

# Patterns of atrial fibrillation recurrence in patients undergoing catheter ablation for persistent atrial fibrillation

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## Background

Atrial fibrillation (AF) is the most common sustained arrhythmia, and is associated with significant morbidity and mortality<sup>1,2</sup>. Catheter ablation is the most efficacious tool for the management of AF, and is superior to medical therapy in maintaining sinus rhythm and improving quality of life. <sup>1, 3,4,5</sup> In recent years with refinements in techniques and ablation tools, procedure duration and complication rates have significantly declined<sup>6</sup>, however recurrence following ablation remains a challenge, particularly in those with persistent AF.

## Aims

To describe the pattern of AF recurrence seen following catheter ablation for persistent AF (PsAF), and to assess how pattern of recurrence influences healthcare utilisation and quality of life.

## Results

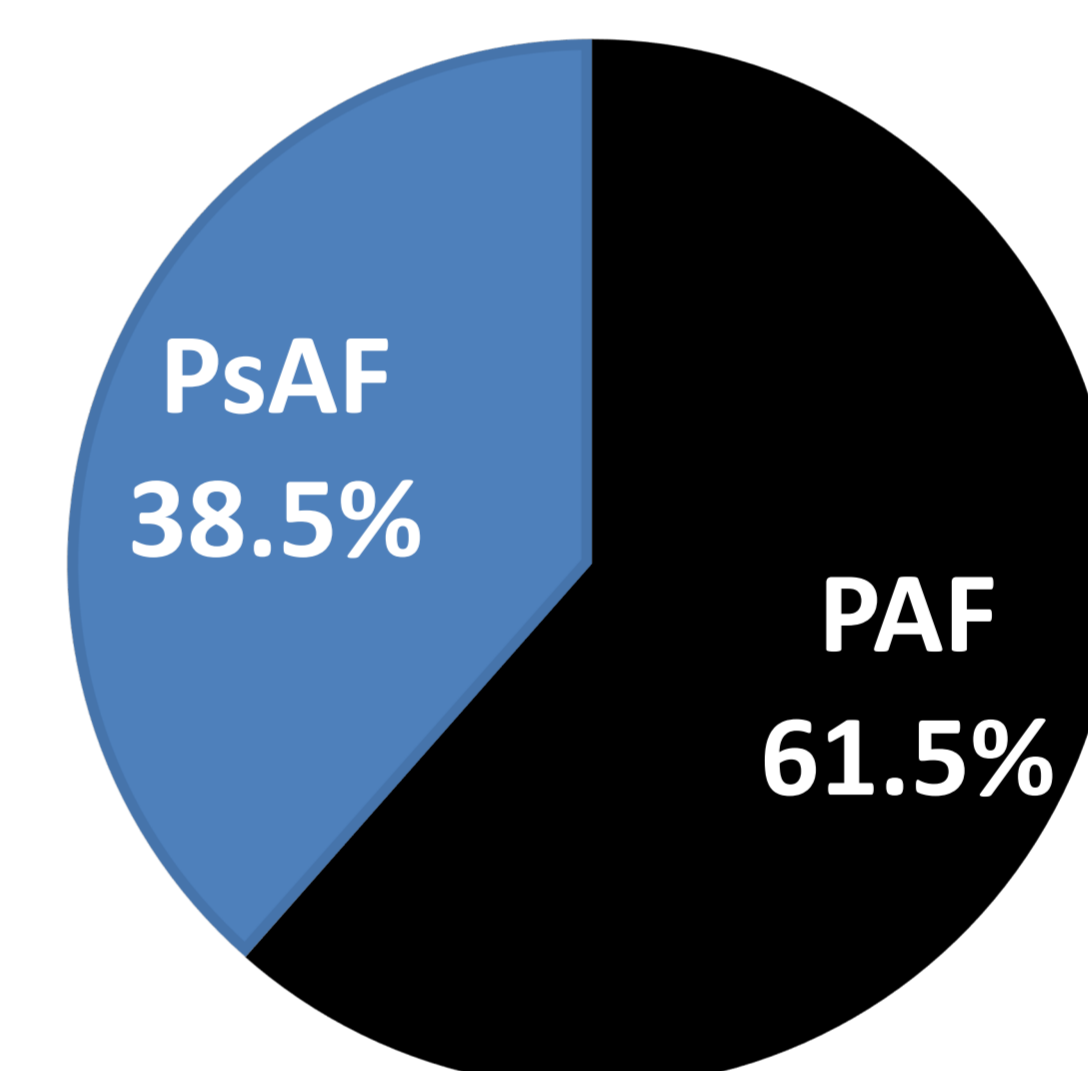
327 patients were included in this analysis (excluded patients: 1 did not undergo ablation, 6 recurrence pattern unknown, 4 did not have recurrence, but remained on antiarrhythmic drugs (ADD) post blanking period). 148 (45.3%) (median age 67.4, 27% female) experienced an AF recurrence. Pattern of recurrence was paroxysmal (PAF) in 91(61.5%) and persistent in 57(38.5%). Recurrence type did not differ between randomisation groups ( $p=0.668$ ). Median AF burden was 20.7% in PsAF recurrence and 0.74% in those with PAF recurrence ( $p<0.001$ ). History of longstanding PsAF( $p=0.006$ ) and heart failure ( $p=0.004$ ) were associated with higher rates of PsAF recurrence. Those with PsAF recurrence had lower baseline left ventricular ejection fraction (50% vs 60%  $p<0.001$ ) and larger left atrial indexed volume (PsAF  $54.2\text{ml}/\text{m}^2\pm 19.3$  vs PAF  $44.7\text{ml}/\text{m}^2\pm 11.8$ ,  $p=0.008$ ) compared to those with PAF. On multivariate analysis only left ventricular ejection fraction remained significant ( $p=0.02$ ).

