# Asymptomatic Wolff-Parkinson-White Syndrome
## Who Should Be Treated?

Manoj N. Obeyesekere, MBBS, Peter Leong-Sit, MD, MSc*,
Andrew D. Krahn, MD, Lorne J. Gula, MD, MSc,
Raymond Yee, MD, Allan C. Skanes, MD,
George J. Klein, MD

**KEYWORDS**

• Asymptomatic • Wolff-Parkinson-White • Electrophysiologic study • Ablation • Accessory pathway • Preexcitation

**KEY POINTS**

- Risk of sudden death as first presentation in truly asymptomatic patients with Wolff-Parkinson-White (WPW) is small.
- Risks associated with routine electrophysiologic study (EPS) and ablation is likely to offset the small benefits on a population level.
- Although it is reasonable to discuss EPS and ablation with the asymptomatic patient with WPW, the evidence suggests that it should not necessarily be advocated.

## INTRODUCTION

Recent studies evaluating invasive electrophysiologic study (EPS)-guided risk stratification of asymptomatic patients with Wolff-Parkinson-White (WPW) ECG pattern followed by prophylactic catheter ablation of the accessory pathway, reported several variables, including the inducibility of arrhythmias to predict the development of future symptomatic arrhythmias.[1–4] Ablation of the accessory pathway in these patients decreased the incidence of future symptomatic arrhythmias. Importantly, these studies were not powered to detect a reduction in mortality. Based on these studies, some physicians advocate routine diagnostic EPS to guide management and/or proceed with ablation in all patients with asymptomatic preexcitation. Although ablation in patients with symptomatic WPW syndrome is well established, the management of the asymptomatic individual remains controversial.[5] Guidelines suggest that the low positive predictive value of invasive EPS in conjunction with the cost and procedural morbidity fail to justify routine use in asymptomatic patients.[5]

This article argues that large-scale screening and routine EPS in asymptomatic patients with a WPW ECG pattern is not justified and elaborates on five factors:

1. The risk of sudden death as the first presentation in asymptomatic patients with WPW is exceedingly small, approximating the sudden death rate in the general population.
2. As suggested in the studies, most patients experiencing sudden death are likely to have experienced symptoms of arrhythmia before the sudden death and were not truly asymptomatic.

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Division of Cardiology, Western University, 339 Windermere Road, C6-110, London, Ontario N6A 5A5, Canada
* Corresponding author.
*E-mail address:* pleongs@uwo.ca

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3. The small but real incidence of procedural complications associated with routine EPS and ablation in asymptomatic individuals will arguably offset the potential benefit of ablation.
4. The predictive accuracy of noninvasive studies or invasive EPS to identify asymptomatic patients at risk of sudden death is low.
5. The cost benefit ratio, although not accurately quantifiable, is undoubtedly exorbitantly high for routinely undertaking EPS and/or ablation in the asymptomatic population.

These factors do not preclude an EPS and possible ablation in well-informed asymptomatic patients who prefer a small procedural risk of serious complications or death against the remote risk of sudden death due to rapidly conducted atrial fibrillation over the accessory pathway that degenerates into ventricular fibrillation (**Fig. 1**). Additionally, in certain circumstances, asymptomatic patients may require EPS for risk stratification and possible catheter ablation (eg, pilots and professional or recreational athletes). Careful deliberation is required when undertaking a diagnostic EPS in asymptomatic patients before proceeding with ablation, based on the location of the accessory pathway and its conduction properties.

## EPIDEMIOLOGY

The prevalence of preexcitation on ECG (ie, the WPW pattern) is estimated to be between 0.1 to 0.3%.[6] A critical issue in the discussion of mass screening or routine invasive assessment and treatment is the incidence of sudden death in this broad population. The risk of sudden death in symptomatic patients with WPW syndrome is estimated to be approximately 0.25% per year or 3% to 4% over a lifetime.[7,8] However, sudden death may be the first event in patients with asymptomatic preexcitation.[9] This incidence of sudden death as the first event is not accurately known. The key issue before recommendations regarding EPS or ablation in asymptomatic patients is to confidently establish the sudden death rate associated with asymptomatic preexcitation and balance this risk against the risk, cost, and feasibility of EPS and ablation in this broad population.

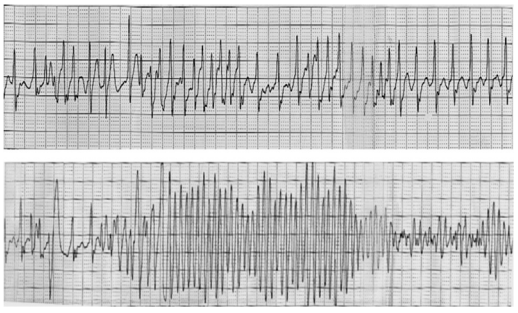

**Fig. 1.** Preexcited atrial fibrillation with a shortest relative risk interval of less than 200 milliseconds. Ventricular fibrillation results during preexcited atrial fibrillation.

### *Meta-Analysis of Reports on Sudden Death in Asymptomatic WPW Patients Without Ablation*

The authors undertook a meta-analysis of studies reporting on the incidence of sudden death in asymptomatic patients with WPW who did not undergo ablation.[10] This meta-analysis included 20 studies published in the English language and demonstrated an extremely low incidence of sudden death in asymptomatic patients. In total, 10 sudden death episodes (five children, five adults) were reported, involving a total of 11,722 person-years of follow-up and 1869 patients. The combined overall risk of sudden death (in children and adults) was estimated at 1.25 with a 95% CI between 0.57 and 2.19 per 1000 person years of follow-up. Interestingly, seven studies originated from Italy and reported the most sudden deaths (9 out of the 10 sudden deaths). Thus, among the 13 non-Italian studies involving 6991 person years of follow-up, only one sudden death was reported. The risk of sudden death in non-Italian adults and children was estimated at 0.26 (95% CI; 0.06–0.81) and 2.1 (95% CI; 0–8.5) per 1000 person years of follow-up, respectively. The risk of sudden death in Italian adults and children was estimated at 2.5 (95% CI; 0.6–5.9) and 1.9 (95% CI; 0.3–4.9) per 1000 person years of follow-up, respectively. The risk of sudden death was statistically significantly lower in the combined non-Italian (0.4, 95% CI; 0.05–0.9) versus the Italian (2.2, 95% CI; 0.9–4.0) studies ($P<.01$).

The combined overall risk of sudden death was numerically higher in children compared with adults, although the test for interaction was not conventionally significant ($P = .07$). Overall, children had a sudden death event rate of 1.9 (95% CI; 0.6–4.1) compared with 0.9 (95% CI; 0.3–1.8) in adults per 1000 patient years of follow-up. This incidence is comparable with the estimated 0.1% per year risk of death in the general population in Europe, Japan, and the United States.[11] Other studies have reported varied sudden death rates in the general population, still approximating the rates in asymptomatic WPW patients. These studies report incidence rates of 0.13 (ages 35–49),[12] 0.09 (ages 0–35),[13] 0.032 (ages 14–35),[14] and 0.028 (ages 1–35)[15] per 1000 person years of follow up.

If most patients with asymptomatic WPW eventually developed supraventricular tachycardia (SVT)