

# **FITNESS FOR INTERNATIONAL TRAVEL**

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## **CONTENTS**

DISCLAIMERS, WARNINGS AND ACKNOWLEDGEMENTS	2
HOW FIT IS FIT ENOUGH TO TRAVEL?	2
A. Possible causes of adverse effects of travelling on the traveller	5
1. Variations in air pressure with altitude	5
2. Reduced oxygen concentration at higher altitudes	6
Explosive decompression	7
3. Dry air in aircraft cabins	7
4. Motion sickness	8
5. Prolonged immobility during the journey	8
6. Time zone changes	9
7. Airport stress	9
8. Infectious diseases	10
9. Toxins	10
10. Injuries	11
B. Possible causes of adverse effects of the traveller on other people	11
C. Miscellaneous problems	12
LINKS	12
DECLARATION OF INTEREST	12
NOT COPYRIGHT	12
COMMENTS	13
NEXT TIME: PREPARING FOR INTERNATIONAL TRAVEL, PART I	13

## **DISCLAIMERS, WARNINGS AND ACKNOWLEDGEMENTS**

Please see the disclaimers, warnings and acknowledgements relating to the whole series in the first article of the series, entitled [\*About the Wanterfall eBooks Travel Health Series.\*](#)<sup>1</sup>

Please note that the early articles in this series will be very general in nature. They will therefore, inevitably, leave many questions unanswered. Later articles in the series will provide more detail about selected aspects of Travel Health.

## **HOW FIT IS FIT ENOUGH TO TRAVEL?**

Many modern methods of travelling are almost as safe as staying at home. Some may even be *safer* than staying at home. For example, a major review of medical emergencies during air travel, based on data collected by two large European airlines near the end of the 20<sup>th</sup> Century, found that there had been only about one fatality per 10,000,000 (ten million) passengers.<sup>2</sup>

However, there is no room for complacency here, as air safety, which had reached a very respectable cruising altitude by the time of that report, now appears to be descending. In other

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<sup>1</sup> Articles in this series may be read or downloaded from the Articles section of Wanterfall eBooks (<http://www.wanterfall.com>)

<sup>2</sup> Lyznicki JM, Williams MA, Deitchman SD & Howe JP the 3rd, for the American Medical Association Council on Scientific Affairs (now known as the American Medical Association Council on Science and Public Health), "Inflight Medical Emergencies", *Aviat Space Environ Med* 2000 (August) vol. 71, no. 8, pp. 832-838.

words, the situation appears to be worsening, rather than improving, in the early years of the 21<sup>st</sup> Century.<sup>3</sup>

Not only that, but non-fatal medical emergencies during flight are, not surprisingly, *much* more common than fatalities, occurring at rates of about 200 – 1,000 per ten million passengers.<sup>4, 5, 6</sup> That being the case, let's start at the very beginning: should you even *consider* travelling away from your home environment?

Well, most people who can walk 100 metres (109 yards) without difficulty, and sit in a chair for some hours at a time without discomfort, can tolerate the more gentle forms of travel. However, various things, especially acute illness or recent medical or surgical treatment, can make it necessary to postpone departure for a variable length of time. In addition, various other things, especially chronic illness or disability, may necessitate extra medical advice, and perhaps some modifications to the itinerary. Occasionally, they may preclude travel altogether.

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<sup>3</sup> Delaune EF the 3rd, Lucas RH & Illig P, "In-flight medical events and aircraft diversions: one airline's experience", *Aviat Space Environ Med* 2003 (January) vol. 74, no. 1, pp. 62-68.

<sup>4</sup> DeJohn CA, Wolbrink AM, Veronneau SJ, Larcher JG, Smith DW & Garrett JS, "An evaluation of in-flight medical care in the U.S.", *Aviat Space Environ Med* 2002 (June) vol. 73, no. 6, pp. 580-586.

<sup>5</sup> Cummins RO & Schubach JA, "Frequency and types of medical emergencies among commercial air travelers", *JAMA* 1989 (March 3) vol. 261, no. 9, pp. 1295-1299.

