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Avoid Deep Vein Thrombosis: Keep the Blood Flowing

By Linda Bren

Holiday travelers will soon clog the nation's highways and inundate its airports in numbers not seen in recent years. The number of travelers over the four-day Thanksgiving holiday is expected to surpass the 31 million Americans who traveled more than 50 miles by car and the 5 million who went by plane in 2003, according to AAA spokesman Lon Anderson. "This is the first year we've seen travel returned to what it was pre-9/11," he says.

No matter what the mode of transportation, sitting motionless for long periods may put some travelers at an increased risk for deep vein thrombosis (DVT), a blood clot in a vein deep within the muscles, usually in the calf or thigh. But people can reduce their risk of getting DVT, says the American Heart Association (AHA), by taking some simple precautions on long trips.

The AHA estimates that 1 out of every 1,000 Americans develops DVT each year. "It oftentimes gives you a swollen, painful leg, usually in the calf," says Richard Stein, M.D., a cardiologist and associate chair of medicine at Beth Israel Medical Center in New York City and a spokesman for the AHA. "But it can be silent," producing no noticeable signs. "Tragic cases are when ... a piece of thrombus [blood clot] breaks off and goes into the lungs," says Stein. This complication of DVT, known as pulmonary embolism, was brought to public attention in 2003 when it caused the death of 39-year-old NBC reporter David Bloom. Bloom had spent long hours reporting the war in Iraq from the cramped quarters of a military vehicle.

Any long period of immobility--such as being bedridden from illness, recovering from surgery, or sitting for extended periods while traveling--is a risk factor for DVT and pulmonary embolism, says the National Heart, Lung, and Blood Institute (NHLBI). DVT can also develop in other instances when the blood flow in the legs is restricted and slows down. Restricted flow may occur with certain types of cancer and cancer treatment, obesity, inherited clotting disorders, pregnancy, and damage to the veins following injury or orthopedic surgery.

Clotting the blood is "nature's way of trying to prevent bleeding," says Wolf Sapirstein, M.D., a cardiologist at the Food and Drug Administration. But when nature's protective mechanism overcompensates and precautions aren't taken, there is a danger of blood clots.

Reducing the Risk While Traveling

DVT has been dubbed "economy-class syndrome," reflecting the cramped legroom in economy class airline seating. But it can happen to passengers in any seating class of an aircraft, according to the Federal Aviation Administration. It can also happen to people on long rides in cars, trains, or buses.

"People should not be afraid to travel," says Stanley Mohler, M.D., professor emeritus of aerospace medicine at the Wright State University School of Medicine in Dayton, Ohio. "They should just anticipate that they may be inclined to be immobile," he says, and take precautions. A two-hour flight wouldn't be a problem, he says, but a 12-hour flight would be "a big problem" if a person sits inactive the entire time. Children who travel don't appear to be at risk for DVT, says Mohler, because they are generally more active in their seats than adults.

In adults, "hub-and-spoke flying is also a problem," he says, referring to a series of connecting flights interspersed with long hours of waiting between flights. "It's important for passengers to keep moving their legs to help the blood flow," even when waiting in the airport terminal, says Mohler, who advises walking when possible. "When you walk, the muscles of the legs squeeze the veins and move blood to the heart."

Another way to help move blood to the heart is to wear compression stockings, which put gentle pressure on the leg muscles. Studies in healthy people have shown that wearing compression stockings minimizes the risk of developing DVT after long flights, according to the AHA. These stockings are available at medical supply stores.

Stein advises avoiding regular socks with very tight elastic bands at the top and sitting with your legs crossed for long periods of time, which constricts the veins. He also urges travelers who can't walk around frequently to exercise their legs by curling or pressing the toes down, which causes the muscles to contract and squeeze on the leg veins, helping to pump the blood along.

Airlines, also, are encouraging passengers to periodically move and stretch their legs. The Australian carrier Qantas, for example, offers leaflets with leg exercises that passengers can do in their seats. Qantas began printing warnings for DVT on its tickets following the highly publicized death of a 28-year-old woman in October 2000. The woman died from a pulmonary embolism shortly after she stepped off a 20-hour Qantas flight from Australia to England after attending the Olympic Games in Sydney.

Stein also advises drinking plenty of fluids to prevent dehydration. Dehydration causes blood vessels to narrow and blood to thicken, increasing the risk for DVT. Reducing alcohol and coffee consumption, which both contribute to dehydration, is also recommended. These steps aren't scientifically proven to prevent DVT, but they're common sense, says the AHA. As for taking aspirin to prevent DVT, "there is no real evidence that an aspirin reduces the likelihood, but it very possibly could be of value," says Stein.

