



Every breath you take

In this issue Dr Chris King looks at the respiratory problems which can commonly affect aircrew.



The respiratory system consists of the nose, larynx and lungs. The function of the nose is to heat and moisten the air and to remove and filter particles in the inhaled air. The larynx generates the voice, and the lungs allow the absorption of oxygen from the air into the bloodstream to supply the body and to remove carbon dioxide produced in metabolism to the outside air.

All parts of the body, particularly the brain, eyes and heart require a constant supply of oxygen to function normally. Any disruption of these processes can cause severe problems or incapacitation and it is important that these processes are not impaired.

The aviation environment is complicated further by the fact that airliner cabin altitude can be set as high as 8,000 feet, and the pressure of oxygen in the atmosphere and the ability of it to be transferred from the lungs via the bloodstream to the body is reduced as altitude increases.

Respiratory problems can be divided into two categories. Either those caused by reduced air pressure such as decompression or those caused by medical problems associated with the respiratory tract.

Potential problems

If you suffer from any of the problems listed below, other than a mild chest infection, it's worth discussing with your AME as the illness and/or treatment may require

temporary grounding until the problem has been evaluated and adequately treated.

- **Nasal congestion** (colds and hay fever) can impair the ability to equalise the pressure in the ear via the Eustachian tube and have been dealt with in a separate article in *The Log* (see April/May 2011 issue).

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- **Chest infections** cause inflammation of the substance of the lungs and are caused by bacteria and viruses. Symptoms include cough, fever and the production of ‘mucky’ sputum. Treatment is usually by way of antibiotics.

- **Asthma** is caused by inflammation of the lung airways and causes narrowing or ‘spasm’ of the tubes. Asthma is characterised by coughing, wheezing, chest tightness and shortness of breath. There is limitation of airflow through the airways and the airways become increasingly sensitive to various agents such as pollen, cats, fumes, dust, cold air and exercise. There is also increased production of mucus by the airways. Treatment nowadays is generally via various sorts of inhalers.

- **Chronic bronchitis** is caused by an increase in the mucus-producing cells in the lungs, producing increasing volumes of sputum. The small gas exchanging cells in the smallest of the airways become damaged thus impairing the gas exchange of oxygen and carbon dioxide. Patients with chronic bronchitis often have a productive cough (ie one that brings up mucus) for most of the year and are very susceptible to chest infections. Smoking is a cause of this illness.

- **Pneumothorax** is a condition where there is air in the cavity between the

chest wall and the lungs, which is called the pleural space. Normally there is negative pressure in this space, which keeps the lungs expanded. This problem can arise either with trauma to the chest wall or due to a rupture of the lung lining, causing communication with the pleural space which interrupts the negative pressure and so the lungs may collapse. This latter ‘spontaneous

pneumothorax’ is more common in young male adults and causes real problems with a flying career. Symptoms include one-sided chest pain and breathlessness. Sometimes these resolve spontaneously or they may require a chest drain to be inserted. If they are recurrent an operation is performed to ‘glue’ the lung onto the chest wall. The CAA will require detailed reports if such a problem has occurred as it is one of the medical conditions that can cause sudden incapacitation on the flight deck.

- **Sleep apnoea** is caused by a collapse of the upper airways during sleep. This can occur as a result of an unusual jaw shape or obesity. During sleep breathing stops (apnoea), which leads to sudden awakening by the patient, not usually remembered. The poor quality of sleep leads to daytime sleepiness which is an obvious problem. There is a scale of sleepiness called the Epworth scale, which can quantify the level of sleepiness and assess the degree of the problem. It can be treated by losing weight and also by using a mask attached to a positive pressure ventilator at night, which prevents the apnoeic attacks thereby aiding an efficient sleep pattern and reducing daytime sleepiness.

If you have any queries about the above or any other issues it is always worth contacting your AME who, I am sure, will be happy to give you further advice. ■

