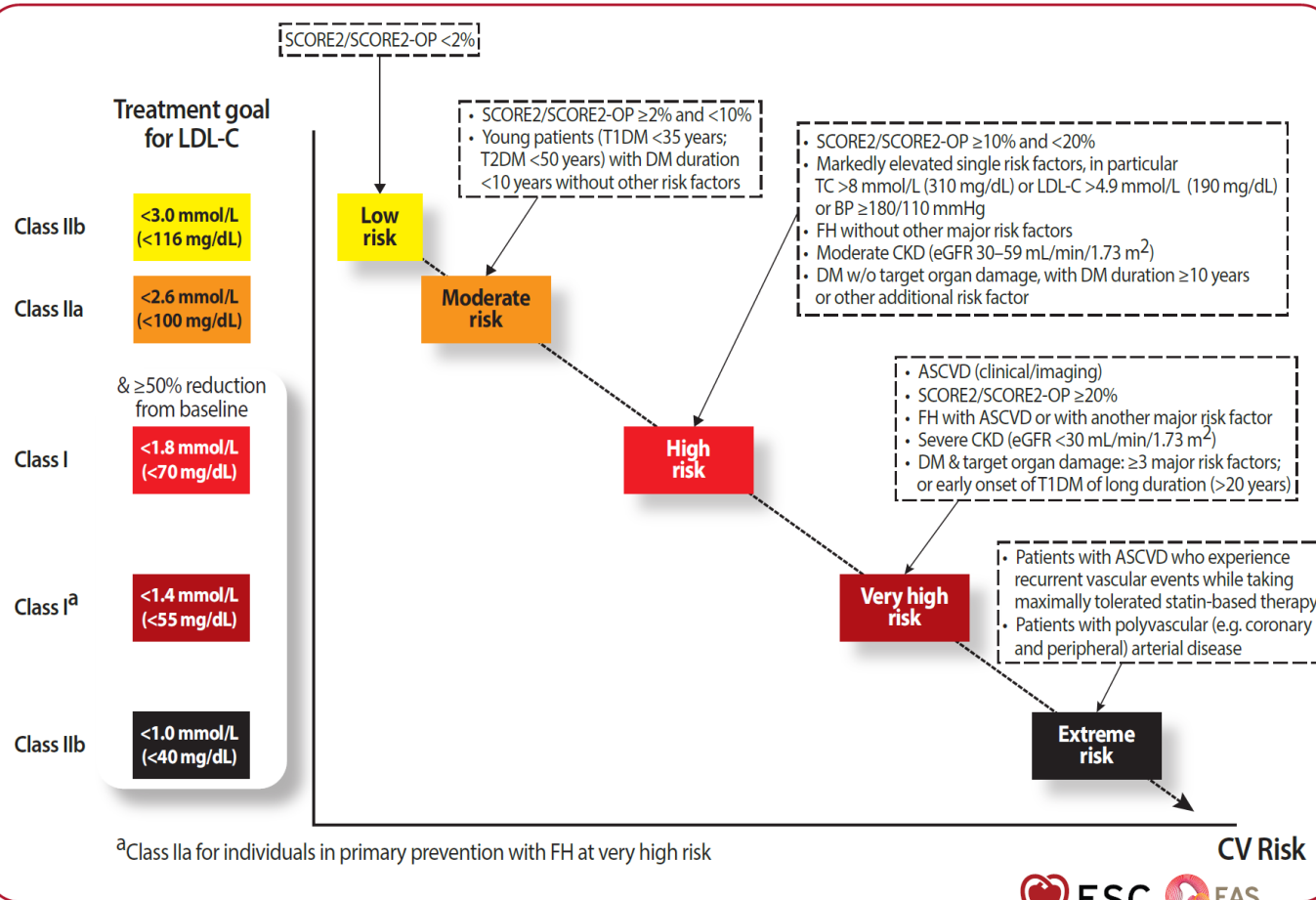
Les traitements

- ① Statines
- ② Ezetimibe
- ③ Anti-PCSK9 (si LDL > 0.7 g/L)



Dyslipidémie (ESC 2025)

Prévention primaire SCORE2 et SCORE2-OP



Insuffisance cardiaque

(recommandations 2021)

Type of HF	HFrEF	HFmrEF	HFpEF
CRITERIA	1	Symptoms ± Signs ^a	Symptoms ± Signs ^a
	2	LVEF ≤40%	LVEF ≥50%
	3	—	Objective evidence of cardiac structural and/or functional abnormalities consistent with the presence of LV diastolic dysfunction/raised LV filling pressures, including raised natriuretic peptides ^c

© ESC 2021

- Insuffisance cardiaque :
 - À FEVG préservée (>50%)
 - À FEVG altérée (≤40%)
 - FEVG intermédiaire (« mid range ») : 41-49% (en cours de changement -> reco 2026)
- Diagnostic étiologique :**
 - Coronaropathie, Valvulopathie, idiopathique...
- Rôle clé de l'ETT
- Traitements indispensables**
 - FEVG altérée :**
 - IEC ou ARAII + Inhibiteur Néprilysine (Sacubitril / valsartan = Entresto®)
 - Bétabloquants
 - Antagoniste des récepteurs des minéralocorticoïdes (MRA)
 - Gliflozines
 - FEVG préservée :**
 - Gliflozines
 - Antagoniste des récepteurs des minéralocorticoïdes (MRA) (reco 2026)
- Penser à la **resynchronisation cardiaque** (BBG > 150 ms et FEVG ≤ 35%) et au **DAI**

Management of HFrEF IC à FEVG altérée

To reduce mortality - for all patients

ACE-I/ARNI

BB

MRA

SGLT2i

To reduce HF hospitalization/mortality - for selected patients

Volume overload

Diuretics

SR with LBBB ≥ 150 ms

CRT-P/D

SR with LBBB 130–149 ms or non LBBB ≥ 150 ms

CRT-P/D

Ischaemic aetiology

ICD

Non-ischaemic aetiology

ICD

Atrial fibrillation

Anticoagulation

Atrial fibrillation

Digoxin

PVI

Coronary artery disease

CABG

Iron deficiency

Ferric carboxymaltose

Aortic stenosis

SAVR/TAVI

Mitral regurgitation

TEE MV Repair

Heart rate SR>70 bpm

Ivabradine

Black Race

Hydralazine/ISDN

ACE-I/ARNI intolerance

ARB

For selected advanced HF patients

Heart transplantation

MCS as BTT/BTC

Long-term MCS as DT

To reduce HF hospitalization and improve QOL - for all patients

Exercise rehabilitation

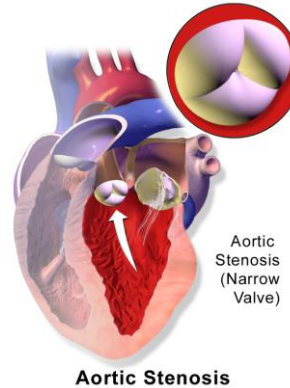
Multi-professional disease management

Recommandations de classe 1

Recommandations de classe 2 (moins forte)

Rétrécissement aortique

(ESC 2025)



Les étiologies :

- Bicuspidie (sujet jeune)
- Post-RAA (rare)
- Dégénératif ou maladie de Mönckeberg (sujet âgé, fréquent++)

Rétrécissement serré :

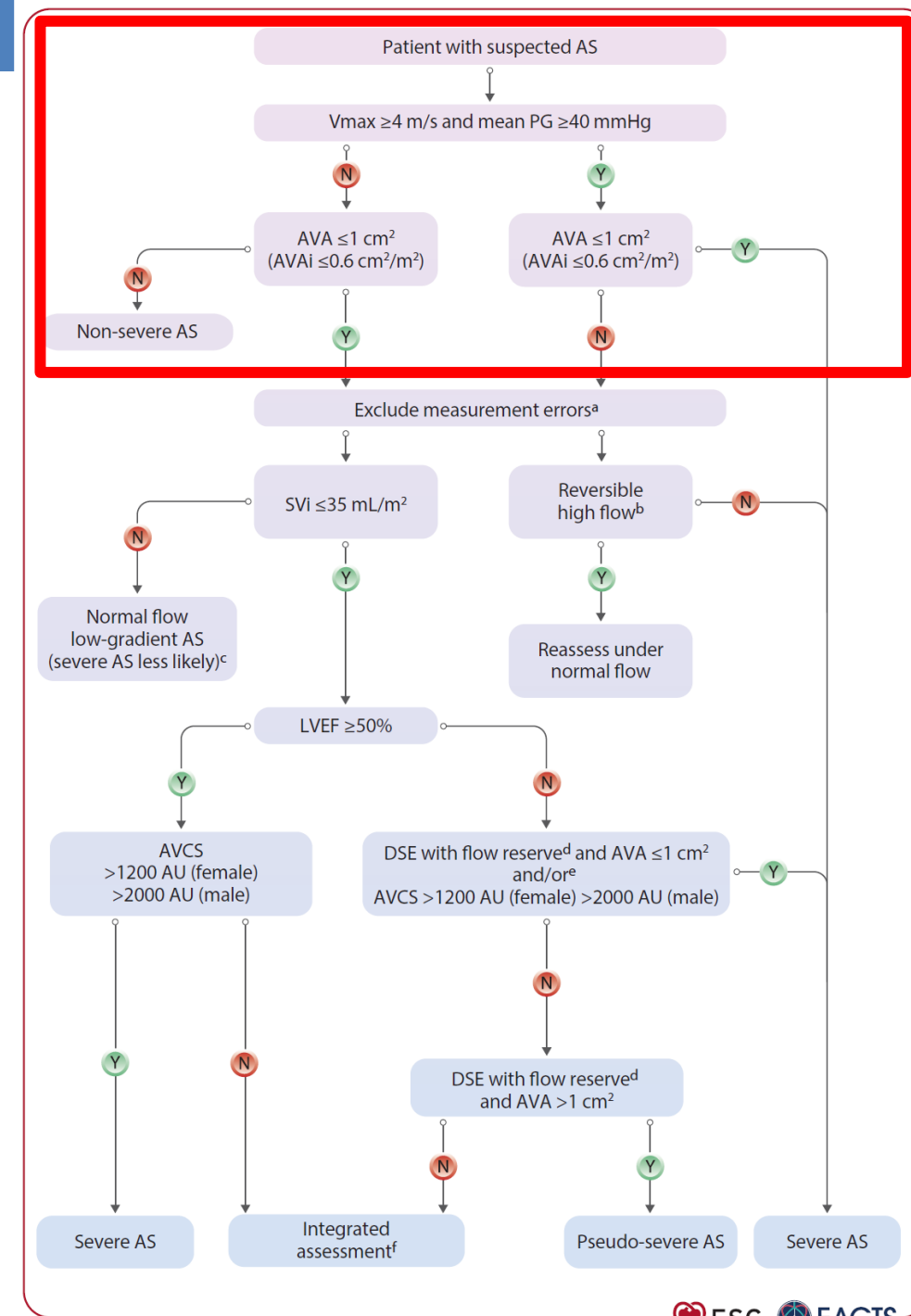
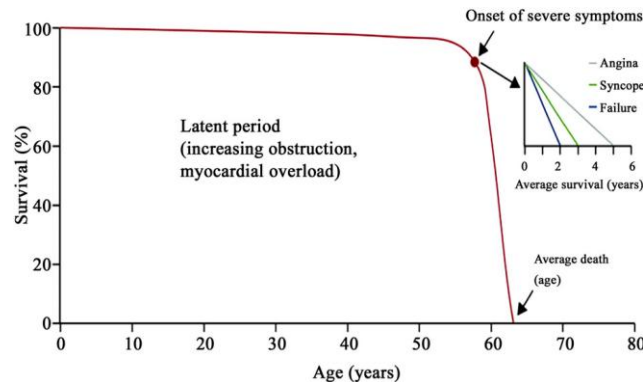
- $V_{max} > 4$ m/s
- Gradient moyen > 40 mmHg
- Surface < 1 cm² ou 0.6 cm²/m²

Symptômes = le tournant de la maladie :

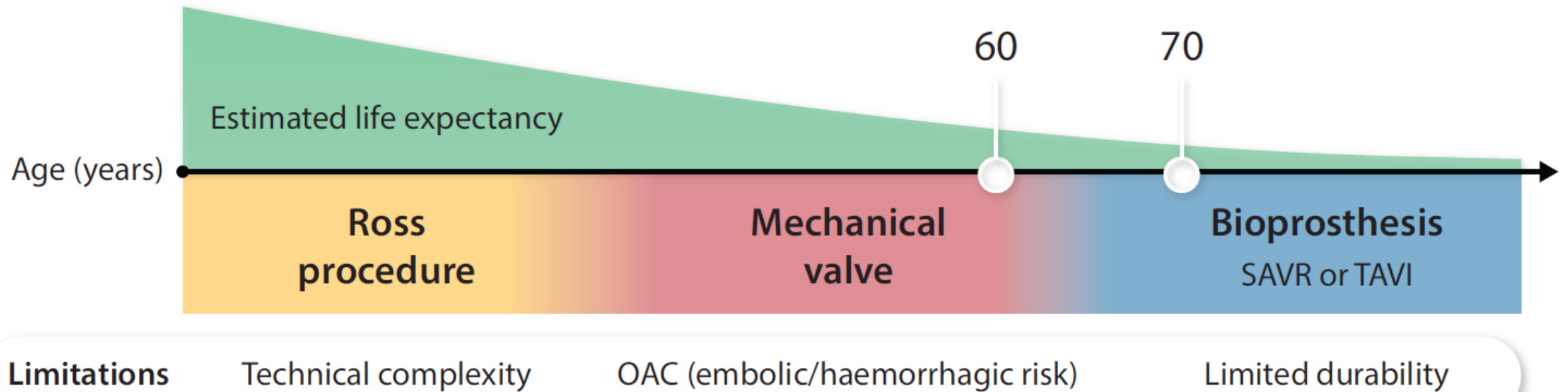
- Insuffisance cardiaque (dyspnée)
- Angor
- Syncope

Traitement (si symptômes et RA serré) :

- RVA (biologique ou mécanique)
 - Valve mécanique : durée → à vie / anticoagulants
 - Valve biologique : durée de vie limitée / pas d'anticoagulants
- TAVI
 - Age > 70 ans
 - Haut risque chirurgical (Euroscore II ou STS score $> 8\%$)



