

Atrial tachycardia



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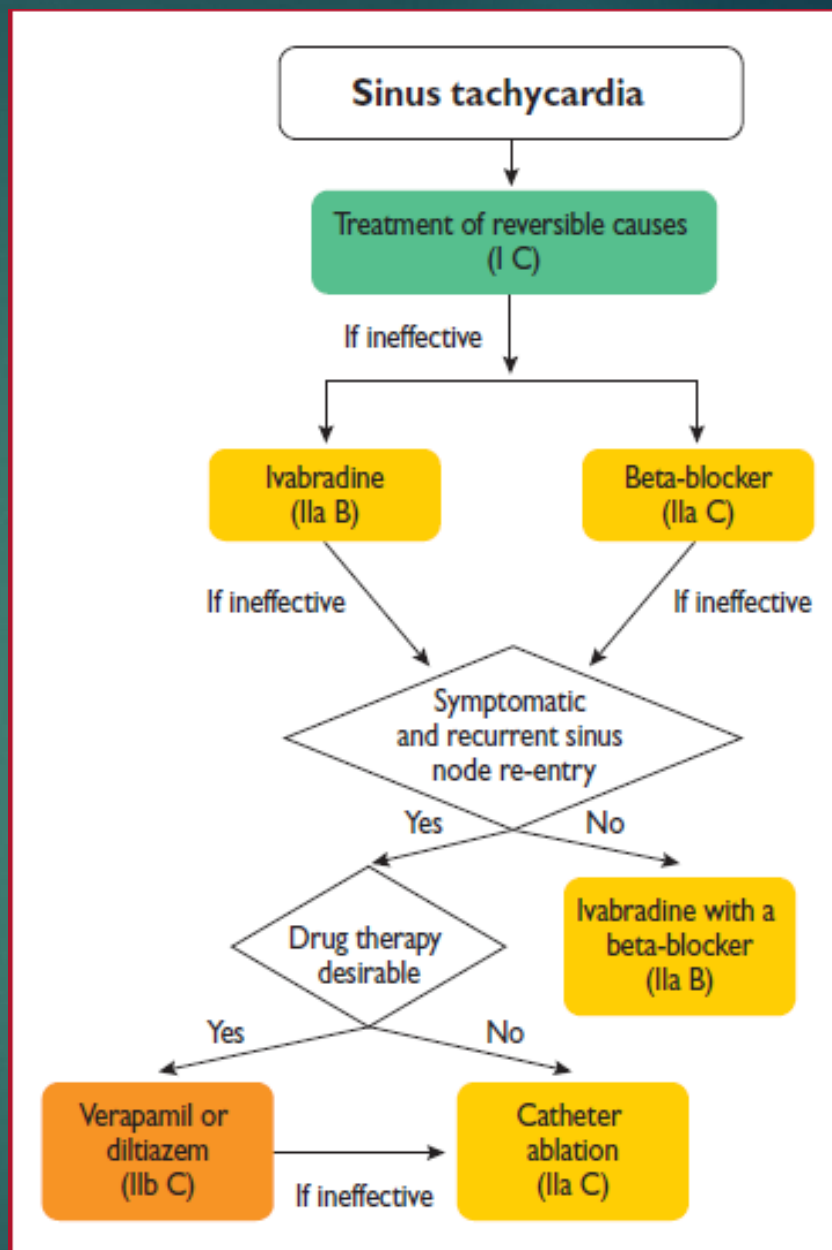
Atrial arrhythmia

- ▶ Sinus tachycardia
 - physiological
 - inappropriate
 - sinus nodal re-entrant tachycardia
 - postural orthostatic tachycardia syndrome
- ▶ Focal atrial tachycardia
- ▶ Multifocal atrial tachycardia
- ▶ Macro-re-entrant atrial tachycardias

