EP News: Quality Improvement and Outcomes

Colleen J. Johnson, MD, MS, FACC,* Anne Marie Smith, MBA†

*From the *Tulane University, New Orleans, Louisiana, and †Heart Rhythm Society, Washington, DC.*

This article continues the series of *Heart Rhythm Journal* quarterly features highlighting science relevant to quality improvement. The focus of this feature is practice improvement surrounding the use and implementation of cardioversion in the treatment of atrial fibrillation. The featured research investigates different approaches to the timing and performance of cardioversion to improve efficacy, labor, and cost.

Early or delayed cardioversion in recent-onset atrial fibrillation (RACE 7 ACWAS)

Pluymaekers et al (N Engl J Med 2019;380:1499, PMID 30883054) conducted a multicenter randomized trial to assess whether a "wait-and-see" strategy was noninferior to early cardioversion in new-onset atrial fibrillation (AF). A total of 437 patients who presented to the emergency department at a variety of hospital settings (academic, nonacademic teaching, and nonteaching) with hemodynamically stable, symptomatic AF of <36 hours' duration were randomized to either a "wait-and-see" approach or an early cardioversion approach. The "wait-and-see" arm was given increasing doses of rate control medications to obtain relief from symptoms and a heart rate of <110 beats/min. Twenty-four hours later, the "wait-and-see" cohort was evaluated in an outpatient setting and, if AF was still present, was referred to the emergency department for cardioversion. The early cardioversion arm was preferentially treated with pharmacological cardioversion or, if necessary, electrical cardioversion. Both groups were evaluated 4 weeks after the initial presentation to assess for AF. The total median duration of the index visit—including delayed cardioversion if necessary—was 30 minutes less in the "wait-and-see" approach (95% confidence interval). In the "wait-and-see" arm, 69% of patients converted spontaneously to sinus rhythm vs 16% in the early cardioversion group. The presence of sinus rhythm at 4-week follow-up was 91% in the "wait-and-see" arm and 94% in the early cardioversion arm ($P = .005$ for noninferiority). In the 355 patients with mobile cardiac telemetric data, recurrence of AF occurred in 30% of the "wait-and-see" arm and 29% in the early cardioversion arm. There were no significant differences between the 2 groups with respect to complications. *On the basis of these findings, the authors conclude that a "wait-and-see" approach to new-onset AF can reduce need for cardioversion, decrease the duration of initial presentation, and lead to fewer misclassifications of persistent AF.*

Funding Sources: The author has no funding sources to disclose. Disclosures: The author has no conflicts of interest to disclose. **Address reprint requests and correspondence:** Ms Anne Marie Smith, Quality Improvement, Heart Rhythm Society, 1325 G St, NW, Suite 400, Washington, DC 20005. E-mail address: amsmith@hrsonline.org.

Electrical vs pharmacological cardioversion for emergency department patients with acute atrial fibrillation (RAFF2): A partial factor randomized trial

Stiell et al (Lancet 2020;395:339, PMID 32007169) conducted a partial factor study to compare pharmacological vs electrical cardioversion of acute atrial fibrillation (AF) (protocol 1) in addition to a comparison of anteroposterior vs anterolateral pad placement in electrical cardioversion of acute AF (protocol 2). Protocol 1 was blind randomization of 396 patients presenting to 11 academic emergency centers with new-onset, hemodynamically stable AF to either pharmacological cardioversion with procainamide followed by electrical cardioversion if necessary or placebo infusion followed by electrical cardioversion. Protocol 2 randomized the subset of patients requiring electrical cardioversion from protocol 1 (244 in all) to an open-label comparison of anteroposterior vs anterolateral pad placement. Conversion to sinus rhythm occurred in 96% of the patients in the pharmacological arm—with a median time to conversion of 23 minutes—vs 92% of patients in the shock-only arm ($P = .07$). Pharmacological cardioversion was found to be more effective in patients presenting with their first episode of AF, as well as in those younger than 70 years. Of the 77% of patients who returned for follow-up at day 14, 95% were in sinus rhythm. There was no difference between the outcomes for the 2 pad positions (94% anterolateral vs 92% anteroposterior; $P = .68$). *The authors conclude that pharmacological cardioversion of acute AF provides a rapid, less labor-intensive resolution of arrhythmia, allowing discharge home and avoiding costly, unnecessary hospital admission or next-day reevaluation by cardiologists.*

Evaluation of a novel cardioversion intervention for atrial fibrillation: The Ottawa AF cardioversion protocol

Ramirez et al (Europace 2019;21:708, PMID 30535367) conducted a trial to evaluate the effectiveness of a standardized protocol for electrical cardioversion (ECV) of atrial fibrillation (AF). For the first 3 years of the trial, the approach to 500 ECVs of AF was performed at the discretion of the treating physician. After a 3-month training period of 48 cardiologists and cardiac surgeons, 389 ECVs of AF were performed using a standardized protocol over the subsequent 2 years. Using the standardized protocol, cardioversion success was increased by 7.4% (91.8% phase I vs 99.2% phase II; $P < .001$). There was a 9.2% absolute increase in first shock success (79.8% phase I vs 88.4% phase II; $P < .001$) and a 6.9% absolute increase in sustained ECV success (84.7% phase I vs 91.6% phase II; $P = .002$). There were no procedural complications in either phase of the study. *This study shows that with the implementation of an institutional standardized protocol, initial and long-term success of ECV of AF can be significantly improved with a number needed to treat of 14.*

1547-5271/$-see front matter https://doi.org/10.1016/j.hrthm.2021.02.013