The Newest Treatments

Beyond the Blood Clot Diagnosis & Management
Addressing Phlebitis & Varicose Veins

SPECIAL ON
MULTIPLE SCLEROSIS

CCSVI & MULTIPLE SCLEROSIS
A POSSIBLE CONNECTION?
Dear Reader:

The Center for Vascular Awareness, Inc. is a 501(c)(3) not-for-profit organization dedicated to fostering mainstream consumer and clinical consciousness of vascular health standards, disease, prevention, and treatment. Maintaining and improving vascular health is a critically important issue. Patients and clinicians can benefit from learning about the impact of everyday lifestyle choices, risk factor modification, current ongoing vascular research, as well as medical, minimally invasive endovascular, and surgical treatment options for vascular disease.

The Center for Vascular Awareness depends on the generosity of our readers to help us fulfill our mission. Your gift will help us to continue to bring this journal to the public for free and enable the support of essential programs and services.

You can donate by sending a check to:

**Center for Vascular Awareness, Inc.**
5 Pine West Plaza, Suite 501
Albany, NY 12205

Your gift is tax-deductible. Our federal tax ID number is 20-1764046.

Thank you for your support!
DIAGNOSIS AND TREATMENT OF DEEP VEIN THROMBOSIS
R. Clement Darling III, MD, The Vascular Group, Albany, NY

BEYOND THE BLOOD CLOT: MEDICATION FOR DVT
Benjamin B. Chang, MD, The Vascular Group, Albany, NY

A PATIENT’S STORY: DAVID AND MELANIE BLOOM
Sharon Cillis, RN, Center for Vascular Awareness, Albany, NY

USING FILTERS TO MANAGE DVT
Sean P. Roddy, MD, The Vascular Group, Albany, NY

THE CHANGING PARADIGM IN DVT TREATMENT
Yaron Sternbach, MD, The Vascular Group, Albany, NY

ARM DVT: DIAGNOSIS AND MANAGEMENT
Paul Kreienberg, MD, The Vascular Group, Albany, NY

UNDERSTANDING PHLEBITIS
Andreas M. Spirig, MD, The Vascular Group, Albany, NY

A PROBLEM OF PRESSURE: VARICOSE VEINS
John B. Taggert, MD, The Vascular Group, Albany, NY

VENOUS DISEASE RESEARCH: MULTIPLE SCLEROSIS AND BEYOND
Deborah Hill, RN, CRC & Manish Mehta, MD, MPH, The Vascular Group, Albany, NY

KEEPING IT PLAIN AND SIMPLE
Benita Zahn, MS, WNYT, Albany, NY
The Journal of the Center for Vascular Awareness

Chief Medical Editor
Manish Mehta, MD, MPH

Operations Coordinator
Sharon L. Cillis, RN

Editor
Joely Johnson, MS

Editorial Advisory Board
Gary L. Bernardini, MD, PhD
Bruce Coplin, MD
Peter Cospito, DO
Carlo Dall’Olmo, MD
R. Clement Darling III, MD
Tony Das, MD
Jose David, MD
Augustine DeLago, MD
Alan M. Dietzek, MD
Karen Fitzgerald, NP
David Ford, MD
Jill Gradner, MD
William Gray, MD
Karthikeshwar Kasirajan, MD
Paul B. Kreienberg, MD
Philip S. K. Paty, MD
Eric Roccario, MD
Sean P. Roddy, MD
Stephanie Saltzberg, MD
Luis Sanchez, MD
Larry Scher, MD
Dhiraj Shah, MD
Martha Turek, MSHSA
Frank J. Veith, MD
Benita Zahn, MS

Published by The Center for Vascular Awareness, Inc.
5 Pine West Plaza, Suite 501
Washington Avenue Extension
Albany, NY 12205
ph (518) 452-1048
fx (518) 869-2306
info@vaware.org

www.vaware.org

V-AWARE © 2010 The Center for Vascular Awareness is published on a regular schedule by the Center for Vascular Awareness, Pine West Plaza, Suite 501, Washington Avenue Extension, Albany, NY 12205. All Rights Reserved. The information contained in this publication, including text and images, is for informational purposes only and is not intended to be a substitute for professional medical advice. This information should not be used to diagnose or treat any health problems or illnesses without consulting with a physician. The Center for Vascular Awareness, Inc. accepts no responsibility for any injury or damage to persons or property occasioned through the implementation of any ideas or the use of any product described herein. The opinions expressed in this publication are those of the authors and are not attributable to any sponsors, the publication, or the Editorial Advisory Board. Reproduction in whole or in part is strictly prohibited without permission. Permission can be obtained by written request to the Center for Vascular Awareness.
Health care in the United States is riddled with complexities and inefficiencies. Delays in treatment can result in longstanding patient disability and death and can contribute to increased healthcare costs for all Americans. Deep vein thrombosis (DVT), which results when a blood clot forms within a deep vein, reminds us of how strategies focused on prevention, risk factor modification, and early diagnosis and treatment can have a significant impact on reducing lifelong disability and death.

March is DVT Awareness Month. It is estimated that 1 to 2 million Americans suffer from DVT, and 1 out of 10 patients (approximately 100,000 to 200,000 per year) with DVT die secondary to complications of pulmonary embolism (PE), which results when a blood clot breaks from the veins and travels to the lungs blocking off oxygenated blood. On a yearly basis, DVT and PE are responsible for more deaths in the United States than AIDS, breast cancer, and all traffic accidents combined.

The list of risk factors for DVT is long, and it is obvious that at any given time any of us can be in danger of developing this potentially life-threatening condition. Furthermore, people who are hospitalized have at least one risk factor for DVT, and medical patients account for half of hospital-acquired DVT and PE events. The Agency for Healthcare Research and Quality estimates that DVT leads to hospital costs of $10,000 and PE can cost $20,000 per patient—and these figures do not even take into account the burden of lifelong disability.

Recently there have been several advances in the prevention, diagnosis, and treatment of DVT. I am excited to have the participation of nationally known faculty members in this issue of V-Aware. Dr. R. Clement Darling III and Dr. Benjamin Chang open the discussion on DVT diagnosis, prevention, and medical management. Next, we have the privilege of introducing the real life story of Melanie Bloom, widow of NBC correspondent David Bloom who died of DVT while covering the war in Iraq.

Since her husband’s death, Melanie has become the national patient spokesperson for the Coalition to Prevent DVT and has had a significant impact on raising awareness of this silent killer. Dr. Sean Roddy and Dr. Yaron Sternbach outline the changing paradigm of DVT management today, from venous cava filters to endovascular treatments that remove clots from deep veins. DVT is not limited to the legs, however, and Dr. Paul Kreienberg focuses his discussion on the diagnosis and treatment of arm DVT. Dr. Andreas Spirig and Dr. John Taggert explore the implications of phlebitis and varicose veins, and Benita Zahn provides her journalistic perspective on DVT and PE.

