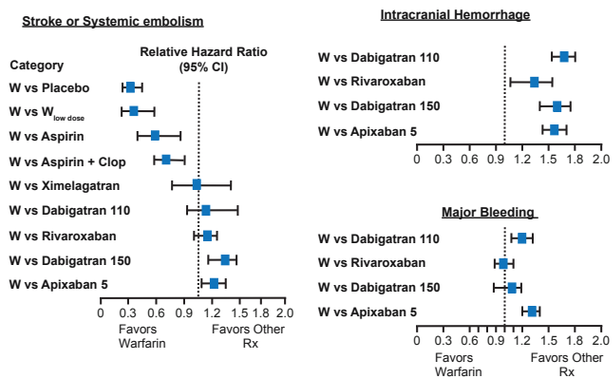
Table 1. Comparison Overview of NOACs With Warfarin

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



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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

ascertain provider treatment patterns, 12 providers who prescribe anticoagulants at the clinic were asked to rank factors used to determine whether anticoagulants would be prescribed, including risk of stroke or embolism, risk of bleeding, and patient adherence to treatment or monitoring.

The results demonstrated that the risk of ischemic stroke was higher than the risk of bleeding in these 50 patients. This suggested that other factors may have contributed to not prescribing anticoagulation therapy for these patients. Review of the medical records also revealed that the older $CHADS_2$ score was used more frequently than the newer CHA_2DS_2-VASc score. Physicians were asked to rank four determinants of deciding to prescribe anticoagulant therapy in order. The results were (highest to lowest): 1) risk of stroke; 2) patient adherence to treatment; 3) risk of bleeding; and 4) patient adherence to monitoring. This study confirmed that the prescription of anticoagulant therapy is not made solely based on a determination of stroke and bleeding risks.

The LARIAT Device Offers a Percutaneous Option to Reduce Ischemic Stroke in Patients With Atrial Fibrillation

Written by John Otrompke

In patients with atrial fibrillation (AF), ~90% of emboli are thought to form within the left atrial appendage (LAA). Since AF is the number one cause of stroke in older adults, some physicians have hypothesized that removing or isolating the LAA may an effective treatment option to reduce the risk of embolic stroke. This is especially applicable to those patients who are poor candidates for anticoagulants, according to Hakop Hrachian-Haftevani, MD, Baptist Health System, South Miami, Florida, USA.

The United States Food and Drug Administration (FDA)-approved LARIAT device is used for percutaneous LAA closure. This device has been used in more than 1400 patients with a closure rate of 98%.

The device is deployed in a series of steps. First, a wire/catheter system is used to cross the atrial septum and place a special wire containing a deflated balloon into the LAA. At the same time, a silk tie (ie, the lariat) is placed around the neck of the LAA from the outside, by a small device inserted via a small incision made in the chest wall. Next, the balloon is inflated inside the LAA to allow placement and tightening of the lariat around the neck of the LAA (proximal to the inflated balloon). The lariat is then further tightened, tied, and cut resulting in isolation of the appendage from the left atrium.

After the procedure, the surgical area is permitted to drain for 24 hours with monitoring and/or management of pericarditis. Periprocedural antibiotics are used in some cases and anticoagulation is continued for a few months after implantation. Isolation of the appendage results in atrophy of the appendage within a year.

The use of preoperative imaging is essential for assessment of the neighboring anatomy in patients planned for this procedure. Unique anatomical characteristics of the appendage must also be taken into account, such as whether it has a single lobe or windsock morphology (technically easier) or whether it has a chicken wing, broccoli, or cauliflower-like morphology. These latter appendage morphologies tend to be larger and are associated with advanced age and existing blood clots.

Despite its benefits, the LARIAT procedure is not for everyone. Patients who should not have the LARIAT procedure include those who have had prior chest radiation, heart surgery, or have developed scars around the LAA and surrounding pericardial region for any other reason. This is because the device requires freedom of movement within the pericardial space. In addition, the upper size limit of the appendage is for this procedure is 4 cm.

For patients with AF that cannot take anticoagulant drugs, the LARIAT device offers an FDA-approved intervention that may be a permanent option to reduce the risk of associated embolic stroke.

Caribbean Physicians Triage Network Improving Quality

Written by John Otrompke

A large integrated network of physicians and other health care providers in the Caribbean, South Florida, and Central America has grown to 1200 providers and at the same time is reducing costs of care, according to a presentation by Kester Nedd, DO, Jackson Health System International Program, Miami, Florida, USA. The network was founded to improve barriers associated with 1) triage of patients; 2) scarcity of certain specialists; 3) case management; and 4) insurance issues that affect delivery of effective care in the region.

The network began at the Jackson Memorial Hospital System and the affiliated University of Miami Miller School of Medicine Health System. Following a successful 1.5-year pilot program, it has grown to include providers in the Bahamas, Barbados, and Panama. The program is driven by physicians, who use algorithms to identify patients at risk for catastrophic events, and communicate with other physicians of the same specialty to triage patients to centers of excellence (COE) in the region, according to Dr. Nedd. The network will be incorporating telemedicine to aid in this effort.