Rétrécissement aortique et chirurgie

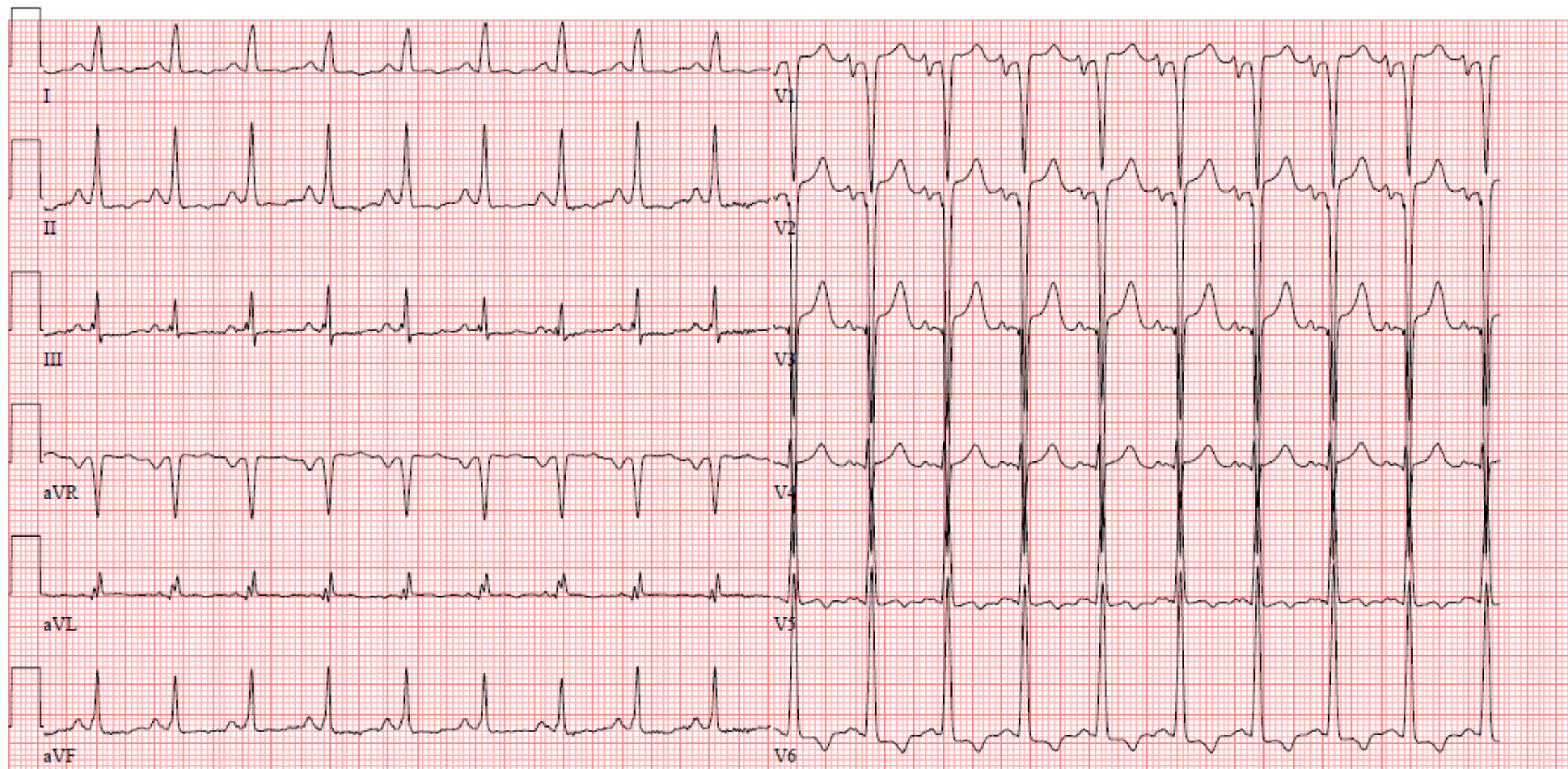


ESC



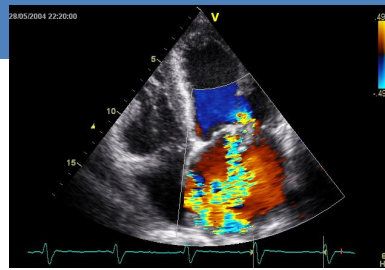
EACTS

Hypertrophie ventriculaire gauche

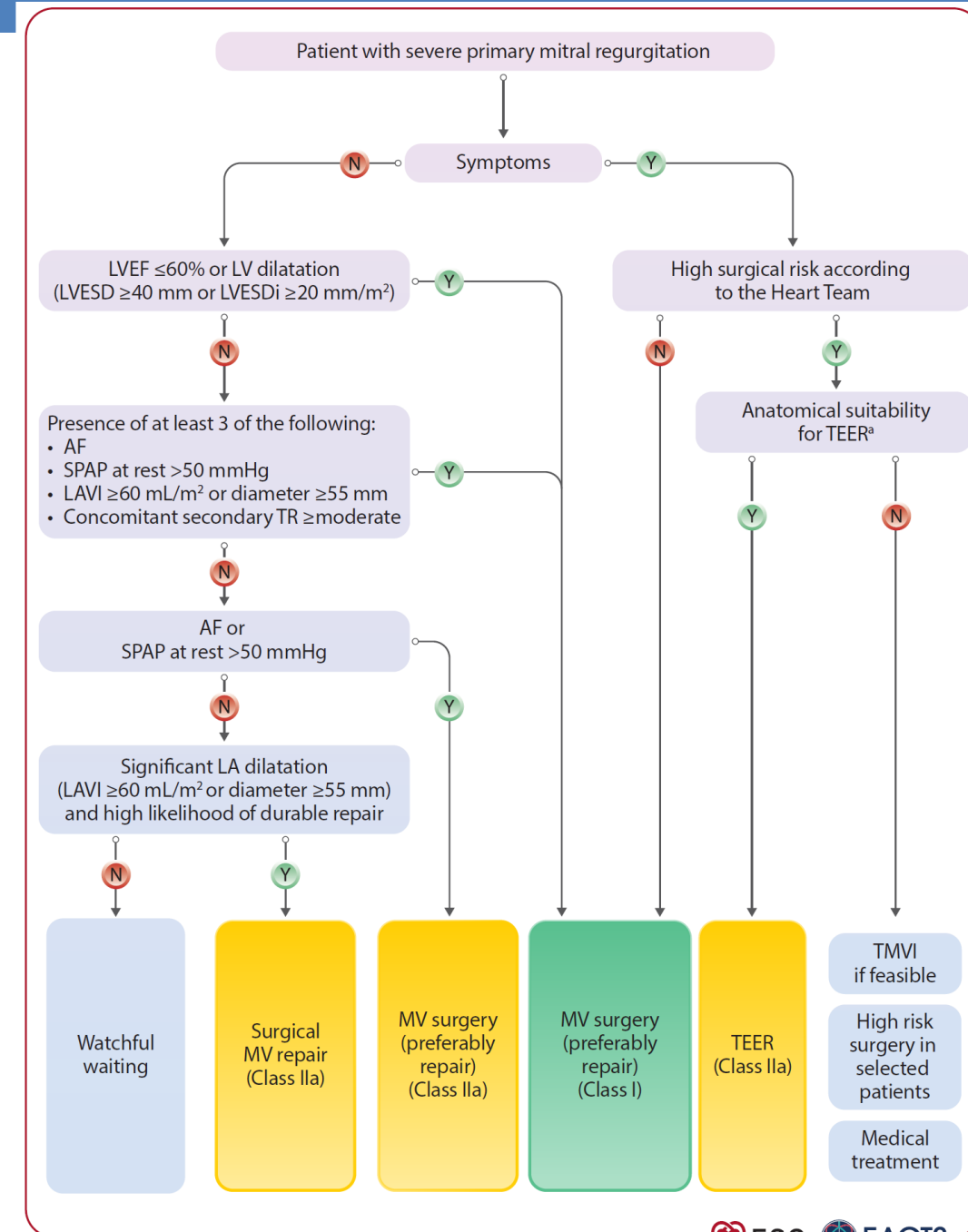


Insuffisance mitrale

(ESC 2025)



- Etiologie : **Dystrophie** (fréquent++), post-RAA, ischémique, post-EI
- IM chronique versus aiguë (rupture de cordage, rupture de pilier)
- Examen clé = ETT
- Classification de l'IM : petite < modérée < moyenne < **importante** (SOR $\geq 40 \text{ mm}^2$; VR $\geq 60 \text{ mL}$)
- **Retentissement** :
 - Dilatation VG et FEVG
 - PAPS (HTAP)
 - Taille de l'oreillette (dilatation de l'OG -> FA)
- **Complications** : Insuffisance cardiaque, EI, embolies, troubles rythmiques
- Traitement :
 - Médical : vasodilateurs (IEC) et diurétiques
 - **CHIRURGIE** si IM importantes et symptômes ou altération FEVG et/ou dilatation VG
 - **Plastie mitrale ++ / RVM biologique ou mécanique**
 - IM aiguë => Chirurgie en urgence
 - Possibilité du MitraClip (TEER)



Insuffisance aortique

(ESC 2025)

IA chronique :

- Dystrophique
- Secondaire à une EI
- Bicuspidie aortique
- Rhumatismale

IA aiguë : 2 principales causes :

- Dissection aortique
- Endocardite infectieuse

- Symptômes : **dyspnée d'effort** (NYHA), **angor d'effort** et parfois de repos (fonctionnel), **insuffisance cardiaque** (rare et tardive, de mauvais pronostic)

Examen clé :

- ETT (mécanisme, quantification, retentissement FEVG et diamètre VG)
- Toujours rechercher une **dilatation de l'aorte ascendante associée** (bicuspidie, Marfan...)

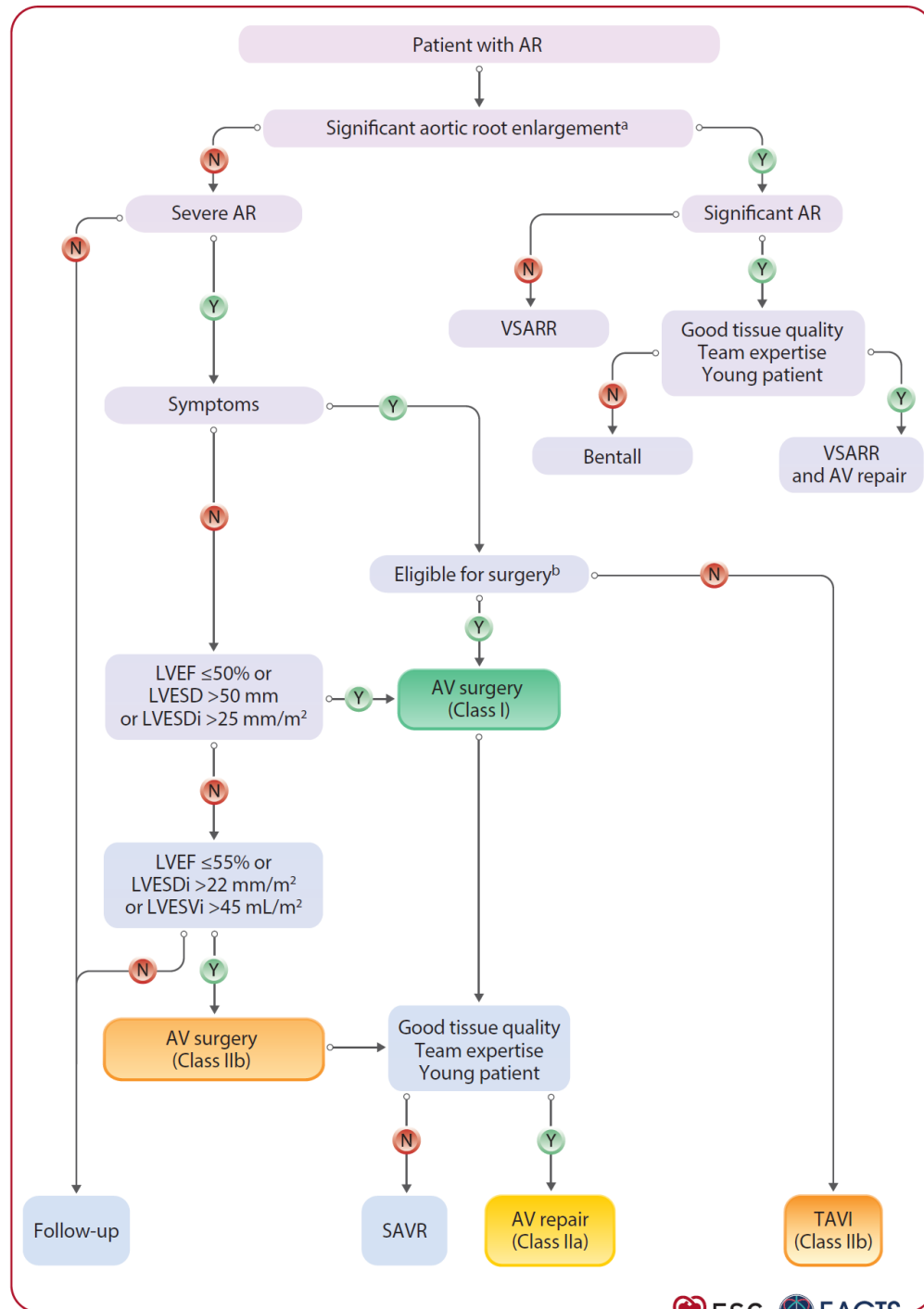
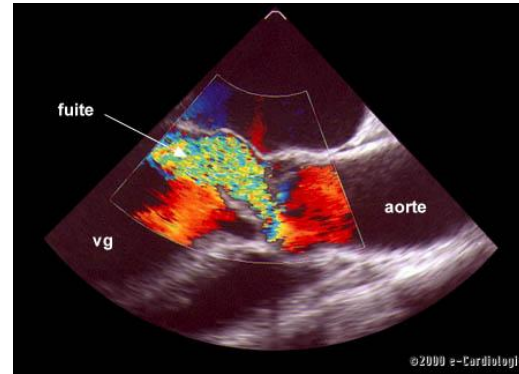
- Le pronostic est sévère dès que les symptômes apparaissent...

- Traitement médical : vasodilateurs (IEC) et traitement de l'insuffisance cardiaque

- **IA aiguë importante** : chirurgie immédiate

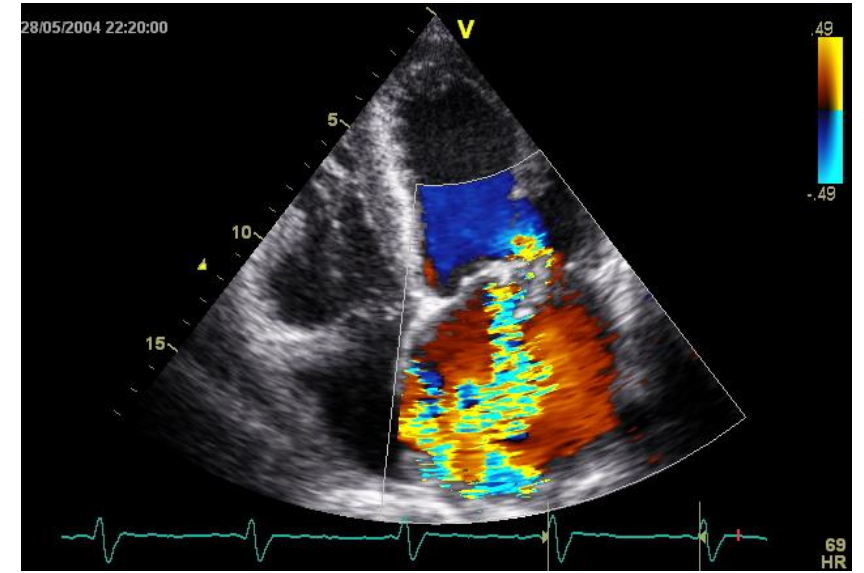
- **IA chronique** : chirurgie si : Symptômes + Diamètre VG > 50 mm (en systole) ou FEVG < 50% ou dilatation de l'aorte ascendante > 55 mm.

- Chirurgie : RVA, Bentall (RVA + tube aortique + Réimplantation coronaires), Tirone David (Tube aortique + réimplantation coronaires sans valve)



Pour les valvulopathies, la prise en charge est simple !