<sup>6</sup> Sand M, Bechara F-G, Sand D & Mann B, "Surgical and medical emergencies on board European aircraft: a retrospective study of 10189 cases", *Critical Care* 2009 (January 20) vol. 13, no. 1, p. R3. Accessed on 21 March 2010 at <http://ccforum.com/content/13/1/R3> (doi: 10.1186/cc7690)

Am I trying to put you off travelling? No, not at all! However, if you are elderly or frail, or have any significant illness, then you should certainly discuss all travel plans with your doctor, so that you are as well prepared as possible, and can avoid any unnecessary complications.

Of course, the more adventurous your plans are, the more important your health and fitness becomes. Even healthy young travellers should have a pre-travel medical assessment if they plan to venture far above – or below – sea level, or if they will be engaging in unusually strenuous activities during the trip.

In very general terms, the main considerations in determining a person's fitness to travel can be considered under the headings shown below. Some of the headings only apply to a particular type of travel, such as air travel, while others are more general in scope.

Of course, not every adverse effect of travel relates directly to the underlying health and fitness of the traveller. However, most of the hazards I will mention are potentially more dangerous to travellers who suffer from a pre-existing illness or disability.

The issues covered in this short article certainly do not constitute a comprehensive list, nor are any of them discussed in any great detail. However, the examples given should provide an idea of the sorts of things which can cause problems. Some of the more important issues will be discussed at greater length in future articles in this series.

## **A. Possible causes of adverse effects of travelling on the traveller**

### **1. Variations in air pressure with altitude**

Although the cabins of modern airliners are pressurised, the pressure maintained is only about three quarters of the normal atmospheric pressure at sea level. It is usually comparable to normal atmospheric pressure at an altitude of 5,000 to 8,000 feet (1,524 to 2,438 metres). The upper end of this range of pressures is the maximum allowed by most civil aviation regulations.<sup>7</sup>

One effect of this variation in pressure is that air is expelled from the middle ear and sinus cavities as altitude increases and the ambient pressure falls. This would not matter at all if air could get back in, as altitude decreases and the ambient pressure rises again. However, even a very slight degree of nasal congestion can act like a one way valve, preventing air from returning as the aircraft descends.

The relative vacuum which results can cause severe pain. Especially in the case of the middle ear, it can also cause quite serious harm, even resulting in long term hearing impairment in some cases. Various medications can ameliorate the problem, but they do not always eliminate it. For this reason, it is preferable to postpone air travel for some weeks after recovering from a respiratory tract infection or allergy.

In some unusual situations, the most important being "pneumothorax" (the presence of air between the lungs and the chest wall, due to a penetrating injury or a lung condition) the

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<sup>7</sup> There are regulations governing aircraft cabin pressure, as well as ventilation rates, humidity and the concentrations of ozone, carbon monoxide and carbon dioxide, in virtually all jurisdictions.

decrease in ambient pressure during ascent can have life threatening consequences.

In the case of pneumothorax, the trapped air remains at its original higher pressure, causing the lungs to be further compressed, because the air inside them is at the lower cabin pressure. This may require an emergency descent and diversion to the nearest airport, to allow the patient to be taken to hospital.

If there is a doctor on board, a needle carefully inserted through the chest wall, without impaling the lung or any other vital structures, will allow the trapped air to escape, and thus stabilise the patient's condition. Depending on the distance from the destination, this might sometimes make it possible for the flight to continue as scheduled.

## **2. Reduced oxygen concentration at higher altitudes**

A reduced concentration of oxygen in the air in aircraft cabins at cruising altitudes is a direct consequence of the reduced air pressure referred to above. However, I have given it a separate heading because the mechanism by which adverse effects may be caused is completely different to the mechanisms mentioned under the previous heading.

As the air pressure falls, the amount of oxygen in a given volume of air is correspondingly reduced. There is still quite enough oxygen to keep a healthy adult fit and well, but not enough for very young, very old, or sometimes even mildly unwell travellers.

