New device to monitor lung function in space

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A new method of collecting blood from the ear, currently part of an interactive exhibition at the Science Museum, could be used to monitor lung function in space. Less invasive, faster and more accurate than current methods, the technique could also be used here on Earth by asthma sufferers.

Levels of oxygen and carbon dioxide in the blood are currently measured by inserting a needle into an artery – an invasive and painful procedure that must be carried out by a doctor or specialist nurse. This method is not feasible in space due to complications that can arise from the procedure, including infection and contamination of the surrounding atmosphere.

Arterialised blood taken from the ear offers a faster and safer method which requires minimal training and does not, therefore, demand the involvement of a medical professional. The earlobe is first massaged with a special cream to fill it with arterialised blood. The blood collector then works by making a small incision in the earlobe and drawing the blood directly into a cartridge. The cartridge plugs into a reader which instantly analyses the blood.

The test can be used to check for breathing problems and lung conditions, including asthma. Given the speed with which it can be used, the blood collector could also show people with asthma how serious their attacks are, providing guidance on whether to use an inhaler or call an ambulance.

The Earlobe Arterial Blood Collector (EABC) was developed by Professor Thais Russomano, Senior Lecturer in the Centre of Human & Aerospace Physiological Sciences at King's College London. She said: 'As astronauts spend longer in space it is crucial that we explore how the human body adapts to low gravity. I want to know how well astronauts' lungs work under these conditions and whether they change over time.

'Measuring the concentration of blood gas is a really good way to understand lung function in space and this self-contained method ensures that there is no opportunity of contamination by the air or any chance for blood to leak.'

The earlobe blood collector is currently being assessed by NASA and may be tested in space. Professor Russomano expects that in space she will be better able to assess lung function because the effects of microgravity serve to distribute blood and air more evenly throughout the body.

Provided by King's College London