- On opère :
 - Les **valvulopathies sévères** :
 - RA ou RM serré
 - IA ou IM sévère (grade 4)
 - **Symptomatiques** :
 - Insuffisance cardiaque
 - Angor (RA, IA)
 - Troubles du rythme
 - **Et / ou entraînant un retentissement sur la fonction cardiaque** :
 - Altération de la FEVG
 - Et / ou dilatation ventriculaire gauche
- On opère les valvulopathie **SEVERES et SYMPTOMATIQUES** (et/ou avec retentissement VG)



Endocardite infectieuse

- Bactéries : staphylocoques et streptocoques majoritairement
- Hémocultures +++ (positives dans 90% des cas)
- Maladie systémique
- **Diagnostic :**
 - Hémocultures
 - ETO
- Bilan d'extension :
 - Scan TAP + crane
- Recherche et traitement de la porte d'entrée

Definite IE
Pathological criteria • Microorganisms demonstrated by culture or on histological examination of a vegetation, a vegetation that has embolized, or an intracardiac abscess specimen; or • Pathological lesions; vegetation or intracardiac abscess confirmed by histological examination showing active endocarditis Clinical criteria • 2 major criteria; or • 1 major criterion and 3 minor criteria; or • 5 minor criteria
Possible IE
• 1 major criterion and 1 minor criterion; or • 3 minor criteria
Rejected IE
• Firm alternate diagnosis; or • Resolution of symptoms suggesting IE with antibiotic therapy for ≤ 4 days; or • No pathological evidence of IE at surgery or autopsy, with antibiotic therapy for ≤ 4 days; or • Does not meet criteria for possible IE, as above

Major criteria
1. Blood cultures positive for IE - Typical microorganisms consistent with IE from 2 separate blood cultures: • <i>Viridans streptococci</i>, <i>Streptococcus gallolyticus</i> (<i>Streptococcus bovis</i>), <i>HACEK</i> group, <i>Staphylococcus aureus</i>; or • Community-acquired enterococci, in the absence of a primary focus; or - Microorganisms consistent with IE from persistently positive blood cultures: • ≥ 2 positive blood cultures of blood samples drawn >12 h apart; or • All of 3 or a majority of ≥ 4 separate cultures of blood (with first and last samples drawn ≥ 1 h apart); or - Single positive blood culture for <i>Coxiella burnetii</i> or phase I IgG antibody titre $>1:800$
2. Imaging positive for IE - Echocardiogram positive for IE: • Vegetation; • Abscess, pseudoaneurysm, intracardiac fistula; • Valvular perforation or aneurysm; • New partial dehiscence of prosthetic valve. - Abnormal activity around the site of prosthetic valve implantation detected by ^{18}F-FDG PET/CT (only if the prosthesis was implanted for >3 months) or radiolabelled leukocytes SPECT/CT. - Definite paravalvular lesions by cardiac CT.
Minor criteria
- Predisposition such as predisposing heart condition, or injection drug use. - Fever defined as temperature $>38^\circ\text{C}$. - Vascular phenomena (including those detected by imaging only): major arterial emboli, septic pulmonary infarcts, infectious (mycotic) aneurysm, intracranial haemorrhage, conjunctival haemorrhages, and Janeway's lesions. - Immunological phenomena: glomerulonephritis, Osler's nodes, Roth's spots, and rheumatoid factor. - Microbiological evidence: positive blood culture but does not meet a major criterion as noted above or serological evidence of active infection with organism consistent with IE.

Endocardite infectieuse

- Antibiothérapie :
 - Streptocoque :
 - Amoxicilline ou Ceftriaxone +/- gentamicine (4 semaines si valve native, 6 semaines si prothèse)
 - Staphylocoque Méti-S :
 - Cloxacilline ou Cefazoline (+ Rifampicine 6 semaines et Gentamicine 2 semaines si prothèse)
 - Staphylocoque Méti-R :
 - Vancomycine (+ Rifampicine 6 semaines et Gentamicine 2 semaines si prothèse)
 - Durée : 4 à 6 semaines si valve native et 6 semaines si prothèse (possibilité de traitement + court de 2 semaines si streptocoque sur valve native, sans complication)
- Chirurgie si :
 - ① Insuffisance cardiaque non contrôlée par TTT médicale
 - ② Syndrome infectieux non contrôlé
 - ③ Risque embolique si taille importante de la végétation (> 15 mm)
 - EI fongique

Recommendation Table 10 — Recommendations for antibiotic regimens for initial empirical treatment of infective endocarditis (before pathogen identification)^a

Recommendations		Class ^b	Level ^c
In patients with community-acquired NVE or late PVE (≥12 months post-surgery), ampicillin in combination with ceftriaxone or with (flu)cloxacillin and gentamicin should be considered using the following doses: ²⁵⁵		IIa	C
Adult antibiotic dosage and route			
Ampicillin	12 g/day i.v. in 4–6 doses		
Ceftriaxone	4 g/day i.v. or i.m. in 2 doses		
(Flu)cloxacillin	12 g/day i.v. in 4–6 doses		
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 dose		
Paediatric antibiotic dosage and route			
Ampicillin	300 mg/kg/day i.v. in 4–6 equally divided doses		
Ceftriaxone	100 mg/kg i.v. or i.m. in 1 dose		
(Flu)cloxacillin	200–300 mg/kg/day i.v. in 4–6 equally divided doses		
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 3 equally divided doses		
In patients with early PVE (<12 months post-surgery) or nosocomial and non-nosocomial healthcare-associated IE, vancomycin or daptomycin combined with gentamicin and rifampin may be considered using the following doses: ³⁹⁵		IIb	C
Adult antibiotic dosage and route			
Vancomycin ^e	30 mg/kg/day i.v. in 2 doses		
Daptomycin	10 mg/kg/day i.v. in 1 dose		
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 1 dose		
Rifampin	900–1200 mg i.v. or orally in 2 or 3 doses		
Paediatric antibiotic dosage and route			
Vancomycin ^e	40 mg/kg/day i.v. in 2–3 equally divided doses		
Gentamicin ^d	3 mg/kg/day i.v. or i.m. in 3 equally divided doses		
Rifampin	20 mg/kg/day i.v. or orally in 3 equally divided doses		

Endocardite infectieuse

- Antibioprophylaxie :
 - Uniquement pour les **procédures dentaires** (avec atteinte de la gencive)
 - **AMOXICILLINE 2 g PO** 30-60 min avant la procédure
 - Ou **AZITHROMYCINE 500 mg PO** si allergie

Table 6 Prophylactic antibiotic regime for high-risk dental procedures

Situation	Antibiotic	Single-dose 30–60 min before procedure	
		Adults	Children
No allergy to penicillin or ampicillin	Amoxicillin	2 g orally	50 mg/kg orally
	Ampicillin	2 g i.m. or i.v.	50 mg/kg i.v. or i.m.
	Cefazolin or ceftriaxone	1 g i.m. or i.v.	50 mg/kg i.v. or i.m.
Allergy to penicillin or ampicillin	Cephalexin ^{a,b}	2 g orally	50 mg/kg orally
	Azithromycin or clarithromycin	500 mg orally	15 mg/kg orally
	Doxycycline	100 mg orally	<45 kg, 2.2 mg/kg orally >45 kg, 100 mg orally
	Cefazolin or ceftriaxone ^b	1 g i.m. or i.v.	50 mg/kg i.v. or i.m.

© ESC 2023

Recommendations	Class ^a	Level ^b
General prevention measures are recommended in individuals at high and intermediate risk for IE.	I	C
Antibiotic prophylaxis is recommended in patients with previous IE. ^{47,84,86}	I	B
Antibiotic prophylaxis is recommended in patients with surgically implanted prosthetic valves and with any material used for surgical cardiac valve repair. ^{47,87–89}	I	C
Antibiotic prophylaxis is recommended in patients with transcatheter implanted aortic and pulmonary valvular prostheses. ^{91–94}	I	C
Antibiotic prophylaxis is recommended in patients with untreated cyanotic CHD, and patients treated with surgery or transcatheter procedures with post-operative palliative shunts, conduits, or other prostheses. After surgical repair, in the absence of residual defects or valve prostheses, antibiotic prophylaxis is recommended only for the first 6 months after the procedure. ^{8,47,97,101}	I	C
Antibiotic prophylaxis is recommended in patients with ventricular assist devices. ¹⁰²	I	C
Antibiotic prophylaxis should be considered in patients with transcatheter mitral and tricuspid valve repair. ⁹⁵	IIa	C
Antibiotic prophylaxis may be considered in recipients of heart transplant. ^{105–107}	IIb	C
Antibiotic prophylaxis is not recommended in other patients at low risk for IE. ^{11,51}	III	C

© ESC 2023

HTA



Moyenne des valeurs de PA en automesure tensionnelle (AMT) ou en mesure ambulatoire de la PA (MAPA) (diurne) correspondant à une HTA

- PAS $\geq$ 135 mmHg ou PAD $\geq$ 85 mmHg

Cibles tensionnelles à 6 mois

- PA diurne en AMT ou en MAPA $<$ 135/85 mmHg
- PA $<$ 140/90 mmHg
- Plus de 80 ans :
 - PAS $<$ 150 mmHg
 - PAS diurne en AMT ou en MAPA $<$ 145 mmHg

Le bilan paraclinique initial comporte :

- sodium et potassium plasmatiques ;
- créatinine plasmatique avec estimation du débit de filtration glomérulaire⁷ ;
- glycémie à jeun ;
- exploration d'une anomalie lipidique à jeun ;
- recherche d'une protéinurie quelle que soit la méthode ;
- ECG de repos.

Bilan à connaître par cœur

CHEZ TOUS LES PATIENTS
SURVEILLANCE RÉGULIÈRE DE LA PA

Découverte d'une PA $\geq$ 140/90 persistante dans le temps

Confirmation de l'HTA par AMT ou MAPA

Bilan clinique et paraclinique

Consultation d'annonce : information du patient/
adhésion du patient

- Recherche facteurs de risque cardio-vasculaire associés
- Recherche hypotension orthostatique
- Rechercher HTA compliquée ou secondaire

- Risques liés à l'HTA
- Bénéfices de la prise en charge

INSTAURER DES MESURES HYGIÉNO-DIÉTÉTIQUES

Mesure de la PA mensuelle (AMT ou MAPA) jusqu'au contrôle de la PA + surveillance selon plan de soins

- Réduire :
- sédentarité - surpoids
 - consommation d'alcool et de tabac
 - aliments gras, salés et sucrés

Surveillance selon plan de soins

PA
contrôlée

Plan de soins de 0 à 6 mois

- Consultation mensuelle jusqu'à l'obtention des chiffres cibles
- Mesurer la PA (AMT ou MAPA)
- Rappeler les mesures hygiéno-diététiques
- Expliquer les difficultés de prises quotidiennes
- Vérifier l'adhésion du patient
- Évaluer la tolérance et l'efficacité de la prise en charge

Plan de soins après 6 mois

- Consultation tous les 3 à 6 mois
- Mesurer la PA (AMT ou MAPA)
- Rappeler les mesures hygiéno-diététiques
- Expliquer les difficultés de prises quotidiennes
- Vérifier l'adhésion du patient
- Contrôle biologique (tous les 1 à 2 ans) et ECG (tous les 3 à 5 ans)
- Évaluer la tolérance et l'efficacité de la prise en charge
- Évaluer le risque d'interactions médicamenteuses
- Adapter les posologies médicamenteuses si besoin

PA
contrôlée

PA
contrôlée

PA
contrôlée

Débuter une monothérapie

Mesure de la PA (AMT ou MAPA) + surveillance selon plan de soins

PA
non
contrôlée

- IEC* ou ARA2** ou inhibiteur calcique ou diurétique thiazidique
- Bêtabloquant en second choix
- De préférence en monoprise
- Prescription en DCI : éviter changement de marque

Débuter une bithérapie

Mesure de la PA (AMT ou MAPA) + surveillance selon plan de soins

PA
non
contrôlée

- Association de 2 classes parmi : IEC ou ARA2, inhibiteur calcique, diurétique thiazidique

Débuter une trithérapie

Mesure de la PA (AMT ou MAPA) + surveillance selon plan de soins

PA
non
contrôlée

- IEC ou ARA2 + diurétique thiazidique + inhibiteur calcique

Cibles tensionnelles NON atteintes à 6 mois
malgré une trithérapie

Rechercher la cause de l'HTA

Avis spécialisé



- Avis spécialisé en cas de :
- HTA sévère (PAS $>$ 180 ou PAD $>$ 110 mmHg) d'emblée
 - HTA avant l'âge de 30 ans
 - HTA avec hypokaliémie
 - Autres situations cliniques évocatrices d'une HTA secondaire

* Inhibiteur de l'enzyme de conversion

** Antagoniste des récepteurs de l'angiotensine 2

HTA (recommandations 2024)



Table 5 Comparison of office, home, and ambulatory blood pressure measurement thresholds for elevated blood pressure and hypertension

	Office BP (mmHg) ^a	Home BP (mmHg)	Daytime ABPM (mmHg)	24 h ABPM (mmHg)	Night-time ABPM (mmHg)
Reference					
Non-elevated BP	<120/70	<120/70	<120/70	<115/65	<110/60
Elevated BP	120/70–<140/90	120/70–<135/85	120/70–<135/85	115/65–<130/80	110/60–<120/70
Hypertension	≥140/90	≥135/85	≥135/85	≥130/80	≥120/70

ABPM, ambulatory blood pressure monitoring; BP, blood pressure.
^aThe BP thresholds provided assume that a standardized approach to office BP measurement is performed (Figure 3). However, evidence indicates that office BP measurement in routine clinical settings is often not done using a standardized approach and, in this case, the routine office BP value may be 5–10 mmHg higher than it would have been if measured using the recommended standardized approach.^{65,66}

