Imperial College Healthcare NHS Trust

Imperial College London

DVT and Flying

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CACVS 2017

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Disclosures

Speaker name: **Sarah Onida**

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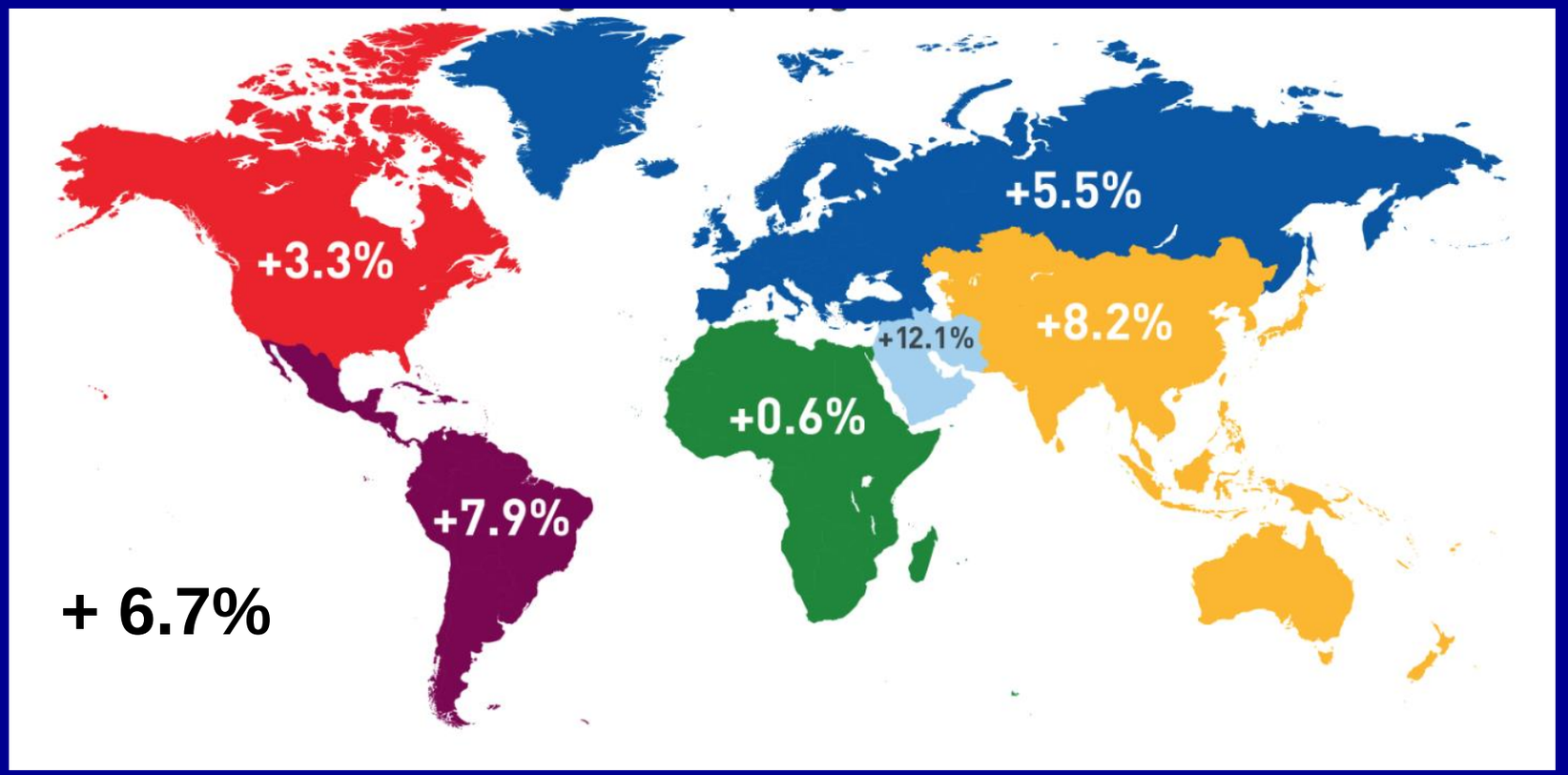
I have the following potential conflicts of interest to report:

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	☐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+12.1%
+0.6%
+7.9%
+ 6.7%

