

Improving Clinical Outcomes in Patients with **Atrial Fibrillation:** **EMERGING OPTIONS**

ASHP *Advantage* e-Newsletter

August 25, 2010

New Case-Based Educational Activities Available for Home Study

Tailoring drug therapy for atrial fibrillation (AF) based on individual patient needs is the focus of three new Web-based activities that are now available as part of the home-study educational initiative, "Improving Clinical Outcomes in Patients with Atrial Fibrillation: Emerging Options." In these activities, patient case scenarios are used to illustrate the decision-making process in initiating and adjusting antiarrhythmic therapy for patients with AF, including patients with structural heart disease or renal dysfunction. In addition, appropriate monitoring plans and potential drug interactions with common antiarrhythmic agents are discussed. Audience response questions are integrated into each case study, allowing participants to apply the information as the case develops.

Initial Stabilization of Atrial Fibrillation and Selection of Appropriate Rhythm Control Strategies
Judy W.M. Cheng

Monitoring and Adjusting Antiarrhythmic Therapy in Atrial Fibrillation
Cynthia A. Sanoski

Antiarrhythmic Therapy for Atrial Fibrillation in Special Patient Populations
James S. Kalus

These activities were first presented as live webinars in April and May 2010. If you missed them, the archived versions are now available on the Web for completion at any time that suits you. Each activity is approved for 1 hour of continuing pharmacy education (CPE), and they can be completed in any order. Please note that individuals who claim CPE credit for a live webinar are ineligible to claim credit for the corresponding Web-based activity.

Tailor Programming to Meet Your Educational Needs

Launched in March 2010, this educational initiative provides two tiers (levels) of CPE programming. Level 1 components require no prior knowledge of AF. A basic knowledge of AF is suggested for level 2 components, but extensive experience is not necessary.

If you go to the initiative Web site at www.ashpadvantage.com/af, you will see the array of educational programming choices available. A series of four level 1 Web-based modules cover the basics of AF:

- » Cardiac Arrhythmias: A Review (0.5 hours CPE)
- » Clinical and Economic Consequences of Atrial Fibrillation (1 hour CPE)
- » Challenges in Managing Atrial Fibrillation (1 hour CPE)
- » New and Emerging Treatments for Atrial Fibrillation (1.25 hours CPE)

A total of 9.75 hours of CPE is available through the initiative. There is no charge for participating in the initiative, and ASHP membership is not required.



Credit is available separately for each module so that participants can select whichever modules suit their needs and complete the modules in any sequence. For example, new practitioners who recently completed their pharmacy education may choose to complete only the fourth module with new and emerging AF treatments if they are familiar with the basic information in the first three modules.

A second level 1 option for individuals who prefer a written format for CPE is the supplement to the *American Journal of Health-System Pharmacy (AJHP)* entitled, "Understanding Atrial Fibrillation and New Therapeutic Advances to Improve its Management" (May 1, 2010, issue). The supplement is approved for 3 hours of CPE, and it can be accessed through the initiative Web site.

The new series of three case-based Web activities is level 2. Pharmacists without prior knowledge of AF are encouraged to complete the level 1 activities on the basics of AF before participating in the level 2 case-based Web activities, although they are not a prerequisite.

Go to the initiative Web site for complete information and to select the activities that best meet your educational needs.

Documenting Outcomes

Participants in the live webinars held in April and May 2010 will receive a brief e-mail survey from ASHP Advantage with questions designed to ascertain how information gleaned from the webinars was applied in clinical practice and its potential or documented impact on patient outcomes. Perhaps you now routinely assess the risk of stroke for patients with AF or have recommended alternative therapy after identifying a potential drug interaction. Maybe you stepped up your patient education efforts or have recommended that the P&T committee review or develop guidelines for the pharmacologic management of AF. Completion of the survey will take only 5-10 minutes, and it will provide valuable feedback about changes in practice, patient outcomes, and unmet educational needs. The aggregate information will also be used to plan future educational activities.

Emerging News

FDA Investigating Potential Safety Concern with Dronedaron

The U.S. Food and Drug Administration (FDA) included dronedaron in a list of 13 potential signals of serious risks or safety information released on June 30, 2010. The safety information was identified by the Adverse Event Reporting System (AERS) during the first quarter of 2010, and it signals potential safety issues, not documented causal relationships. For dronedaron, the potential safety issue relates to congestive heart

failure. FDA is continuing to evaluate this issue to determine the need for any regulatory action, such as requiring additional data to characterize the risk, and it will issue additional public communications as appropriate.