Unfortunately, the problem of venous insufficiency is not limited to the extremities; it may also play a role in neurological disorders such as multiple sclerosis (MS). Recently there have been several observations on the association between MS and chronic cerebrospinal venous insufficiency (CCSVI), and Deborah Hill and I present a supplementary article focusing on this topic and pointing out other current DVT research.

I hope you enjoy this issue of V-Aware, and we look forward to your comments and suggestions at info@vaware.org.
Deep vein thrombosis (DVT) is a condition in which a clot or thrombus forms in one of the deep veins of the body, most commonly in the leg or pelvis.

If undetected, the thrombus can extend into the leg, causing severe swelling and pain. More dangerously, the clot may also break loose and travel to the lung, causing a potentially lethal complication known as a pulmonary embolus. (DVT can also occur in the arm; see page 12). Fortunately, DVT can be detected by an easy diagnostic test called a duplex ultrasound, which is noninvasive, can be performed in a doctor’s office, and can immediately diagnose the problem.

UNDERSTANDING CLOTS
There are primarily two types of veins in the body: superficial and deep. Superficial veins, such as the saphenous vein of the leg or the cephalic vein of the arm, can be seen through the skin when you look at your ankle or wrist. These veins carry a small amount of blood, less than 9%, back to the heart. If a thrombus forms in a superficial vein, it leads to thrombophlebitis, but this clot is not dangerous and causes relatively limited inflammation, pain, redness, and swelling of the extremity and has no risk of causing a pulmonary embolus.

The deep veins, on the other hand, are next to the long bones of the body and flow toward the heart and lungs. When clots form here, especially in the deep veins above the knee, patients need to be placed on an anticoagulant or blood-thinning medication (heparin, eventually converting to warfarin) for 3 to 6 months. This treatment aims to prevent complications of DVT, such as a potentially fatal pulmonary embolus or postphlebitic syndrome (painful, persistent swelling of the limb). Although blood thinners do not melt the clot, the medication will stop the clot from increasing in size and also help it adhere to the vessel wall so it is less likely to travel to the lungs.

SYMPTOMS AND RISKS
In about half of all cases, DVT occurs without any notable symptoms. When signs of DVT do occur, they include swelling, pain in the leg (often starting in the calf and feeling like a cramp or charley horse), redness and warmth over the affected area, or pain and swelling in the arm or neck if the blood clot occurs in that area.

Patients at high risk for DVT are those who are on prolonged bed rest, had recent surgery, smoke cigarettes, have fractures, who take medications such as estrogen or birth control pills, who are obese, or who sit or have sat for long periods, such as in a plane or car. Also at higher risk for DVT are people who have cancer, who had a previous blood clot, or who are hypercoagulable (a condition in which the blood clots more readily). DVTs are most common in adults over the age of 60 but can occur at any age.
ANTICOAGULATION TREATMENT
A diagnosis can be easily performed at an ICAVL-accredited vascular lab via a venous duplex examination. The test can evaluate the existence of a clot in the deep venous system and can also determine the age and extent of the clot.

Once diagnosed, the patient should be treated immediately with either IV heparin or subcutaneous heparin (low-molecular-weight heparin) that can be delivered on an outpatient basis. The patient should also be placed on Coumadin. It can take 3 to 5 days for the Coumadin level to become adequate to discontinue the heparin therapy. This anticoagulation treatment is usually continued for at least 3 months, but often 6 months, and patients with an identifiable blood-clotting problem may be placed on lifelong therapy.

Studies are currently being performed to examine early intervention in DVT using lytic therapy to melt the clot. This approach may help preserve venous valve function and prevent long-term swelling or other problems with the leg.

Although the potential complications of DVT can be significant and even lethal, they can be virtually eliminated by early diagnosis with venous duplex examination and prompt treatment with anticoagulation therapy under the supervision of a board-certified vascular surgeon.

Non-invasive ultrasound evaluation for DVT.

Ask Your Doctor
1. What can I do to prevent DVT?
2. How are signs of DVT different from other leg pain?
3. Should I be tested for blood-clotting problems?
Beyond the Blood Clot: MEDICATION FOR DVT
Benjamin B. Chang, MD

A blood clot (thrombus) is a potentially dangerous problem that, unfortunately, is not uncommon.

A BALANCING ACT
Many patients are puzzled when they are afflicted with deep vein thrombosis (DVT) and wonder “Why did this happen to me?” There usually are identifiable reasons for the condition. As early as the 19th century, Rudolf Virchow explained the causes of thrombosis and related embolic complications, and his work remains a good starting point for an understanding of abnormal clotting.

In the normal human bloodstream, blood is held in a dynamic balance between forces and factors that promote clotting versus those that inhibit clotting. This balance requires a beautifully designed but complicated interaction between the clot-resistant (antithrombogenic) inner lining of the vein wall and the blood proteins involved in promoting or preventing clot formation, as well as blood components such as platelets. Imbalance between these forces can lead to clot formation. A concept called Virchow’s Triad expresses this interaction by stating that venous thrombosis is promoted by:

1. Damage to the vein wall.
2. Sluggish blood flow (stasis).
3. Blood that has an abnormal tendency to clot (hypercoagulability).

STEPS TO CLOTTING
A couple of examples can show how damage, stasis, and hypercoagulability interact to lead to clot formation. Blood clots are unfortunately common in patients undergoing major surgery. Such operations cause significant trauma to the patient, and the body’s response to any wounding associated with possible blood loss is to ramp up the clot-promoting factors in the blood (hypercoagulability). In addition, individuals who have just undergone surgery may not be able to move around immediately, leading to sluggish blood flow, especially in the legs (stasis). Finally, some surgeries may also cause direct injury to veins, thereby completing the setup for a typical postoperative thrombosis.

Another example of how clotting can happen would be someone who presents with a painful, swollen calf that comes to be diagnosed as DVT. Upon questioning, these individuals are often found to have engaged in activities that promote sluggish blood flow (such as air travel or prolonged car travel), may be taking medications that cause hypercoagulability (for example, estrogen replacement therapy), or may be smokers. Blood tests may reveal congenital or acquired defects in the clotting system that would make these patients prone to clotting.
COMPLICATIONS
DVT may cause local pain and swelling, but it rarely will actually dangerously impair blood flow to the affected limb. The most feared and potentially fatal complication of DVT, however, is a pulmonary embolism, whereby a piece of thrombus breaks off or is dislodged from the original site and is carried by the circulation to lodge in the lungs, causing sudden cardiopulmonary decompensation. Forty percent of people with a pulmonary embolism will die within 3 months, according to Mayo Clinic researchers.