Travellers with significant heart or lung conditions are the most likely to be dangerously affected. Although oxygen masks should drop from the ceiling if unexpected depressurisation

occurs<sup>8</sup>, oxygen therapy under "normal" cabin conditions is usually only available if it has been arranged in advance, and if every link in the "chain" of those arrangements was successful.

### **Explosive decompression**

Explosive decompression due to structural failure or penetration of an aircraft's hull is a rare and deadly example of reduced oxygen concentration at high altitude. There is a very good reason for the routine advice, given during the safety briefing at the beginning of all flights, to fit your own oxygen mask *before* assisting *anyone* else, such as babies or disabled companions. This is the reason: you have approximately 20 seconds of "usable consciousness", starting from the time of decompression. If you do not have your mask on by the end of that 20 seconds, you will never assist anyone, either now or later. Why? Simply because you, and whoever needs your assistance, will both be unconscious, for a few minutes, and then dead forever.

### **3. Dry air in aircraft cabins**

Perhaps low humidity could be avoided, but in practice the air in aircraft cabins is often extremely dry. This can have remarkably deleterious effects on travellers with a wide variety of pre-existing ear, nose, throat, eye and skin conditions, especially during long journeys.

The air in an aircraft cabin is usually sourced from the engine air intakes, heat sterilised and filtered. It is recirculated to some

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<sup>8</sup> Whenever the planned route is over high ground that would prevent an immediate descent to 10,000 ft (3,048 m) or below, oxygen masks are required to be carried. At a predetermined cabin pressure, usually equivalent to an altitude of 10,000 – 14,000 ft (3,048 – 4,267 m) a barometrically triggered mechanism releases oxygen masks for all passengers and aircrew and opens the associated oxygen flow valves.

extent, otherwise it would be even drier. The partial recirculation sometimes results in cross infection, if one or more passengers happens to have a respiratory tract infection.

However, as discussed in a later article in this series, by far the most common method of acquiring most types of respiratory tract infection is by touching one's own face, and especially the nose, mouth or eyes, with one's own fingers. Unless those fingers have just been washed or disinfected, they frequently transfer infectious material from someone or something they have previously touched.

#### **4. Motion sickness**

Most forms of travel can cause the unpleasant, and occasionally dangerous, condition of motion sickness. Many things can be done to relieve this problem, but there is no perfect solution to it. As well as being unpleasant in itself, it can exacerbate various pre-existing conditions. Motion sickness will be discussed in a future article in this series.

#### **5. Prolonged immobility during the journey**

Narrow seats, reduced legroom and narrow aisles are not at all conducive to a normal amount of movement. This situation is most pronounced during economy air travel, but it can also be a significant problem during coach travel.

Immobility may cause considerable discomfort to travellers who are prone to musculoskeletal pain, especially if the latter affects the back or the neck. In addition, it is almost certainly a significant predisposing factor in the development of the potentially fatal condition of deep vein thrombosis, which will be discussed in a future article in this series.



## **6. Time zone changes**

Changes in local time are most pronounced during long flights with a major east or west directional component. Eastward travel is the chief culprit as regards "jet lag", and both eastward and westward travel can make the timing of medication doses difficult to adjust, particularly for travellers who require insulin injections for diabetes. The effects of time zone changes will be discussed in a future article in this series.

## **7. Airport stress**

With the increasing frequency of both terrorist attacks and drug smuggling, the time spent in airports is rapidly becoming the most stressful aspect of travel. The "guilty unless proved innocent" approach to drug smuggling, adopted by almost all countries, adds an element of real danger to the tedious and exhausting hours spent standing in long queues.<sup>9</sup>

The time spent waiting for security checks to be completed could also, rather paradoxically, increase the likelihood of being present at the time of an explosion or other dangerous incident. (Security measures also add to the cost of air travel, which is another potential cause of stress.)

For unwell or disabled travellers, the long distances between drop off, check in, departure gate and aircraft, which are an inevitable feature of very large airports, can also pose significant physical challenges. Some of these problems will be discussed in future articles in this series.

