DVT and Flying

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I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Shareholder in a healthcare company
- Owner of a healthcare company
- Other(s)

I do not have any potential conflict of interest
VTE risk and flying

John Homans MD
Flying at the back of the plane

THE ECONOMY CLASS SYNDROME
Recognised problem

Prevent DVT when you travel

If you're travelling long distance, there are several ways you can reduce your risk of deep vein thrombosis (DVT).

Who's at risk of DVT?
Conditions that may increase your risk of DVT on flights of eight hours or more:
- history of DVT or pulmonary embolism
- cancer
- stroke
- heart disease
- inherited tendency to clot (thrombophilia)
- recent surgery – pelvic region or legs
- obesity
- pregnancy
- hormone replacement therapy

Download the Fly Healthy, Fly Fit guide

Fly Healthy, Fly Fit

Qatar Airways presents simple ways to fly healthy, in association with the Chopra Center for Wellbeing & Deepak Chopra

This easy-to-follow guide offers tips and exercises to help keep you healthy, balanced and relaxed throughout your flight. The guide can be found in the seat-back pocket onboard all Qatar Airways long-haul flights or you can download it here.

Deep vein thrombosis (DVT)

DVT is a blood clot in a deep vein. There is a slight risk of developing DVT if you remain seated in an aircraft for a prolonged duration. Therefore, during your flight, it's important to regularly get up and walk around or carry out the exercises in this guide.

How To Prevent Deep Vein Thrombosis When You Fly

9 Tips For Flying Economy Class
Long Haul?
Traveller’s thrombosis: airlines still not giving passengers the WRIGHT advice!

J R H Scurr, N Ahmad, D Thavarajan and R K Fisher
Royal Liverpool University Hospital, Liverpool, UK

Phlebology 2010;25:257–260

Table 1  Summary of current recommendations for traveller’s thrombosis prophylaxis

<table>
<thead>
<tr>
<th>General measures for all travellers taking flights &gt;4–8 hours: (Grade 1C)*</th>
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</thead>
<tbody>
<tr>
<td>Avoidance of constrictive clothing around the lower extremities or waist</td>
</tr>
<tr>
<td>Maintenance of adequate hydration</td>
</tr>
<tr>
<td>Frequent calf muscle contraction</td>
</tr>
<tr>
<td>Insufficient evidence to support the routine use of active thromboprophylaxis for all travellers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thromboprophylaxis for passengers with additional risk factors putting them at high risk for VTE must be made on an individual basis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider active thromboprophylaxis with:</td>
</tr>
<tr>
<td>Properly fitted, below-knee GCS, providing 15–30 mmHg of pressure at the ankle† (Grade 2C)*</td>
</tr>
<tr>
<td>A single prophylactic dose of LMWH, injected prior to departure (Grade 2C)*</td>
</tr>
<tr>
<td>The use of aspirin for VTE prophylaxis is not recommended† (Grade 1B)*</td>
</tr>
</tbody>
</table>

LMWH = low molecular weight heparin; VTE = venous thromboembolism; GCS = graduated compression stockings
*Recommendation of American College of Chest Physicians
†Recommendation of International Consensus Statement
Factors:

- Venous stasis
- Haemoconcentration due to liquid loss
- Immobilization
- Cramped position
- Hypobaric hypoxia
- Low humidity
• Relative risk of VTE 2.8
• 18% higher VTE risk for each 2h increase in travel duration
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18% higher VTE risk for each 2h increase in travel duration
Thrombosis risk increased also by car, bus or train travel
Increased by the presence of risk factors eg recent surgery
- Relative risk of VTE 2.8
- 18% higher VTE risk for each 2h increase in travel duration
- Thrombosis risk increased also by car, bus or train travel
- Increased by the presence of risk factors eg recent surgery
- Association between air travel and VTE is strongest for flights > 8 hours
  > 4 hours, immobile, window seating + obese increased risk
• Relative risk of VTE 2.8
• 18% higher VTE risk for each 2h increase in travel duration
• Thrombosis risk increased also by car, bus or train travel
• Increased by the presence of risk factors e.g. recent surgery
• Association between air travel and VTE is strongest for flights > 8 hours
• No evidence that dehydration, alcohol intake and travel in economy class increase risk
• FIRST CLASS SYNDROME
Hypobaric Hypoxia

- No effect on coagulation markers

- No procoagulant changes

- ↑ in TAT if Factor V Leiden using the OCP
Postoperative Flying

- Any travel > 3 h – 1.4
- Plane travel > 3 h – 1.2
- Plane travel > 8 h - 1.3
- Previous VTE – 1.7
- Surgery – 6.7

- Surgery within previous 28 days – 32.1
- Low risk – 5
- Medium risk + high risk > 30

- No statistically significant difference in VTE events
- Chemoprophylaxis
Preoperative Flying

Deep vein thrombosis and air travel: record linkage study
C W Kelman, M A Kortt, N G Becker, Z Li, J D Mathews, C S Guest, C D J Holman

What is already known on this topic
Venous thromboembolism has been suggested to be up to four times more likely to develop within two to four weeks of a flight (the "hazard period"). The incidence of pulmonary embolism is greater among passengers travelling more than 10 000 km

What this study adds
The risk of venous thromboembolism is highest within two weeks of a long haul flight.
The annual risk of venous thromboembolism is increased by 12% in those undertaking one long haul flight a year.