VTE risk and flying

John Homans MD

ORIGINAL ARTICLE ARCHIVE

Thrombosis of the Deep Leg Veins Due to Prolonged Sitting

John Homans, M.D.*

N Engl J Med 1954; 250:148-149 | January 28, 1954 | DOI: 10.1056/NEJM195401282500404

Flying at the back of the plane

Recognised problem

NHS choices Your health, your choices

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:

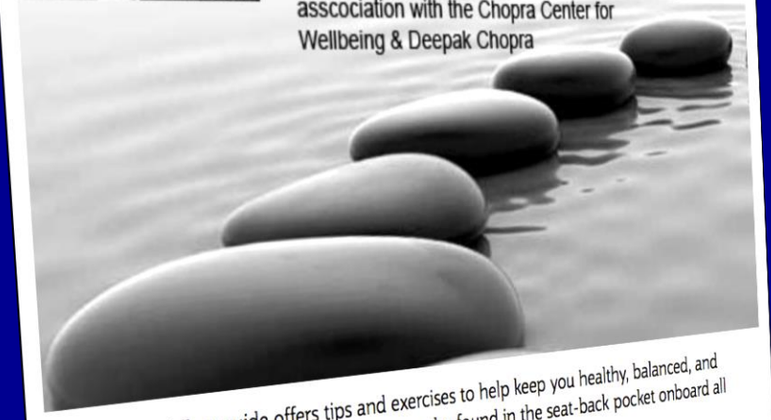
- history of DVT or pulmonary embolism
- cancer
- stroke
- heart disease
- inherited tendency to clot (thrombophilia)
- recent surgery – pelvic region or legs
- obesity
- pregnancy
- hormone replacement therapy

QATAR AIRWAYS القطرية

Download the Fly Healthy, Fly Fit guide

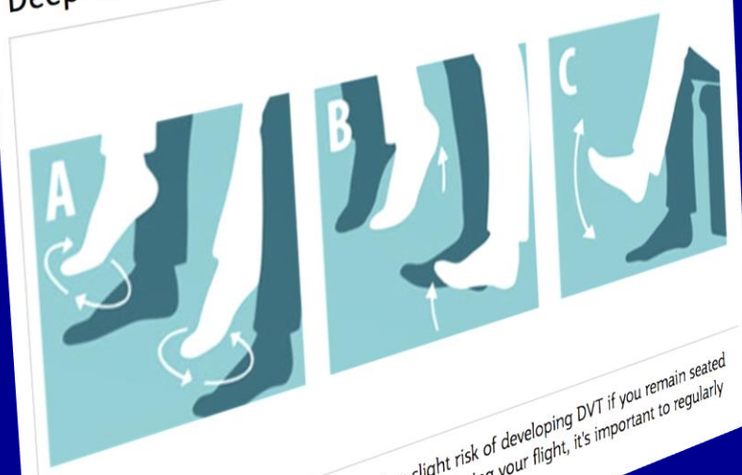
Fly Healthy, Fly Fit

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



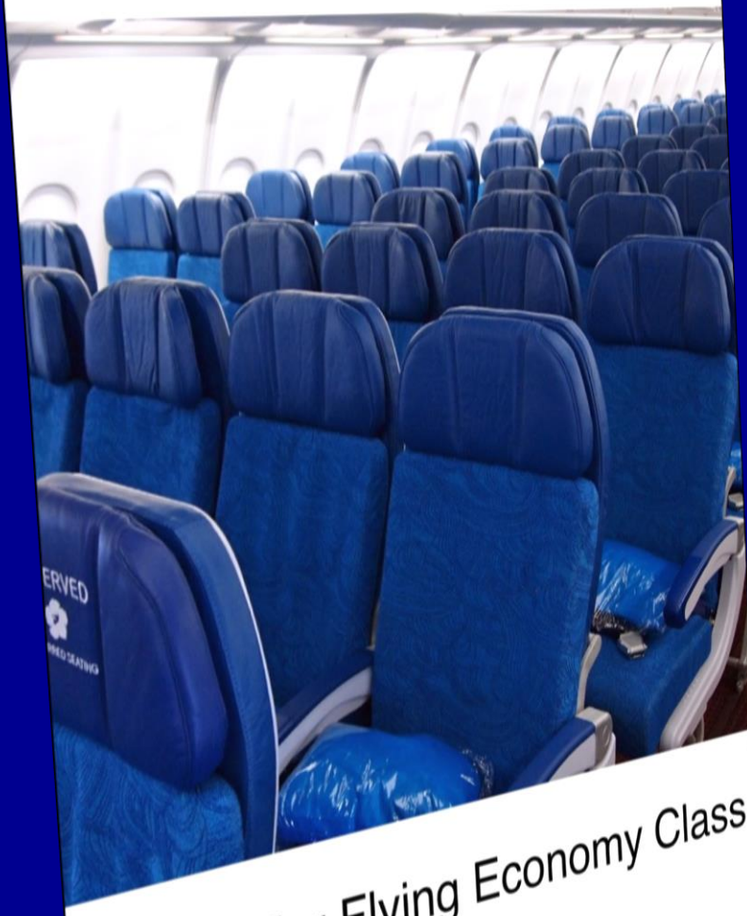
This easy-to-follow guide offers tips and exercises to help keep you healthy, balanced, and relaxed throughout your flight. The guide can be found in the seat-back pocket onboard all Qatar Airways long-haul flights or you can download it here.