Reference: U.S. Food and Drug Administration. Potential signals of serious risks/new safety information identified by the Adverse Event Reporting System (AERS) between January – March 2010. <http://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/Surveillance/AdverseDrugEffects/ucm216272.htm> (accessed 2010 Jul 22).

Faculty

Cynthia A. Sanoski
Pharm.D., FCCP, BCPS
Initiative Chair
Chair and Associate Professor
Department of Pharmacy Practice
Jefferson School of Pharmacy
Thomas Jefferson University
Philadelphia, Pennsylvania

Judy W.M. Cheng
Pharm.D., M.P.H., FCCP, BCPS
Professor of Pharmacy Practice
Massachusetts College of Pharmacy and
Health Sciences
Clinical Pharmacist
Brigham and Women's Hospital
Boston, Massachusetts

James S. Kalus
Pharm.D., BCPS (AQ-Cardiology)
Senior Manager, Patient Care Services
Department of Pharmacy Services
Henry Ford Hospital
Detroit, Michigan

Head-to-Head Trial Comparing Vernakalant with Amiodarone

Vernakalant is an emerging antiarrhythmic agent for conversion of AF to normal sinus rhythm with atrial-selective activity that appears to minimize the risk for proarrhythmia. The results of a phase III randomized, double-blind study comparing the efficacy and safety of vernakalant and amiodarone for conversion of recent-onset AF to sinus rhythm in 254 adults were presented at the Heart Rhythm Society's 31st Annual Scientific Sessions on May 14, 2010. Vernakalant 3 mg/kg was administered by intravenous (i.v.) infusion over a 10-minute period, followed by an additional infusion of 2 mg/kg over 10 minutes if needed after a 15-minute observation period. Amiodarone 5 mg/kg was administered by i.v. infusion over a 60-minute period, followed by an additional maintenance infusion of 50 mg over 60 minutes.

Sixty (51.7%) of 116 patients in the vernakalant group and 6 (5.2%) of 116 patients in the amiodarone group achieved conversion from AF to sinus rhythm within the first 90 minutes (the primary endpoint), a difference that is significant. The median time to conversion in patients who responded to vernakalant was 11 minutes. The rate of symptom relief (i.e., absence of AF symptoms at 90 minutes) was significantly higher in the vernakalant group (53.4%) than in the amiodarone group (32.8%).

Five vernakalant-treated patients and 2 amiodarone-treated patients experienced serious adverse events, and 3 vernakalant-treated patients and 1 amiodarone-treated patient experienced adverse events leading to discontinuation of the study drug. No cases of torsades de pointes, ventricular fibrillation, or polymorphic or sustained ventricular tachycardia were reported. These results suggest that vernakalant is more effective for the conversion of recent-onset AF to sinus rhythm than amiodarone without an undue risk of toxicity.

Reference: Camm AJ. Clinical efficacy and safety of vernakalant compared with amiodarone for intravenous conversion of recent onset atrial fibrillation. Presented at the Heart Rhythm Society's 31st Annual Scientific Sessions. Denver, CO: May 14, 2010. http://www.hrsonline.org/Sessions/ScientificProgram/upload/lbct_aad_comparison.pdf (accessed 2010 Jul 22).

Amiodarone-Warfarin Interaction

Empiric reduction in the warfarin dose is recommend-

ed when amiodarone is initiated in a patient receiving a stable dose of warfarin because amiodarone inhibits the metabolism of warfarin by cytochrome P450C9, which could lead to hemorrhagic complications. The time to onset of an interaction between the two drugs is difficult to predict when the two drugs are initiated simultaneously, which often is necessary for patients with new-onset AF because amiodarone steady state may not be achieved for several weeks or months.

To clarify the timing of the interaction, Edwin and colleagues at Henry Ford Hospital in Detroit, Michigan, compared the international normalized ratio (INR) response to warfarin in 18 patients who initiated both amiodarone and warfarin during the same hospital stay (the amiodarone group) with that in 42 patients who initiated only warfarin (the warfarin group) over a 5-day period. The total and average daily warfarin doses were lower in the amiodarone group (22.6 mg and 4.9 mg, respectively) than those in the warfarin group (27.6 mg and 5.7 mg, respectively). However, the INR values were slightly higher in the amiodarone group than in the warfarin group on days 2-4 after initiation. Two thirds of patients in the amiodarone group and one third of patients in the warfarin group had an INR value exceeding 2 on day 5. A trend toward greater deviation from the expected INR value after a daily dose of warfarin 5 mg was observed in the amiodarone group compared with the warfarin group.