Even if DVT does not embolize, the local and permanent damage it causes to the vein where it occurs can lead to scarring. Vein scarring creates a tendency for repeated clot formation (rethrombosis) or pooling of blood in the lower legs with swelling (edema) and ulcer formation (called chronic venous stasis disease). Edema and ulcers may not be fatal, but each can cause a major decrease in a person’s quality of life.

MEDICATION OPTIONS
Given the grave consequences of DVT, therapy is usually administered immediately and aggressively. Otherwise, once even a small clot is formed, it tends to produce more clotting, leading to a progressively larger clot, which in turn increases the risk of fatal pulmonary embolus.

Heparin, a naturally occurring compound, can be quickly given intravenously to stop this snowballing thrombosis (clotting diathesis). Although heparin does not cause pre-existing clots to dissolve, it pushes the balance of the body’s clotting system away from clot formation and allows the body’s own clot-dissolution mechanisms to go to work. Heparin administration is complicated by bleeding about 7% of the time, and 1% of individuals may have a paradoxical immune response to heparin formation, leading to increased clotting. In these individuals, other, more expensive alternatives include anticoagulant medications such as danaparoid, lepirudin, or argatroban.

One of the major advances in the initial treatment of low- to moderate-risk DVT is the use of a type (fractionated portion) of heparin, typically Lovenox (enoxaparin), which can be administered twice a day by subcutaneous injection by the patient or caregiver, making hospitalization unnecessary. Lovenox is equally effective as heparin in decreasing the complications of DVT but costs much more and still carries a risk of hemorrhage or immune-related increased clotting.

Both heparin and Lovenox are likely to produce significant osteoporosis when administered for more than a month. Given that it takes more than a month for the initial clot and damage to the vein wall to be stabilized, long-term therapy usually involves the use of warfarin sodium (Coumadin), an oral anticoagulant. Effective in DVT treatment, Coumadin can be inconvenient for many individuals to take; its effect on the clotting system varies greatly from person to person and usually requires at least weekly blood tests to assess the effects of the current dose and to guide further dosing recommendations. The drug also requires dietary restrictions, especially in regards to eating green vegetables and consuming alcohol, which can negatively affect quality of life.

Patients with an episode of DVT are usually maintained on anticoagulant therapy for at least 6 weeks to 6 months. After the anticoagulant is stopped, many patients would benefit from a series of blood tests that seek to identify if the patient had an identifiable factor leading to a tendency to form clots. This information is important for the patient, as well as the patient’s family, especially in the case of clotting defects that can be genetically inherited (such as factor V Leiden). Patients proving to be strongly hypercoagulable may need to take Coumadin permanently to prevent further thromboses.

TREATMENT WORKS
DVT affects many thousands of patients each year with often debilitating or fatal results. Anticoagulation treatment is the most common approach in the vast majority of patients, and it has excellent success in avoiding the major complications posed by blood clots.

Ask Your Doctor
1. I am going to have surgery; am I at risk for DVT?
2. Can I get DVT more than once?
3. How would I know if I have an inherited clotting disorder?
A PATIENT’S STORY: 
David and Melanie Bloom

During the 2003 invasion of Iraq, NBC news correspondent and Today show weekend co-anchor David Bloom provided coverage from the front lines.

Americans were mesmerized watching David reporting from the moving “Bloomobile” tank as it traveled though the desert to the battlefield.

This was the first time the public was able to see the war firsthand. We listened as David reported in a whisper because the enemy was close by. We held our breath listening to bombs and machine guns fire off in the distance. The sense that this reporter was in harm’s way was authentic. When David’s death was reported in April 2003, the public quickly assumed that he was killed by an insurgent’s bomb or bullet.

The news of his sudden death shocked us all, but to hear that he died of a pulmonary embolism (PE) caused by deep vein thrombosis (DVT) was particularly surprising, especially given that David was only 39 years old and appeared to be in excellent health.

In DVT, a blood clot forms in the deep veins, most commonly in the legs. In David’s case, a piece of the clot broke free (an embolus) and traveled to his lungs causing a PE. The PE likely cut off blood flow to the lungs, causing respiratory distress, respiratory failure, and death.

A NEED FOR AWARENESS

After her husband’s life was taken by a complication of DVT, Melanie Bloom, David’s widow, learned that approximately 300,000 people die from PE, the majority caused by DVT. She was also surprised to learn that complications from DVT kill more people each year in the United States than breast cancer and AIDS combined. Yet, many people have never heard of the condition or its complications.
Looking back, Melanie has been able to identify several of David’s risk factors. Before his death, David had taken long flights overseas. And, while in Iraq, he was dehydrated and spent many hours sitting still and cramped in the tank. Additionally, 2 nights before David’s death, he had complained to Melanie about pain he was experiencing in his calves. He also had one risk factor that he never knew about, an inherited genetic blood disorder called factor V Leiden. Melanie was shocked to learn that all of these signs combined to increase David’s odds for developing DVT and suffering a PE. She believes that had she known then what she knows now, David’s life could have been saved through knowledge and awareness.

Some additional risk factors for DVT include limited mobility, cancer, recent surgery, obesity, being over age 40, dehydration, blood disorders, certain heart or respiratory conditions, some orthopedic surgeries, and a family history of DVT. Women are at greater risk for DVT when they are on hormone replacement therapy or birth control pills.

Melanie recalls the first time she was interviewed on Larry King Live. On the air, she told David’s story and educated the public about the worrisome signs of DVT. After the show, her parents called her. Melanie said, “I grew up in a tiny town in Kansas. One of my neighbors was watching the show with my parents. He got up about halfway through the interview and left. He drove himself to the hospital and was admitted for DVT. He had felt a nagging leg pain for a couple of days and decided not to wait. He was admitted to the hospital on the spot with DVT.”

SPEAKING OUT
After David’s death, information about DVT and PE became more prevalent in the news. Melanie states, “When the condolence mail started coming to my house, I was struck by how many people talked about someone they knew who had been having signs and symptoms of DVT. Many people wrote that they went to their doctor because of what they learned from David’s tragic death, and I realized this was really important information and that I needed to speak out.” These personal stories quickly inspired Melanie to become a crusader for DVT awareness, and she began her role as the national patient spokesperson for the Coalition to Prevent DVT.

KNOWLEDGE IS POWER
Melanie believes that knowledge is power. After David’s death, his brothers were tested for the blood disorder factor V Leiden and both tested positive. Melanie also had her three daughters tested, and each of the girls carry the blood disorder. “This knowledge has galvanized me to continue raising awareness about DVT prevention,” she said.