When traveling by car, "Don't take a 10-hour trip without stopping every couple of hours," says Stein. "Get out and walk a bit." Even if you're the driver, you still need to take walking breaks, he says. "Pushing on the gas pedal isn't enough activity even for the one leg."

"Deep vein thrombosis went unrecognized for decades because the clots that formed in the large veins in the legs often started coming off in little pieces after a person had been home for a day or two," says Mohler, "so they would go to the emergency room with a suspected possible heart attack."

Chest pain can be a symptom of both heart attack and pulmonary embolism. Other common symptoms of pulmonary embolism are unexplained shortness of breath and coughing up blood. It's important to tell your doctor if you have taken a long trip recently, says Mohler, so you can be diagnosed correctly.

If you have any symptoms of pulmonary embolism, sit down and tell someone you have an emergency and need immediate help, says Stein. At that point, "there is no value in putting your feet up or drinking gallons of water. Getting to an emergency room quickly is your best shot."

Another potential complication of DVT is post-phlebitic syndrome, a permanent condition caused by valves in the leg veins that don't work properly. "The body has mechanisms within itself to dissolve clots, but it's a very slow process," says George Shashaty, M.D., an FDA hematologist. "In the interim, an inflammatory reaction occurs that can scar the veins, especially the valves." The valves then fail to prevent blood from flowing backwards, allowing the blood to pool in the leg veins and cause pain, swelling, and sometimes varicose veins and skin ulceration.

Diagnosis and Treatment

A commonly used FDA-approved medical test to diagnose DVT is the duplex ultrasound, says Sapirstein. A handheld device is passed back and forth on the surface of the affected area, sending sound waves from the body to a machine that generates and displays a picture of the blood flow on a video screen for a doctor to evaluate.

Another less commonly used test, venography, may be done to diagnose DVT if ultrasound does not give a clear diagnosis, says Sapirstein. A dye is injected into a vein, which makes the blood flow visible when an X-ray is taken.

Duplex ultrasound, chest X-rays, and other tests may be used to diagnose a pulmonary embolism. "The primary treatment for deep vein thrombosis and pulmonary embolism is blood thinners," says Sapirstein. Blood thinners, or anticoagulants, such as heparin, will not dissolve clots already formed, but will keep them from growing and prevent new ones from forming. Heparin may be given as an injection below the skin surface or into a vein (intravenously).

People at risk for DVT may be prescribed the blood thinner Coumadin (warfarin) to keep clots from growing. Warfarin is currently the only FDA-approved blood thinner taken orally. "Other agents are being developed as oral anticoagulants but aren't on the market yet," says Kathy Robie-Suh, M.D., Ph.D., an FDA internist. Warfarin interacts with many other medications. "If you are on warfarin, the doctor needs to know all the other medications you are on, including over-the-counter," says Robie-Suh, and patients should make sure they take their warfarin before going on a trip. People who have had one deep vein clot are prone to getting more.

"When a patient cannot tolerate blood thinners or continues to develop clots, then you have to go to an alternative, such as a filter," says Sapirstein. The FDA has cleared medical filters, such as "umbrella filters," that a surgeon can insert into the vena cava, a large vein in the abdomen that returns oxygen-depleted blood to the heart. The filter is inserted in a folded position and then springs open against the vein walls to keep the vein open for blood flow. The filter does not keep blood clots from forming, but it prevents their passage from the veins in the lower extremities to the heart and lungs. These filters may either remain in place permanently or be removed later.

Another treatment alternative for pulmonary embolisms is administering one of the FDA-approved thrombolytics. These potent drugs, known as "clot-busters," are given intravenously to quickly dissolve large clots that are unlikely to break up on their own. They are used only in life-threatening situations because they may cause sudden and severe bleeding.

What Makes Deep Vein Thrombosis More Likely?

- an inherited condition that causes increased risk for clotting
- low blood flow in a deep vein due to injury, surgery, or being immobile
- cancer and its treatment
- other medical conditions, such as varicose veins
- sitting for a long period of time, as on long trips
- pregnancy and the first six weeks after giving birth
- being older than age 60
- being overweight
- taking birth control pills or hormone therapy
- having a medical condition that requires a tube placed in a vein to allow easy access to the bloodstream for medical treatment (central venous catheter).

Facts About Deep Vein Thrombosis and Pulmonary Embolism

- Nine out of 10 cases of pulmonary embolism are caused by blood clots that form in the legs and then travel to the lungs.
- More than 600,000 people in the United States have a pulmonary embolism each year, and more than 10 percent of them die from it.
- Most who die do so within 30 to 60 minutes after symptoms start.
- Pulmonary embolism occurs equally in men and women.
- The risk of having a pulmonary embolism doubles for each 10 years after age 60.

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