We all want our blood to clot when we cut ourselves. Development of blood clots is essential for life. Occasionally, however, a blood clot forms inside an artery or a vein and causes problems that can be serious if the flow of blood to a vital organ is blocked. If an artery to the heart becomes blocked, it causes a “heart attack” or if a blockage occurs in an artery to the brain, it causes a stroke. A clot in a large vein causes deep-vein thrombosis (DVT) or pulmonary embolism (PE, a clot to the lung).

If you develop a blood clot in a blood vessel, or if you are at high risk for developing a blood clot, doctors prescribe blood thinners or “anticoagulants.” The most common blood thinners are heparin and warfarin (also known as Coumadin®). Our UC Davis Anticoagulation Clinic (AC clinic) plays a central role in making sure all of our patients who need treatment with a blood thinner are given proper care. If the blood is not thinned enough a new clot can form, but if the blood is too thin bleeding can occur. Thinning the blood the correct amount can be tricky, particularly with warfarin. It is like trying to stay on the balance beam during Olympic gymnastics competition. Attaining that delicate balance requires medical expertise (which we provide) coupled with active patient participation. Each patient must obtain blood tests when they are scheduled, call the AC clinic if a new problem arises, ask questions to clear up confusion or concerns, and always let us know when taking new medications.

Most of our patients take warfarin to help prevent a stroke. Patients who have atrial fibrillation or who have a mechanical heart valve should take warfarin continuously. Properly taken, blood thinners dramatically reduce the risk of developing a stroke or a blood clot.

How anticoagulant drugs work

Anticoagulant drugs can be injected into a vein or under the skin, or taken by mouth. They can work in three ways:

- Special proteins in our bloodstream are needed to make a blood clot. Some anticoagulants – the most common of which is warfarin (or Coumadin®) –
reduce the level of these clot-forming proteins.

- Other anticoagulants prevent these proteins from working. Heparin and Lovenox are two drugs that work this way.
- A clot also can form when blood elements called platelets are “activated” and stick together. Some anticoagulants prevent platelets from being so sticky in arteries. The main drugs that do this are aspirin and clopidogrel (Plavix).

For the drug warfarin, we have to repeatedly measure your blood clotting time (called INR, or “international normalized ratio”) in order to keep the blood thinned just right. The UC Davis Anticoagulation Clinic has great expertise in managing warfarin, and we follow guidelines created by the Joint Commission, which is a regulatory agency that accredits hospitals.

We give you the best treatment available

The UC Davis Anticoagulation Clinic has a reputation as being one of the best AC clinics in the United States. In the late 1980s we created our outpatient clinic and at the same time began to see every patient in the hospital who required a blood thinner. More recently we have improved the communication between the hospital and clinic, making sure that all patients are followed closely as they leave the hospital and change to out-of-hospital treatment. We don’t want any mistakes to occur between the time patients are in the hospital and when they arrive in the clinic.

The UC Davis Anticoagulation Clinic now manages more than 2,300 patients. Among the many anticoagulation clinics throughout the United States, few are as large as ours at UC Davis, and few have the medical expertise that we have.

Your medical director, Dr. Richard White, has focused all of his research toward improving care of patients who require anticoagulant therapy. Dr. William Dager, the pharmacist who heads the hospital anticoagulation team, also is a nationally renowned specialist who presents at national meetings throughout the United States. Other specialists include:

Dr. Ted Wun (a hematologist, or blood expert),
Dr. Susan Murin (lung specialist),
Dr. Jennifer Branch (pharmacist),
Dr. Julianna Burton (pharmacist),
Dr. Jason Bandy (pharmacist),
Dr. Teresa Kwong (pharmacist) and
Dr. Janeane Giannini (pharmacist).

What to expect at the clinic

The UC Davis Anticoagulation Clinic likes to welcome each new patient with a 90-minute appointment and education session. During that meeting, a pharmacist explains everything a patient needs to know about warfarin, including its side effects; how much to take and when to take it; when to get blood tests; and how to deal with bleeding, missed doses or other problems. A pharmacist meets with each patient to discuss his or her individual anticoagulant needs. Additional teaching is done in person or by phone as needed when new questions or problems arise.

Grateful patient Louise Hicks expresses thanks

This note from patient Louise Hicks (shown here with Jason Bandy, Pharm.D.) describes the ongoing care she receives at the UC Davis Anticoagulation Clinic.

“Since my valve replacement in 2003, I have received excellent care in the anticoagulation clinic, from Jennifer along with another pharmacist. I am not treated just as a patient – Jennifer and I have become wonderful friends, and my friendship has grown with Jason since he has come on. They are very knowledgeable about what they are doing, and I get very timely follow-up. Everything is a positive experience with them, as they help keep me healthy. They do a good job at keeping my INR where it needs to be.”
Dr. Richard White directs your Anticoagulation Clinic

The UC Davis Medical Center’s Anticoagulation Clinic operates under the medical direction of Richard H. White, M.D., an internationally recognized authority on anticoagulation drugs and therapy. He also has expertise in treating patients with rheumatoid arthritis and other rheumatic diseases, and in general adult medicine. His study of the pharmacology of anticoagulants and epidemiology of venous thrombosis has generated more than 100 research papers.