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?

Original article

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

General measures for *all* travellers taking flights >4–8 hours: (Grade 1C)*
Avoidance of constrictive clothing around the lower extremities or waist
Maintenance of adequate hydration
Frequent calf muscle contraction
Insufficient evidence to support the routine use of active thromboprophylaxis for all travellers.
Thromboprophylaxis for passengers with additional risk factors putting them at high risk for VTE must be made on an individual basis.
Consider active thromboprophylaxis with:
Properly fitted, below-knee GCS, providing 15–30 mmHg of pressure at the ankle† (Grade 2C)*
A single prophylactic dose of LMWH, injected prior to departure (Grade 2C)*
The use of aspirin for VTE prophylaxis is not recommended† (Grade 1B)*

LMWH = low molecular weight heparin; VTE = venous thromboembolism; GCS = graduated compression stockings
*Recommendation of American College of Chest Physicians[4]
†Recommendation of International Consensus Statement[2]

Short Communication

Br. J. Dis. Chest (1977) *71*, 138

PULMONARY THROMBOEMBOLISM AFTER TRAVEL

IAN S. SYMINGTON* AND BRYAN H. R. STACK

Department of Respiratory Medicine, Western Infirmary and Knightswood Hospital, Glasgow

Summary

Pulmonary thromboembolism developed in eight patients shortly after travel. Pre-existing vein disease was present in this group. Possible prophylactic measures are suggested.

ELSEVIER

Pathophysiology 15 (2008) 243–252

ISTP PATHOPHYSIOLOGY

www.elsevier.com/locate/pathophys

Travel thrombosis: Pathomechanisms and clinical aspects

Tamás Sándor*

2nd Department of Surgery, Faculty of Medicine, Semmelweis University, Kútvölgyi Klinikai Tömb, Kútvölgyí út 4, H-1125 Budapest, Hungary

Received 2 October 2008; accepted 4 October 2008

Factors:

- Venous stasis
- Haemoconcentration due to liquid loss
- Immobilization
- Cramped position
- Hypobaric hypoxia
- Low humidity