Recurrent PsAF was associated with higher rates of hospitalisation (73.7% vs 40.7%  $p<0.001$ ), cardioversion (64.9% vs 17.8%  $p<0.001$ ), ADD use (75.4% vs 40.7%  $p<0.001$ ) and repeat ablation (29.8% vs 16.5%  $p=0.055$ ). Quality of life as assessed by AFEQT questionnaire improved in both groups, however the improvement from baseline to 12 months was greater in those with PAF recurrence than PsAF ( $\Delta 13.3\pm 22.7$  vs  $\Delta 23.1\pm 25$ ,  $p=0.024$ ).

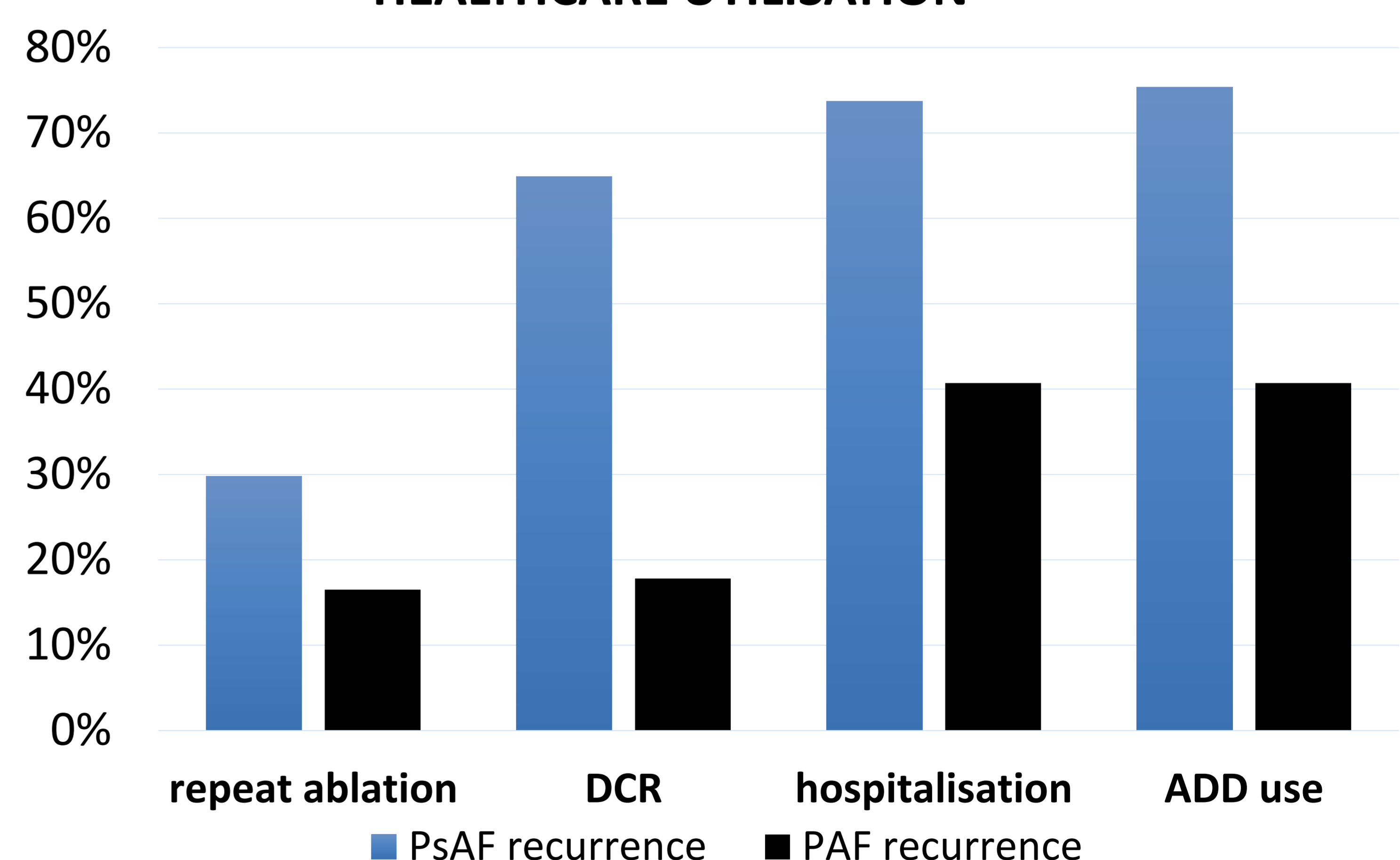
## Methods

CAPLA was an international multi-centre study that randomised 338 patients with symptomatic PsAF to pulmonary vein isolation (PVI) with or without posterior wall isolation (PWI). Patients underwent twice daily single lead ECG, or implantable device monitoring for a minimum follow-up of 12 months. All outcomes were assessed after a three-month blanking period post ablation.

### RECURRENCE PATTERN



### HEALTHCARE UTILISATION



## Conclusion

AF recurrence is more often paroxysmal after catheter ablation for PsAF, irrespective of ablation strategy. PsAF recurrence was more common in those with a history of longstanding persistent AF, heart failure, larger left atrial size and reduced ejection fraction. PsAF recurrence compared to PAF recurrence resulted in higher AF burden and increased healthcare utilisation.