These findings suggest that the interaction between amiodarone and warfarin manifests within 1 week when the two drugs are initiated simultaneously, although the full impact may not be observed until later. Patients with AF who initiate the two drugs simultaneously should be closely monitored for the need for warfarin dose reduction during the first week after therapy is initiated.

Reference: Edwin SB, Jennings DL, Kalus JS. An evaluation of the early pharmacodynamic response after simultaneous initiation of warfarin and amiodarone. *J Clin Pharmacol.* 2010; 50:693-8.

DIONYSOS Study Published

In July 2009, FDA approved dronedarone, an amiodarone congener for maintenance of sinus rhythm after cardioversion in patients with AF. Approval was based on the results of several published and unpublished clinical trials, including the Efficacy and Safety of Dronedarone Versus Amiodarone for the Maintenance of Sinus Rhythm in Patients With Atrial Fibrillation

(DIONYSOS) trial. In this randomized, double-blind trial, 504 patients with persistent AF received dronedarone 400 mg orally twice daily or amiodarone 600 mg orally once daily for 28 days followed by 200 mg orally once daily for at least 6 months. The results of this study were published in April 2010. The median duration of treatment was 7 months. The primary composite endpoint was recurrence of AF (including unsuccessful electrical cardioversion, no spontaneous conversion, and no electrical cardioversion) or premature study drug discontinuation. The incidence of the primary composite endpoint after 12 months was significantly higher in the dronedarone group (75.1%) than in the amiodarone group (58.8%), primarily because the rate of AF recurrence was higher in the dronedarone group (63.5% versus 42.0% in the amiodarone group). The rate of AF recurrence after successful cardioversion was 36.5% with dronedarone and 24.3% with amiodarone.

The main safety endpoint (MSE) in the DIONYSOS study

was occurrence of thyroid-, hepatic-, pulmonary-, neurologic-, skin-, eye-, or gastrointestinal-specific events, or premature study drug discontinuation following an adverse event. The incidence of the MSE after 12 months was 39.3% with dronedarone and 44.5% with amiodarone, primarily because of fewer thyroid, neurologic, skin, and ocular events in the dronedarone group. The rate of premature study drug discontinuation was lower with dronedarone (10.4%) than amiodarone (13.3%). The majority (95.6%) of enrollees received oral anticoagulants to prevent stroke. International normalized ratio values were monitored, and anticoagulant dosage adjustments were made as needed. Supratherapeutic INR levels (>4.5) were more common in patients treated with amiodarone than in patients treated with dronedarone, despite more frequent adjustment of anticoagulant therapy in the amiodarone group. There was a significantly lower incidence of hemorrhagic events in the dronedarone group (5.6%) than in the amiodarone group (11.4%). Thus, although dronedarone appears less effective

Update on RACE II Study

Quality-of-life data from the RACE II study were reported at the recent Heart Rhythm Society's 31st Annual Scientific Sessions. In the RACE II study, a lenient rate-control strategy for managing permanent AF with a target resting heart rate less than 110 beats per minute (bpm) was judged noninferior to conventional strict rate control with a target resting heart rate less than 80 bpm. Cardiovascular morbidity and mortality were similar with the two strategies. However, rate control was easier to achieve with the lenient rate-control strategy than the strict rate-control strategy.

Quality of life was assessed using several measures (e.g., Short Form-36 health survey questionnaire) at baseline and after 1 and 3 years (median 3 years), and it was comparable in the lenient and strict rate-control groups throughout the study. Advanced age (>75 years) and a history of heart failure but not the rate-control strategy were associated with a decrease in quality of life.

Despite these findings, because of limitations of the RACE II study (e.g., lack of per protocol analysis, possibility that the study duration of 3 years was inadequate), the strict rate-control strategy should not be abandoned.