Sinus tachycardia

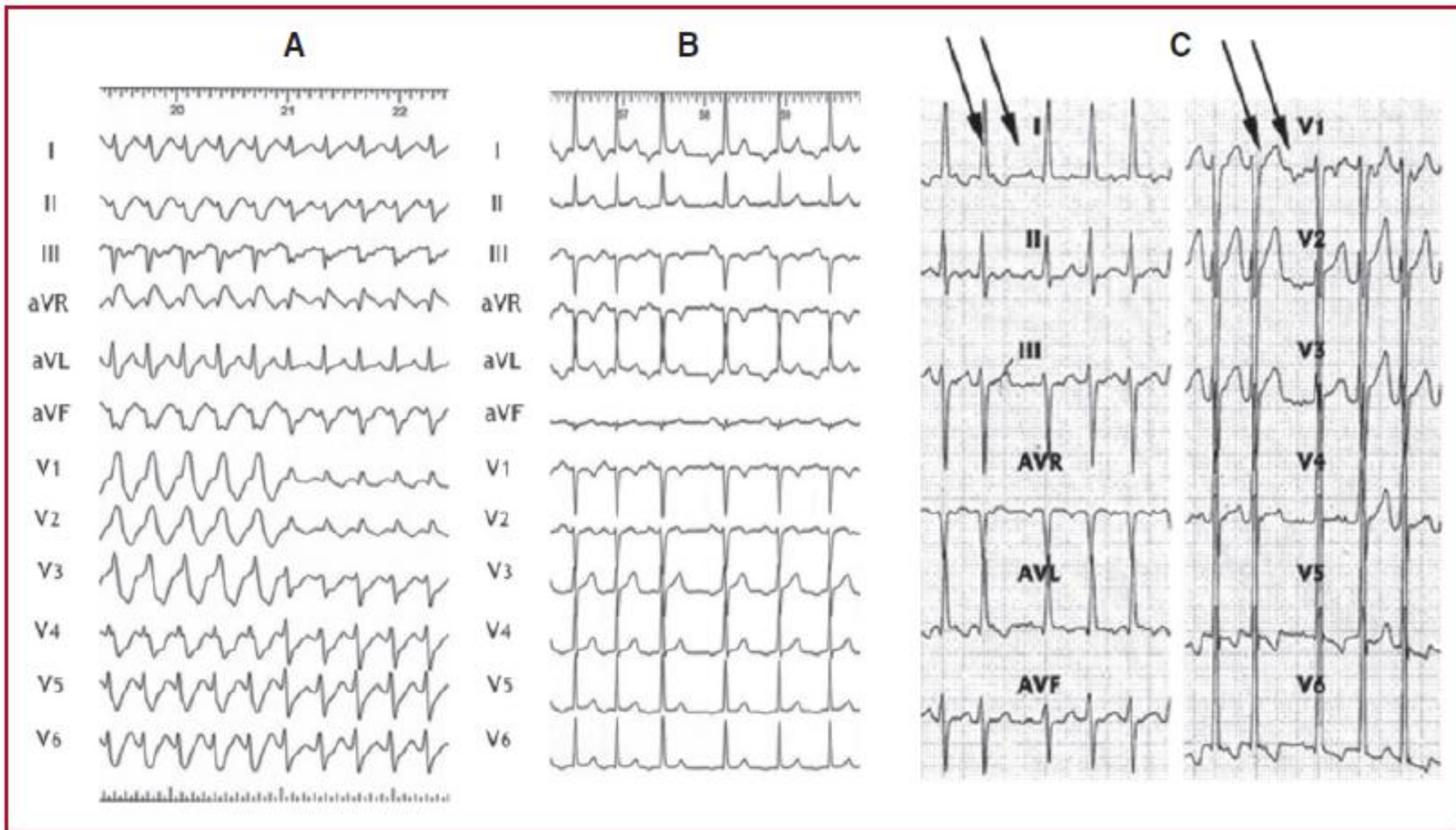
- ▶ - physiological
- ▶ -inappropriate
- ▶ Sinus node re-entrant tachycardia
- ▶ Postural orthostatic tachycardia syndrome

Recommendation	Class ^a	Level ^b
Inappropriate sinus tachycardia		
Evaluation and treatment of reversible causes is recommended. ^{139,144,162}	I	C
Ivabradine alone or in combination with a beta-blocker should be considered in symptomatic patients. ^{146–149,151,152}	IIa	B
Beta-blockers should be considered in symptomatic patients. ^{139,147}	IIa	C
Sinus nodal re-entrant tachycardia		
Non-dihydropyridine calcium channel blockers (verapamil or diltiazem) in the absence of HFrEF, may be considered in symptomatic patients. ¹⁶³	IIb	C
Catheter ablation should be considered in symptomatic patients who do not respond to drug therapy. ^{164–166}	IIa	C
Postural orthostatic tachycardia syndrome		
A regular and progressive exercise programme should be considered. ^{167–169}	IIa	B
The consumption of ≤ 2 –3 L of water and 10–12 g of sodium chloride daily may be considered. ^{170,171}	IIb	C



