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link to Reader's Digest article [1]

lungs [2] mental health [3] heart [4] infection [5] disability [6]

Much has been written about the sickness, blocked sinuses, blood clot risk and jet lag commonly experienced as a result of air travel. For some passengers, however, flying represents a much more serious health risk.

The pressure's the problem

At a cruising altitude of up to 50,000 feet, the air pressure is reduced to three-quarters of that on the ground. As the pressure reduces, so does the concentration of oxygen: a profound concern for those struggling to breathe. In future, aircraft are anticipated to fly higher, at altitudes of up to 60,000 feet. In these conditions, your every breath would contain fewer molecules of oxygen.

The air is also deliberately dry on an aeroplane, to prevent freezing and corrosion of engine parts and condensation on landing (when it might 'rain on the plane'). Dry air can irritate the lungs and dry them out.

How's your breathing?

The dry, oxygen-poor air on the aeroplane may present a challenge to those with breathing problems, such as chronic obstructive pulmonary disease [7] or cystic fibrosis.

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The Cystic Fibrosis Foundation [8] emphasises, however, that "living with cystic fibrosis doesn't have to stop you from travelling to see the world or visiting loved ones". People with severe cystic fibrosis might first need to ask their doctor to complete a 'Fit to Fly' form before they travel, and carry inflight oxygen.

Many people with cystic fibrosis can travel safely: a German study [9] exposed 36 patients with cystic fibrosis to

high altitude in the Alps for 7 hours, and their breathing was unaffected.

How's your mind?

Robert Hughes, a 25 year old man with schizophrenia, caused a plane to make an emergency landing as he tried to open the cabin door. Others with controlled and managed schizophrenia can travel safely. Even if you don't have a history of mental illness, stresses related to flying can alter your behaviour. It's worth completing a travel mental health checklist [10] once you've packed your suitcase.

How's your heart?

Patients with severe heart failure [11] (unable to walk without becoming breathless) may not be fit to fly, or may require supplemental oxygen during the flight. This is because, in heart failure, the patient's body tissues are already short of oxygen (as the weakened heart is less effective at pumping oxygen-rich blood around the body).

Once inside the aeroplane, the lower concentrations of inspired oxygen trigger a slight increase in heart rate in all passengers, to try to increase oxygen delivery to your organs. In patients with severe heart failure, the weakened heart will struggle to meet this demand. The Aerospace Medical Association also advise against flying for two weeks after a heart attack or heart surgery for this same reason.

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Are you infectious?

Modern aircraft design limits the spread of infections such as ebola, TB [12] and measles. John Oxford, a London virologist, points out that "the aeroplane ventilation goes from the ground to the ceiling, where the air is filtered for bacteria and viruses before it recirculates." He states that "the biggest risk is not on the plane, but in the taxi on the way to the airport".

Nevertheless, passenger screening, quarantine and follow-up of exposed passengers will take place if the risk is thought to be high.

If you are suffering from a cold or the flu whilst flying, you may infect other passengers. But you could also damage your own health, because during ascent and descent you may be unable to equalise the air pressure in your middle ear with the cabin pressure due to a blocked Eustachian tube [13]. Swallowing and yawning can help unblock this tube, but in severe cases, dizziness, tinnitus and damage to the eardrum can occur. Pilots attempt a slow descent to minimise this problem.

If you can't fly

The Jumbulance [14] makes it possible for severely unwell passengers to enjoy holidays across Europe without flying. I'm travelling with them as a volunteer nurse in the summer. Watch this space.

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[1] http://www.readersdigest.co.uk/health/health-centre/are-you-medically-fit-fly [2] https://helencowan.co.uk/../tags/lungs [3] https://helencowan.co.uk/../tags/mental%20health [4] https://helencowan.co.uk/../tags/heart [5] https://helencowan.co.uk/../tags/infection [6] https://helencowan.co.uk/../tags/disability [7] https://www.copdfoundation.org/COPD360social/Community/Blog/Article/6/Safe-to-Travel.aspx [8] https://www.cff.org/ [9] http://erj.ersjournals.com/content/25/4/718 [10] file:///C:/Users/Helen/Downloads/Mental_Health_Psychosis.pdf [11] http://www.heartfailurematters.org/en_GB/Living-with-Heart-Failure/Air-travel [12] https://www.cdc.gov/tb/publications/factsheets/general/tbtravelinfo.htm [13] http://patient.info/health/eustachian-tube-dysfunction [14] http://www.jumbulance.org.uk/