Examples of when a lenient rate-control strategy might be considered include the following:

- » Asymptomatic patients with a resting heart rate less than 110 bpm having difficulty achieving a heart rate less than 80 bpm,

- » Patients who should not receive multiple atrioventricular node blocking drugs (e.g., a β -blocker, calcium channel blocker, and digoxin), and
- » Patients in whom a reduction in heart rate below 80 bpm cannot be achieved without digoxin who are not good candidates for digoxin therapy.

A rhythm-control strategy should be used for patients who remain symptomatic despite use of either a lenient or strict rate-control strategy.

References: Dorian P. Rate control in atrial fibrillation. *N Engl J Med.* 2010; 362:1439-41. Editorial.

Groenveld HF, Crijns HJGM, Van den Berg MP et al. Quality in life in lenient versus strict rate control in patients with permanent atrial fibrillation, data from Race II. Presented at the Heart Rhythm Society's 31st Annual Scientific Sessions. Denver, CO: May 14, 2010. http://www.hrsonline.org/Sessions/ScientificProgram/upload/lbct_ratecontrol_qol.pdf (accessed 2010 Jul 22).

Kalus JS. Pharmacotherapeutic decision-making for patients with atrial fibrillation. *Am J Health-Syst Pharm.* 2010; 67(Suppl 5):S17-25.

Van Gelder IC, Groenveld HF, Crijns HJGM et al. Lenient versus strict rate control in patients with atrial fibrillation. *N Engl J Med.* 2010; 362:1363-73.

than amiodarone for preventing AF recurrence, the lower likelihood of an interaction with oral anticoagulants and better tolerability of dronedarone may make it a better choice for patients who cannot tolerate amiodarone.

References: U.S. Food and Drug Administration Cardiovascular and Renal Drugs Advisory Committee. Multaq (dronedarone) briefing document. March 18, 2009. <http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/CardiovascularandRenalDrugsAdvisoryCommittee/UCM134981.pdf> (accessed 2010 Jul 22).

Le Heuzey JY, De Ferrari GM, Radzik D et al. A short-term, randomized, double-blind, parallel-group study to evaluate the efficacy and safety of dronedarone versus amiodarone in patients with persistent atrial fibrillation: the DIONYSOS study. *J Cardiovasc Electrophysiol*. 2010 Apr 6 [Epub ahead of print].

Dronedarone Place in Therapy

Evidence-based guidelines for making therapeutic decisions in patients with AF were published in 2006 by the American College of Cardiology (ACC), American Heart Association (AHA), and European Society of Cardiology (ESC) before dronedarone became available. In April 2010, Singh and colleagues from Cedars-Sinai Medical Center in Los Angeles published a commentary in the *Journal of the American College of Cardiology* in which published clinical trials of the efficacy and safety of dronedarone for maintenance of sinus rhythm in patients with AF (including DIONYSOS) are analyzed. These authors adapted a flow diagram in the ACC/AHA/ESC guidelines that illustrates the therapeutic decision-making process for antiarrhythmic drug therapy to maintain sinus rhythm in AF so that the flow diagram illustrates the potential role of dronedarone for this purpose. Dronedarone cannot be used in patients with New York Heart Association (NYHA) functional class IV heart failure or symptomatic heart failure (NYHA functional class II or III) with a recent decompensation because of the increased mortality observed with the drug in the placebo-controlled ANDROMEDA study. However, the drug might be a reasonable alternative in patients with less advanced heart failure (NYHA functional class II or less or ejection fraction >35%) who cannot tolerate low-dose amiodarone or dofetilide (the only options in the ACC/AHA/ESC guidelines). Dronedarone use is likely to be safe for patients with a low or intermediate cardiovascular risk (e.g., patients with no or minimal heart disease, hypertension, or coronary artery disease) who are stable.

In an accompanying commentary, Torp-Pedersen and

colleagues from Denmark suggest that the safety data for dronedarone are superior to those for other antiarrhythmic agents in patients at low or intermediate cardiovascular risk, and the drug might even be considered first-line therapy for low-risk patients (e.g., patients with nonpermanent AF). Additional comparative clinical trials and clinical experience are needed to determine the place of dronedarone in maintaining sinus rhythm in patients with AF.

Dronedarone and other new or emerging drug therapies were among the topics discussed by the Atrial Fibrillation Exchange Group, an international multidisciplinary group recently convened to analyze trends in the management of AF. The discussion was summarized by Prystowsky and colleagues in the April 2010 issue of the *Journal of Cardiovascular Electrophysiology*. The group suggested that the introduction of dronedarone and other new pharmacotherapies for AF may facilitate a change in paradigm from the current focus on treating AF symptoms and avoiding adverse effects to one in which avoiding hospitalization and improving long-term outcomes (as was demonstrated in the ATHENA study of dronedarone by Hohnloser and colleagues) are emphasized.