Dr. White is a professor of medicine and chief of the Division of General Medicine, and he holds the Hibbard E. Williams Endowed Chair in the Division of General Medicine. Grateful patients and community members contribute financially to the chair fund, which supports Dr. White’s research in anticoagulation and prevention of blood clots.

“During the past three years the endowment fund has enabled me to conduct some very interesting projects that pertain to treatment of patients who have venous blood clots, also known as thromboembolic disorders, which include deep vein thrombosis and pulmonary embolism,” White said. You can contribute to this fund or support our research efforts by contacting the Anticoagulation Clinic.

“My focus has been on trying to determine the risk factors associated with development of deep vein thrombosis and pulmonary embolism. Each year more than 300,000 Americans develop these two clotting conditions, and another 75,000 Americans have a recurrence of this clotting problem,” White added.

White also oversees the operation of the General Medicine Research Group, members of which are researchers and coordinators who conduct clinical studies, such as the BRIDGE study and studies of new anticoagulants. For more information on these and other trials, please call 916-734-8158.

During the past 25 years Dr. White has conducted research studies investigating diagnostic testing for deep vein thrombosis; identification of risk factors associated with venous thrombosis or pulmonary embolism; elucidation of risk factors for blood clot formation in patients who have cancer; and treatment of venous thrombosis. He also has conducted clinical studies of new anticoagulants. He and his colleagues recently completed a study of the efficacy of a new drug, dabigatran, in preventing stroke in patients with atrial fibrillation. He is preparing to study another new oral drug, apixiban, in treatment of deep vein thrombosis.

With funding through the H.E. Williams Endowment, he also has conducted analytical studies of risk factors for recurrent venous thromboembolism; risk factors for thromboembolism in pregnant women; effects of race and ethnicity on the incidence of thromboembolism; the effects of age on the incidence of postoperative thromboembolism; and occurrence of thromboembolism in patients with various forms of cancer.

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Let’s talk about DVT

A blood clot that forms spontaneously in a large vein deep below the skin’s surface poses a potentially life-threatening danger. Such a clot, known as a deep vein thrombosis (or DVT), most commonly forms in the legs. It can cause the affected vein to become inflamed and inhibit the return of blood to the heart.

Injuries, surgeries and certain medical conditions, including lupus, immobility, obesity and congestive heart failure, can trigger DVT. Immobility causes the condition commonly called “economy-class syndrome” which has been associated with very long airplane flights, particularly if passengers remain seated without moving for extended periods of time – but the condition can affect first-class passengers as well. Low cabin pressure, low humidity and dehydration appear to be contributing factors.

To prevent DVT, keep your calf muscle moving and drink plenty of water on any long plane trip, Dr. White advises. Compression stockings, which promote blood flow by applying pressure to leg muscles, also may help reduce the risk of developing DVT on long airline flights.

The UC Davis Anticoagulation Clinic, in consultation with vascular specialists, can evaluate a patient for the presence of DVT. A complete study usually takes about 30 minutes. If DVT is discovered, it is treatable with anticoagulation drugs in our clinic.
Clinical trial opportunities for patients

Dr. Richard White and his colleagues in the UC Davis Health System are conducting numerous clinical studies, also known as clinical trials, to evaluate new anticoagulants. These new drugs may replace warfarin in the treatment of DVT and PE (venous thrombosis) and prevention of stroke in patients who have atrial fibrillation.

One study is trying to determine the best way to manage patients who have atrial fibrillation but who must stop taking warfarin for a few days before they undergo a surgical or other procedure (such as a colonoscopy). This study, called the BRIDGE study, is being run by the National Institutes of Health. We are examining what happens when a patient stops taking warfarin for five days before a procedure and restarts it after the procedure – and comparing that to the effects of stopping warfarin before a procedure while giving heparin injections for three days before the procedure and three to seven days after the procedure along with warfarin. Doctors do not know which of these treatments is best in terms of lowest risk of stroke while minimizing risk of bleeding. We hope to find the answer with this study.

Home monitors are available for patients to use to show their INR values. Similar to diabetic monitors, these monitors use test strips to determine the INR. Doctors are conducting another clinical trial through Alere, referred to as the Hemosense Calibration clinic, which is testing the accuracy of the various lots of test strips manufactured for an at-home INR test device. This study is performed using blood samples from study patients on warfarin at the clinic twice monthly.

Another clinical trial is the REVERSE II study, in which doctors hope to determine if specific risk factors can make a patient's leg prone to re-developing a blood clot after three to six months of warfarin treatment. Future research will examine the effectiveness of one of the new blood thinners for treating patients whose leg develops a new blood clot while in the hospital.

“We also are starting some research studies to determine the most optimal way to treat blood clots in patients who have developed cancer, and we are beginning to do studies to determine who should receive a metal device called an inferior vena cava filter in their major abdominal vein,” Dr. White said. In addition, UC Davis faculty researchers are preparing to conduct studies to determine which types of patients are at greatest risk of developing blood clots during a hospitalization.

“We cannot perform this research without the cooperation and participation of our patients,” Dr. White added. In the future, he may contact you if you may benefit from any ongoing or upcoming clinical trials.

For information regarding any clinical or academic research, please call 916-734-8158.