

Travelling with chronic lung disease

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Most people with chronic lung disease can travel safely when clinically stable. They should be encouraged to plan ahead and to consider general issues, such as travel insurance and health care, as well as disease-specific issues, such as the need for medication and oxygen during air travel.

Key points

- **Air travel is generally safe for the great majority of patients with chronic lung disease.**
- **Adverse events are very rare despite three billion passenger flights each year worldwide, many involving patients with lung disease.**
- **Patients with lung disease should travel only during periods of clinical stability.**
- **The presence of cardiac disease that may limit the normal physiological adaptation to hypoxia should be taken into account in assessing risk for those with lung disease.**
- **Travellers with lung disease should plan ahead, ensure they have adequate insurance and avoid areas where access to medical services may be limited.**
- **Even if air travel is safe for patients with lung disease, impairment of exercise tolerance at high altitude destinations can limit the enjoyment of travel.**

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Most patients with chronic lung disease are able to travel safely wherever they wish. However, some issues specific to the destination, mode of travel and patient need to be considered when planning travel.

General considerations for travellers with chronic lung disease

Access to health care may become important for people with chronic disease, and variation in the availability, expertise and cost of health care in other countries should be considered. Travel insurance can seem expensive; however, so are the costs of overseas health care and medical evacuation. Furthermore, travel can involve levels of physical activity not tolerated even by patients in optimal health at home. For patients with significant respiratory symptoms, the effect is compounded if travel is to a hot, humid or high-altitude location. Importantly, patients should travel only when clinically stable. Travel plans and bookings should be made with the need for flexibility in mind. If necessary, outward or return journeys must be delayed.

Altitude-related considerations

As air pressure falls, oxygen availability decreases and arterial oxygen saturation falls in all people. At an altitude of 2400 m, equivalent to the lowest pressure that occurs during commercial air flights, hyperventilation is unnecessary because physiological adaptation occurs through increased cardiac output and greater peripheral oxygen extraction. The reduction in exercise capacity is well tolerated and symptoms are uncommon during flight because exercise tasks are minimal. However, managing well in an aircraft environment with minimal activity may not equate to comfortable tolerance of moderate-altitude (2400 to

3000 m) travel that involves exercise, such as considerable walking or moving luggage. In people with chronic lung disease with greater functional impairment and concurrent heart disease that limits adaptation to a higher altitude destination, some caution is needed and specialist evaluation in the travel planning phase is wise. People with severe lung disease who wish to travel by air are also advised to choose an airline with an appropriate support structure, particularly if oxygen is needed. Where necessary, a discussion with the medical personnel of the airline can be useful.

Disease-specific considerations

Asthma

Travel for people living with asthma should generally be uneventful if the asthma is well controlled. If travel is planned for an extended duration or to a remote location then a clinical review is suggested as part of the planning process. This review should include a structured questionnaire that assesses current control and measurement of lung function. If control is suboptimal then the greatest short-term benefit will come from improved adherence to preventer treatment and correction of inhaler technique errors. An asthma management plan should be prepared and a supply of oral corticosteroid should be considered in patients with a history of asthma exacerbations. Inhalers function well in all but the most extreme ambient conditions. For dry powder inhalers, attention should be given to inhaling promptly after device actuation if conditions are very humid. Patients should take their asthma medication with them in the cabin on board aircraft.

Recent pneumothorax

A pneumothorax will expand in the low-pressure environment of commercial aircraft. A recent unresolved pneumothorax is a contraindication to air travel. Although the evidence base on pneumothorax and travel is poor, patients should wait at least one week after confirmed resolution of a pneumothorax before flying.¹ There is a significant risk of recurrent pneumothorax in the 12 months after a first episode and a higher risk after second or subsequent events. Patients with recurrent pneumothorax and those with a history of pneumothorax who are travelling

for extended periods to remote locations should consider surgical pleurodesis before travel. In these cases, as well as in patients with chronic pneumothorax or large bullous lung disease, referral to a specialist with experience in assessing travel safety should be considered.

Venous thromboembolism

Patients with a recent pulmonary embolism need to be clinically stable and well anticoagulated before travel. Those who take warfarin will need to access INR testing at appropriate intervals. The novel oral anticoagulants (NOACs) avoid the requirement for INR monitoring. However, medical staff in some destinations may be less familiar with the assessment and management of coagulation status during bleeding episodes for patients taking NOACs. Consideration could be given to providing patients with a relevant information sheet.

