Researchers develop new method for looking into the lungs

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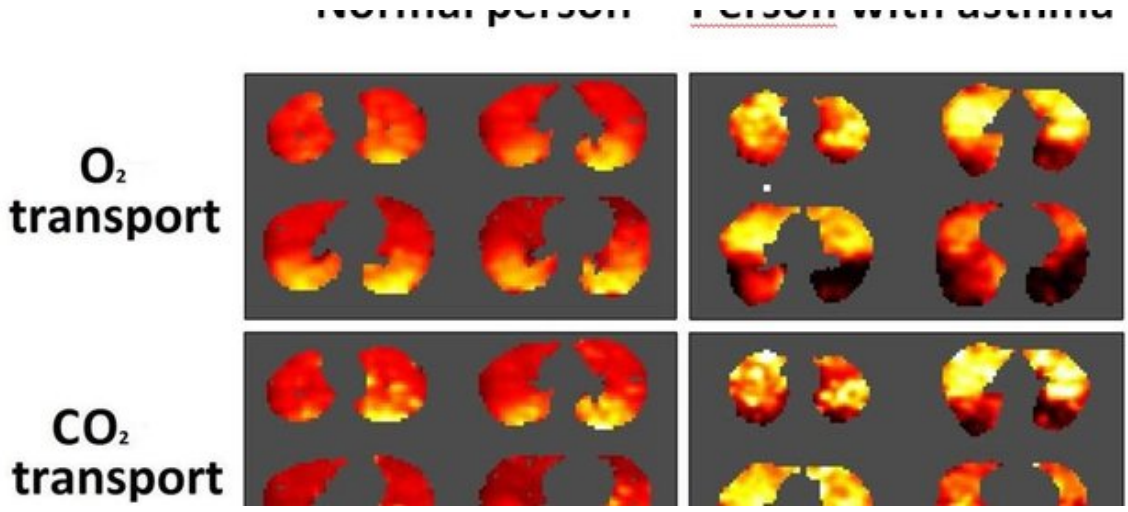

The picture shows a far better gas transport in a person with no lung diseases in contrast to a person with asthma.

For the first time, researchers have succeeded in producing 3D images showing oxygen and CO_2 transport in the lungs. The new method provides hope for better treatment of COPD and lung cancer.

Every time we breathe, oxygen and CO_2 is transferred between our blood and the air in the lungs. It is crucial for us to maintain life that this gas transport functions, and detailed knowledge about the movement of oxygen and CO_2 is therefore also important. Not least in the case of

patients with pulmonary lung diseases such as COPD, lung cancer and asthma, and also for acutely ill patients who are on a respirator.

For these patients, the latest research in the area may turn out to be the first step on the road to more effective forms of treatment.

"We are the first to develop a new model for how you can see into the lungs. The model provides a kind of 3D map of how and where the CO_2 and oxygen transfers take place," says engineer and PhD student Troels Johansen from the Department of Clinical Medicine at Aarhus University.

Woking in collaboration with researchers from Harvard Medical School, Troels Johansen has developed a mathematical model as part of his PhD project that provides the basis for the 3D images, which in turn are developed from PET scans.

The new method has just been published in an article in the scientific journal *Respiratory Physiology & Neurobiology*.

Images give better treatment

The new model can be used for different groups of patients:

"For example, if we take cancer patients with a tumour in the lung, it will be easier to predict the consequences of removing part of the lung by surgery. It will also be easier for doctors to determine the COPD patients who will benefit from an operation and those who will not. We also believe that the new model will come to contribute with knowledge that can help patients in intensive care who are on a respirator," says Troels Johansen.

"The new model is not only able to make it easier for doctors to foresee

the consequences of high-risk lung operations. It will also contribute new basic knowledge about the crucial oxygen and CO_2 transfer in both healthy and diseased lungs," says Troels Johansen.

More information: Troels Johansen et al, A method for mapping regional oxygen and CO2 transfer in the lung, *Respiratory Physiology & Neurobiology* (2016). DOI: 10.1016/j.resp.2015.10.017

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