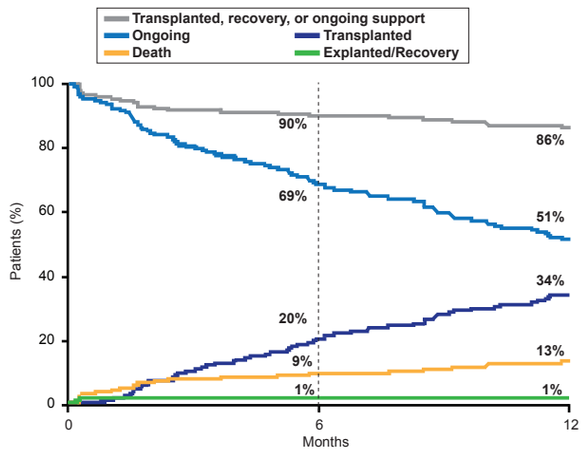
Figure 1. 12-Month Outcomes for HM II LVAD Bridge to Transplant

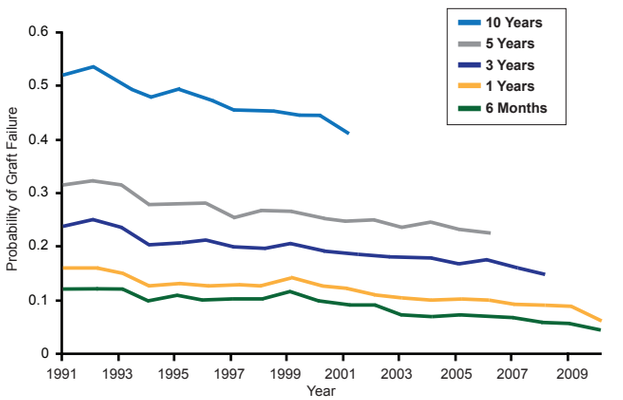


Reproduced from Starling RC et al. Results of the Post-U.S. Food and Drug Administration-Approval Study With a Continuous Flow Left Ventricular Assist Device as a Bridge to Heart Transplantation. *J Am Coll Cardiol* 2011;57(19):1890-1898. With permission from Elsevier.

Dr. Savage reviewed the progress in heart transplantation since 1967. Advancements in immunosuppressive therapy in conjunction with improvements in surgical technique, organ harvesting/preservation, patient selection, and other factors have been the primary reason for continued improvements in patient prognosis. Data on the current characteristics and survival of patients post transplant from the 2011 annual report of the Scientific Registry of Transplant Recipients (SRTR) and Organ Procurement and Transplantation Network (OPTN) were discussed [OPTN and SRTR. OPTN/SRTR 2011 Annual Data Report. Department of Health and Human Services, Health Resources and Services Administration, Healthcare Systems Bureau, Division of Transplantation; 2012. Available at http://srtr.transplant.hrsa.gov/annual_reports/2011/flash/05_heart/index.html]. Dr. Savage mentioned factors associated with reduced waiting times for heart transplant including 1) United Network for Organ Sharing Status 1A or 1B; 2) VAD implantation; and 3) blood type A, B, or AB. Dr. Savage noted that it tends to be more difficult to find a match for patients with type O blood, since they can only receive a heart from a type O donor. The majority of transplanted adults continued to be males and the mean age at transplantation in 2011 was 50.9 years. Coronary artery disease as an etiology of cardiac failure in this population appears to be decreasing while nonischemic cardiomyopathies is increasing.

Dr. Savage concluded by highlighting that although the total annual number of heart transplants performed in the United States remains steady (~1800 to 2000), based on availability of donor hearts, the rate of survival to first graft failure in recipients continues to improve (Figure 2) [OPTN and SRTR. OPTN/SRTR 2011 Annual Data Report. HHS/HRSA/HSB/DOT 2012. Available at http://srtr.transplant.hrsa.gov/annual_reports/2011/flash/05_heart/index.html].

Figure 2. Decreasing Acute and Long-Term Graft Failure



Source: OPTN and SRTR. OPTN/SRTR 2011 Annual Data Report.

New Oral Anticoagulants Can Prevent Stroke Associated With Atrial Fibrillation

Written by Lynne Lederman

Atrial fibrillation (AF), the most common cardiac arrhythmia, is associated with a 5-fold increased risk of stroke. Strokes related to AF are more severe and result in greater morbidity and mortality than strokes from other causes. Alexander Turpie, MD, McMaster University, Hamilton, Ontario, Canada, reviewed the historic role that vitamin K antagonists (VKAs), particularly warfarin, have had in reducing the risk of stroke associated with AF. Problems with older anticoagulants (eg, delayed onset and offset of action, unpredictable dose-response, narrow therapeutic index, and numerous interactions with food and drugs) have led to many patients not receiving needed therapy. In addition, the requirement for regular monitoring and a high risk of intracranial hemorrhage have been especially problematic.

