Wolff-Parkinson-White (WPW) syndrome can be associated with a malignant arrhythmia resulting in sudden death. Symptomatic patients have an estimated risk reported to be ≈0.25% per year, or 3% to 4% over a lifetime.1 In 1979, Klein et al2 reported 31 patients with WPW who had resuscitated ventricular fibrillation. During electrophysiological study, 25 of these patients had induction of atrial fibrillation that conducted rapidly via the accessory pathway. This finding supported the theory that rapid preexcited atrial fibrillation may result in ventricular fibrillation and sudden death. An extensive literature search revealed a single report in 1971 of a 63-year-old woman with a pacemaker who had a resuscitated episode of ventricular fibrillation preceded by rapid preexcited atrial fibrillation.3 Although there are known instances of patients arriving at emergency departments with rapidly conducting atrial fibrillation and who progressed to ventricular fibrillation, we know of no record showing the entire progression from sinus rhythm to ventricular fibrillation.

Case Study
A 23-year-old man with palpitations was noted to have a WPW pattern suggestive of a right-sided accessory pathway (Figure 1). An echocardiogram demonstrated a structurally normal heart with a slightly decreased ejection fraction, and a cardiac event monitor was applied. On day 13, while watching a movie with his family, the patient experienced an abrupt onset of chest pain and palpitations, and he became very anxious. When emergency medical services arrived, he was unresponsive and unable to be revived despite multiple defibrillation attempts.

Review of his cardiac event monitor demonstrated preexcited sinus rhythm followed by premature ventricular complexes that triggered orthodromic reciprocating tachycardia. This degenerated into rapidly conducting preexcited atrial fibrillation. Atrial fibrillation persisted for >3 minutes and then deteriorated into ventricular fibrillation and sudden cardiac death (Figure 2).

Conclusion
The demonstration of this lethal arrhythmia in the clinical setting correlates with what has been postulated as the mechanism by data obtained during electrophysiological studies. Patients who have preexcited R-R intervals of ≤250 ms during induced atrial fibrillation are at increased risk of sudden death.2 Catheter ablation remains the first-line therapy for symptomatic WPW. Recommendations for asymptomatic pediatric patients with a WPW pattern have been proposed by Cohen and colleagues4 for risk stratification in athletes and pre–sports participation. However, the nonathlete may be at equal risk. The patient in this report, although symptomatic, was not athletic, and his sudden cardiac death occurred when he was at rest. The available tracing unmistakably validates the mechanism of sudden arrhythmic death associated with WPW.

Disclosures
None.

References
Figure 1. Baseline ECG demonstrating Wolff-Parkinson-White pattern.

Figure 2. Continuous rhythm strip showing preexcited sinus rhythm in sequence by wide complex tachycardia, supraventricular tachycardia, atrial fibrillation with rapid ventricular response, and degeneration to ventricular fibrillation.
Wolff-Parkinson-White Syndrome: A Stepwise Deterioration to Sudden Death
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Circulation. 2016;133:105-106
doi: 10.1161/CIRCULATIONAHA.115.019703
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
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