Air Travel-related Thrombosis

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Key Takeaways:

- For all long-distance (>4h) travelers, consider frequent ambulation, calf exercises, aisle seat, hydration, avoid tight clothing, limit under-seat baggage that restricts mobility.
- Compression stockings, aspirin, or anticoagulants are not recommended for travelers without additional risk factors.
- Travelers already on prophylactic/treatment-dose anticoagulation do not require additional prophylaxis for travel.
- For long-distance travelers at increased risk (eg, prior VTE, active cancer, recent surgery/trauma, or ≥2 risk factors) consider bilateral below-knee graduated compression stockings (20-30 mmHg).
- For travelers at very high risk, a short course of prophylactic-dose anticoagulation may be considered on an individualized basis (single dose pre-departure, given LMWH/DOAC peak effect of 2-4h).

Objective:

To summarize the available literature on the risk of venous thromboembolism (VTE) related to air travel and provide recommendations for preventative measures while traveling long distances.

Background:

Long-distance travelling by plane increases the risk of VTE, which includes deep vein thrombosis (DVT) or pulmonary embolism (PE); however, the absolute VTE risk from travel is low. The pathogenesis of travel-related thrombosis is likely multifactorial: immobility/venous stasis, hypobaric environment, vessel damage, and dehydration.

Known risk factors for travel-associated VTE include obestiy (BMI ≥30), hormonal therapy, thrombophilia, pregnancy (including the postpartum period), active cancer, recent major surgery or hospitalization, advanced age (>40 years), extremes of height (>190cm or <160mc), or a prior history of VTE. Window seating compared to aisle seating has been associated with greater risk and the effect is most pronounced in passengers with BMI ≥30.

Long distance travelers have a 3-fold increase in VTE risk compared to the general population (3.2 per 1000 patient-years within 8 weeks of a long distance (>4 hours) flight, compared with 1.0 per 1000 patient-years with no travel exposure). The incidence of symptomatic VTE after flights >4 hours is 1 in 4,656 person-flights. Symptomatic PE occurs in 0.39 per million travelers overall, rising to 1.65 per million for flights >8 hours (vs 0.25 per million for 6-8 hour flights) – these figures likely underestimate true incidence, as fatal PE during travel and symptomatic PE in the weeks following are not captured.

For context, the risk associated with long-haul travel is lower than some other minor provoking factors (eg, knee arthroscopy or short-leg cast immobilization). Pilots do not appear to be at increased risk. A 2025

systematic review and meta-analysis of surgical patients with recent air travel (7 studies, ~25,000 patients) found no statistically significant increase in VTE risk when air travel accompanied recent surgery (pooled OR 1.96, 95% CI 0.54–7.08), though certainty of evidence was very low; this does not change the recommendation to manage recent surgery as an independent risk factor below.

Preventative of travel-related VTE:

General preventative measures:

General preventative measures aim to minimize the impact of environmental factors that predispose to travel-related VTE. While there have been no studies evaluating the efficacy of general preventative measures, accepted recommendations include:

- Getting up and walking every 1-2 hours
- Choose an aisle seat, when possible, to facilitate movement
- Avoid constrictive clothing
- Minimize under-seat baggage that restricts leg room and mobility
- Staying hydrated and avoiding alcohol while traveling

Compression stockings

Compression stockings reduce leg swelling and may help prevent DVT while traveling. A Cochrane review of 9 randomized trials (stocking strengths 10-30 mmHg) found a 90% relative reduction in asymptomatic DVT – detected on post-flight screening ultrasound – with the greatest benefit in passengers with additional VTE risk factors. This 2021 review remains current (no update as of 2026). The clinical significance of preventing these small numbers of asymptomatic DVTs is unknown.

Use of aspirin or anticoagulants

The effectiveness of a short course of aspirin or anticoagulants for preventing travel-related VTE remains unknown and is not routinely recommended; as of this 2026 review, no trials have evaluated direct oral anticoagulants (DOACs) for short-term travel prophylaxis. In the only randomized trial to date, a single pre-flight dose of low molecular weight heparin (LMWH: enoxaparin 1 mg/kg, given 2-4 hours before flying) reduced asymptomatic DVT on post-flight ultrasound screening compared with 3 days of aspirin or no therapy (0/82 vs 3/84 vs 4/83). As with compression stockings, the clinical significance of preventing these small numbers of asymptomatic DVTs is unknown. For individuals who have additional risk factors for VTE, there is little data to guide management. The recommendations below are all based on low quality evidence, and an individualized management plan that considers both the risks and benefits of treatment is needed.

Recommendations:

In all long-distance (>4 h) travelers (baseline risk) it is reasonable to consider:

- Frequent ambulation and calf exercises; consider an aisle seat.
- Adequate hydration, avoid tight clothing, and minimize under-seat baggage if it restricts mobility.

We do not recommend routine use of compression stockings, aspirin, or anticoagulants to prevent travel-related VTE in those without additional risk factors.

For travelers already on prophylactic or treatment-dose anticoagulation (for any indication) no additional VTE prophylaxis is required for air travel. (Monitor usual medication timing around departure.)

For long-distance travelers who are at increased risk of VTE (previous unprovoked or travel-related VTE, active cancer, recent surgery or trauma, ≥2 risk factors including combinations of the above with obesity, limited mobility, advanced age, known thrombophilia, pregnancy, or estrogen use) the use of bilateral below-knee graduated compression stockings is recommended to prevent travel-related VTE, at a stocking strength of 20-30 mmHg.

A short course of prophylactic-dose anticoagulation may be considered in select patients who are at very high risk of VTE, based on an individualized decision that weighs the risks and benefits of therapy and takes into account patient values and preferences. Given peak anticoagulant effects of 2-4 hours with LMWH and direct oral anticoagulants (DOACs), a single prophylactic dose can be taken shortly before the journey starts. The use of anticoagulants for short-term prevention has not been studied, the efficacy of such an approach is unclear, and the optimal number of doses around travel is unknown. DOACs should not be used in pregnant or breastfeeding women.

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Date of version: 31August2026

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