Frequency of venous thromboembolism in Australian citizens (n=153) by days after flight arrival for first 100 days. Day 0 was counted as 0.5 days.
Venous Thromboembolism from Air Travel
The LONFLIT Study

Gianni Belcaro, PhD, George Geroulakos, PhD, Andrew N. Nicolaides, MS, Kenneth A. Myers, MS, and Michelle Winford, Pescara, Italy, London, England, and Melbourne, Australia

Angiology Volume 52, Number 6, 2001

LONFLIT 1

- Average flight duration was 12.4 h

- Risk assessment:
  - Hx DVT
  - Reduced mobility
  - Neoplastic disease within last 2 years
  - Severe obesity
  - Large VV
  - A documented coagulation disorder

LONFLIT 2

- 833 high risk subjects

Low risk (n=355) → 0%

High risk (n=355) → 2.8%

High risk (n=422) → 4.5%

High risk (n=411) → 0.24%
Venous Thrombosis from Air Travel: The LONFLIT3 Study
Prevention with Aspirin vs Low-Molecular-Weight Heparin (LMWH) in High-Risk Subjects: A Randomized Trial

Maria Rosaria Cesarone, MD, Gianni Belcaro, MD, PhD, Andrew N. Nicolaides, MD, MS, Lucrezia Incandela, MD, Maria Teresa De Sanctis, MD, George Geroulakos, PhD, Andrew Lennox, PhD, Kenneth A. Myers, MS, M. Moia, MD, Edmondo Ippolito, MD, and Michelle Winford, Pescara, Italy; London; and Melbourne, Australia

High risk (n=100) → 4.8%

High risk (n=100) → 3.6%

High risk (n=100) → 0.6%

85% of DVTs were observed in non aisle seats
- Flight length
- Risk factors
- Ambulation
- Aisle seat
- Calf exercises
- Compression stockings

6.1.1. For long-distance travelers at increased risk of VTE (including previous VTE, recent surgery or trauma, active malignancy, pregnancy, estrogen use, advanced age, limited mobility, severe obesity, or known thrombophilic disorder), we suggest frequent ambulation, calf muscle exercise or sitting in an aisle seat if feasible (Grade 2C).

6.1.2. For long-distance travelers at increased risk of VTE (including previous VTE, recent surgery or trauma, active malignancy, pregnancy, estrogen use, advanced age, limited mobility, severe obesity, or known thrombophilic disorder), we suggest use of properly fitted, below-knee GCS providing 15 to 30 mm Hg of pressure at the ankle stockings during travel (Grade 2C). For all other long-distance travelers, we suggest against the use of GCS (Grade 2C).

6.1.3. For long-distance travelers, we suggest against the use of aspirin or anticoagulants to prevent VTE (Grade 2C).
Types of surgery

As a rough guide, the Civil Aviation Authority (CAA) says that before flying, you should allow:

- one day after simple cataract or corneal laser surgery
- one day after a colonoscopy
- one to two days after keyhole surgery
- four to five days after simple abdominal surgery
- seven days after more complicated eye surgery
- 10 days after chest surgery or a coronary artery bypass graft
- 10 days after more complicated abdominal surgery

For other types of surgery, allow:

- one to two days after surgery where a plaster cast is applied – if you have a broken arm or leg, it will affect where you can sit; for example, you won't be allowed to sit in an emergency seat and you may have to purchase an extra seat if you cannot bend your knee to sit normally
- two to six weeks after surgery for retinal detachment that involves having a gas bubble put in your eye
Prevent DVT when you travel

- Compression stockings for flights > 4 hours
- Wear loose, comfortable clothes
- Consider flight socks
- Do anti DVT exercises
- Mobilise
- Drink plenty of water
- Don’t drink alcohol or take sleeping pills

- Hx of VTE
- Cancer
- Stroke
- IHD
- Thrombophilia
- Recent pelvic or lower limb surgery
- Obesity
- Pregnancy
- HRT
## DVT Risk Factors and Flying

- Increased VTE risk for at least 2 weeks following a flight
- Individual risk assessment is necessary
  - Compression (>3 hours)
  - Anticoagulation (risk ax)
- Sit in an aisle seat
- Mobilise if possible

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Risk status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>✗</td>
</tr>
<tr>
<td>Dehydration</td>
<td>✗</td>
</tr>
<tr>
<td>Economy Class</td>
<td>✗</td>
</tr>
<tr>
<td>Immobility</td>
<td>✓</td>
</tr>
<tr>
<td>Hypobaric Hypoxia</td>
<td>✗ ?</td>
</tr>
<tr>
<td>Surgery</td>
<td>✓ ?</td>
</tr>
<tr>
<td>Flight time</td>
<td>✓ ?</td>
</tr>
</tbody>
</table>
Thank You