Melanie Bloom is very excited about the progress being made on the public policy front. In 2008, then-Acting Surgeon General and retired Rear Admiral Steven K. Galson, MD, MPH, issued a “Call to Action” that deems DVT and PE national public health priorities. Additionally, early this March, the Coalition to Prevent DVT kicked off the 7th annual DVT Awareness Month and launched a new campaign, “DVT Awareness in Motion.” The organization is working with Melanie and Mary Ann Wilson, RN, founder and host of the television exercise series Sit and Be Fit to educate the public about the risks for DVT and the importance of maintaining proper blood circulation.

When asked what she would like people to know about her mission, Melanie said, “I would like DVT to become a household name with the general public. It’s my hope that hospitals prioritize DVT awareness and prevention and that our grass roots efforts take off to help spread the word about DVT. Getting more political muscle behind this movement would be enormously beneficial.” Melanie said, “David Bloom is remembered for his work as a journalist, but his enduring legacy will be raising the public’s awareness about DVT. His death has served to shine a spotlight on an issue that needs public recognition.” It makes her feel good when people tell her that they went to seek help after hearing about David’s story. The knowledge that David’s death and story have saved lives gives Melanie the energy to continue her mission of making DVT a household name.

- by Sharon Cillis, RN

LEARN MORE
For more information about DVT risk, prevention, and management, go to the Web site for The Coalition to Prevent Deep Vein Thrombosis at www.preventdvt.org
DVT is the medical condition in which a clot (thrombus) has developed within one of the deep, major veins of the body. In most cases, a lower extremity is affected, and symptoms include pain and swelling in the troubled leg.

The main concern that DVT brings, however, is that the clot may increase in size, and a piece may break free. Because the venous circulation is responsible for returning blood to the heart, the dislodged thrombus may travel to the right side of the heart and ultimately become wedged within the lung vasculature; this condition is known as a pulmonary embolism (PE). The larger the piece of clot that lodges in the lung, the higher the patient’s risk of respiratory failure, hemodynamic collapse, or, often, death. This emergency situation is best treated with immediate hospitalization and drugs that include intravenous blood thinners (such as heparin) and immediate management of the cardiovascular and respiratory collapse that the patient often develops.

The obvious question is, how does one prevent this catastrophic cascade of a dislodged clot from a DVT traveling through the largest vein in the body, the inferior vena cava (IVC), and reaching the lungs? Therapeutic anticoagulation treatment will reduce the possibility of PE and further clotting. The American Academy of Chest Physicians has periodically released consensus statements, which most physicians consult when determining appropriate therapy.

PREVENTING PE
The IVC is a large vein that returns blood from the lower half of the body through the abdomen to the heart and lungs. Because the majority of DVTs occur in the lower extremities or in the pelvic veins, the flow of blood in and around most clots will pass through the IVC on its way back to the heart and, ultimately, lungs.

One of the major goals of treating DVT is to prevent potentially deadly PE. Routine medical therapy includes intravenous, injected, or oral treatment with blood-thinning drugs such as heparin, enoxaparin (Lovenox), fondaparinux (Arixtra), or warfarin (Coumadin).
In patients who are at a higher risk for developing PE or who can’t receive blood thinners, the treatment often focuses on other minimally invasive means of trapping the blood clots in the IVC before they reach the lungs. In the past, surgical exploration of the abdomen was performed with the IVC intentionally tied closed to prevent further clots from entering the lung. In 1973, Greenfield introduced a stainless steel implantable device that required a small groin incision and acted as a “strainer” in the IVC, trapping large pieces of thrombus while allowing blood to flow freely back to the heart. Technical improvements now allow insertion of this prosthetic filter through a vein in the groin (femoral vein) or the neck (jugular vein), using a minimally invasive percutaneous approach with local anesthetic and avoiding surgery altogether. IVC filters act as “fatal PE prophylaxis.” They do not prevent emboli from occurring but simply halt large and potentially life-threatening clots from entering the heart and lungs. Smaller pieces of clot are not trapped but, fortunately, are fairly benign.

**FILTER USE**

IVC filters are most often placed in individuals with DVT who are actively bleeding or who cannot undergo anticoagulation because of the potential for bleeding. Examples include those who have had recent intracranial surgery, a bleeding duodenal ulcer, or retroperitoneal hemorrhage. If the patient’s status improves, blood-thinning treatment is then started (or restarted) in addition to the IVC filter as therapy for the DVT.

Some physicians also feel that IVC filters are appropriate as a preventive measure in patients at high risk for clots, such as the morbidly obese after gastric bypass surgery or the multitrauma patient with a head injury in the intensive care unit setting. Rarely, extension of clot in the lower extremity may be identified while the patient is taking blood thinners. Such an individual’s blood may clot more than that of the general population. An IVC filter may prevent PE as the clot burden grows. This approach poses a dilemma, however, as the presence of a foreign body (the IVC filter itself) may induce further clot instead of providing prophylaxis.

**REMOVABLE FILTERS**

Recent advances in device manufacturing have allowed for the implantation of removable filters. Before attempting retrieval of a device, contrast angiography is necessary to rule out trapped debris in the IVC filter that could enter the bloodstream during removal. Also, there are time limits on retrieval because, over time, the filter may experience tissue ingrowth from the vein, which would prevent removal. Additionally, this scarring response, or trapping of additional blood clots that could potentially have resulted in PE, may lead to complete blockage of the IVC. In the long-term, this occlusion can lead to significant problems such as chronic leg swelling, aching, and possibly ulceration.

If you have DVT and are unable to take blood-thinning drugs, an IVC filter may prevent PE and save your life. If your doctor suggests an IVC filter, find out all you can about your condition and the ways in which a filter can help.
Deep vein thrombosis (DVT) can occur in any part of the body’s vascular system.

Blockage of vein circulation can result in localized swelling and, in extreme cases, compromised organ function or risk of damage to an arm or leg. For decades, treatment with anticoagulant drugs has been the mainstay of therapy for DVT, with two main goals: preventing a clot from growing larger and limiting the risk of the clot becoming dislodged and traveling with venous flow to the lung resulting in a pulmonary embolism.

**CHANGES IN TREATMENT**

In recent years, the treatment for most patients with uncomplicated DVT has evolved from prolonged hospitalization to outpatient therapy under a physician’s care. Home injection of fractionated heparin (such as Lovenox) has replaced hospitalization with continuous infusion of unfractionated heparin combined with conversion to oral anticoagulants such as warfarin (Coumadin). The hospital regimen, which included patients’ adherence to bed rest for a period of days, has given way to early ambulation and a patient’s more rapid return to usual activities in conjunction with the use of compression stockings. Hospital-based treatment has thus become less frequent; in more severe cases, patients may be admitted for pain management or, rarely, to manage a threatened limb.

Ultimately, the duration of anticoagulation treatment will depend on the location and extent of the clot, as well as ongoing risk factors for recurrent thrombosis and the body’s own ability to restore circulation through the affected vein.