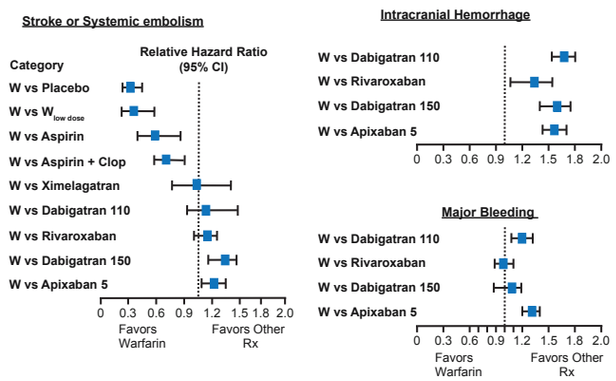
As the population ages, the number of individuals with AF at risk of stroke is increasing. The problems associated with VKAs have resulted in the need for the development of new agents which do not require as close of monitoring. Dr. Turpie reviewed the development of new oral anticoagulant (NOAC) therapies and compared the features of the NOACs with those of warfarin (Table 1).

Table 1. Comparison Overview of NOACs With Warfarin

Features	Warfarin	New Agents
Onset	Slow	Rapid
Dosing	Variable	Fixed
Food effect	Yes	No
Drug interactions	Many	Few
Monitoring	Yes	No
Half-life	Long	Short
Antidote	Yes	No

NOACs include the drugs which prevent thrombosis through factor Xa inhibition (rivaroxaban, apixaban, and edoxaban) and direct thrombin inhibitors (dabigatran) [Eikelboom JW, Weitz JI. *Circulation* 2010]. Clinical trials of NOACs found that these drugs have similar or improved efficacy in reducing stroke or systemic embolization and a lower incidence of intracranial hemorrhage when compared with warfarin (Figure 1) [Granger CB et al. *N Engl J Med* 2011; Patel MR et al. *N Engl J Med* 2011; Connolly SJ et al. *N Engl J Med* 2009].

Figure 1. Stroke Prevention: Oral Anticoagulant Effect



Reproduced with permission from A Turpie, MD.

Noting that the trials of these agents had different designs, included patients with different risk factors, and had slightly different endpoint definitions, Dr. Turpie does not believe that the current clinical trials provide evidence that allows one to compare the individual NOACs. Of the current guidelines for treating patients with AF, Dr. Turpie prefers the guideline from the European Society of Cardiology, updated in 2012 [Camm AJ et al. *Eur Heart J* 2012]. The three new important points these guidelines make are 1) assess stroke risk exclusively with CHA_2DS_2-VASc in preference to $CHADS_2$; 2) administer anticoagulation for stroke prevention with a CHA_2DS_2-VASc score of ≥1; and 3) if anticoagulant therapy is indicated, one of the novel nonmonitored drugs apixaban, rivaroxaban, or dabigatran should be used in preference to VKAs.

Although NOACs do not require monitoring, the activated partial thromboplastin time can be used qualitatively for patients on dabigatran and the prothrombin time for patients on rivaroxaban [Heidbuchel H et al. *Europace* 2012; Mani H et al. *Thromb Hemost* 2011]. This may provide useful in formation where suspected overdosage or lack of adherence is suspected, and for patients with renal insufficiency or extreme body weight. All anticoagulant drugs cause bleeding, and the lack of an antidote for the new agents has been mentioned as a drawback. Dr. Turpie said that bleeding should be managed by discontinuing the drug, providing fluid resuscitation, applying pressure on the bleeding site if exposed, and giving recombinant factor VIIa or prothrombin complex concentrates for ongoing life-threatening bleeding. Dabigatran is cleared primarily by the kidney [Elkeboom JW, Weitz JI. *Circulation* 2010], requiring more careful management that includes routine monitoring of renal function in patients with reduced creatinine clearance.

Undertreatment of Atrial Fibrillation With Anticoagulant Therapy in a "Real-World" Outpatient Clinic

Written by Lynne Lederman

One quality-of-care measure for patients with atrial fibrillation (AF) is adequate treatment with anticoagulant therapy. Jeffrey D. Simmons, MD, MPH, Florida International University Herbert Wertheim School of Medicine, Miami, Florida, USA, observed that many patients with AF at the Miami Beach Community Health Center (MBCHC) were not receiving anticoagulant therapy. A study in Australia in 2002 [Peterson GM et al. *Int Med J* 2002] showed that utilization of anticoagulant therapy is potentially limited by incorrect estimations of efficacy and safety with vitamin K anticoagulants. In that study, one third of cardiologists overestimated the benefit of anticoagulation.

Barriers to anticoagulation therapy at MBCHC include poor routine follow-up with visits often only for crisis management, inadequate or no health insurance, difficulty paying for out-of-pocket expenses for tests and medications, transportation issues, language/cultural barriers, and a high rate of concomitant mental health illness. For his study, Dr. Simmons searched the clinic electronic health records for patients with a diagnosis of AF but no prescriptions for a vitamin K antagonist, a factor Xa inhibitor, or a direct thrombin inhibitor. The electronic health records of 50 patients identified were reviewed to determine the risks for embolism and bleeding using the $CHADS_2$, CHA_2DS_2-VASc, and HAS-BLED scores. To