

**Table 2. Comparison of In-Hospital Mortality with the TIMI, GRACE, and FD Risk Scores.**

Patient	TIMI RS	GRACE RS	FD RS
1 (STEMI)	Intermediate	High (36%)	
2 (NSTEMI)	Low	Intermediate	Low
3 (STEMI)	High	High (36%)	
4 (NSTEMI)	Intermediate	High	Intermediate
5 (STEMI)	Intermediate	High (36%)	
6 (STEMI)	Intermediate	High (36%)	

FD=front-door; GRACE=Global Registry of Acute Coronary Events; NSTEMI=non-ST elevation myocardial infarction; RS=risk score; STEMI=ST elevation myocardial infarction; TIMI=Thrombolysis in Myocardial Infarction.

## Unexpected Atrial Fibrillation During Pacemaker Implantation

Written by Toni Rizzo

Atrial fibrillation (AF) occurs unexpectedly in about 5% of pacemaker implantation procedures and is more common in patients with sick sinus syndrome (SSS) than in those with atrioventricular block. Meredith I. Sedney, MD, PhD, Ziekenhuis Bronovo, The Hague, the Netherlands, discussed problems when AF occurs during pacemaker implantation and potential solutions to the problems, citing data from the literature and from local experience.

Standard measurements for optimal positioning of electrodes during implantation cannot be obtained when AF persists. When this occurs, postoperative lead malfunction can occur, necessitating lead replacement. Some physicians switch from Atrial Demand Pacemaker (AAI) or Optimal Pacemaker (DDD) to Ventricular Demand Pacemaker (VVI) implantation, which induces pacemaker syndrome and increases the risk of AF. Electrical or chemical cardioversion to restore sinus rhythm prolongs the procedure, which increases the risk of infection and increases stimulation thresholds. Other possible solutions are blind lead positioning (using fluoroscopy without measurements) and mapping of the atrial wall to search for sufficient endocardial signal amplitude.

A review of pooled data from 3 studies on signal amplitude requirement at implantation (n=93) found that in all cases, the procedure was continued during AF and mapping of the AF wave was used to guide optimal lead placement. Sinus rhythm was achieved in <6 weeks in 95% of patients in one study [Wolfhard UF et al. *Pacing Clin Electrophysiol* 1998], 83% of patients in a German study [Driever R et al. *Zentralbl Chir* 2003], and in 34% (plus 66% by electrical cardioversion) in the third study [Wiegand UK et al. *Pacing Clin Electrophysiol* 2000].

The best reflection of electrode-endocardium distance is a high-frequency component (hfc); shorter distance and larger hfc result in better long-term pacing and sensing. Filtered signals have an hfc (slew rate) and are estimated by high-pass filters. A filtered signal has the advantage of showing the endocardial signal more clearly. Pacing system analyzers provide filtered signals as detected by the pacemaker.

Dr. Sedney and her colleagues investigated atrial lead performance over 5.2 years (range, 1 to 8 years) in 13 patients with unexpected AF. The amplitude of the filtered and unfiltered atrial endocardial signals was compared and used as a guide for electrode placement. During implantation a minimum of 0.5 mV of filtered signal was required. Indications for implantation were SSS (62%), complete heart block (23%), and others (15%). After the implant, 92% of patients converted to sinus rhythm in <6 weeks. Only 1 patient remained in chronic AF. All patients had good measurements of stimulation and sensing thresholds and none needed replacement for malfunction (Table 1).

**Figure 1. AF Amplitude: Bronovo and Pooled Results.**

Results	Bronovo (n=13)	Pooled (n=93)
IEGM (mV) filtered	1.5±1.0	
IEGM (mV) unfiltered	2.5±1.4	
IEGM (mV) mean		1.8
Problems during FU (%)	none	4.3
SR <6 weeks (%)	92	34-95

FU= follow-up; IEGM=intracardiac electrogram; SR=sinus rhythm.

Unexpected AF during pacemaker implantation can occur, which complicates the implant procedure. Data from the literature and from Ziekenhuis Bronovo Hospital show that fibrillatory endocardial signals can be used as a guide for optimal electrode placement. Using filtered signal as a guide can keep the implantation short and simple.

## Risk Factors for Atrial Fibrillation in Women in an Urban Setting

Written by Rita Buckley

### *Atrial Fibrillation: A New Epidemic*

Atrial fibrillation (AF) is one of the most common and chronic disorders in modern cardiology [Kirchhof P et al. *Europace* 2012], and its medical, social, and economic aspects are set to worsen in the coming decades [Camm AJ et al. *Europace* 2012]. Dawn Scantlebury, MBBS, DM, Mayo