VTE Risk
Immobility

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Supplement

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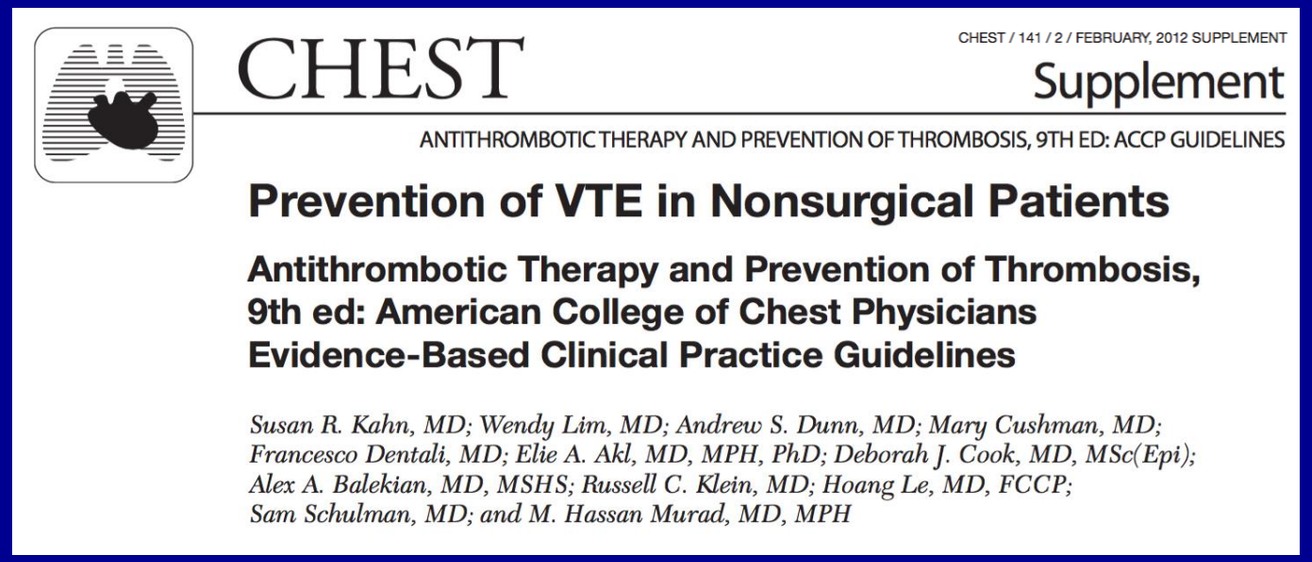
- Relative risk of VTE 2.8
- 18% higher VTE risk for each 2h increase in travel duration

VTE Risk
Immobility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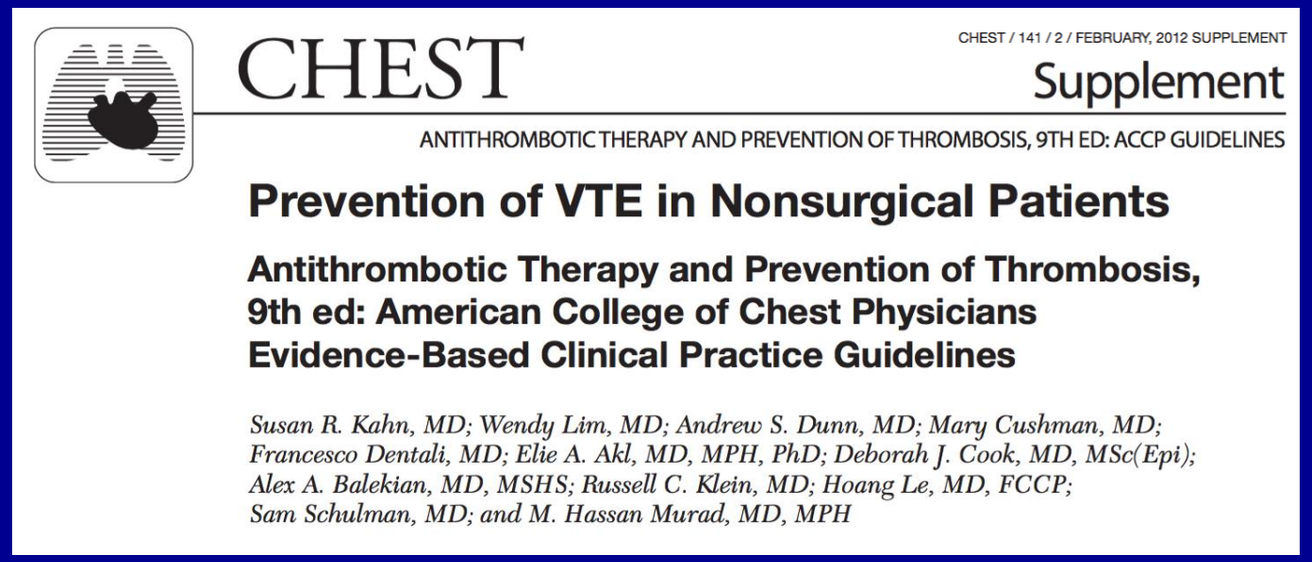
- Increased by the presence of risk factors eg recent surgery

VTE Risk
Immobility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- Relative risk of VTE 2.8
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- 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

VTE Risk
Immobility

- Rela
- 18%

- Thro
- Incre

- Asso hours
  >

- No evidence that dehydration, alcohol intake and travel in economy class increase risk