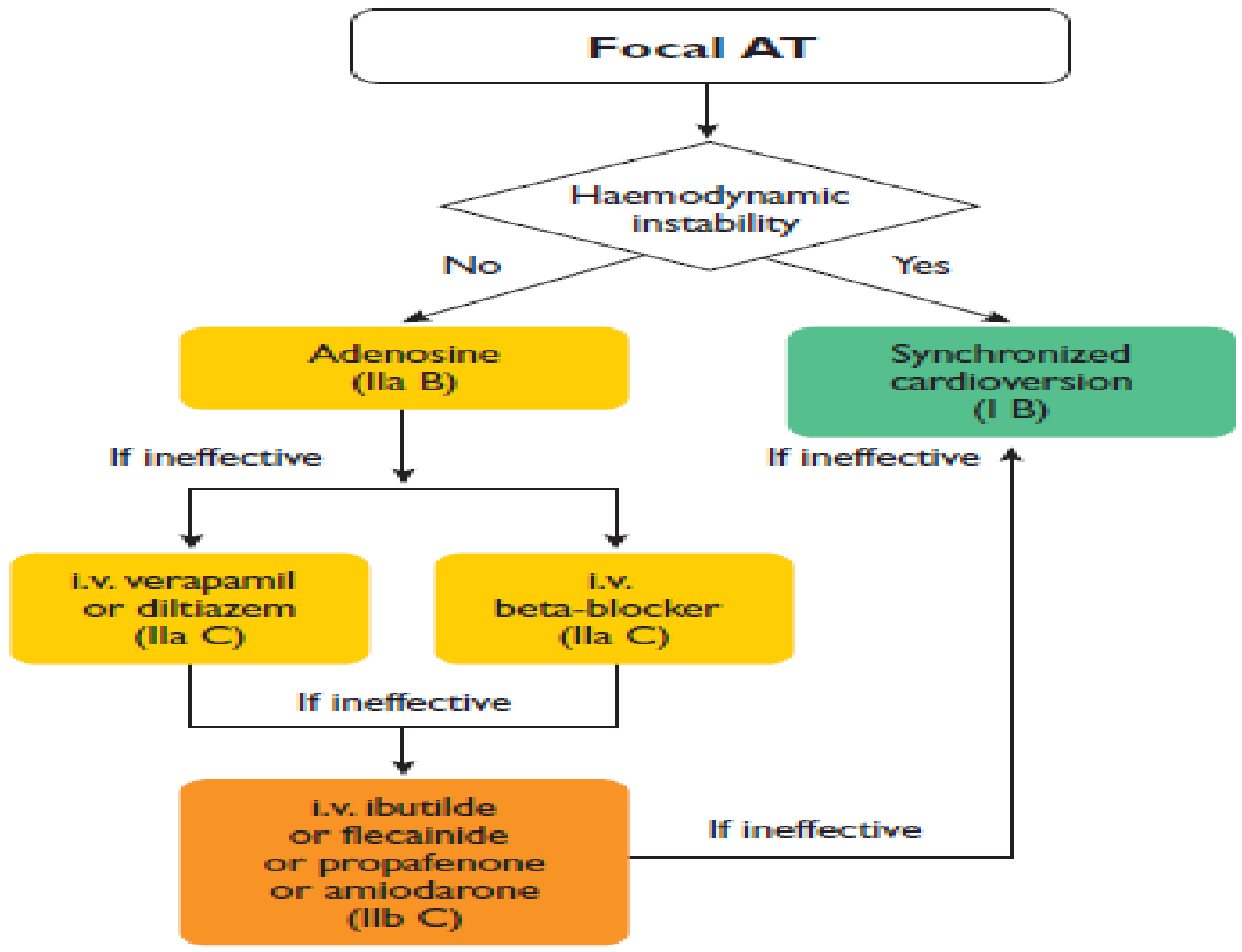
Focal atrial tachycardia

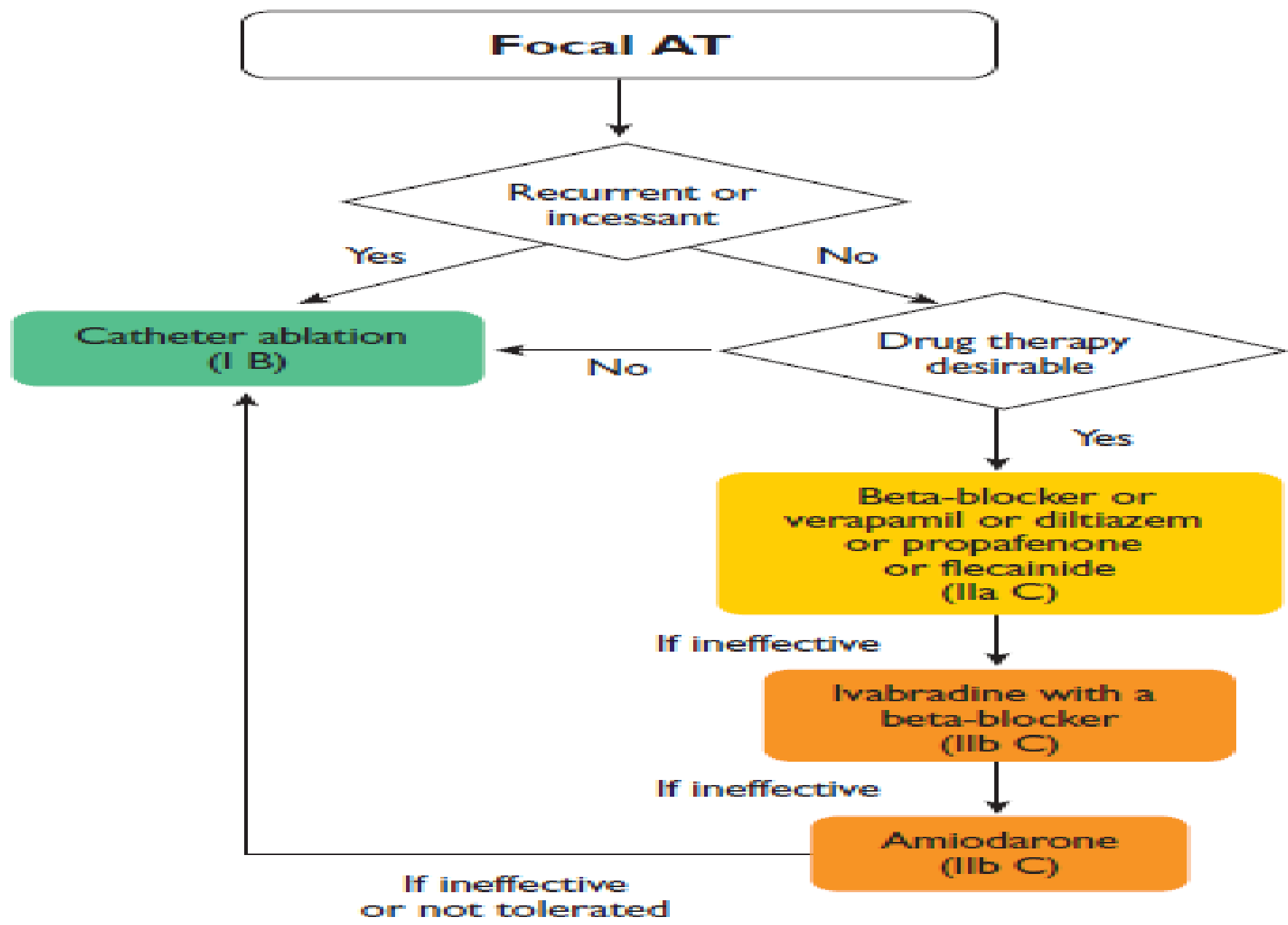
- is defined as an organized atrial rhythm more than 100 bpm initiated from a discrete origin and spreading over both atria in a centrifugal pattern . The ventricular rate varies depending on AV nodal conduction
- Depending on the AV conduction and AT rate, the P waves may be hidden in the QRS or T waves. The P waves are monomorphic with stable CL, which helps to rule out organized AF. Adenosine injection can help by slowing the ventricular rate or, less frequently, by terminating focal AT.



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Figure 7 Focal atrial tachycardia. (A) Focal atrial tachycardia originating at the lateral right atrium conducted initially with full and then incomplete right branch bundle block aberration. (B) Focal atrial tachycardia originating at the left atrium (left superior pulmonary vein). (C) Focal atrial tachycardia from the right atrial appendage. Atrioventricular dissociation during carotid sinus massage (P waves indicated by arrows).