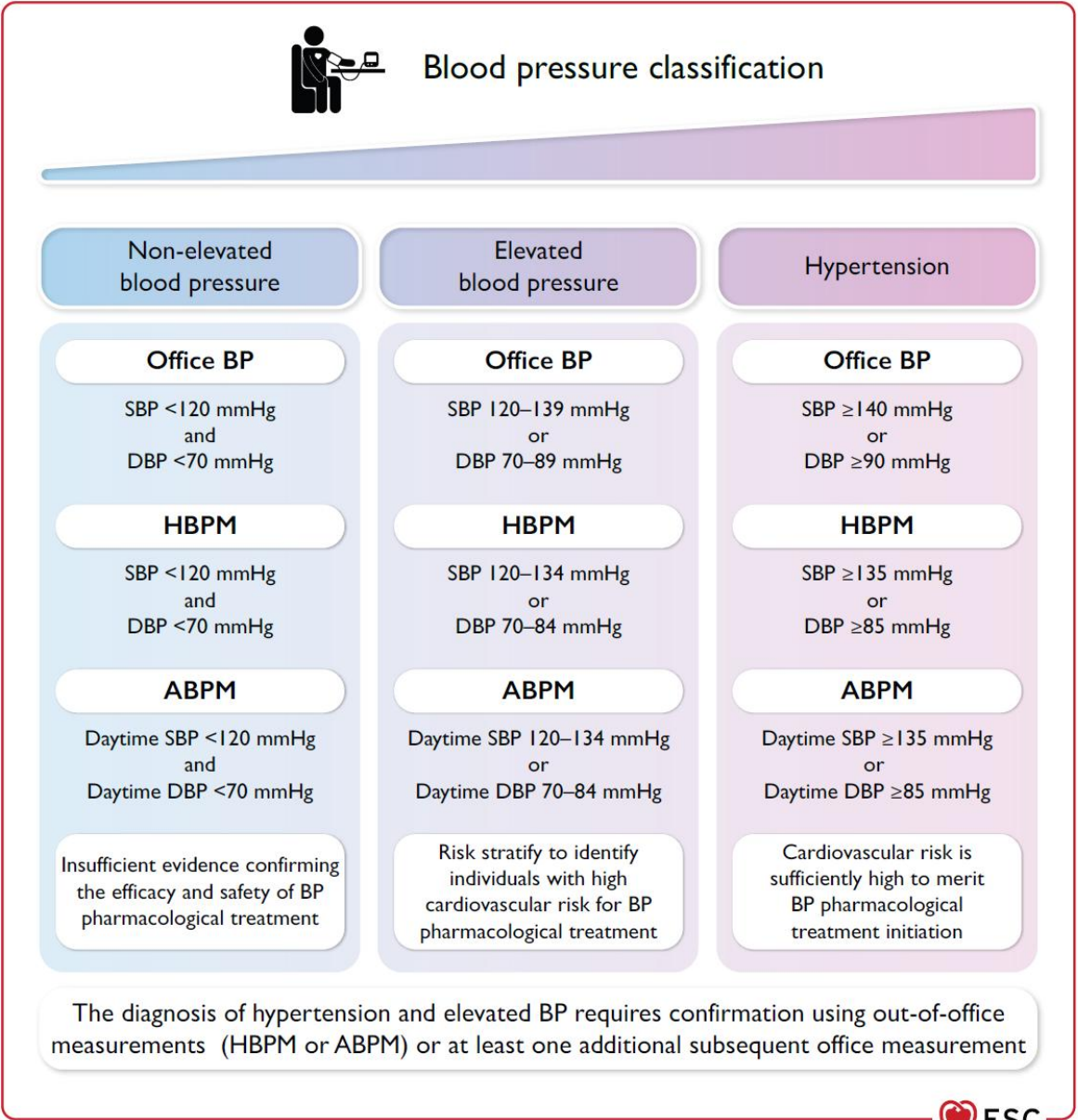
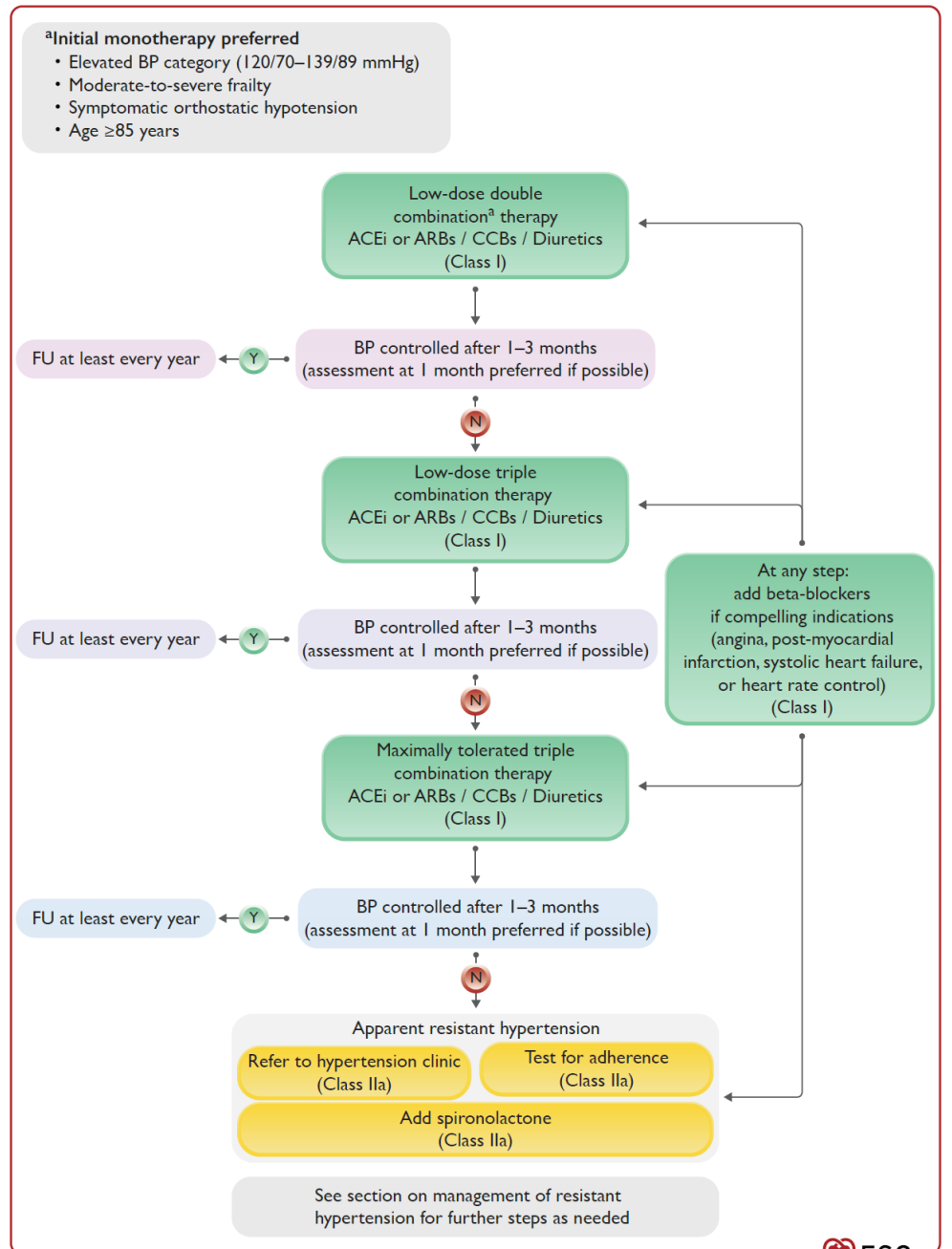
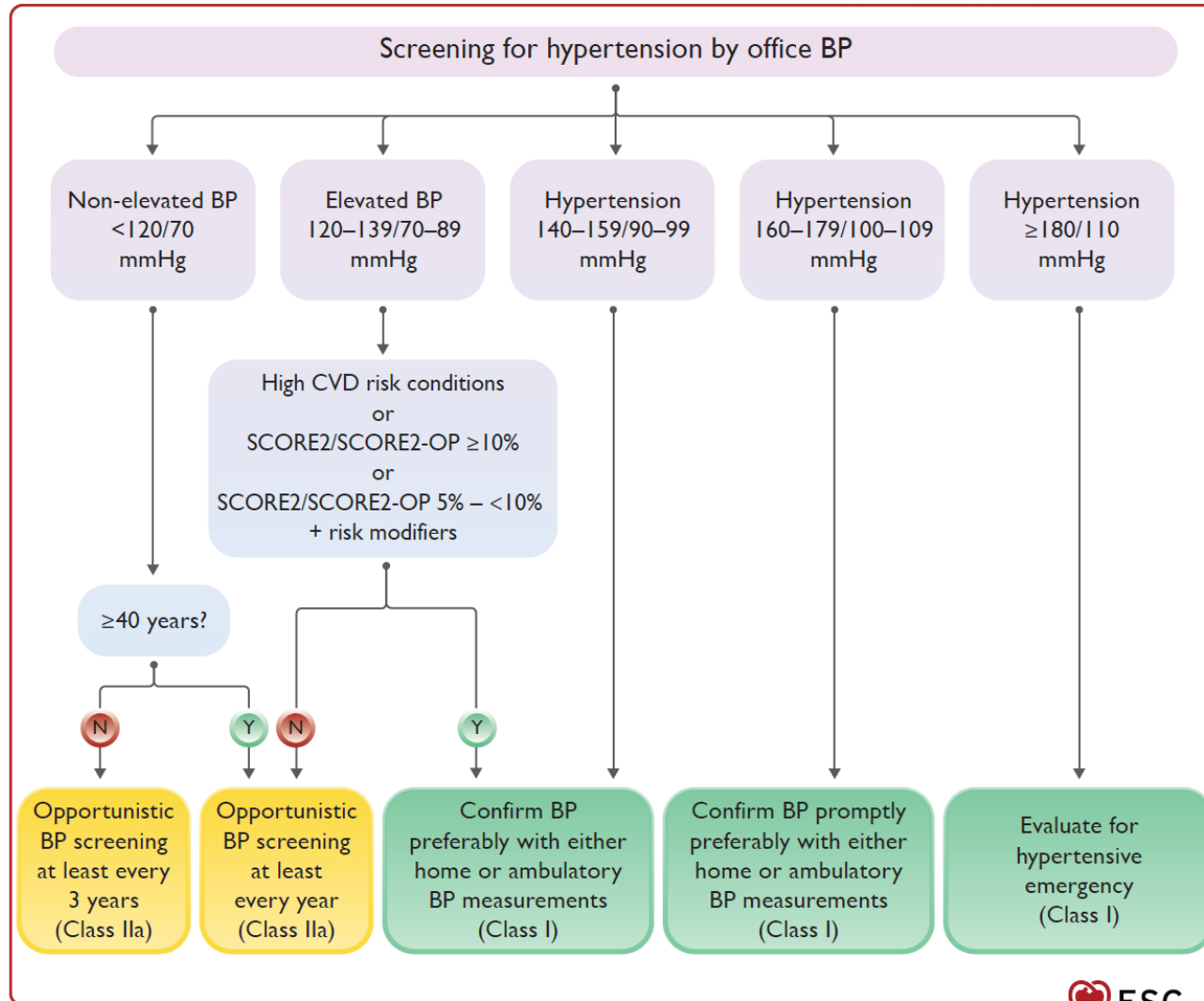


Figure 6 Blood pressure categories. ABPM, ambulatory blood pressure monitoring; BP, blood pressure; DBP, diastolic blood pressure; HBPM, home blood pressure monitoring; SBP, systolic blood pressure. We note that the respective non-daytime ABPM thresholds for elevated BP and hypertension diagnosis are listed in Section 5 (Table 5).

HTA (recommandations 2024)



HTA

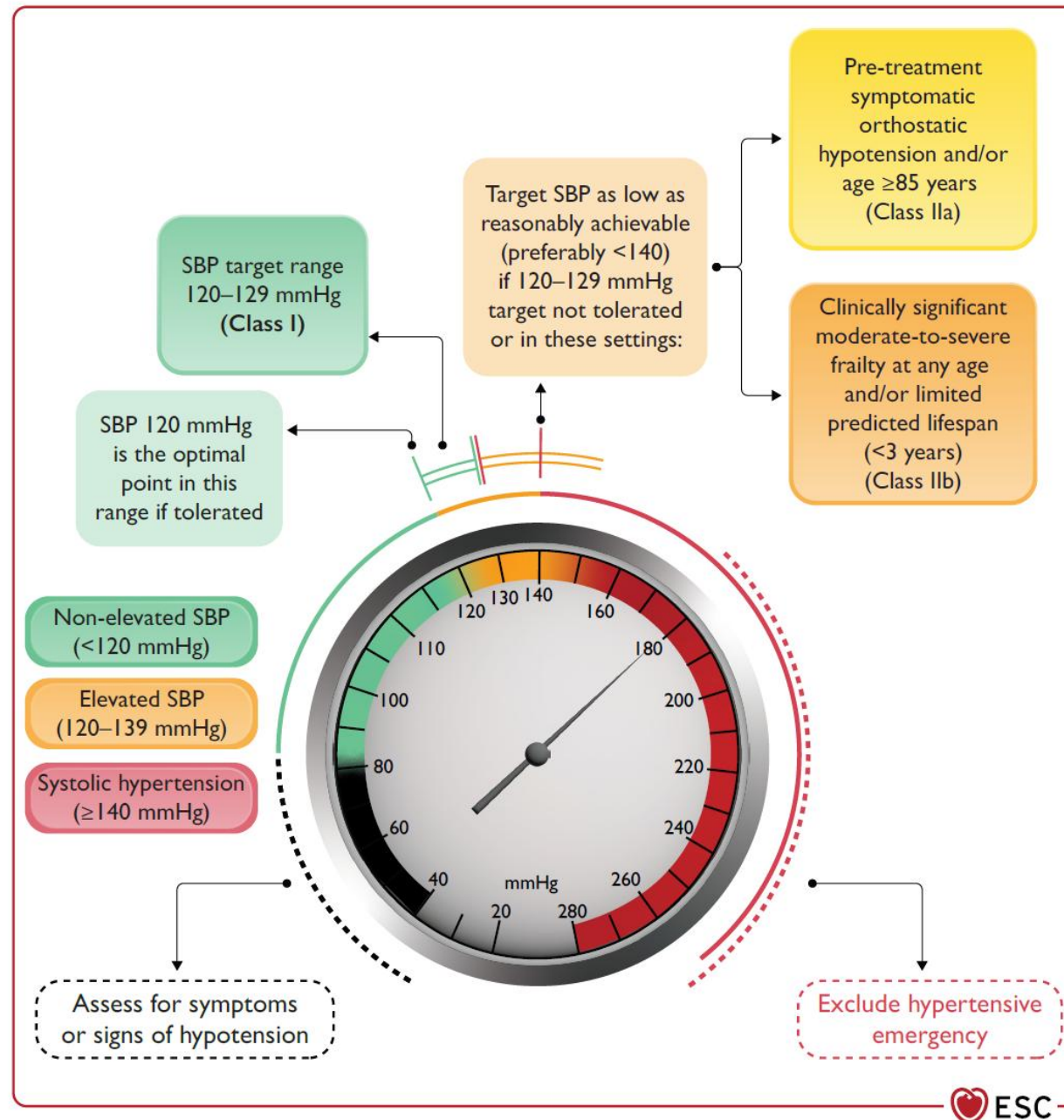


Figure 20 Systolic blood pressure categories and treatment target range. BP, blood pressure; SBP, systolic blood pressure.

Embolie pulmonaire

- Incidence : entre 40 et 120 pour 100000 habitants / an
- **Facteurs de risque majeurs** :
 - Fracture membre inférieur
 - Hospitalisation pour insuffisance cardiaque
 - Prothèse totale de genou ou hanche
 - Traumatisme majeur
 - Infarctus du myocarde (dans les 3 mois)
 - Antécédent d'EP / TVP
 - Lésion de la moelle épinière
- **Clinique** :
 - **Douleur thoracique** (douleur pleurale à type de point de côté)
 - **Dyspnée** (brutale ou plus progressive)
 - **Syncope** (rare)
- **Score de probabilité** (score de Genève ou score de Wells)
- **ECG** :
 - Tachycardie sinusale (parfois FA)
 - Déviation axiale droite
 - BBD
 - Ondes T négatives dans le précordium droit (ischémie fonctionnelle du VD)
 - S1Q3 : historique, non spécifique, peu informatif
- **Biologie** : D-dimères → Valeur prédictive négative
- **Imagerie** : **Angioscanner thoracique +++**
- **Score de risque** : score de PESI
- EP grave = de haut risque (thrombolyse)
 - ACR
 - PAs < 90 mmHg ou ≥ 40 mmHg de la PAs (pendant plus de 15 min) ou recours à des amines
- **TTT anticoagulant de l'EP** :
 - **Anticoagulation non vitamine K** en 1^{ère} intention (Rivaroxaban, Apixaban,...)
 - **AVK** comme alternative (en 1^{ère} intention si SAPL ou insuffisance rénale)
 - **Durée ≥ 3 mois**
 - Arrêt à 3 mois si 1^{er} épisode d'EP associé à un facteur de risque majeur et transitoire



Table 5 The revised Geneva clinical prediction rule for pulmonary embolism

Items	Clinical decision rule points	
	Original version ⁹¹	Simplified version ⁸⁷
Previous PE or DVT	3	1
Heart rate		
75–94 b.p.m.	3	1
≥ 95 b.p.m.	5	2
Surgery or fracture within the past month	2	1
Haemoptysis	2	1
Active cancer	2	1
Unilateral lower-limb pain	3	1
Pain on lower-limb deep venous palpation and unilateral oedema	4	1
Age >65 years	1	1
Clinical probability		
Three-level score		
Low	0–3	0–1
Intermediate	4–10	2–4
High	≥ 11	≥ 5
Two-level score		
PE-unlikely	0–5	0–2
PE-likely	≥ 6	≥ 3

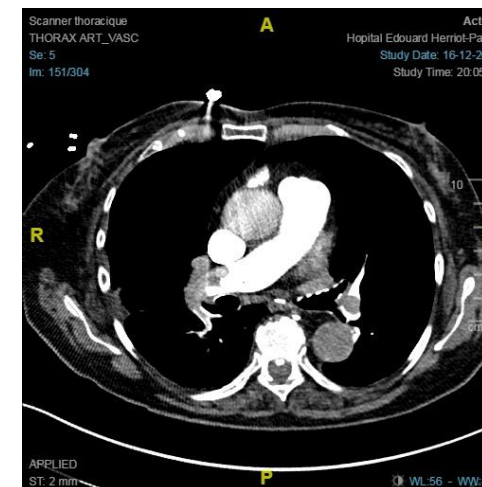
b.p.m. = beats per minute; DVT = deep vein thrombosis; PE = pulmonary embolism.