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<sup>9</sup> Unfortunately, contraband can quite easily be added to your luggage after it has been checked in – even if you never so much as blink an eye before that time. There are various measures available to reduce this risk, but not one of them is foolproof.

## **8. Infectious diseases**

The risk of acquiring an infection as a result of travel is an enormous topic, to which many of the future articles in this series will be devoted. For the moment, I will just say two things.

Firstly, any international journey usually involves close and prolonged proximity to many people, as well as considerably decreased control over what you inhale, touch, drink, eat or get bitten by. Therefore, the journey itself inevitably involves a significant risk of contracting an infection.

Secondly, the most interesting places to travel to are usually teeming with a wide variety of microorganisms that your body's immune system has never encountered before, as well as numerous, and very persistent, insect and other vectors bent on introducing the former to the latter.

## **9. Toxins**

Admittedly, there are plenty of opportunities to encounter various toxins, wherever you happen to be. However, many of the more interesting travel destinations offer a much wider variety of toxic substances than you are probably used to dealing with. Even an entirely innocuous looking bread roll, mushroom, fish or bowl of nuts may sometimes contain an invisible but deadly poison!

Some destinations also offer an assortment of venomous snakes, spiders or sundry other creeping, crawling, swimming or flying creatures, some of which may be perfectly willing, especially if disturbed, to introduce you to some toxins of their own. The avoidance of toxins, whether ingested or injected, will be the subject of a number of future article in this series.

## **10. Injuries**

Opportunities to sustain injuries are also widely available. However, some destinations provide far more opportunities than exist at home. In addition, the specific risks are often different, which means that you may well lack the knowledge, experience and skills necessary to avoid them. Some of these issues will be discussed in future articles in this series.

### **B. Possible causes of adverse effects of the traveller on other people**

Although the vast majority of people are able to travel safely by commercial aircraft, airline officials naturally refuse to accept any passenger who is considered to constitute a risk to the safe operation of the aircraft, or to the safety of any individual person. A prospective passenger who is or may be suffering from, or carrying, an infectious disease would be one obvious example.

Other examples may not be quite as obvious, especially as the *convenience* of all interested parties is also taken into account. For example, advanced pregnancy makes it at least possible that delivery could occur en route, which might well cause great inconvenience to a number of people, as well as potential dangers to both mother and baby.

Prospective passengers who may require emergency treatment, possibly necessitating diversion of the flight, are also likely to be rejected. Persons who manifest, or have a history of manifesting, any behavioural problems, would also be considered potential causes of inconvenience at best, and danger at worst, and would therefore probably also be rejected.

## **C. Miscellaneous problems**

Unusually hazardous destinations, perhaps as a result of a natural disaster or military conflict, obviously pose particularly severe risks for the traveller who for some reason cannot avoid the destination entirely (which is always the safest course).

Unusual requirements, such as a motorised wheelchair or mobility scooter, intermittent renal dialysis, or continuous oxygen therapy, also pose difficult problems. In some cases, such problems may prove insurmountable, and thus virtually preclude any type of travel.

Some of these miscellaneous problems will be discussed in future articles in this series.

## **LINKS**

[\*Some Useful Travel Health Websites\*](#)<sup>10</sup>

[\*Partial Bibliography for the Travel Health Series\*](#)<sup>11</sup>

## **DECLARATION OF INTEREST**

Dr Coates receives no financial or other incentives from any travel-associated bodies.

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<sup>10</sup> [www.wanterfall.com/Travel-Health/Travel-Health-Series-Introduction.htm#App1](http://www.wanterfall.com/Travel-Health/Travel-Health-Series-Introduction.htm#App1)

<sup>11</sup> [www.wanterfall.com/Travel-Health/Travel-Health-Series-Introduction.htm#App2](http://www.wanterfall.com/Travel-Health/Travel-Health-Series-Introduction.htm#App2)

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**NEXT TIME: PREPARING FOR INTERNATIONAL TRAVEL, PART 1**