Critical Review Form
Therapy

Managing Emergency Department Patients with Recent-Onset Atrial Fibrillation, *J Emerg Med* 2012; 42:139-148

Objective: **"To describe our practice patterns and to determine the rate of adverse events in the ED and the incidence of thromboembolic events within 30 days of index presentation." (p. 140)**

Methods: **Prospective convenience-sampling observational trial from three neighboring community-based hospital ED's in Northern California between June 2005 and November 2007. Two of the facilities had EM residency programs. Clinicians were responsible for recruiting patients by recognizing new-onset (symptom onset within the preceding 48 hours) A-fib or A-flutter, although consent was not obtained until telephone follow-up at least 45-days later. Exclusion criteria included ECG without A-Fib or A-flutter, uncertain symptom duration, or if the presenting symptoms/signs were not confidently related to the atrial dysrhythmia. Somehow (chart review, treating physician?) demographic features, chief complaint, and warfarin/rate-reduction home medications were recorded. Treating ED physicians prospectively recorded rate-reduction and cardioversion med doses administered, procedural sedation, and energy level/number of shocks used for electrical cardioversion.**

Patients were analyzed in one of four categories: spontaneous cardioversion, attempted cardioversion, conversion to sinus rhythm hoped for, or cardioversion contraindicated. Adverse ED-based events that were evaluated included bradycardia, hypotension, AV block, ventricular tachycardia, ventricular fibrillation, asystole, torsades de pointes, bag valve mask ventilations, endotracheal tube intubations, or vomiting. Investigators had access to 18 hospitals' electronic medical records (EMR) in Northern California and assessed 30 day arterial embolic CVA by retrospective review of these EMR's at least 45 days after their ED evaluation. In addition, at least three attempts were made to contact the patient or their surrogate by telephone at least 45 days after the index ED visit. No primary outcome or power calculation is provided. There were no protocols for pharmacological or electrical cardioversion.

Guide		Comments
I.	**Are the results valid?**	
A.	**Did experimental and control groups begin the study with a similar prognosis (answer the questions posed below)?**	
1.	Were patients randomized?	No, this was an observational trial.
2.	Was randomization concealed (blinded)?	There was no randomization or blinding.
3.	Were patients analyzed in the groups to which they were randomized?	Not a randomized trial so intention to treat is not relevant.
4.	Were patients in the treatment and control groups similar with respect to known prognostic factors?	There were no treatment or control groups, but the 4 categories of patients described likely have different prognostic and management trajectories at baseline.
B.	**Did experimental and control groups retain a similar prognosis after the study started (answer the questions posed below)?**	
1.	Were patients aware of group allocation?	Yes, no randomization or blinding.
2.	Were clinicians aware of group allocation?	Yes. Subtle or overt patient characteristics probably influenced which management option clinicians selected.
3.	Were outcome assessors aware of group allocation?	Probably. No clear statement of blinding.
4.	Was follow-up complete?	Yes. "For the 30-day follow-up, the investigators undertook a structured review of the medical records (both hard-copy charts and electronic data) and attempted to contact all 206 patients. Two hundred four (99.0%) patients or their surrogates were contacted by phone at least 45 days after the index ED visit and were asked to participate in the follow-up arm of the study. Among these, 204 (100%) gave their informed consent at the time of the telephone interview." (p. 144) In addition, among the 16 home observation patients, "All 16 patients returned as directed and 11 (68.8%) were found to have spontaneously converted." (p. 143)

II.	What are the results (answer the questions posed below)?	
1.	How large was the treatment effect?	• 206 patients (93% A-fib, 7% A-flutter) met inclusion criteria with **mean age 64 years** and 40% women. Palpitations (76%) were the most common chief complaint. • Patients were analyzed in the following groups: spontaneous cardioversion (29%), attempted cardioversion (56%), home observation (7%), ineligible for cardioversion (7%). • 58% had a prior history of A-fib. • **75% presented within 10 hours of symptom onset**. • **63% had rate-reduction** (B-blocker or calcium channel blocker) medication administered **with 72% success rate**. • 28.6% of patients spontaneously (i.e. no electrical or chemical cardioversion) converted to NSR during their ED stay. • 56% had attempted cardioversion (including 5% for clinical instability) with 56% **electrical cardioversion first (97% success rate)** and 46% **pharmacological cardioversion first (60% success rate)**. • The pharmacological agents used included ibutilide (48% success rate), procainamide (70%), and amiodarone (75%). • 7.8% had home observation management, and these patients had significantly shorter symptom duration upon initial ED presentation (3.0 vs. 7.8 hours, p=0.03) • 9.2% were already on warfarin and an additional 7.3% had warfarin started in the ED (no $CHADS_2$

		scores provided). • 2/206 (1%, 95% CI 0.1-3.5%) had a thromboembolic event within 30 days and both had previously refused warfarin therapy. • **No patients died** during the 30 day follow-up period. • **88.8% were discharged home from the ED**.
2.	How precise was the estimate of the treatment effect?	Note 95% CI above.
III.	**How can I apply the results to patient care (answer the questions posed below)?**	
1.	Were the study patients similar to my patient?	Difficult to determine with the very limited patient demographics that were provided. These are community (suburban) hospitals in Kaiser-Permanente system so unique access to PCP and specialty care. Readers remain uncertain whether these results would extrapolate to urban ethnically diverse populations with limited health insurance or access to medical care.
2.	Were all clinically important outcomes considered?	No discussion of costs, patient preferences, or clinician comfort with various management strategies. They also do not assess ED length of stay, ED recidivism, or recurrent A-fib/A-flutter.
3.	Are the likely treatment benefits worth the potential harm and costs?	The sum of data seems to indicate that a) The current standard of care to admit all new onset A-fib/A-flutter patients for further work-up and monitoring may be unnecessary. b) Either pharmacologic or electrical (but probably the latter with a significantly higher success rate) are safe and effective in ED. The ED management of acute onset A-fib/A-flutter should be incorporated into

		future AHA and ACEP guidelines. No costs or societal benefits are tested or hypothesized. Future trials should compare various drug-regimens and shock-first approaches for A-fib/A-flutter with symptom duration <48º.

Limitations

1) **Convenience sampling without data on non-enrolled patients (CONSORT-like diagram).**

2) **No randomization or blinding.**

3) **Uncertain external validity outside of the Kaiser system, which has unique access to primary care providers and motivators to avoid ED visits. In fact, the authors' affiliation with the Kaiser-Permanente system was raised as a potential source of bias since the healthcare system profits (literally) when hospital admission rates and ED recidivism are reduced.**

4) **No assessment of $CHADS_2$ scores (anticoagulation benefit).**

5) **No details on the proportion and timing of post-ED diagnostic evaluations for patients (Echo, Cardiology referrals, etc.) which could influence outcomes and again limit external validity.**

6) **No primary outcomes or power calculation.**

7) **No chart review methods (Gilbert 1996, Worster 2004).**

Bottom Line

Community-hospital based rapid cardiovert and discharge home for A-fib or A-flutter is safe and effective within an organized healthcare system like Kaiser-Permanente, avoiding 89% of admissions with a 30-day stroke risk of 1% (95% CI 0.1-3.5%) and no identified cases of mesenteric ischemia or peripheral limb ischemia. Future pragmatic community-based trials are needed in less structured, less

integrated healthcare networks to assess the most effective cardioversion management algorithm, clinician acceptance/adherence, and cost-effectiveness.