TREATMENT ATRIAL FLUTTER AND MACROREENTRANT ATRIAL TACHYCARDIAS

Initial management of atrial flutter is similar to that for atrial fibrillation, discussed in more detail below. Electrical cardioversion is warranted for hemodynamic instability or severe symptoms. Otherwise, rate control can be achieved with administration of AV nodal–blocking agents, but this is often more difficult than for atrial fibrillation. The risk of thromboembolic events is felt to be similar to that associated with atrial fibrillation. Anticoagulation is warranted prior to conversion for episodes more than 48 h in duration and chronically for patients at increased risk of thromboembolic stroke based on the CHA_2DS_2-VASc scoring system **(Table 276-6)**.

For a first episode of atrial flutter, conversion to sinus rhythm with no antiarrhythmic drug therapy is reasonable. For recurrent episodes, antiarrhythmic drug therapy with sotalol, dofetilide, disopyramide, and amiodarone may be considered, but more than 70% of patients experience recurrences. For recurrent episodes of common atrial flutter, catheter ablation of the cavotricuspid isthmus abolishes the arrhythmia in over 90% of patients with a low risk of complications that are largely related to vascular access and infrequent heart block. Approximately 50% of patients presenting with atrial flutter develop atrial fibrillation within the next 5 years.

MULTIFOCAL ATRIAL TACHYCARDIA

Multifocal AT (MAT) is characterized by at least three distinct P-wave morphologies with rates typically between 100 and 150 beats/min. Unlike atrial fibrillation, there are clear isoelectric intervals between P waves **(Fig. 276-11)**. The mechanism is likely triggered automaticity from multiple atrial foci. It is usually encountered in patients with chronic pulmonary disease and acute illness.

TREATMENT MULTIFOCAL ATRIAL TACHYCARDIA

Therapy for MAT is directed at treating the underlying disease and correcting any metabolic abnormalities. Electrical cardioversion has no effect. The calcium channel blockers verapamil or diltiazem may slow the atrial and ventricular rate. Patients with severe pulmonary disease often do not tolerate beta blocker therapy. MAT may respond to amiodarone, but long-term therapy with this agent is usually avoided due to its toxicities, particularly pulmonary fibrosis.

ATRIAL FIBRILLATION

Atrial fibrillation (AF) is characterized by disorganized, rapid, and irregular atrial activation with loss of atrial contraction and with an irregular ventricular rate that is determined by AV nodal conduction **(Fig. 276-12)**. In an untreated patient, the ventricular rate also tends

TABLE 276-6 CHA_2DS_2-VASc RISK ASSESSMENT AND ORAL ANTICOAGULANTS

Risk Factors	Points	CHA_2DS_2-VASc Score	Estimated Annual Stroke Rate[a]
C – congestive heart failure	1	0	0
H – hypertension	1	1	1.3%
A – age ≥75 y	2	2	2.2%
D – diabetes mellitus	1	3	3.2%
S – stroke or TIA, embolus	2	4	4.0%
V – vascular disease	1	5	6.7%
A – age 65–75 y	1	6–9	>9%
Sex – female	1		

Anticoagulants	Mechanism	Excretion	Dosing Considerations	Risk/Benefit
Warfarin	Vitamin K antagonist	Liver	Adjusted to INR 2–3 Days to therapeutic effect Multiple drug/food interactions (e.g., amiodarone)	Major hemorrhage: 1% per year Intracranial hemorrhage: 0.1–0.6% per year Risk of bleeding increases with INR >3.5 Inexpensive
Dabigatran[b]	Thrombin inhibitor	Kidney CCr >30 mL/min CCr 15–30 mL/min	150 mg bid 75 mg bid P-glycoprotein substrate (inducers – rifampin, reduce concentration) (inhibitors – amiodarone, verapamil, dronedarone, quinidine), Proton pump inhibitors may reduce absorption	Onset of action within hours No reversal agent for bleeding
Rivaroxaban	Xa inhibitor	Kidney CCr ≥50 mL/min CCr 15–50 mL/min	P-glycoprotein substrate 20 mg daily 15 mg daily	No reversal agent for bleeding
Apixaban	Xa inhibitor	Kidney and liver Cr >1.5 mg/dL	P-glycoprotein substrate 2.5 mg bid	No reversal agent for bleeding

[a]Modified from GY Lip et al: Lancet 379:648, 2012. [b]U.S. Food and Drug Administration recommended dosing; other regimens are available outside the United States.

Abbreviations: CCr, creatinine clearance; Cr, creatinine; INR, international normalized ratio; TIA, transient ischemic attack.