Table 7 Original and simplified Pulmonary Embolism Severity Index

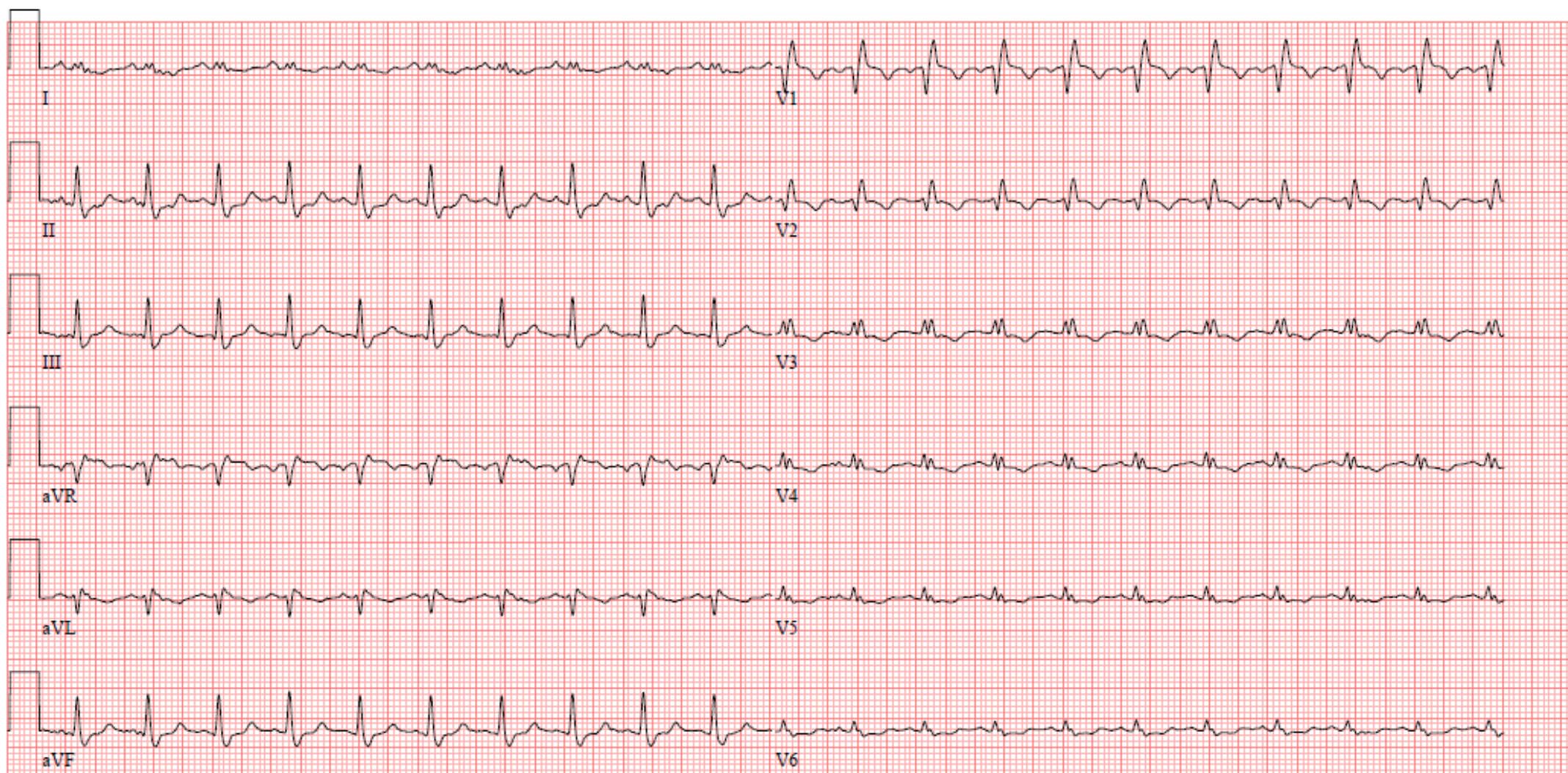
Parameter	Original version ²²⁶	Simplified version ²²⁹
Age	Age in years	1 point (if age >80 years)
Male sex	+10 points	–
Cancer	+30 points	1 point
Chronic heart failure	+10 points	
Chronic pulmonary disease	+10 points	1 point
Pulse rate ≥ 110 b.p.m.	+20 points	1 point
Systolic BP <100 mmHg	+30 points	1 point
Respiratory rate >30 breaths per min	+20 points	–
Temperature <36°C	+20 points	–
Altered mental status	+60 points	–
Arterial oxyhaemoglobin saturation <90%	+20 points	1 point
Risk strata^a		
	Class I: ≤ 65 points very low 30 day mortality risk (0–1.6%)	0 points = 30 day mortality risk 1.0% (95% CI 0.0–2.1%)
	Class II: 66–85 points low mortality risk (1.7–3.5%)	
	Class III: 86–105 points moderate mortality risk (3.2–7.1%)	≥ 1 point(s) = 30 day mortality risk 10.9% (95% CI 8.5–13.2%)
	Class IV: 106–125 points high mortality risk (4.0–11.4%)	
	Class V: >125 points very high mortality risk (10.0–24.5%)	

BP = blood pressure; b.p.m. = beats per minute; CI = confidence interval.

^aBased on the sum of points.

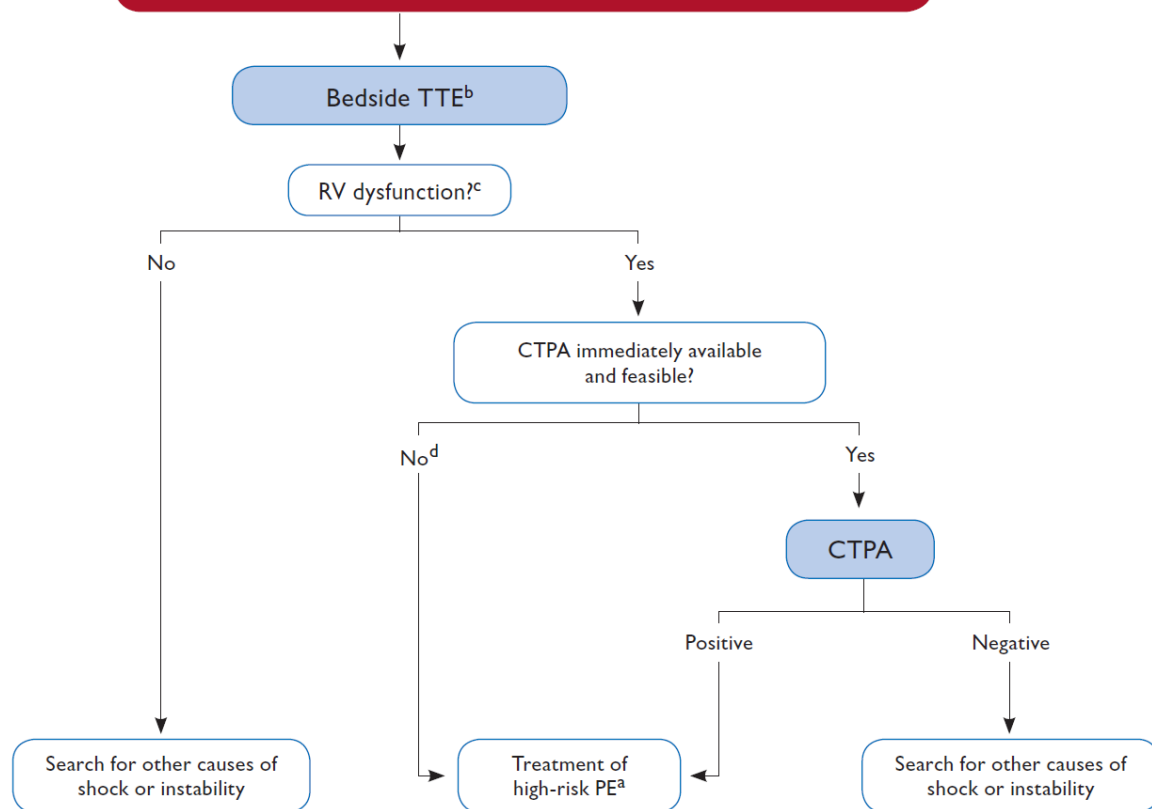


ECG - embolie pulmonaire



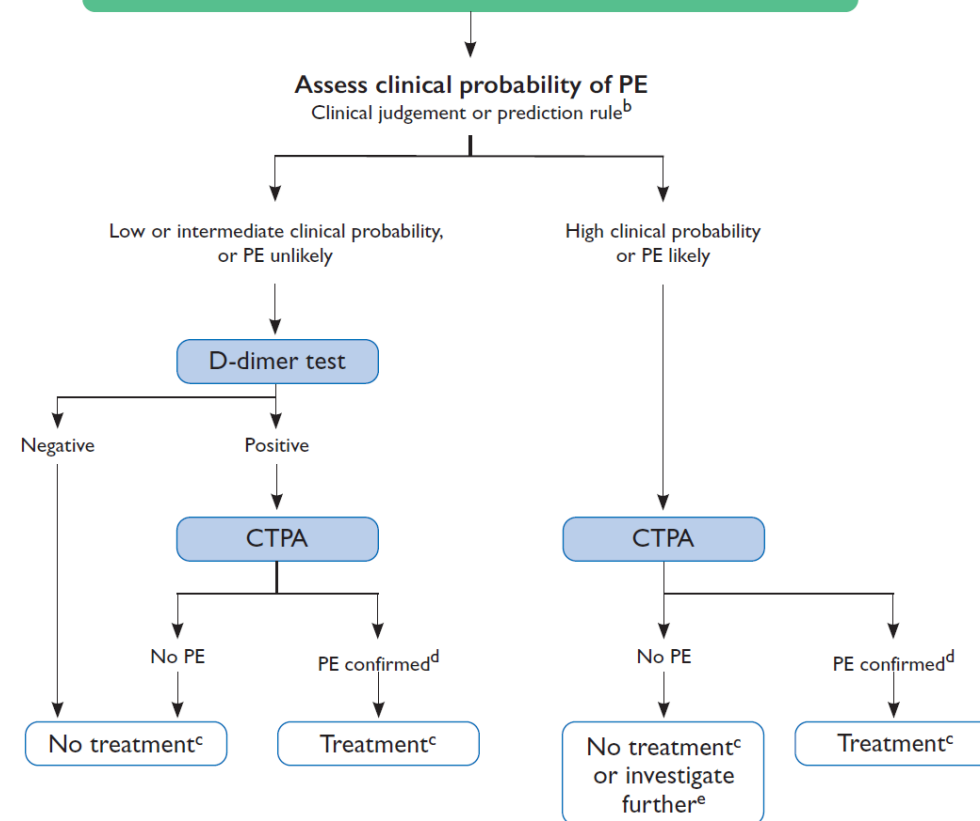
Embolie pulmonaire

Suspected PE in a patient with haemodynamic instability^a



©ESC 2019

Suspected PE in a patient without haemodynamic instability^a

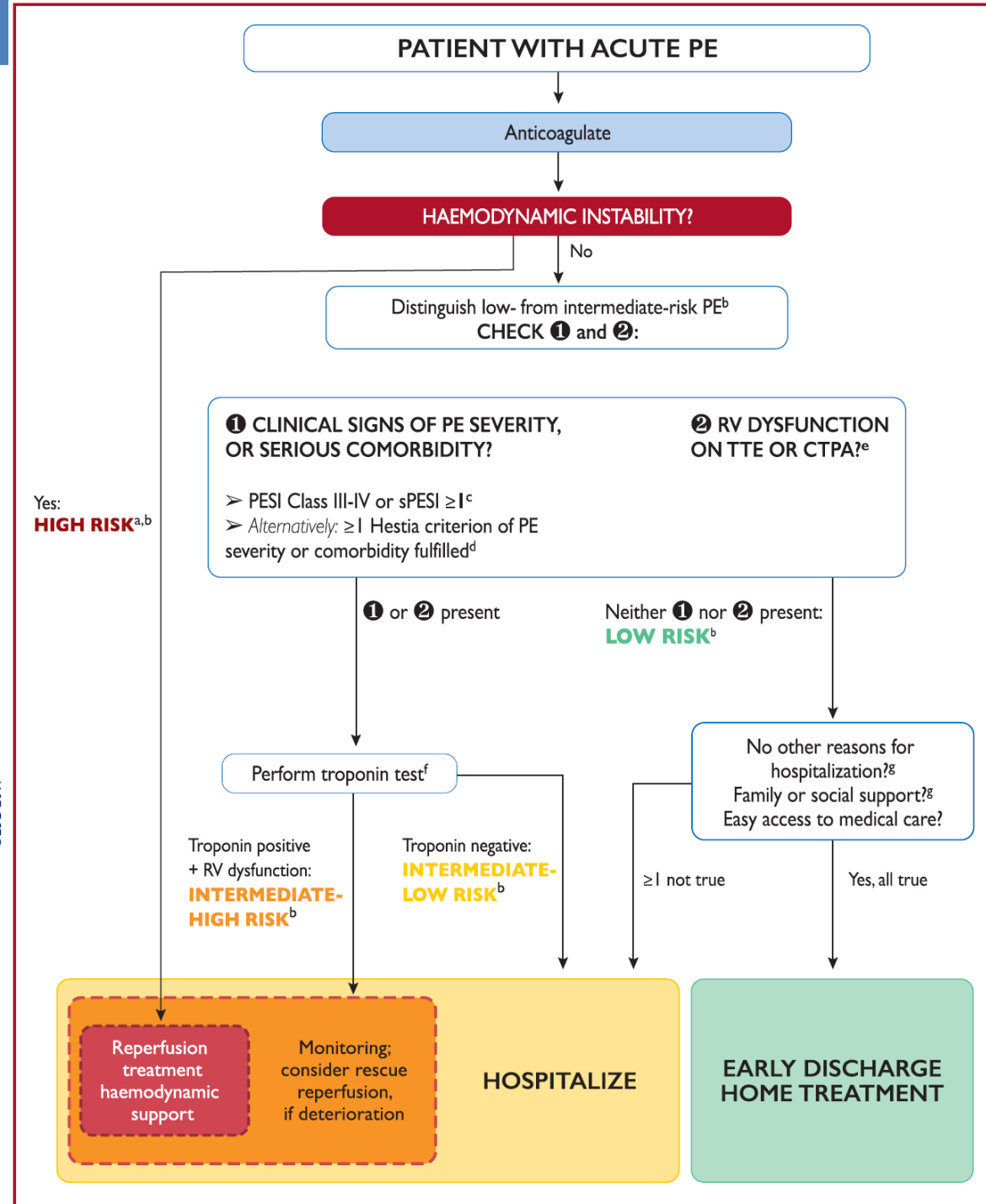


©ESC 2019

Embolie pulmonaire

Early mortality risk		Indicators of risk			
		Haemodynamic instability ^a	Clinical parameters of PE severity and/or comorbidity: PESI class III–V or sPESI ≥1	RV dysfunction on TTE or CTPA ^b	Elevated cardiac troponin levels ^c
High		+	(+) ^d	+	(+)
Intermediate	Intermediate–high	-	+ ^e	+	+
	Intermediate–low	-	+ ^e	One (or none) positive	
Low		-	-	-	Assesment optional; if assessed, negative

©ESC 2019

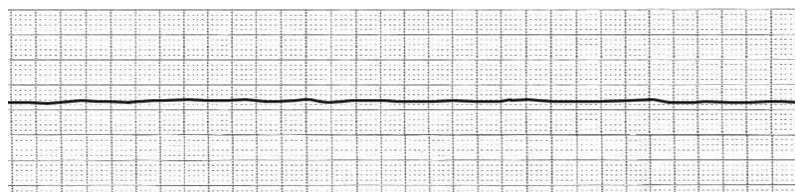


Arrêt cardiocirculatoire

- 2 type d'ACR :