References: Singh D, Cingolani E, Diamond GA et al. Dronedarone for atrial fibrillation: have we expanded the antiarrhythmic armamentarium? *J Am Coll Cardiol*. 2010; 55:1569-76.

Køber L, Torp-Pedersen C, McMurray JJ et al. Increased mortality after dronedarone therapy for severe heart failure. *N Engl J Med*. 2008; 358:2678-87.

Torp-Pedersen C, Pedersen OD, Køber L. Antiarrhythmic drugs: safety first. *J Am Coll Cardiol*. 2010; 55:1577-9. Commentary.

Prystowsky EN, Camm J, Lip GYH et al. The impact of new and emerging clinical data on treatment strategies for atrial fibrillation. *J Cardiovasc Electrophysiol*. 2010 Apr 8 [Epub ahead of print].

Hohnloser SH, Crijns HJ, van Eickels M et al. Effect of dronedarone on cardiovascular events in atrial fibrillation. *N Engl J Med*. 2009; 360:668-78.

Racial Disparities in AF Treatment

In a national, population-based, longitudinal study known as REGARDS involving more than 30,000 blacks and whites at least 45 years old with over sampling (i.e., disproportionately high representation) from blacks and persons residing in the southeastern "stroke belt" states (North Carolina, South Carolina, Georgia, Alabama, Arkansas, Louisiana, Tennessee, and Mississippi), 432 participants had AF. Awareness of AF was two

thirds lower in blacks with the disorder than in whites with AF, and the use of warfarin treatment to prevent stroke was three fourths lower in blacks than in whites.

In a separate analysis of REGARDS study data from 26,580 subjects without a stroke or transient ischemic attack at baseline, the risk for stroke over a follow-up period of nearly 5 years was higher in blacks than whites and residents in the stroke belt than other geographic areas. These findings suggest a need for greater vigilance and efforts to detect AF and properly

treat patients who are black, especially those who reside in the stroke belt, to reduce the risk for stroke.

References: Meschia JF, Merrill P, Soliman EZ et al. Racial disparities in awareness and treatment of atrial fibrillation: the REasons for Geographic and Racial Differences in Stroke (REGARDS) study. *Stroke*. 2010; 41:581-7.

Howard VJ, Kleindorfer D, McClure LA et al. Stroke incidence as the major contributor to racial and regional disparities in stroke mortality: The REasons for Geographic and Racial Differences in Stroke (REGARDS) study. Presented at the American Stroke Association International Stroke Conference 2010. San Antonio, TX: February 26, 2010. Abstract 158. <http://stroke.ahajournals.org/cgi/reprint/01.str.0000366114.11305.66> (accessed 2010 Jul 22).

Frequently Asked Questions

FAQs about Atrial Fibrillation Management

Through the TALK TO US feature on the initiative Web site and activity evaluations, pharmacists have the opportunity to ask the faculty for insight on clinical dilemmas and controversial issues. Included here are answers to several frequently asked questions that have been submitted, and more are posted in the Resources Center on the initiative Web site. You can also share reports of the impact on practice of information gleaned from these educational activities using the TALK TO US feature.

Q Should the use of both sotalol and metoprolol in a patient with AF be considered duplication of therapy because both drugs are β -blockers?

A The use of sotalol and metoprolol simultaneously in patients with AF is not uncommon or considered therapeutic duplication. Although sotalol is a β -blocker, its antiarrhythmic effects are the result of potassium channel blockade. The β -blocking effect of sotalol in patients with AF may be insufficient to achieve the target heart rate. Metoprolol may be required to provide heart rate control and other cardiovascular benefits (e.g., prevention of myocardial infarction, secondary prevention of coronary artery disease). Pharmacist monitoring of blood pressure and heart rate can optimize outcomes from combination therapy with sotalol and metoprolol in patients with AF.

—James S. Kalus, Pharm.D., BCPS (AQ-Cardiology)

Q I see amiodarone used quite a bit and wonder why, given that the drug is considered second-line therapy for maintenance of sinus rhythm in many patients with

AF according to guidelines from the American College of Cardiology (ACC), American Heart Association (AHA), and European Society of Cardiology (ESC).