Hypobaric Hypoxia

Journal of Thrombosis and Haemostasis, **12**: 902–909 DOI: 10.1111/jth.12564

ORIGINAL ARTICLE

No effect of isolated long-term supine immobilization or profound prolonged hypoxia on blood coagulation

A. VENEMANS-JELLEMA,*† A. J. M. SCHREIJER,*‡ S. LE CESSIE,* J. EMMERICH,§¶ F. R. ROSENDAAL*** and S. C. CANNEGIETER*

**Department of Clinical Epidemiology, Leiden University Medical Center, Leiden; †De Onderzoekerij, Leiden; ‡Department of Communicable Disease Control, Municipal Health Service, Utrecht, the Netherlands; §Université Paris Descartes, INSERM UMRS765, Paris; ¶Department of Vascular Medicine, Hôpital Européen Georges Pompidou, AP-HP, Paris, France; and **Department of Thrombosis and Haemostasis, Leiden University Medical Center, Leiden, the Netherlands*

- No effect on coagulation markers

ORIGINAL CONTRIBUTION

Effect of Hypobaric Hypoxia, Simulating Conditions During Long-Haul Air Travel, on Coagulation, Fibrinolysis, Platelet Function, and Endothelial Activation

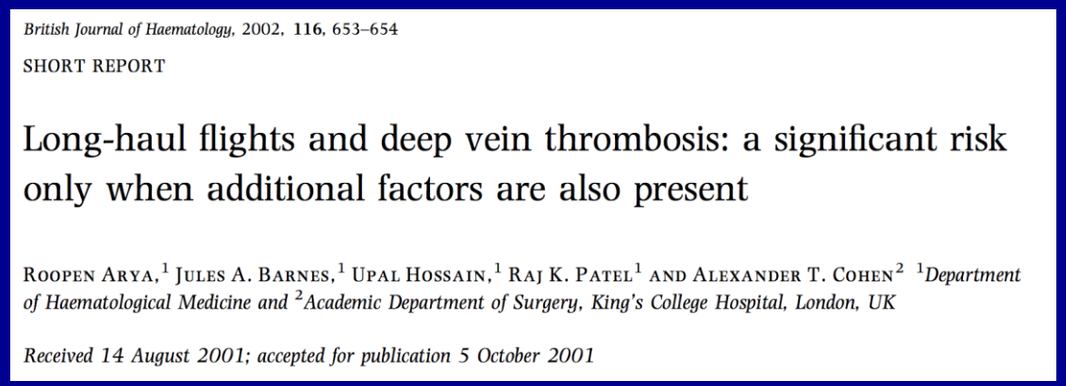
- No procoagulant changes

Activation of coagulation system during air travel: a crossover study

A J M Schreijer, S C Cannegieter, J C M Meijers, S Middeldorp, H R Büller, F R Rosendaal*

- ↑ in TAT if Factor V Leiden using the OCP

Postoperative Flying



British Journal of Haematology, 2002, **116**, 653–654

SHORT REPORT

Long-haul flights and deep vein thrombosis: a significant risk only when additional factors are also present

ROOPEN ARYA,[1] JULES A. BARNES,[1] UPAL HOSSAIN,[1] RAJ K. PATEL[1] AND ALEXANDER T. COHEN[2] [1]*Department of Haematological Medicine and* [2]*Academic Department of Surgery, King's College Hospital, London, UK*

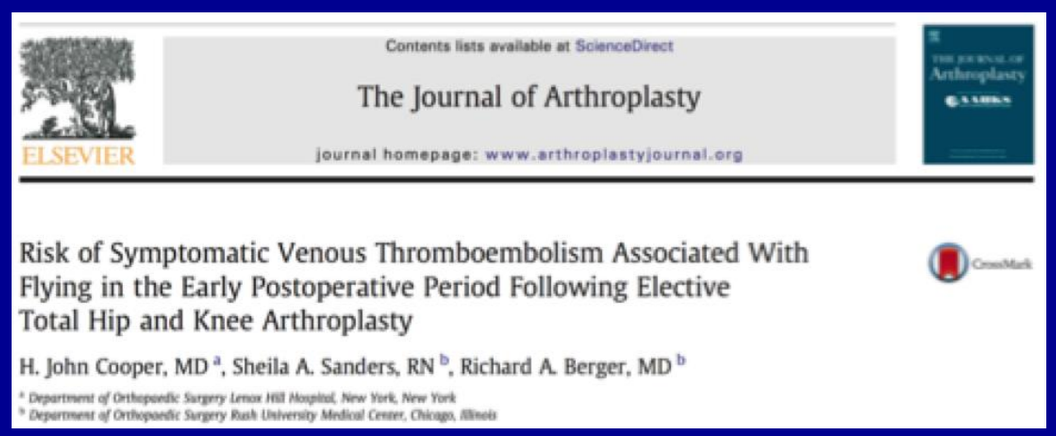
Received 14 August 2001; accepted for publication 5 October 2001