When anticoagulation medication is deemed unsafe, treatment is aimed at preventing pulmonary embolism. A variety of filters may be placed in the inferior vena cava to trap clots and keep them from reaching the pulmonary circulation.
PREVENTING LONG-TERM PROBLEMS

These newer, outpatient strategies have been successful in limiting the short-term impact of DVT, however, the focus has gradually shifted to preventing longer-term complications as well. Damage to the local vein valves can result in chronic leg swelling and pain. Postthrombotic syndrome, a combination of pain, swelling, and associated skin changes, will ultimately affect the majority of DVT patients with a significant burden of pain, disability, and cost. In the most severe cases, the management of chronic open leg ulcers challenges physicians and patients alike.

Beyond standard anticoagulation, clinical evidence has emerged to support the use of adjunctive therapies aimed at restoring venous outflow. The goals are to minimize damage to the veins and restore function more rapidly, while speeding a patient’s return to everyday activities and preserving both function and appearance of the affected leg.

QUICK INTERVENTION IS KEY

Ultimately, for patients with recently diagnosed DVT, an orderly approach to care provided by a dedicated team will yield optimal results. With prompt screening and patient evaluation, treatment may be instituted with appropriate adjunctive therapies. Quick intervention may enhance long-term outcomes, minimizing future symptoms, disability, and overall treatment cost.

For appropriately selected patients, the following treatments are currently available and have been endorsed by the American College of Chest Physicians:

**Thrombolysis**

Drugs can be used to pharmacologically disrupt the thrombus. Tissue plasminogen activator is the agent used most frequently. Catheter-based delivery of the thrombolytic agent directly into the clot is preferred, although systemic therapy has been used as well. Ultrasound waves delivered locally at the same time may accelerate the process, reducing treatment time and the overall dose of thrombolytic agent needed.

**Mechanical thrombectomy**

Physical disruption of the dominant thrombus may be accomplished with devices that either directly destroy the clot by macerating it into small particles or that disrupt it with multiple fluid jets. The resulting particles may be removed by catheter-based aspiration or dissolved with thrombolytic agents.

**Catheter aspiration thrombectomy**

A clot can also be removed percutaneously by catheter. Generally, this treatment is given in conjunction with drugs that can break down the clot (thrombolysis).

**Operative venous thrombectomy**

Surgical clot removal is reserved for patients with severe symptoms or threatened extremities in situations when thrombolysis treatment presents excessive risk. Direct thrombus extraction rapidly restores blood flow, reversing associated complications.

**Filters**

The advent of retrievable vena cava filters may improve treatment for lower extremity thrombosis by decreasing the risk of embolization induced by catheter-based intervention. For more information on filters, see page 8 of this issue.

**Balloon angioplasty/stenting**

Balloons are used both to treat focal narrowings in the affected veins, which may serve as an impediment to blood flow, as well as another way of breaking down thrombus. In instances where the narrowings prove resistant to treatment with balloon angioplasty alone, a stent may provide the support needed to reopen the vein completely. Although stents remain a last resort, they are commonly used, for example, in patients with May-Thurner syndrome, in which the left iliac vein is compressed extrinsically by the right iliac artery.

**Ask Your Doctor**

1. How extensive is my clot?
2. Which type of treatment is best for my DVT?
3. Will declotting procedures help limit long-term leg swelling?
ARM DVT:
Diagnosis and Management

Paul B. Kreienberg, MD

Many people are familiar with blood clots that occur in the veins of the legs. Fewer people realize, however, that this condition may also occur in the arms.

DIAGNOSIS
People with arm deep vein thrombosis (DVT) often have swelling, pain, bluish skin discoloration, and perhaps visibly dilated veins on the chest wall of the affected side. Usually, these signs and symptoms will develop rather suddenly. The diagnosis can often be confirmed by performing an ultrasound examination of the arm veins. Once the ultrasound determines that a clot is present, further history and evaluation are usually aimed at identifying the cause of clot.

CAUSES AND TREATMENTS
Arm DVT can be caused by a number of factors:
• Effort-induced thrombosis.
• Clogged vein caused by an indwelling deep vein catheter or pacemaker wire.
• Prior trauma to the deep veins (a collarbone fracture, for example).
• Generalized disorders such as congestive heart failure, dehydration, or having “thick” (hypercoagulable) blood.

A: Normal axillary vein in arm.
B: Clogged axillary vein in arm.

Thrombolysis and angioplasty of clogged axillary vein.
Arm DVT usually occurs in the axillary vein, located in the armpit. A condition referred to as effort thrombosis happens because of anatomic compression of the vein between the first rib and the collarbone. Eventually, the vein becomes scarred and can clot, producing symptoms. The problem often follows vigorous activity and is more common in younger people.

These patients are often treated with blood-thinning medicine to help dissolve the clot, given by a catheter placed within the thrombus. Patients may also require surgery to make more room for the vein and may also need balloon treatment (angioplasty) of the vein itself. These patients are then given blood thinners and wear compressive arm stockings for several months. Timing is everything, and patients with arm DVT and effort thrombosis need immediate treatment for optimum outcomes. Left untreated, patients will often have disabling swelling and arm pain with exercise.

Individuals with arm DVT from other causes are treated differently. Clots due to indwelling central catheters are treated by catheter removal and then blood thinners. Thromboses related to pacemaker wires are treated with blood thinners alone. Patients usually take blood-thinning medication for 3 to 6 months. Patients can also wear compressive arm stockings to relieve swelling. If for some reason a clot cannot be dissolved, a filter may be inserted in the vein just before the heart to prevent the clot from traveling to the lungs.

**DIAGNOSIS IS KEY**
The incidence of arm DVT is increasing as a result of the more frequent use of central catheters for chemotherapy, nutrition, and other medical issues. Arm DVT has the potential to produce the same problems as lower extremity DVT: clots traveling to the lung, chronic pain, swelling, and disability. Prompt recognition and appropriate diagnosis and treatment are essential. Depending on the cause of the clot, treatment options vary—but the most important step is to be correctly diagnosed.
UNDERSTANDING PHLEBITIS

Andreas Spirig, MD

Thrombophlebitis (also called phlebitis) happens when a blood clot causes swelling in a vein.

If the affected vein is located deep in a muscle, it’s called deep vein thrombosis (DVT). In a vein closer to the skin, the condition is referred to as superficial thrombophlebitis (ST). ST occurs most commonly in the legs but can also affect the arms, the breast (Mondor’s disease), or the neck. It is generally a benign and self-limiting situation, but at times, ST can be persistent and can cause significant physical difficulties. On occasion, ST may be associated with more serious conditions such as cancer or a tendency for clotting (hypercoagulability). ST can lead to DVT, pulmonary embolism (PE), or serious infections (septic thrombophlebitis) and so needs prompt and careful evaluation and treatment by a vascular specialist.