Focal AT

Recurrent or incessant

Yes

No

Catheter ablation (I B)

No

Drug therapy desirable

Yes

Beta-blocker or verapamil or diltiazem or propafenone or flecainide (IIa C)

If ineffective

Ivabradine with a beta-blocker (IIb C)

If ineffective

Amiodarone (IIb C)

If ineffective or not tolerated

Multifocal atrial tachycardia (MAT)

is defined as a rapid, irregular rhythm with at least three distinct morphologies of P waves on the surface ECG. Multifocal AT is commonly associated with underlying conditions, including pulmonary disease, pulmonary hypertension, coronary disease, and valvular heart disease, as well as hypomagnesaemia and theophylline therapy.²⁰⁹ It may also be seen in healthy infants under 1 year of age, and carries a good prognosis in the absence of underlying cardiac disease.²¹⁰ It may be difficult to distinguish multifocal AT from AF on a single ECG trace, so a 12 lead ECG is indicated to confirm the diagnosis. On the ECG, the atrial rate is >100 bpm. Unlike AF, there is a distinct isoelectric period between visible P waves. The PP, PR, and RR intervals are variable. Although it is assumed that the variability of P-wave morphology implies a multifocal origin, there have been very few mapping studies of multifocal AT. Magnesium (i.v.) may also be helpful in patients, even in those with normal magnesium levels

Recommendations for the therapy of multifocal atrial tachycardia

Recommendation	Class ^a	Level ^b
Acute therapy		
Treatment of an underlying condition is recommended as a first step, if feasible. ²⁰⁹	I	C
i.v. beta-blockers, or i.v. non-dihydropyridine calcium channel blockers (verapamil or diltiazem) should be considered. ^{213,214}	IIa	B
Chronic therapy		
Oral verapamil or diltiazem should be considered for patients with recurrent symptomatic multifocal AT in the absence of HFrEF. ^{217,218}	IIa	B
A selective beta-blocker should be considered for patients with recurrent symptomatic multifocal AT. ^{214,219}	IIa	B
AV nodal ablation followed by pacing (preferable biventricular or His-bundle pacing) should be considered for patients with LV dysfunction due to recurrent multifocal AT refractory to drug therapy. ²¹⁶	IIa	C

Macro-re-entrant atrial tachycardia (MRAT)

It may be cavotricuspid isthmus (CTI) dependent or non-CTI dependent.

Typical atrial flutter is the most frequent CTI dependent flutter, i.e. a macro-re-entry circuit around the tricuspid annulus using the CTI as a critical passage at the inferior boundary.

