overcomes many of the limitations of intermittent monitoring in assessing arrhythmia recurrence and offers the opportunity to determine the most accurate estimate of AF ablation outcomes.[1086–1088] In those patients in whom the decision is made to continue long-term anticoagulation regardless of ablation outcome, the cost and effort of continuous rhythm monitoring is likely not warranted.

9.4.2. Intermittent postablation rhythm monitoring

Intermittent rhythm monitoring includes standard 12-lead ECGs, ambulatory patch or electrode ECG monitors, transtelephonic monitoring systems, and patient and automatically activated external recorders.[1089,1090] The wide availability of direct-to-consumer mobile health devices for heart rate and rhythm assessment equipped with either ECG-based or photoplythesmography-based technology has increased the availability of rhythm monitoring options in the postablation setting.[1091,1092] In a study conducted after AF ablation, a smartphone-based single-lead system was compared with transtelephonic monitor ECGs with 100% sensitivity and 97% specificity in detecting AF or AFl.[1090] A pilot randomized study demonstrated that the use of a self-monitoring strategy with an ECG-based hand-held device for rhythm assessment in patients after AF ablation resulted in a similar rate of AF detection and less requirement for additional ECG monitoring when compared with the standard-of-care follow-up practice.[1093] Furthermore, long-term intermittent monitoring with an ECG-based hand-held device was shown to be significantly more effective in detecting AF recurrences after AF ablation when compared with short, continuous (Holter) heart rhythm monitoring.[1094] The potential of integrating similar monitoring paradigms in the postablation care of AF patients is being evaluated in a multicenter international project.[1095]

Intermittent monitoring is limited by reduced sensitivity in detecting sporadic arrhythmias, resulting in underdetection of recurrences, which inflates estimates of arrhythmia-free survival. Such misclassification errors likely affect the accuracy and precision of comparative risk estimates. In a secondary analysis of the CIRCA-DOSE trial enrolling paroxysmal AF patients undergoing catheter ablation, the sensitivity for detecting postablation arrhythmia recurrences was shown to increase with the intensity of intermittent rhythm monitoring.[7] Commonly employed intermittent monitoring protocols (three short-duration 24 and 48 h ambulatory Holter ECG monitors) failed to detect a considerable proportion of recurrences (sensitivity 15.8 and 24.5%, respectively) and demonstrated poor agreement with the true AF burden.[7] Based on computational simulation, an intermittent postablation monitoring with a minimum cumulative duration of 28 days on an annual basis, using serial longer term (7-day and 14-day) ambulatory ECG devices, provides a reasonable arrhythmia detection (sensitivity nearly 60%) and quantification of AF burden (nearly 80% agreement) when compared with the gold standard of continuous monitoring with ICM.[7] In a recent systematic review, intermittent monitoring was associated with detection of significantly less atrial arrhythmia recurrences than continuous monitoring in paroxysmal AF, but not in persistent AF or paroxysmal-persistent combined arms.[1096]

9.4.3. Practical considerations on postablation rhythm monitoring

The suggested pattern and intensity of postablation rhythm monitoring should be tailored based on whether patient management is part of routine clinical care or part of a clinical research trial. Monitoring strategies implemented during routine clinical care may be less strict and standardized than in clinical trials, since documentation of asymptomatic arrhythmia recurrences in everyday practice does not affect decision-making in postablation management except in patients where discontinuation of anticoagulation is considered or in the presence of impaired ventricular function (*Section 9.3.1.3.*). In this context, as part of routine clinical care, rhythm status should be assessed during regular follow-up within 2–3 months after ablation with a minimum standard of a 12-lead ECG. In the absence of symptoms, all patients should be evaluated on an annual basis thereafter with a 12-lead ECG in every follow-up visit (*Section 9.6.*). In case of arrhythmia symptoms, some type of intermittent rhythm monitoring is suggested. Intensity and type of monitoring should be individualized based on symptom severity, frequency, availability of monitoring tools, associated cost, and patient preferences.

In the clinical trial setting, it is evident that continuous invasive monitoring represents the gold standard of postablation monitoring and intermittent monitoring of prolonged duration with longer term ambulatory ECG devices stands as best alternative.[7] However, their standardized employment in clinical trials would increase substantially the cost of trial conduction and would prevent consistency in trial reporting and comparisons with historical controls. In addition, the availability of longer term ambulatory ECG devices is limited in several practices thus impairing widespread implementation of prolonged duration monitoring regimens. Furthermore, prolonged duration intermittent rhythm monitoring can be burdensome for patients and may result in reduced compliance.

Based on the above considerations, the writing group suggests that, in the clinical trial setting and in the absence of invasive monitoring, a minimum of 24-hour continuous Holter type monitor should be considered every 3 months for the first year following catheter ablation, preferably in combination with symptom-based monitoring. Where available, longer duration recordings with 7-day or 14-day continuous monitoring are preferable.

9.5.1. Incidence and pathophysiology of early recurrence after atrial fibrillation ablation

Recurrences of atrial tachyarrhythmia (AF or AFl or AT) may occur in the initial weeks to months after catheter ablation,