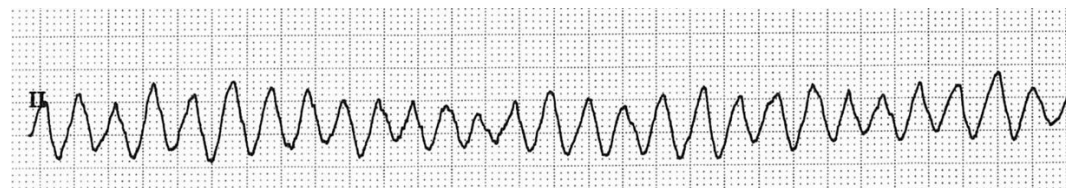
- **Asystolie**

- EP
 - AVC (hémorragique)
 - Intoxication

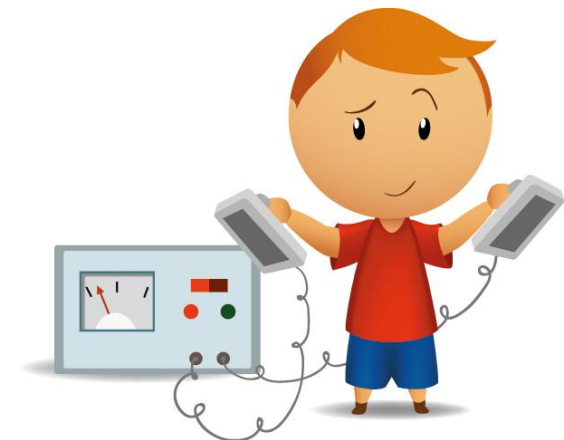


- **Trouble du rythme ventriculaire (chocable) (FV, TV)**

- IDM
 - Intoxication

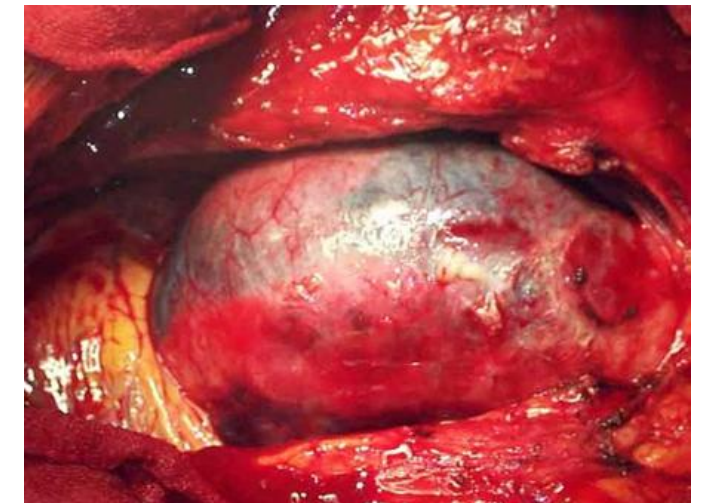
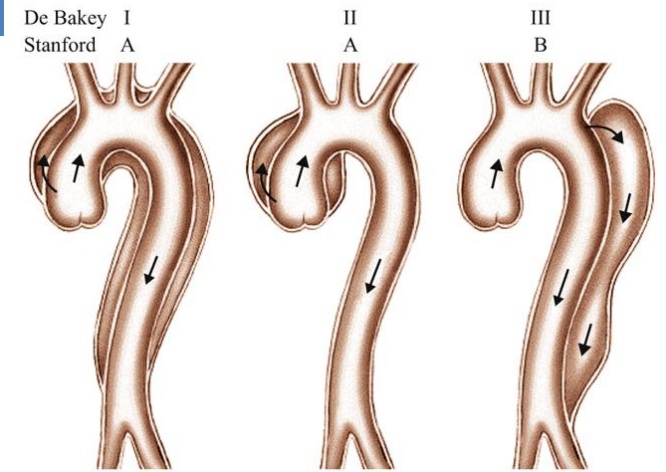


- A : « Airway » (maintien des voies aériennes libres)
- B : « Breathing » (assistance respiratoire)
- C : « Circulation » (maintenir une circulation)
- D : « Defibrillation » (si le rythme initial est une tachycardie ou une fibrillation ventriculaire) et « Drogues »
- **Massage cardiaque externe :**
 - 100-120/min
 - Compressions de 4 à 5 cm d'amplitude
 - 30/2
- CEE si rythme chocable
- Adrénaline 1 mg toutes les 3 à 5 minutes :
 - Immédiatement si asystolie
 - Après le 3^{ème} choc si FV



Dissection aortique

- **Urgence diagnostic et thérapeutique**
- HTA ancienne, syndrome de Marfan, maladie de Turner
- Douleur thoracique aiguë, prolongée, intense, à type de déchirement, irradiant dans le dos, migratrice, descendant vers les lombes. Déficit neurologique parfois associé.
- ECG normal ou SCA si la dissection aortique a lésé une artère coronaire.
- **ANGIOSCANNER THORACIQUE** ou ETO
- **Contrôle tensionnel en urgence :**
 - Bêtabloquants IV ou IVSE (1^{ère} intention) (ex : Esmolol)
 - Inhibiteurs calciques IVSE (2^{ème} intention)
- Chirurgie en urgence : Type 1 ou 2 / Stanford A
 - Bentall, Tyrone David ou tube droit



Dissection aortique



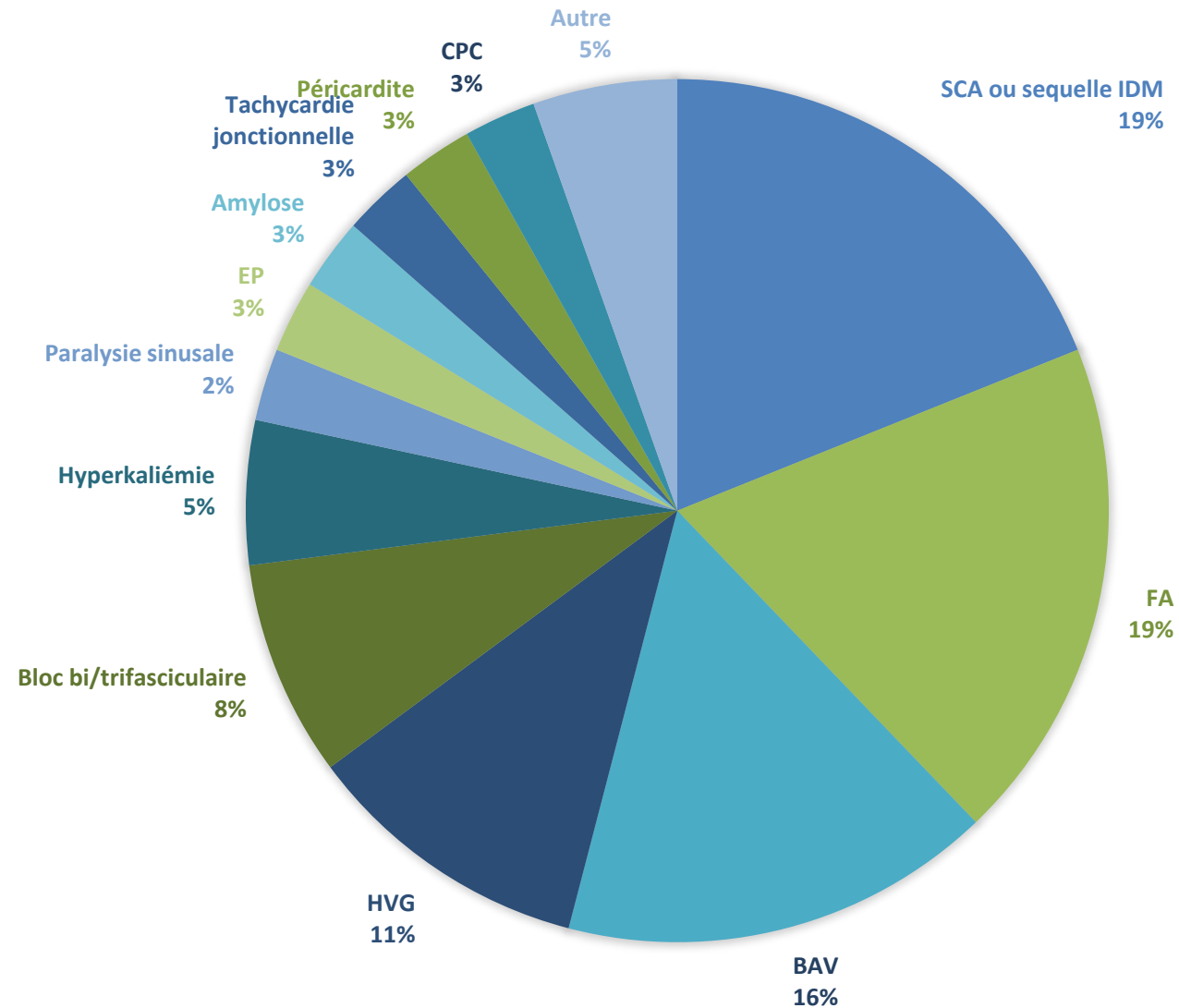
ETO



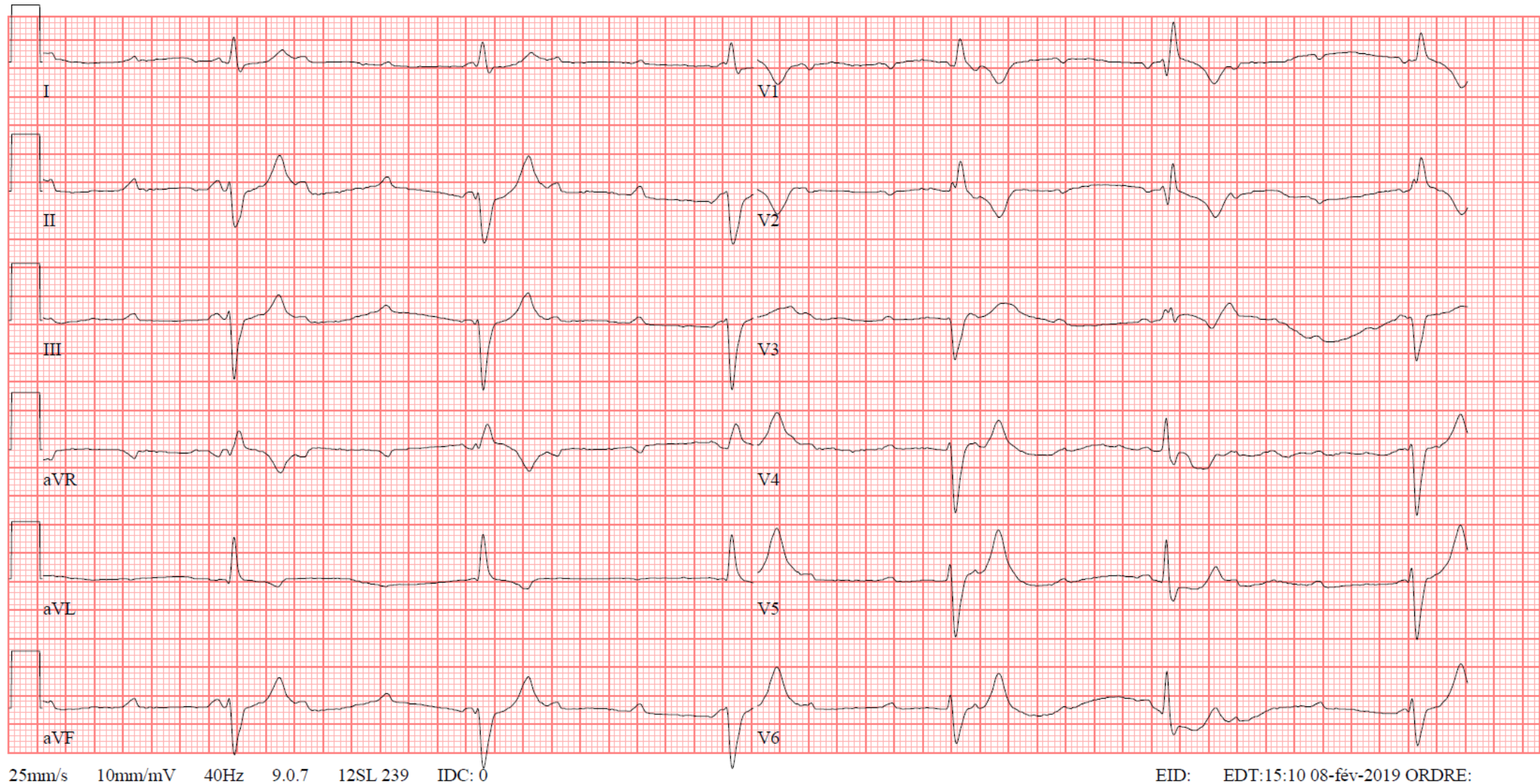
Angioscanner thoracique

AUTRES ECG À CONNAITRE

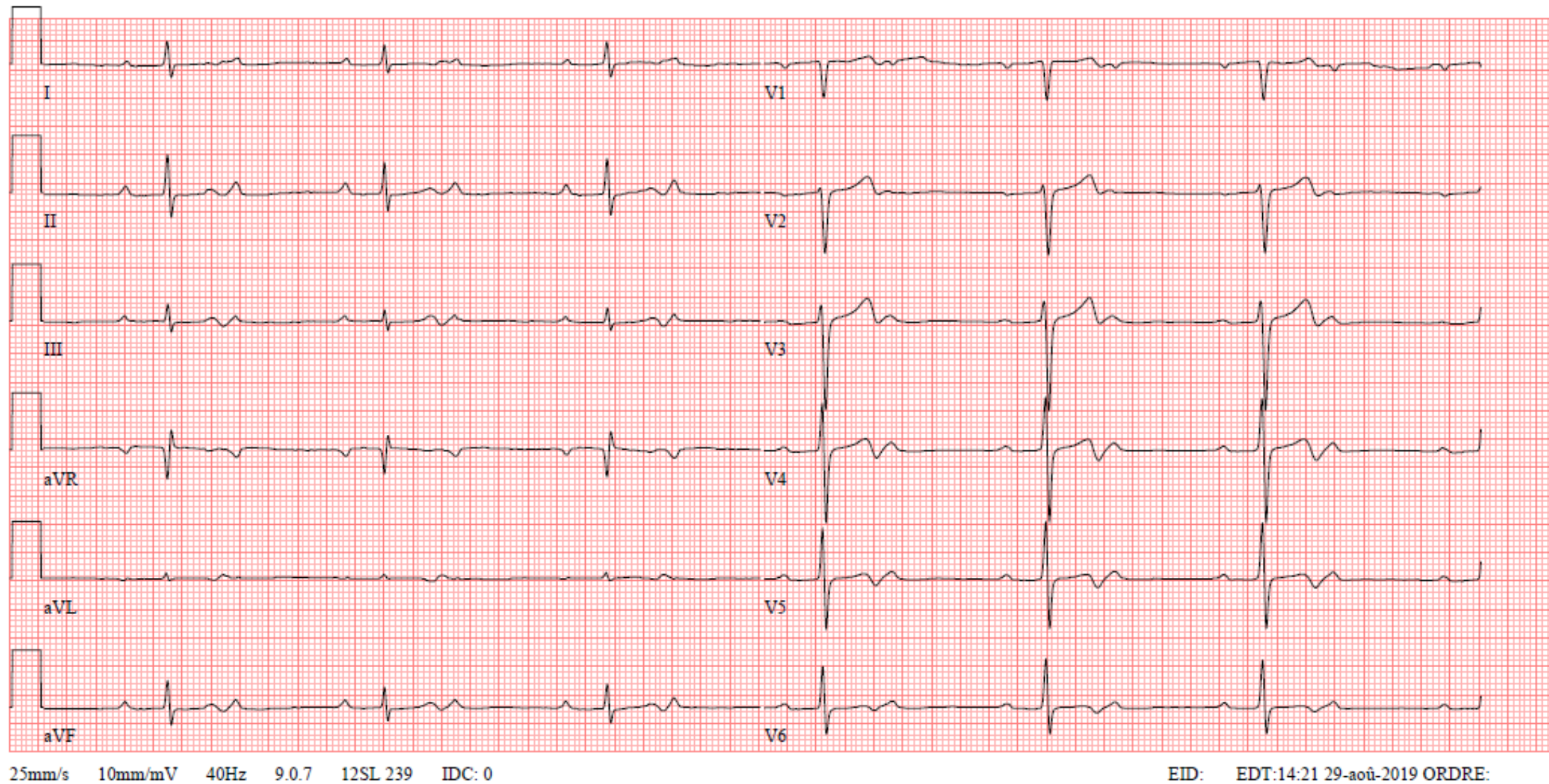
Les ECG à l'ECN(i) EDN...