CAUSES AND RISKS

In general, the factors of Virchow’s triad (trauma, stasis, and hypercoagulability) are common causes behind any venous thrombosis. Varicose veins in the legs are frequently associated with ST. Obesity, smoking, prolonged immobilization, infections, hormone replacement therapy, an underlying malignancy (migratory thrombophlebitis or Trousseau’s syndrome), and a hypercoagulable condition (such as factor V Leiden, protein C or S deficiency, or prothrombin gene mutation) may also make a patient more likely to develop ST. Sometimes, ST may be caused by more rare underlying conditions such as Buerger’s disease (thromboangiitis obliterans) or vasculitis. When it occurs in the arms, phlebitis is most frequently a result of placement of an intravenous catheter or infusion of an irritating intravenous solution.
**SIGNS AND SYMPTOMS**

Individuals with ST will have the classic symptoms of pain, swelling, and redness over the affected veins. During a physical examination, the physician will note a tender, reddened, and hard area over the affected area. On rare occasions, ST can happen with few or no symptoms and may then be associated with DVT. The most frequently involved areas are varicose veins of the legs, but thrombosis of the greater or lesser saphenous veins may also indicate a risk of DVT. Infection (septic thrombophlebitis) and thrombosis are frequently difficult to distinguish and may happen at the same time. It is important to treat both conditions aggressively, as septic thrombophlebitis may have a more grave clinical course. In rare cases, PE may also be associated with ST.

**DIAGNOSIS**

Diagnosis of ST should be made by an expert vascular specialist trained in the evaluation of vascular disorders. A physical examination usually points out the diagnosis, but ultrasound is the most important way to confirm the diagnosis and also to rule out the more serious condition of DVT. An experienced ultrasound technologist should be able to make the diagnosis easily. If ST is spotted in the greater saphenous vein, a follow-up ultrasound is necessary, as 1 out of 8 patients may show growth of the clot into the deep venous system. Venography is generally not indicated, as the contrast agent may cause more irritation to the veins. However, computed tomography venography may occasionally be helpful to diagnose associated DVT, especially in the pelvic or iliac venous system.

**EVALUATION**

If there is an obvious cause for a case of ST, such as trauma, varicose veins, or an intravenous cannula, no further search for a reason is necessary. A patient with recurrent ST should undergo further evaluation for a hypercoagulable condition such as factor V Leiden, protein C or S, antithrombin C, antiphospholipid antibodies, lupus anticoagulant, factor VIII, or homocysteine. A patient with migratory thrombophlebitis should be examined for an underlying malignancy. In that case, appropriate tests include serum carcinoembryonic antigen, prostate-specific antigen, mammography, and computed tomography scans.

**TREATMENT**

For milder forms of ST, aspirin or ibuprofen in conjunction with a compression bandage and application of hot, wet compresses may provide enough pain relief. Symptoms generally improve in 1 to 2 weeks, but sometimes may linger. If the thrombosis is extensive or involves the greater saphenous vein (a large superficial vein that travels along the inner thigh and connects with the deep femoral vein at the groin), the physician may consider systemic anticoagulation, either with low-molecular-weight heparin or a vitamin K antagonist such as warfarin (Coumadin). A saphenofemoral or saphenopopliteal ligation may be equally effective if the greater or lesser saphenous vein is involved. Should an infection be suspected, antibiotic therapy is absolutely necessary. On rare occasions, the infected vein segment may need to be surgically removed.

ST is a relatively frequent but usually benign condition of the venous system. Occasionally, it may have serious consequences (DVT, PE, or sepsis) or be associated with a more dangerous underlying condition (such as a hypercoagulable state or cancer). It is therefore crucial that suspected ST be evaluated right away, preferably by a well-trained vascular specialist.
A Problem of Pressure: VARICOSE VEINS

John Taggart, MD

Many of us can easily and correctly identify varicose veins. In fact, vein disorders and ailments have been recognized, written about, and treated as far back as ancient Egyptian times. Vein problems now rank among the most common medical conditions worldwide.

Varicose veins are abnormally enlarged, ropey, and tangled-looking veins visible under the skin. They appear most commonly in the lower legs but can occur anywhere. Similar to varicose veins but smaller in size are telangiectasias and reticular veins. Telangiectasias are permanently dilated veins within the skin layers and measuring less than 1 mm in diameter. Reticular veins are similar to telangiectasias but larger, measuring 1 to 3 mm in diameter.

Risk factors for varicose veins include a family history, pregnancy, female gender, increasing age, obesity, and standing for long periods of time. There is a common misconception that varicose veins are a sign of problems in other blood vessels including the arteries and the heart, but that is not the case. Varicose veins are not a marker for increased risk of atherosclerosis, coronary artery disease, heart attack, or stroke.

Long-standing vein disorders can eventually cause abnormalities of the skin and soft tissues. The skin of the lower leg can become darkened and brownish as pigments from blood cells become trapped and deposited there. The soft tissues may harden, become inflamed, and even ulcerate. Blood clots may form in the superficial veins causing pain and inflammation that may last for several weeks. Fortunately, most patients do not experience these more severe outcomes.

SYMPTOMS
The most common symptoms of varicose veins of the lower extremities are aching pain, leg fatigue, and a sensation of leg heaviness. Symptoms are commonly made worse by long periods of standing and usually become more noticeable throughout the day. The pain results from nerves within the soft tissues just below the skin being irritated by the highly pressurized and engorged adjacent veins. The legs may retain increasing amounts of fluid during the course of the day and become truly heavier.

Of note, a patient’s symptoms are not directly related to the length or size of the varicose veins. Pain from the small-diameter telangiectasias and reticular veins can be similar to that caused by much larger varicosities.

VALVES UNDER PRESSURE
Varicose veins are caused by abnormally high pressure within the superficial veins and faulty valves that connect the superficial veins to the deeper vein system. In the legs, the deep veins can have pressures that are 2 to 3 times higher than are seen in arm veins. Normally, the pressure in the deep system is not transmitted to the superficial system. A system of one-way check valves prevents the blood in the deep
system from passing into the superficial system. When these valves don’t function properly, highly pressurized deep system blood fills the superficial veins, a condition called venous reflux. Valves that have failed are referred to as incompetent.

The causes of valve failure, or incompetence, are not entirely clear. Wear and tear, hormonal influences, and prior blood clots all play a role. At this time, there is no reliable way to repair or replace incompetent valves.