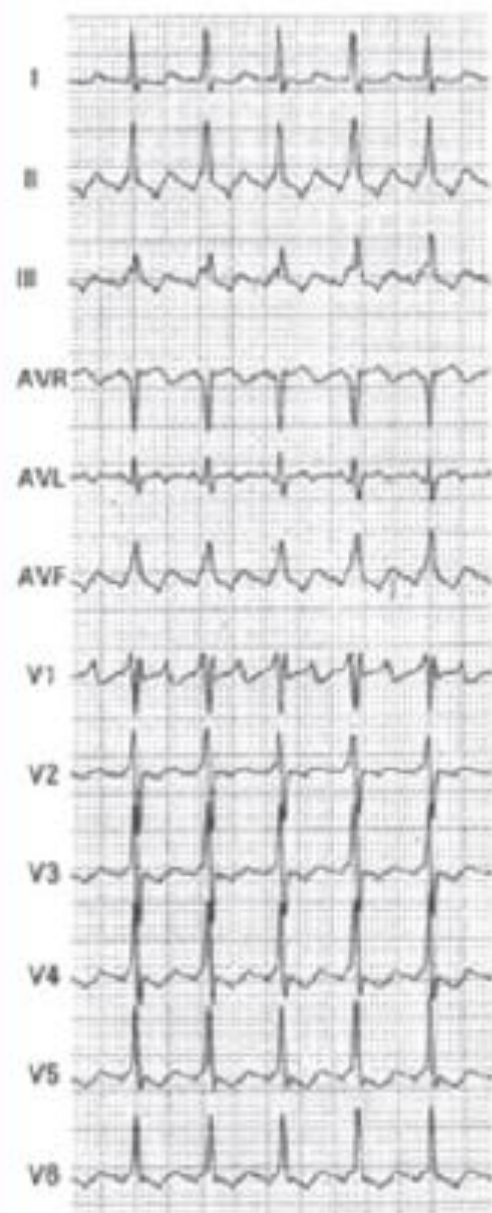
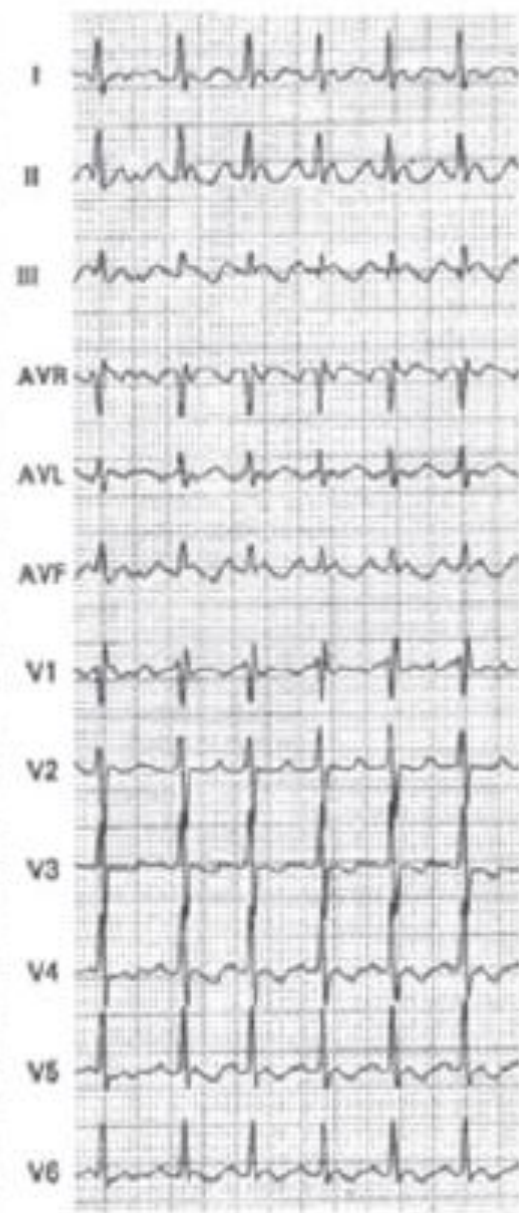
The activation is usually counterclockwise or anticlockwise resulting in the saw tooth ECG pattern (typical common flutter), or clockwise that results in a different ECG pattern (typical reverse flutter).

An atypical ECG pattern may not exclude CTI-dependent MRAT.

Other circuits using part of the CTI are in essence CTI dependent with a similar ECG appearance to typical common flutter.

Non-CTI dependent MRAT may occur either in the right atrium usually after surgery for congenital heart defects or in the left atrium usually after ablation procedures.

Progressive atrial degeneration or fibrosis may also be a cause.

A**B**

Recommendations for the therapy of macro-re-entrant atrial arrhythmias

Recommendations	Class ^a	Level ^b
Anticoagulation, as in AF, is recommended for patients with atrial flutter and concomitant AF. ⁴	I	B
Patients with atrial flutter without AF should be considered for anticoagulation, but the threshold for initiation has not been established. ^{241–247}	IIa	C
Acute therapy		
Haemodynamically unstable patients		
Synchronized DC cardioversion is recommended for haemodynamically unstable patients. ^{248,249}	I	B
Haemodynamically stable patients		
i.v. ibutilide or i.v. or oral (in-hospital) dofetilide are recommended for conversion to sinus rhythm. ^{250–257}	I	B
Low-energy (≤ 100 J biphasic) electrical cardioversion is recommended for conversion to sinus rhythm. ^{248,249}	I	B
High-rate atrial pacing is recommended for termination of atrial flutter in the presence of an implanted pacemaker or defibrillator. ^{258–260}	I	B
i.v. beta-blockers or non-dihydropyridine calcium channel blockers (verapamil or diltiazem) (i.v.), should be considered for control of rapid ventricular rate. ^{235–238}	IIa	B
Invasive and non-invasive high-rate atrial pacing may be considered for termination of atrial flutter. ^{258,261}	IIb	B
i.v. amiodarone may be tried if the above are not available or desirable. ^{239,240}	IIb	C
Propafenone and flecainide are not recommended for conversion to sinus rhythm. ²⁵⁰	III	B
Chronic therapy		
Catheter ablation should be considered after the first episode of symptomatic typical atrial flutter. ^{262,263}	IIa	B
Catheter ablation is recommended for symptomatic, recurrent episodes of CTI-dependent flutter. ^{262–264}	I	A
Catheter ablation in experienced centres is recommended for symptomatic, recurrent episodes of non-CTI-dependent flutter. ^{224,265–269}	I	B

Thank you