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Flying and Blood Clots: A Deadly Risk

By TANYA MOHN
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Life-threatening blood clots and flying have been linked for more than 50 years, but a new study of [business travelers](#) confirms the risk, particularly for those who take long flights or fly frequently.



Herman Wouters for The New York Times

Michael G. Reiff, an executive with Royal Dutch Shell, was hospitalized with blood clots several years ago. He has cut his flying time since then.

Immobility is considered a major factor behind the condition, called deep vein thrombosis.

But while it is often referred to as “economy-class syndrome” because of the cramped seating there, D.V.T. also occurs among those who fly in business class and first class, the researchers found.

People who fly four hours or more, the study found, have three times the risk of developing clots compared with periods when they did not travel.

D.V.T. occurs when a blood clot forms within the large deep veins of the body, usually in the leg. If untreated, part of the clot may break off

and travel to the lungs, where it can cause a pulmonary embolism, a potentially fatal condition.

Frits R. Rosendaal and Suzanne C. Cannegieter of Leiden University Medical Center in the Netherlands, the study's lead researchers, tracked almost 9,000 employees of large international companies and organizations over a four- or five-year period, in what they call the most comprehensive study of its kind to date. The results were published this fall in the online journal PLoS Medicine; preliminary findings were reported in late June by the [World Health Organization](#).

"We now know out of 4,500 people who fly, one will get a D.V.T. within eight weeks after travel," Dr. Cannegieter said. "It's not really a huge amount," but, she said, the risk increases with the duration of a flight and the number of flights in a short period. [Obesity](#), a person's stature, oral contraceptive use, hormone replacement therapy and inherited blood clotting disorders also increase risk.

A combination of these factors "may increase risk twenty- to fiftyfold," Dr. Rosendaal said.

Rob Donnelly, vice president for health at [Royal Dutch Shell](#), which participated in the study, said the company uses a Web-based tracking system that helps identify at-risk employees. That allows the company to take additional measures if necessary. Employees log onto the company's intranet for training about risks, symptoms and preventive measures for D.V.T. (and other conditions or diseases).

The goal is to have awareness without panic, Dr. Donnelly said. "This is a manageable risk for the vast majority of people."

Several years ago, Michael G. Reiff, an American executive with Royal Dutch Shell, was hospitalized with life-threatening blood clots on his lungs after a flight from Houston to Amsterdam.

Mr. Reiff, 53, who is head of global compensation and benefits, took long flights almost 50 percent of the time when traveling. He always flew first class or business class.

He has since cut his flying time almost in half and no longer sleeps on planes. “Now I literally walk up and down the aisles.” At work, “I walk the halls every two hours, even at meetings,” Mr. Reiff said.

Rochelle Broome, corporate medical director for primary care at CHD Meridian Healthcare, which operates 231 on-site health care centers for 105 corporate clients, said that in addition to walking, she recommends that employees do frequent seat exercises to ensure increased blood circulation. Many airlines provide examples in flight magazines or in-cabin videos.

“You don’t have to take a pill. There’s no shot. It’s easy,” said Dr. Broome, who experienced several serious D.V.T.’s herself.

About three years ago, CHD Meridian began a series of initiatives on D.V.T. prevention that includes briefings during one-on-one travel consultations and routine exams, informational materials and a yearly D.V.T. awareness month.

D.V.T. typically includes unexplained pain, tenderness, redness and [swelling](#), often in the leg. Once a clot has traveled to the lung, common symptoms include chest pain and breathing difficulties.

But diagnosis can be difficult. Some cases are asymptomatic or can mirror other illnesses. Leg pain can be mistaken for an athletic injury or strained muscle. Chest pain is often diagnosed as a [heart attack](#) or the [flu](#).

When Randy Fenninger, 60, president of MARC Associates, a lobbying firm in Washington, entered an emergency room with chest pain, he was not properly diagnosed until almost seven hours later. “My experience is not at all unique,” said Mr. Fenninger, who is

president of the National Alliance for Thrombosis and Thrombophilia, a nonprofit health education group.

He recommends that people who have recently been on a plane tell health care workers and check their family medical history. At the time, Mr. Fenninger did not know that he has a genetic clotting disorder that put him at higher risk.

The alliance recently received cooperative agreements totaling more than \$1.3 million from the [Centers for Disease Control and Prevention](#) that is to be used to increase public awareness.

But overestimating the risk can lead to use of potentially dangerous precautions, Dr. Cannegieter said. “You try to prevent one problem, but create another one.”

Aspirin is effective in preventing heart attacks and strokes, but not D.V.T. Aspirin and anticoagulant medicine, which also thins the blood, can cause uncontrolled [bleeding](#).

Luc Robyn, corporate medical adviser for Nestlé, which participated in the study, said in the past employees were tempted to take anticoagulants protectively. “But now that we know that absolute risk is not so high we can really tailor recommendations,” Dr. Robyn said. Anticoagulants are administered only if there is a pre-existing condition.

The researchers also warn against wearing commercial compression stockings. They are only effective if custom fit; if not, they may cause harm by blocking blood flow. Excessive alcohol [consumption](#) or taking sleeping pills that promote immobility are discouraged.

Lennart Dimberg, lead occupational health specialist at the [World Bank](#) in Washington, which also participated in the study, said his organization has a policy stipulating that when travel requires nine or more hours of flying time, staff members may take a one-day rest stop in each direction to recuperate before working.

Dr. Rosendaal said the risk increases during long car, train and bus trips when cramped seating is common, though it is highest during air travel.

“There is some evidence that the low air pressure in a plane affects the complex coagulation system of the blood,” Dr. Rosendaal said. When oxygen level goes down, the body may behave as if it is losing blood, making clot formation more likely. During sleep, less oxygen is taken in, another reason that [sedatives](#) are strongly discouraged.

“I’m sure there is a genetic predisposition,” Dr. Rosendaal said. “We know the tip of the iceberg. We have a lot of work to do.”