ULTRASOUND

Although varicose veins are typically visible from the skin surface, ultrasound is the best way to determine the location of the faulty valves. Other abnormalities such as blood clots can also be seen with ultrasound. An ultrasound test is safe, pain-free, noninvasive, and can often be performed right in your physician’s office. It uses no radiation and can be done quickly. The information obtained with ultrasound is used to plan most varicose vein procedures.

TREATMENT OPTIONS

The symptoms of varicose veins often improve when a patient wears compression socks. These specially fitted, medical-grade stockings compress the superficial veins, reducing vein engorgement and leg swelling. The varicose veins will reappear once the stockings are removed, as the stockings address symptoms but not the underlying problem.

Many people experience incomplete pain relief with compression socks and also find the socks uncomfortably tight, inconvenient, and difficult to wear. Patients with conditions such as arthritis may have a particularly hard time getting the stockings on and off.

After trying compression stockings, most patients request further, more effective treatment. Now, more than ever, minimally invasive office-based procedures are available to remove or eradicate varicose veins and to reduce pressure within the superficial venous system. These outpatient treatments usually fit into busy family and work schedules, making them convenient and attractive to patients.

Sclerotherapy

Injecting a solution directly into a diseased vein can cause it to scar and close. This treatment typically works best for smaller veins and areas of limited reflux and valve incompetence.

Stab phlebectomy

The creation of a tiny incision—no stitches needed—and direct removal of varicose veins works well for larger varicose veins and those that persist despite other treatments.

Endovenous vein ablation

Heat energy from either a laser or radiofrequency catheter can be used to close veins with significant amounts of reflux. This procedure also helps prevent future varicose veins from forming.

A number of other treatments are available and used in particular situations. A personalized treatment plan can be created after evaluation and discussion with your physician regarding the benefits, risks, and alternatives to each of these treatments. Varicose veins are common enough that you may find yourself facing them one day; fortunately, there has never been a better time to have varicose veins treated.

Ask Your Doctor

1. Can you perform an ultrasound right in your office?
2. Will accredited and experienced vascular technologists perform my ultrasound?
3. Will my insurance cover planned treatments?

Varicose veins and venous insufficiency result in chronic hyperpigmentation and scarring.
Venous Disease Research:

MULTIPLE SCLEROSIS AND BEYOND

Deborah Hill, RN, CRC and Manish Mehta, MD, MPH

It has long been known that venous obstruction or reflux in the lower extremities can lead to chronic venous insufficiency (CVI) resulting in persistent leg swelling, induration, dermatitis, hyperpigmentation, and ulcers.

Patients with CVI have elevated pressure in their dilated and engorged veins, resulting in sluggish blood flow. This slowed circulation then causes red blood cells and protein-rich fluid to escape into the subcutaneous tissue leading to hyperpigmentation and inflammation. Studies have shown that legs affected with CVI have a 20-fold higher concentration of iron deposits compared to non-affected legs; increased iron and protein can lead to a chronic inflammatory response.

TREATING MULTIPLE SCLEROSIS

It has been more than 100 years since the first diagnosis of multiple sclerosis (MS), an inflammatory disorder that results in demyelination of the central nervous system. The exact underlying cause of MS remains unknown; however, it has long been considered to be related to an autoimmune response. According to the National MS Society, approximately 400,000 Americans are affected by MS. Symptoms typically begin in early adulthood and include neurologic sensory and motor disturbances that can lead to severe lifelong disability. There is no cure for MS, and medical management provides only limited benefit.

Paolo Zamboni, a vascular surgeon at the University of Ferrara in Italy, has recently illustrated a significant association between MS and chronic cerebrospinal venous insufficiency (CCSVI). Zamboni and colleagues evaluated the extracranial venous outflow from the brain in patients with and without MS and noticed a dramatic association of venous outflow abnormalities in patients with MS. His findings suggest that extracranial venous stenosis in the neck veins that drain blood from the brain (the internal jugular veins) and the vein that drains blood from the spinal cord (the azygous vein) can result in venous reflux and increased central nervous system venous pressures. This process is similar to the way that CVI in the lower extremities leads to increased venous pressures and related problems. In the case of MS, the increased venous pressures can potentially lead to the weakening of the blood-brain barrier and extravasation of the of the red blood cells carrying hemoglobin with iron. The iron deposition that is seen in patients with MS may be responsible for the inflammation that can lead to demyelination of the neurons in the brain and spinal cord.
Zamboni and colleagues have also evaluated the safety and feasibility of endovascular angioplasty of extracranial central veins in MS patients with CCSVI. A study published in 2009 looked at 65 patients with CCSVI who underwent balloon angioplasty of extracranial central vein stenosis and were followed up for a mean of 18 months. Their findings indicate that endovascular treatment of CCSVI had significant improvement in clinical outcomes of MS, particularly in patients with the relapsing-remitting type of the disease. After venous angioplasty, there was a significant decrease in venous pressures in all treated veins and a drop in the number of active brain lesions.

On February 10, 2010, the results of the first prospective blinded study of CVI prevalence in MS patients showed promising results supporting the significance of CCSVI in MS patients. This 500-patient study compared extracranial venous outflow from the brain in MS patients and compared it to healthy individuals and found a significantly higher incidence of CCSVI in MS patients (62.5% vs 25.9%). These data are certainly encouraging, and further studies with advanced imaging including venography will be necessary to further evaluate the relationship between CCSVI and MS.

**OTHER VENOUS TRIALS IN NY**

The vein-related research trials described here are currently recruiting participants or plan to do so in the near future. For information go to clinicaltrials.gov.

**THE ATTRACT Study**

Washington University School of Medicine, St. Louis, MO
National Institutes of Health
Albany Medical Center, Albany, NY
Mount Sinai Medical Center, New York, NY
Stony Brook University Medical Center, Stony Brook, NY
University of Rochester Medical Center, Rochester, NY

**DESIRABLE Trial**

Multi-Center Desirudin Utilization Trial in Patients With or Without Thrombosis Requiring an Alternative to Heparin-Based Anticoagulation

St. Peter’s Hospital, Albany, NY
Albany Medical Center, NY

**Discharge ALERT: Quality Improvement Initiative For UTE**

Sponsor: Bringham and Women’s Hospital in collaboration with Sanofi–Aventis

Albany Medical Center, NY
North Shore University Hospital, Long Island, NY
This issue of V-Aware focuses on deep vein thrombosis (DVT)—but does anyone outside the medical profession understand what that is?

Many people know that blood clots are a natural part of healing after an injury. In the case of DVT, however, the clotting process happens unnecessarily at the wrong time and in the wrong place, namely, inside large and small veins that lie deep within the body.

EVEN ROCK STARS GET IT

To find out how much people do know about DVT, I tapped into the pulse of the public by jumping onto Facebook and Twitter to pose the question, “Have you or a loved one ever been diagnosed with DVT?” The response was overwhelming but not in the way a vascular specialist would hope. Most of the respondents replied with their own question: “What is DVT?”