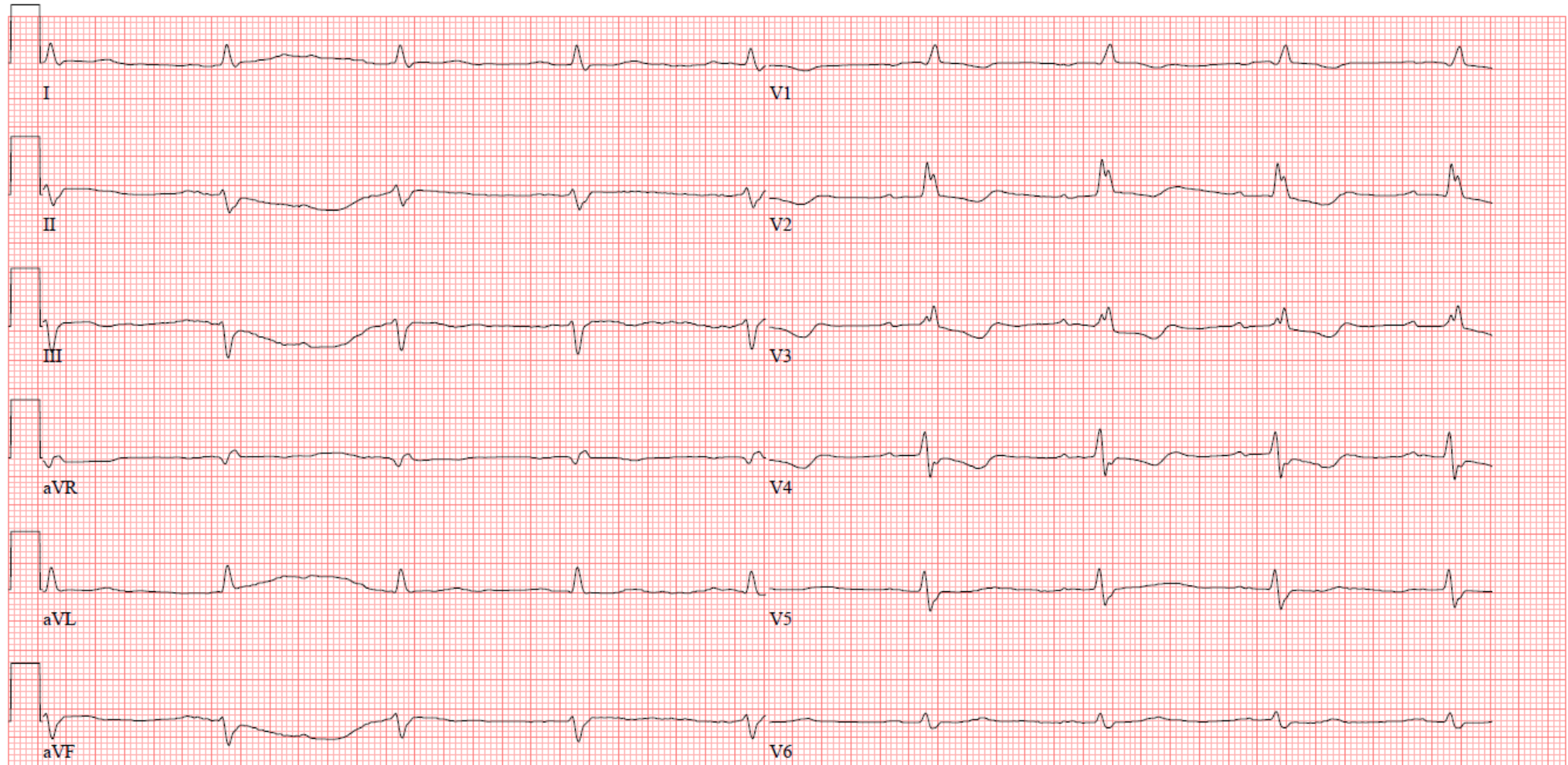
Troubles du rythme et de la conduction – BAV complet



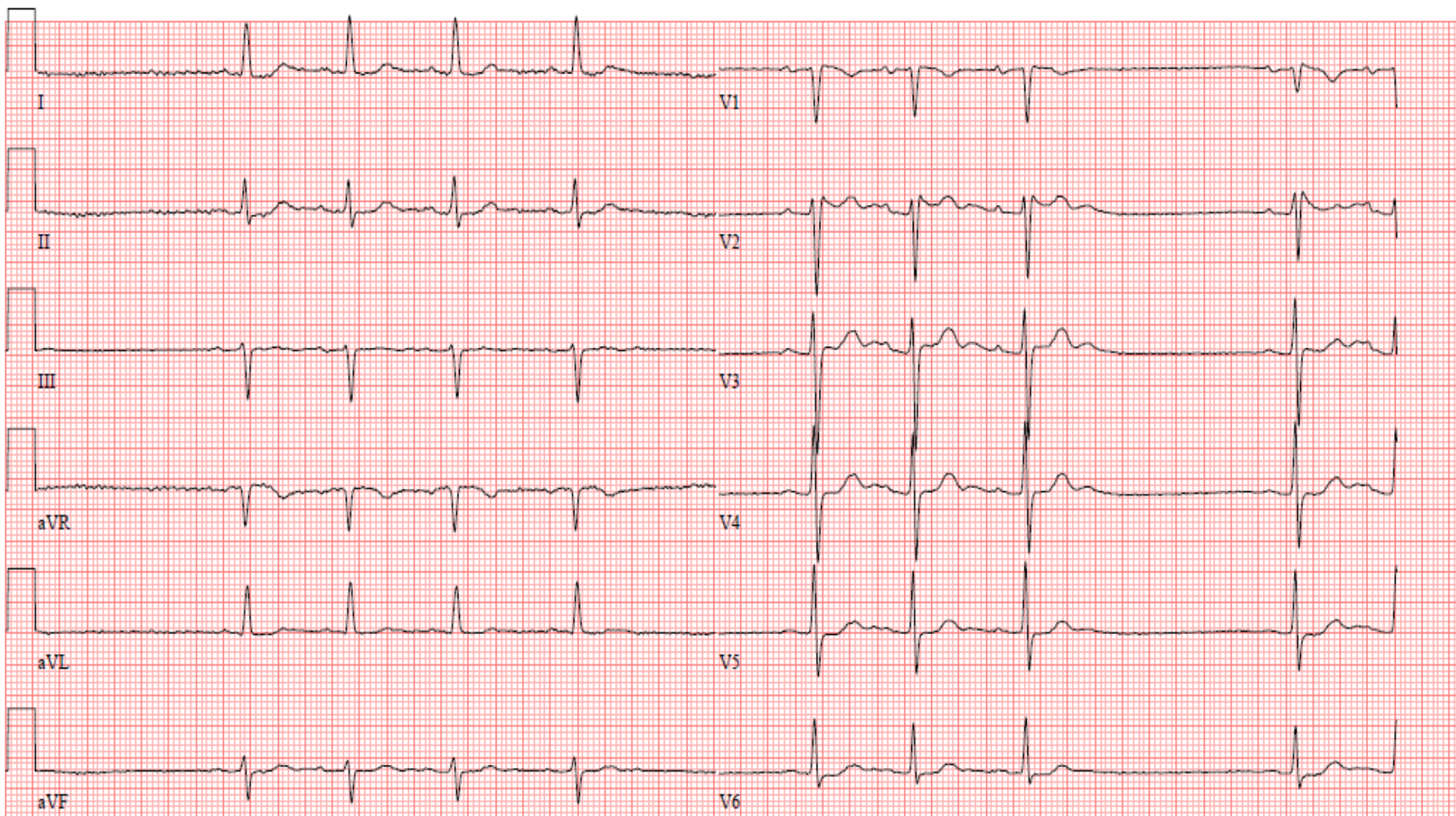
Troubles du rythme et de la conduction – BAV 2 Mobitz 2



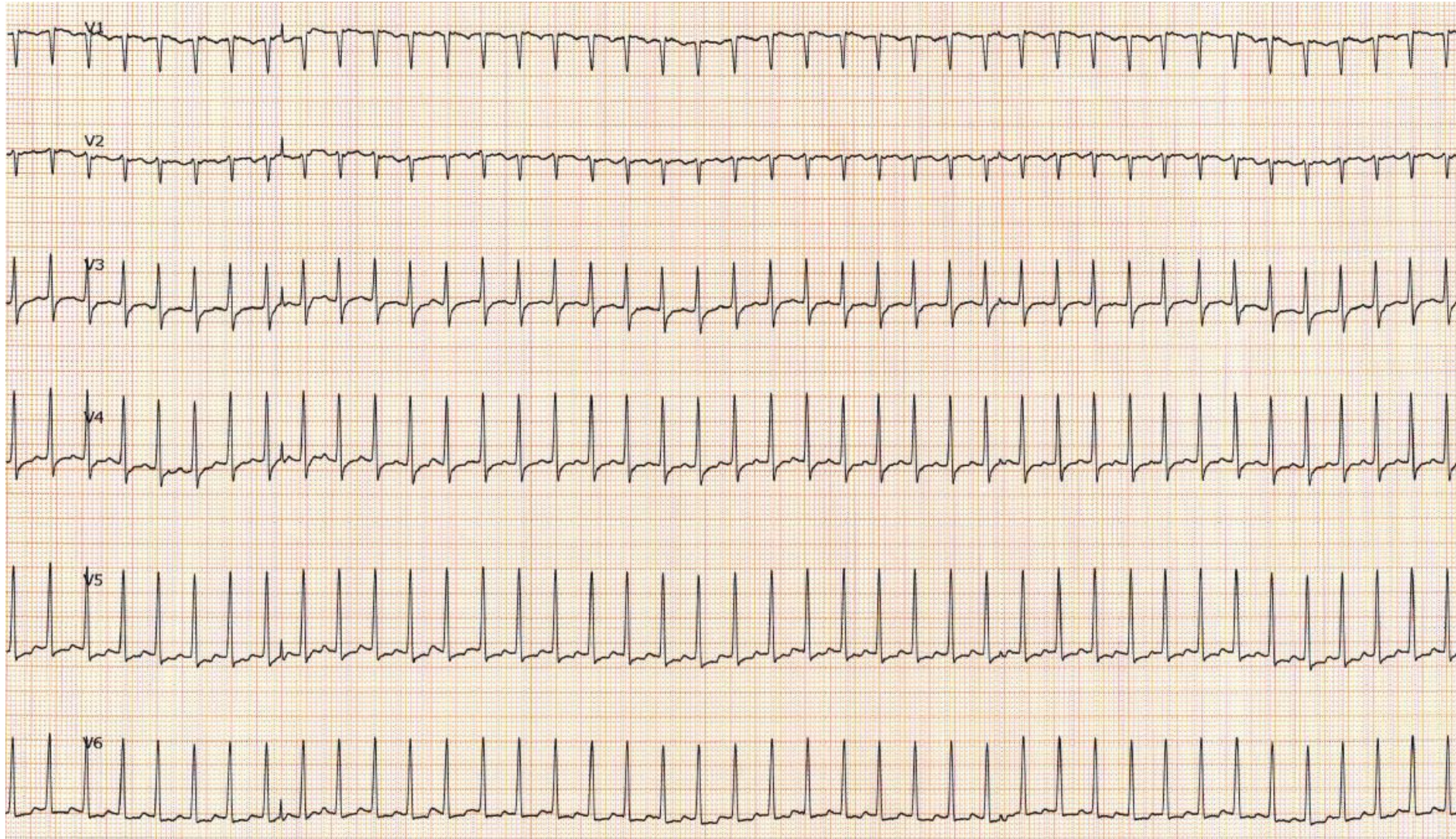
Bloc bi-fasciculaire (BBD + HBAG)