A Amiodarone is considered a second-line agent for many patients with AF because it is not a benign drug and it has many extracardiac toxicities. However, I believe that amiodarone is often chosen first because it is more effective than some first-line therapies for maintaining sinus rhythm. Amiodarone also is the least likely antiarrhythmic agent to cause torsades de pointes. Amiodarone often is the only option as is the case for patients with AF and heart failure.

References: Fuster V, Rydén LE, Cannom DS et al. ACC/AHA/ESC 2006 guidelines for the management of patients with atrial fibrillation—executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Revise the 2001 Guidelines for the Management of Patients With Atrial Fibrillation). *J Am Coll Cardiol*. 2006; 48:854-906.

Lafuente-Lafuente C, Mouly S, Longas-Tejero MA et al. Antiarrhythmics for maintaining sinus rhythm after cardioversion of atrial fibrillation. *Cochrane Database Syst Rev*. 2007; (4):CD005049.

—James S. Kalus, Pharm.D., BCPS (AQ-Cardiology)

Q Is flecainide ever used in patients with AF? If flecainide therapy fails to maintain sinus rhythm, is propafenone a useful alternative?

A The class Ic antiarrhythmic agents flecainide and propafenone are not widely used in AF because most patients with AF have structural heart disease (e.g., valvular heart disease, heart failure, coronary artery disease, hypertension with or without left ventricular hypertrophy), and it is not safe to use these agents

in patients with structural heart disease. However, flecainide and propafenone are first-line therapy for maintaining sinus rhythm in patients with AF who do not have structural heart disease, according to ACC/AHA/ESC guidelines. The drugs are well tolerated, although they can cause proarrhythmia. Propafenone provides additional β -blocking activity, so a trial is warranted in a patient with AF recurrence during flecainide therapy.

Reference: Fuster V, Rydén LE, Cannom DS et al. ACC/AHA/ESC 2006 guidelines for the management of patients with atrial fibrillation—executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Revise the 2001 Guidelines for the Management of Patients With Atrial Fibrillation). *J Am Coll Cardiol.* 2006; 48:854-906.

—Cynthia A. Sanoski, Pharm.D., FCCP, BCPS

Q I understand that dronedarone cannot be used in patients with AF and severe heart failure or symptomatic heart failure with a recent decompensation. What is considered recent with respect to decompensated heart failure when considering whether it is safe to initiate dronedarone in a patient with AF? If dronedarone is initiated in a patient with chronic stable heart failure and he or she develops decompensated heart failure, how should the patient be managed?

A In the placebo-controlled ANDROMEDA study of patients who were hospitalized with symptomatic heart failure and severe left ventricular systolic dysfunction, increased mortality was observed in patients receiving dronedarone. Therefore, the drug should not be used in patients who present with heart failure symptoms or have a history of decompensated heart failure. The drug might be considered for patients with chronic stable heart failure that is not severe if heart failure symptoms have been well controlled for a few months or even 1 year.

If decompensation occurs during dronedarone therapy, the drug should be withheld for at least 1 month during which the patient should be monitored. Therapy may be restarted if the patient's condition remains stable during that period, but the cause of decompensation (e.g., patient nonadherence to drug therapy or dietary recommendations) should be taken into consideration when deciding whether to restart therapy or switch to another drug.

Reference: Køber L, Torp-Pedersen C, McMurray JJ et al. Increased mortality after dronedarone therapy for severe heart failure. *N Engl J Med.* 2008; 358:2678-87.

—James S. Kalus, Pharm.D., BCPS (AQ-Cardiology) and Judy W.M. Cheng, Pharm.D., M.P.H., FCCP, BCPS

To share this e-Newsletter with a colleague, go to www.ashpadvantage.com/af and click on REFER A COLLEAGUE.

Continuing Pharmacy Education



The American Society of Health-System Pharmacists is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

For complete information about educational activities that are part of the 2010 Atrial Fibrillation Initiative, visit www.ashpadvantage.com/af. There is no charge for the activities, and ASHP membership is not required.

Planned and coordinated by ASHP Advantage and supported by an independent educational grant from sanofi aventis U.S.



Contact ASHP Advantage for assistance or questions. | Copyright 2010 | Trademark | ASHP Privacy Policy