A long-haul aircraft flight is a significant predisposing factor for venous thromboembolism (VTE) for patients with a previous VTE or other known risk factors for DVT including pregnancy, active malignancy, recent surgery or obesity. Risk of VTE increases progressively with total flight duration, with only a small risk of severe events on flights less than 4 hours.² Aspirin is not effective in preventing thrombotic events.

There is good evidence supporting administration of subcutaneous low molecular weight heparin for patients who are travelling long distances and have strong risk factors for VTE.³ The general recommendations from airlines to help prevent VTE are sound: avoid alcohol and caffeine as they are dehydrating and drink adequate water to account for the dehydrating effect of cabin air. Compression stockings may be helpful and are advisable for those at higher risk. Choosing an aisle seat may make it easier to walk about for short distances in the cabin and also reduce any subconscious fluid restriction to avoid the need to climb over other passengers to access the bathroom. The leg exercises recommended by some airlines are sensible but of unproven benefit.

Chronic obstructive pulmonary disease and interstitial lung disease

Patients with chronic obstructive pulmonary disease (COPD) or interstitial lung disease

are often concerned about travel safety. Questions of safety generally relate to commercial aircraft flight and travel to moderate-altitude destinations. Most of the available consensus guidance relates to this group, and recommendations are well considered, taking into account that very few problems occur in almost three billion aircraft passenger flights annually, many involving people with these lung diseases.⁴

Most patients with COPD will not need supplemental oxygen during air travel. During short flights (less than 2 hours), the period of hypoxia is short, associated risks are low, and patients who can walk onto the aircraft will usually be fine. Demonstration of hypoxaemia during an altitude simulation test, even to a level that would be very concerning in an acute clinical setting, may not indicate an absolute need for supplemental oxygen during flight.^{5,6} Effective adaptation occurs via a small increase in cardiac output and increased peripheral oxygen extraction.

Loss of muscle bulk accentuates the adverse impact of travel to a moderate-altitude destination on oxygen uptake. If time permits, patients with COPD or interstitial lung disease should be strongly encouraged to participate in a pulmonary rehabilitation program, as this can increase functional capacity and the potential for an enjoyable travel experience. Like patients with asthma, those at higher risk of a COPD exacerbation should have a self-management plan and carry with them an antibiotic and/or oral corticosteroid course, as appropriate. Patients should travel only during periods of clinical stability.

Pulmonary hypertension

Pulmonary hypertension is a growing problem because of an increase in diagnoses, lengthening survival and improved symptom responses to modern therapy. Current guidelines, unsupported by any meaningful evidence, are particularly conservative in relation to patients with pulmonary hypertension and recommend travel with oxygen at what may be very low risk thresholds. It is likely that the considerations regarding travel should be similar to those for patients with COPD or interstitial lung disease. If functional status on treatment is good at sea level then commercial

aircraft travel to a low-altitude destination is likely to be safe and well tolerated.

In the presence of moderate pulmonary hypertension, travel to destinations higher than 1500 m where an exercise demand is inevitable should be avoided. Although this travel may not represent a great risk, breathlessness may be severe and limit the intended enjoyment of travel.⁷ Patients with pulmonary hypertension and little functional reserve should fly with supplemental oxygen, even for short flights. If they are to be assessed before travel, particularly with altitude simulation, it should be conducted in an expert centre.

Cystic fibrosis

Most cystic fibrosis centres have some expertise in the area of travel safety. Young people living with cystic fibrosis are often very keen to travel. In terms of the challenge of altitude or hypoxia, the general principles for assessment based on functional status apply as for COPD. Patients should travel only during periods of clinical stability. Airway dehydration will occur during long aircraft flights, when cabin humidity is

typically less than 15%, and in cold or hot, dry conditions. Attention to fluid status in both settings is important. Continued access to all medications, including dietary supplements, is crucial.

Conclusion

Most people with lung disease can travel safely. The evidence base for recommendations is limited and most international guidelines err on the side of caution. People with severe lung disease who wish to travel should be encouraged to plan ahead. This includes allowing for flexibility in bookings so that they travel only during periods of clinical stability, choosing an airline with an appropriate support structure and ensuring access to medications, including when on board aircraft. **RMT**

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