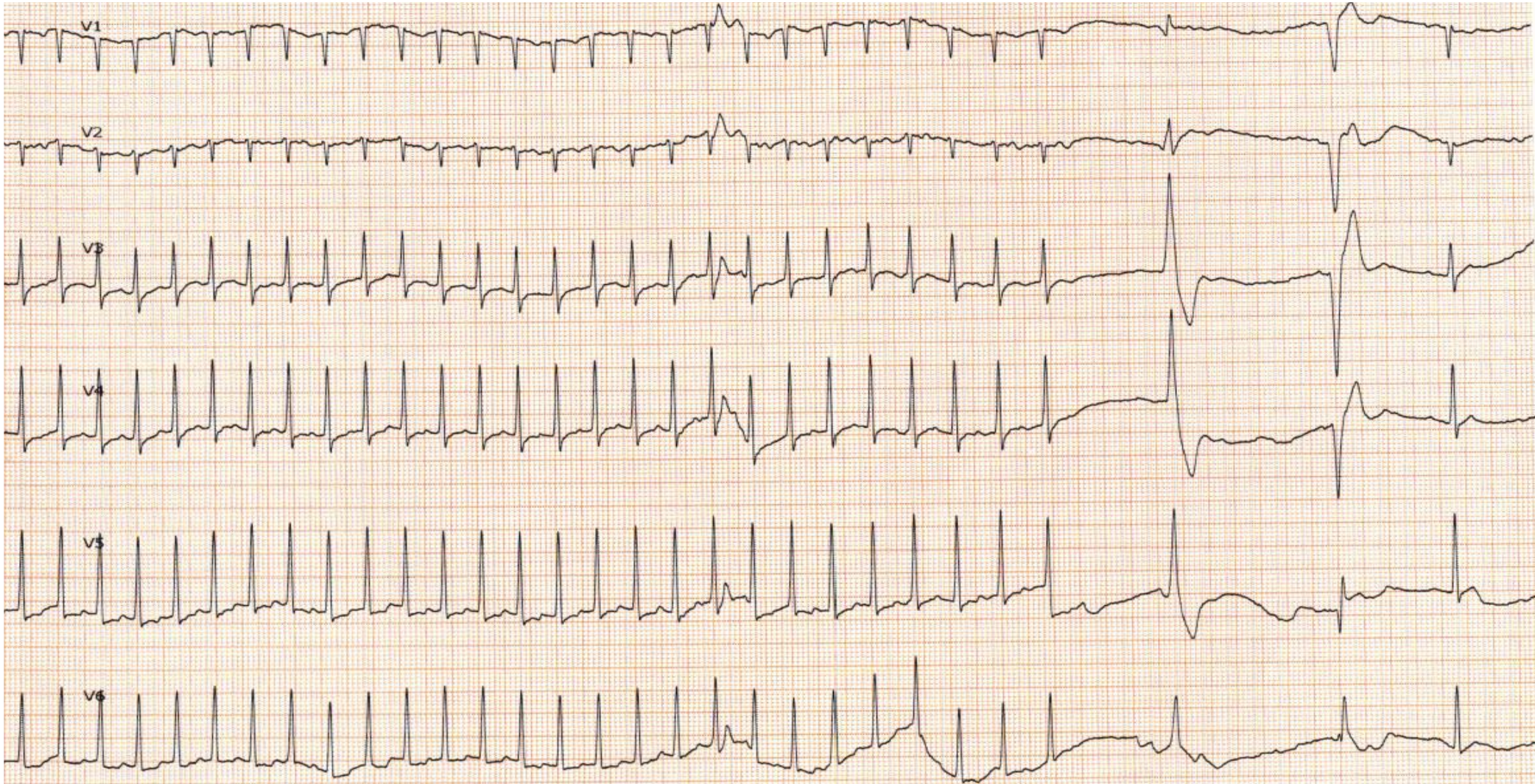
Dysfonction sinusale



Tachycardie jonctionnelle

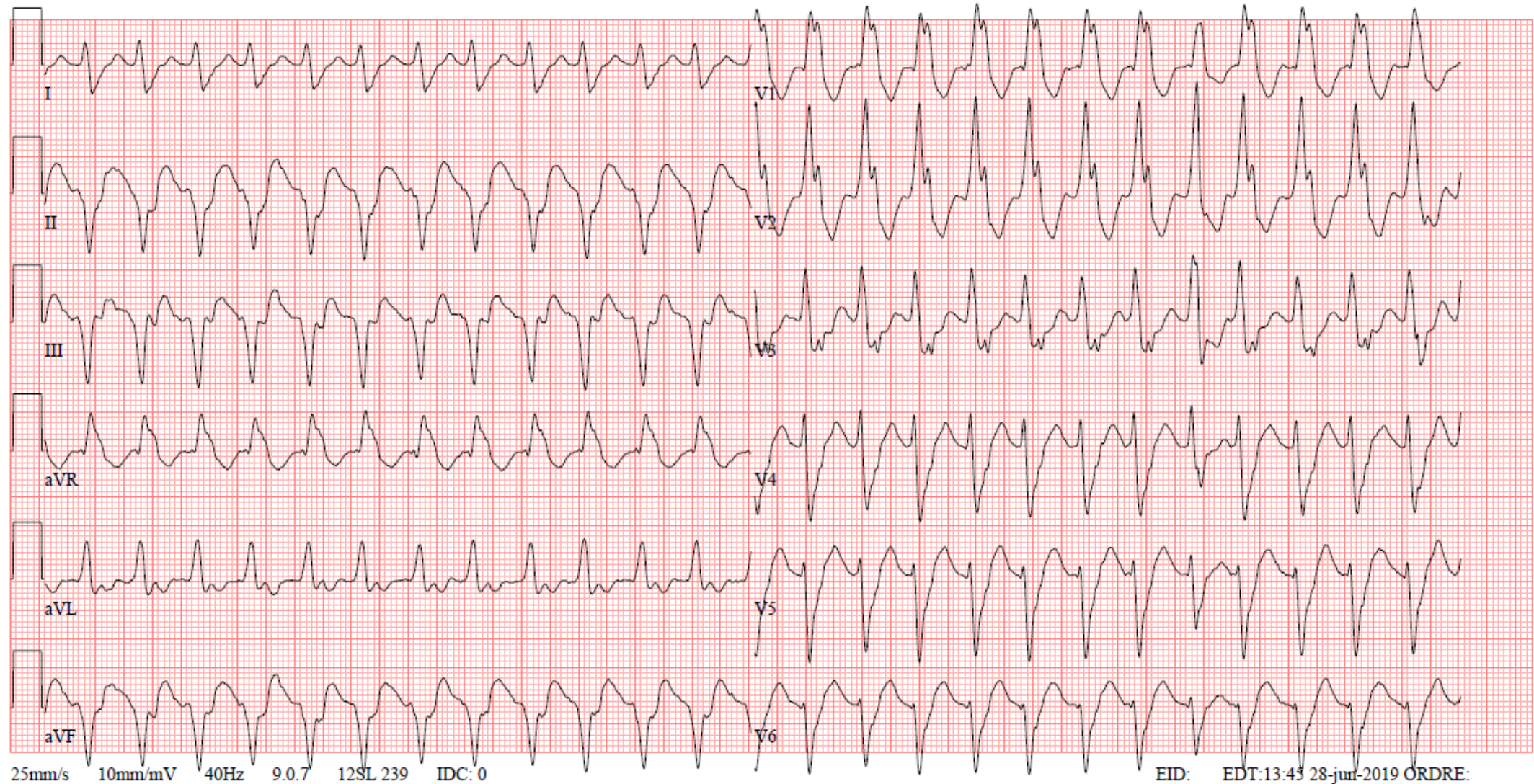


Tachycardie jonctionnelle - Striadyne



Contre-indication
de la Striadyne :
ASTHME

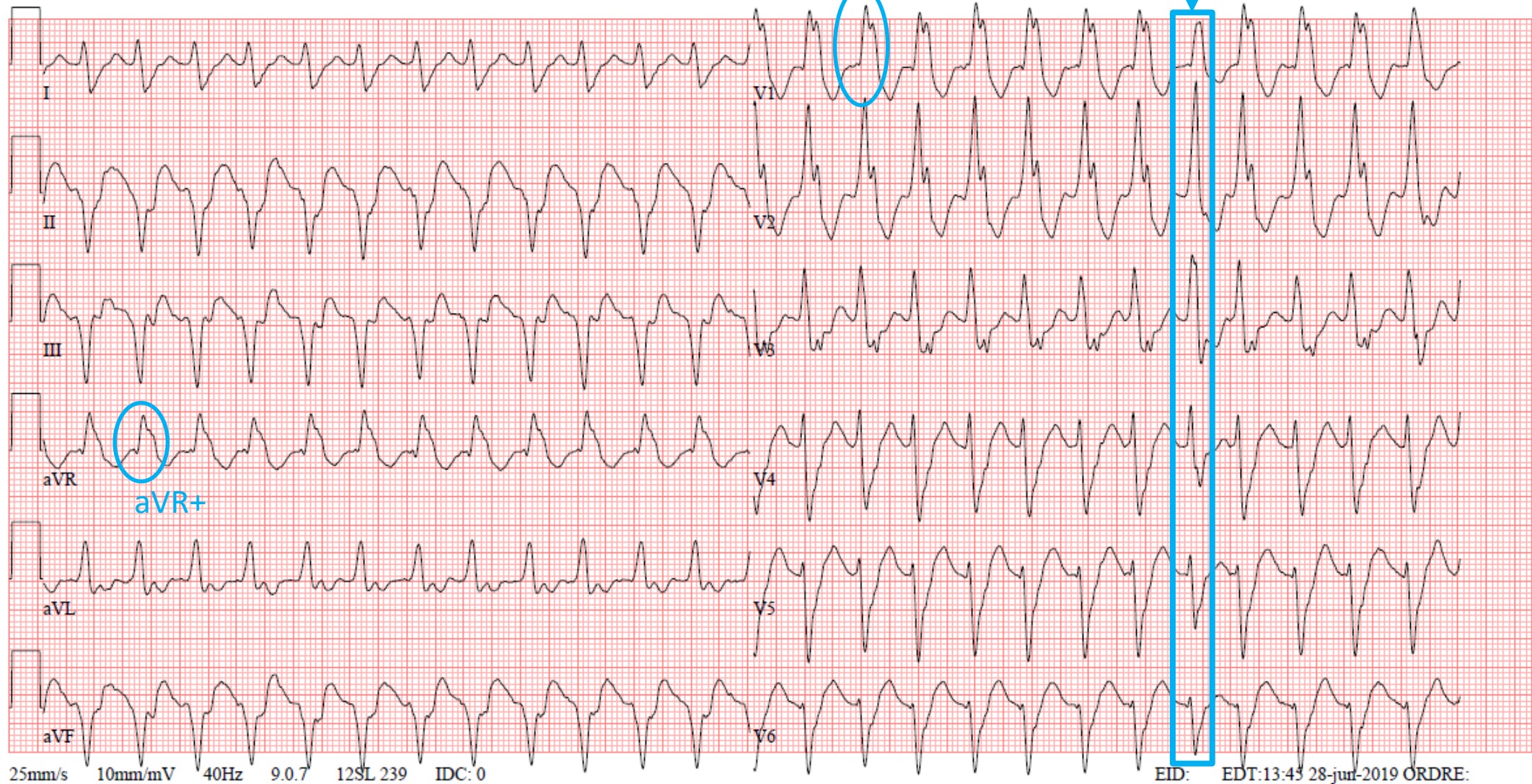
Tachycardie ventriculaire



Tachycardie ventriculaire

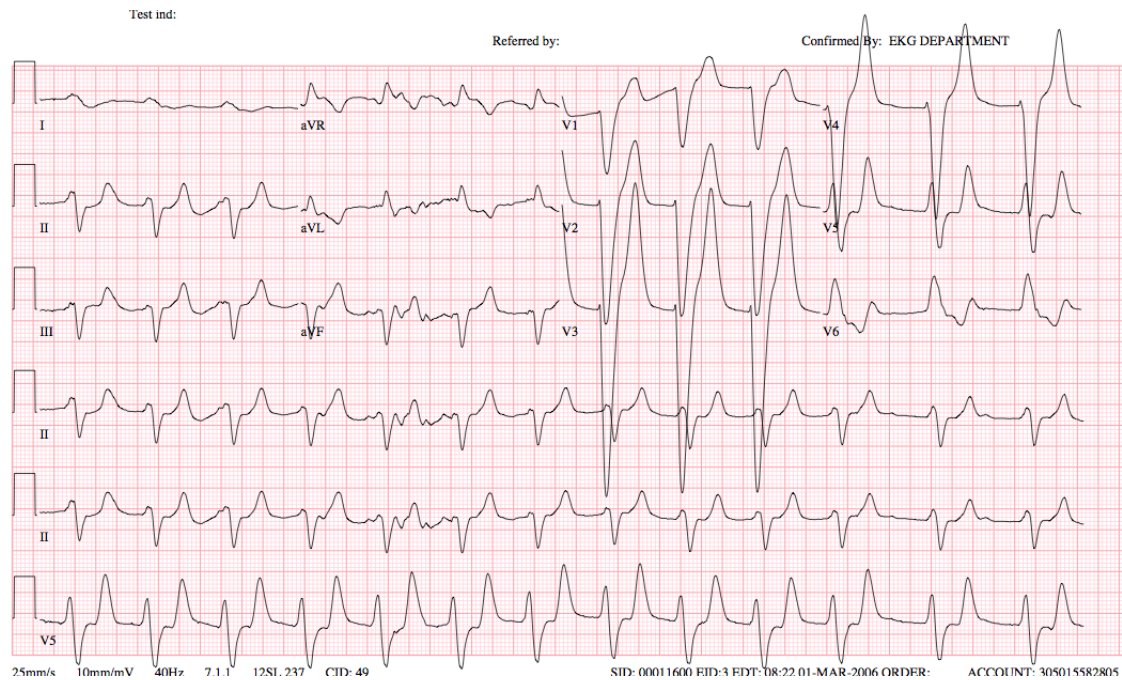
Signe des oreilles de lapin
 $R > R'$ (contrairement au BBD)

Complexe de fusion

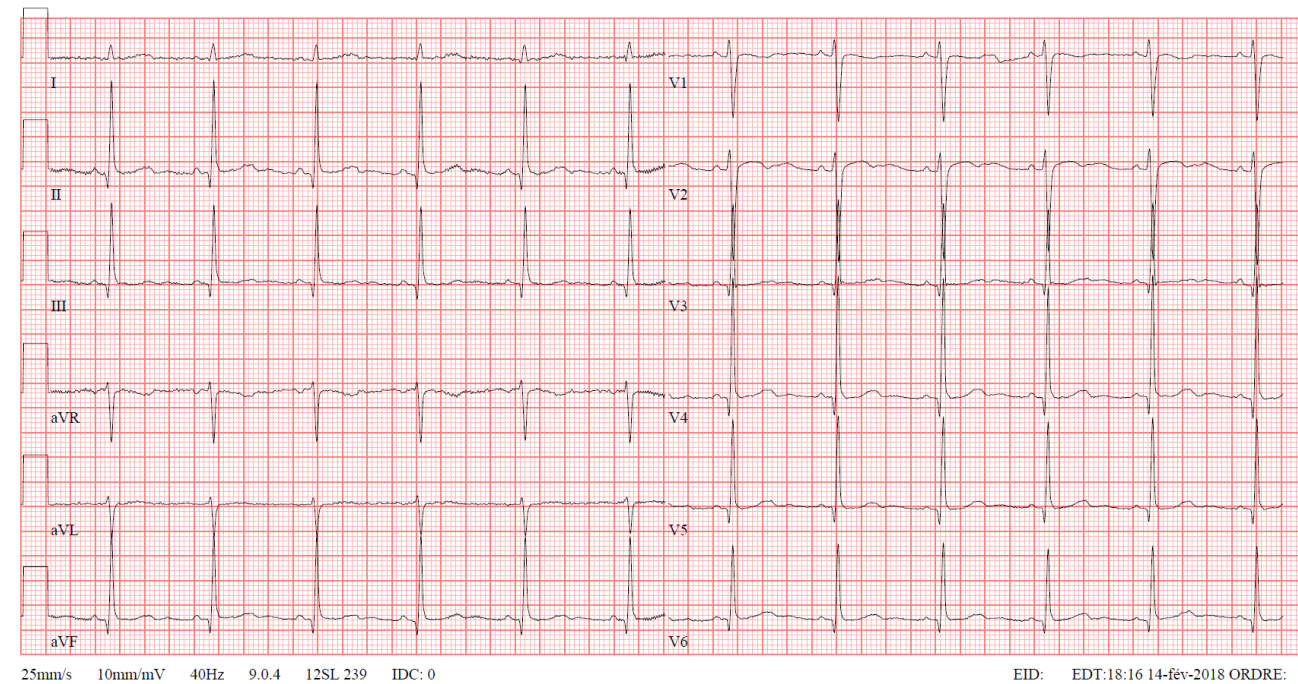


Troubles ioniques

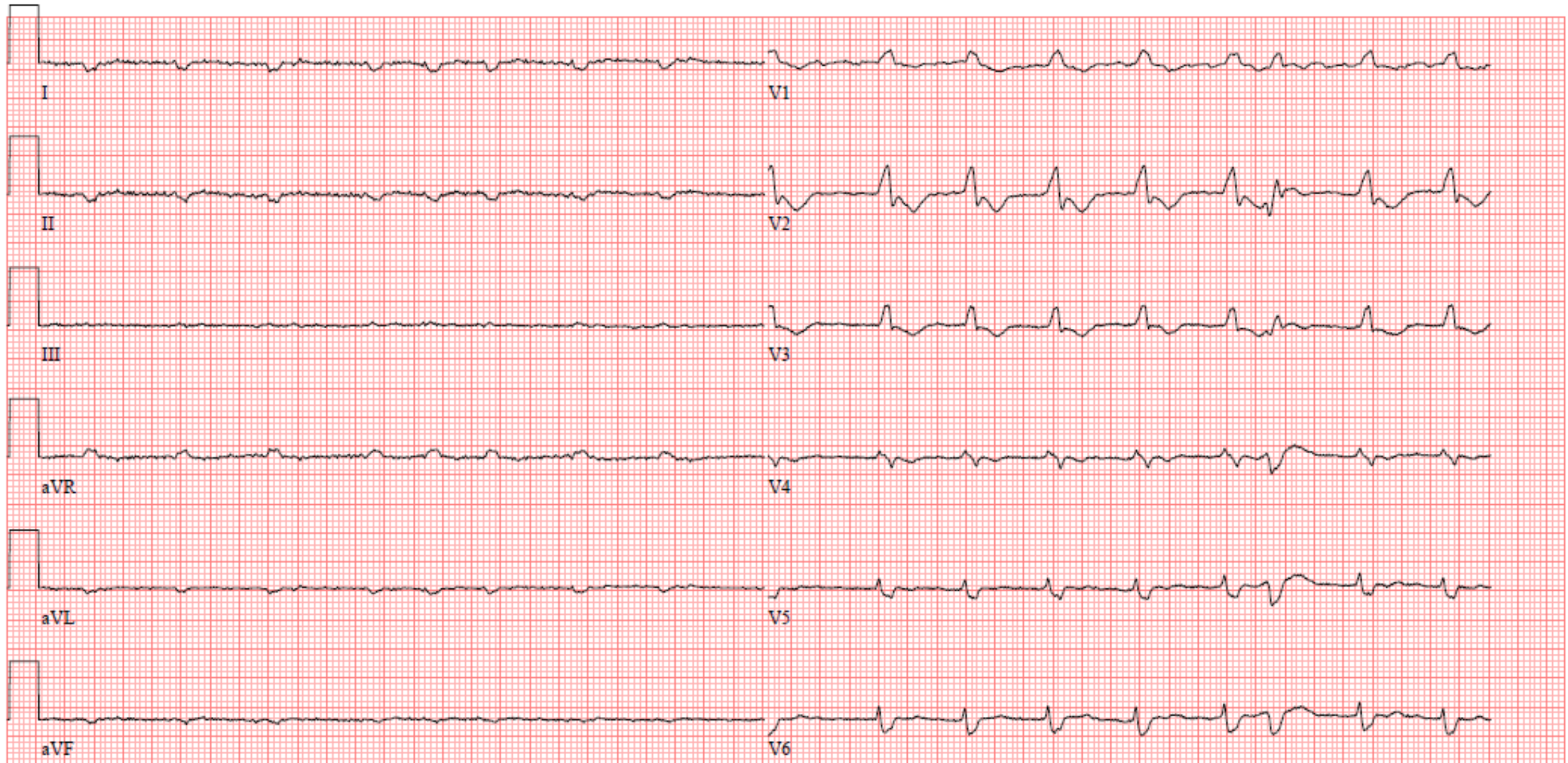
Hyperkaliémie menaçante



Hypokaliémie



Amylose cardiaque – Insuffisance cardiaque, HVG à l'ETT



Bon courage !!!