## References

1. Calkins H, Hindricks G, Cappato R, et al. 2017 HRS/EHRA/ECAS/APHS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation. Heart Rhythm. 2017;14(10):e275-e444. doi:10.1016/j.hrthm.2017.05.012; 2. Kirchhof P, Benussi S, Kotecha D, et al. 2016 ESC guidelines for the management of atrial fibrillation developed in collaboration with EACTS. Europace. 2016;18(11):1609-1678. doi:10.1093/europace/euw295; 3. Packer, Douglas L., et al. "Effect of catheter ablation vs antiarrhythmic drug therapy on mortality, stroke, bleeding, and cardiac arrest among patients with atrial fibrillation: the CABANA randomized clinical trial." Jama 321.13 (2019): 1261-1274; 4. Mark, Daniel B., et al. "Effect of catheter ablation vs medical therapy on quality of life among patients with atrial fibrillation: the CABANA randomized clinical trial." Jama 321.13 (2019): 1275-1285; 5. Kistler PM, Chieng D. Persistent atrial fibrillation in the setting of pulmonary vein isolation—where to next? J Cardiovasc Electrophysiol. 2020;31(7):1857-1860. doi:10.1111/jce.14298; 6. Benali, Karim, et al. "Procedure-related complications of catheter ablation for atrial fibrillation." Journal of the American College of Cardiology 81.21 (2023): 2089-2099.