- 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

bjh research paper

Cumulative flying time and risk of venous thromboembolism

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



Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Risk of Symptomatic Venous Thromboembolism Associated With Flying in the Early Postoperative Period Following Elective Total Hip and Knee Arthroplasty

H. John Cooper, MD [a], Sheila A. Sanders, RN [b], Richard A. Berger, MD [b]

[a] *Department of Orthopaedic Surgery Lenox Hill Hospital, New York, New York*

[b] *Department of Orthopaedic Surgery Rush University Medical Center, Chicago, Illinois*

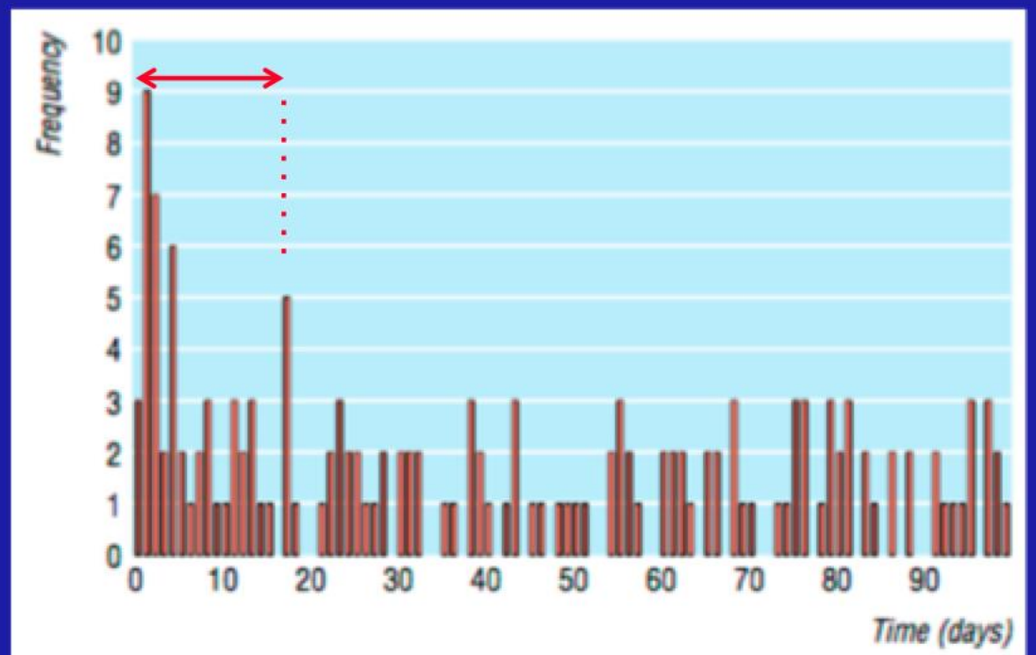
- No statistically significant difference in VTE events
- Chemoprophylaxis

Preoperative Flying

Papers

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



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

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

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

Low risk (n=355) → 0%

High risk (n=355) → 2.8%

LONFLIT 2

- 833 high risk subjects

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) → ASPIRIN → 3.6%

High risk (n=100) →  → 0.6%

85% of DVTs were observed in non aisle seats

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- 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).

NHS choices Your health, your choices

You are here: Common health questions / When can I fly after surgery?

When can I fly after surgery?

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

NHS choices Your health, your choices

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

Alcohol	✗
Dehydration	✗
Economy Class	✗
Immobility	✓
Hypobaric Hypoxia	✗ ?
Surgery	✓ ?
Flight time	✓ ?

Thank You