One fellow even asked, “You mean digital video transmission?”

Clearly there’s some static in the transmission of information about DVT and how to prevent it.

There was one response that really had me confused: “You mean like Jethro Tull?” I thought that band sang “Aqualung” not “clot in lung.”

Well, it turns out Jethro Tull’s front man Ian Anderson, a flautist, guitarist, singer, and songwriter, suffered from DVT about a decade ago. He’d fallen onstage and tore a ligament in his knee but continued with the band’s tour. Sitting in a cramped position for many hours on long plane flights, the potentially deadly trouble began brewing. In recounting his story, Anderson wrote that only one of the many doctors he saw even hinted at the potential for a vein-related problem, telling him to take an aspirin daily but without really explaining why.

Eventually, Anderson developed what he called a “huge and life-threatening clot.” After experiencing extreme shortness of breath, he was hospitalized. When he recovered and learned about the danger he had faced, he created a Web site in the hope of sparing others his fate: www.j-tull.com/musicians/iananderson/dvt.html.
CLARIFYING THE RISK
Too bad an 82-year-old grandmother from Albany, NY, wasn’t a Jethro Tull fan. She might have avoided a similar situation. As her daughter describes her, Yolanda is fun-loving and active. A former restaurant owner, she is an avid painter and loves to go antiquing. She’s always ready to enjoy time with her four children, 15 grandchildren, and five great grandchildren. But all that was jeopardized in January 2009 when Yolanda fell, fracturing her pelvis in two places. Doctors determined she was not a candidate for surgery and prescribed rehabilitation, which meant many hours with little movement. No one warned her about the potential for DVT or the symptoms to be alert for.

Unfortunately, Yolanda got a double dose of trouble. DVT occurred in each leg and then traveled to her lungs. Luckily, she survived and has been treated with warfarin (Coumadin) ever since.

Yolanda tells me that she warns others nowadays and encourages people to ask their doctor about their risk if they’re facing surgery and have to spend any time on bed rest. She doesn’t understand why she wasn’t made aware of the potential for trouble. It’s impossible to determine what she was told at the time. The only thing that’s clear is if she was warned, it was not in language she could understand.

When doctors warn their patients about DVT, they have to be very clear about what it is, what causes it, and the symptoms to be alert for. Doctors and nurses may easily understand what DVT means, but most people are more familiar with the term blood clot. When Yolanda explained her condition to me, she said it was blood clots that almost killed her. Even after her run-in with DVT, she still didn’t use that term.

NO ONE IS IMMUNE
Being unaware of something or unable to comprehend the language used to describe a condition is easily remedied. But how do you combat a reputation that makes those affected deny what’s happening?

Take the case of a good friend of mine. He’s a big guy, a former baseball player. Now, as the coach of a college team, he’s attuned to the nuances of his players’ health but not his own. A few months ago, he noticed he had shortness of breath but dismissed it as being overtired, gaining a few extra pounds, the busyness of the holidays. But it worsened to the point that his wife could hear his labored breathing. It wasn’t until he collapsed while working out that he received treatment. My friend was diagnosed with a pulmonary embolism (PE). Did it start with DVT? He won’t even entertain that thought—in fact, he bristles when you ask. Why? Because DVT sounds like a weakness, and strong guys don’t get something like that.

But they do. The American Society of Hematology says more than 375,000 Americans suffer from DVT every year. Nearly 300,000 people will succumb to a PE, meaning that a piece of clot will break away and travel to the lung, causing a fatal loss of blood flow.

WATCH FOR SYMPTOMS
To protect yourself from DVT and PE, be aware of the following symptoms:

- Unexplained shortness of breath (the most common symptom of PE).
- Chest discomfort, usually worse with a deep breath or coughing.
- A general sense of anxiety or nervousness.
- Lightheadedness or fainting.
- Very low blood pressure.

Risk factors include smoking, being overweight, being sedentary for long periods of time without moving your legs (such as during a long plane or car trip), having surgery, or taking birth control pills or hormone replacement therapy. A family history of blood clots, being over age 60, trauma to your leg, cancer, and even pregnancy are other risk factors.

It doesn’t matter if you’re a rock star, a grandmother, or a baseball player. Given the right set of circumstances and the right risk factors, anyone can suffer from DVT. If you don’t know you’re at risk or don’t know the symptoms to watch for, you could die—plain and simple. Medical practitioners should take note and be sure to make their explanations just as plain and simple.
 EARLY DETECTION EQUALS SUCCESSFUL OUTCOMES

Over 30,000 Lives Saved

The Vascular Group PLLC is one of the largest vascular speciality practices in the world dedicated to comprehensive vascular care. Our world-class leadership, knowledge, and experience in the treatment of vascular illnesses are unmatched.

To date we have performed more than:

- 13,000 lower-extremity revascularizations by endovascular and open surgical repair
- 12,000 carotid artery revascularizations for stroke prevention and treatment by surgery and stent
- 6,000 thoracic and abdominal aortic aneurysm repairs by endovascular or open surgical means
- 5,000 varicose vein procedures to improve patient quality of life

The Vascular Group has been a pioneer in vascular research and has provided comprehensive and cutting-edge procedures in upstate New York over the past three decades.

For more information on the highest-quality vascular care, please contact The Vascular Group PLLC.

ph (518) 262-5640
fx (518) 262-6720
toll free (877) 827-2852

www.albanyvascular.com
The Vascular Group was founded to establish a comprehensive vascular care center consisting of board-certified vascular specialists trained in endovascular, angiographic, and surgical techniques. Our physicians distinctively combine expertise in both traditional open surgery and cutting-edge, minimally invasive catheterization techniques to manage peripheral vascular disease. We are committed to promoting vascular health and delivering the highest-quality care to our patients and our community.

Dhiraj M. Shah, MD
R. Clement Darling III, MD
Devon E. M. Bock, MD
W. John Byrne, MD
Benjamin B. Chang, MD
Nishan Dadian, MD
Paul B. Kreienberg, MD
Manish Mehta, MD
Kathleen J. Ozsvath, MD
Philip S. K. Paty, MD
Jorge Rey, MD
Sean P. Roddy, MD
Stephanie S. Saltzberg, MD
Andreas M. Spirig, MD
Yaron Sternbach, MD
John B. Taggert, MD

The Vascular Group, PLLC
43 New Scotland Ave
Mail Code 157
Albany, New York 12208
ultimateSAAAVE.com

Gore is working to raise patient awareness of AAA and increase the screenings of at-risk individuals.

This new site, ultimatesaaave.com, will provide patient-centered information that includes:

- What is AAA?
- How someone is screened for AAA
- The Medicare screening benefit
- Common treatment options
- A national directory of screening physicians