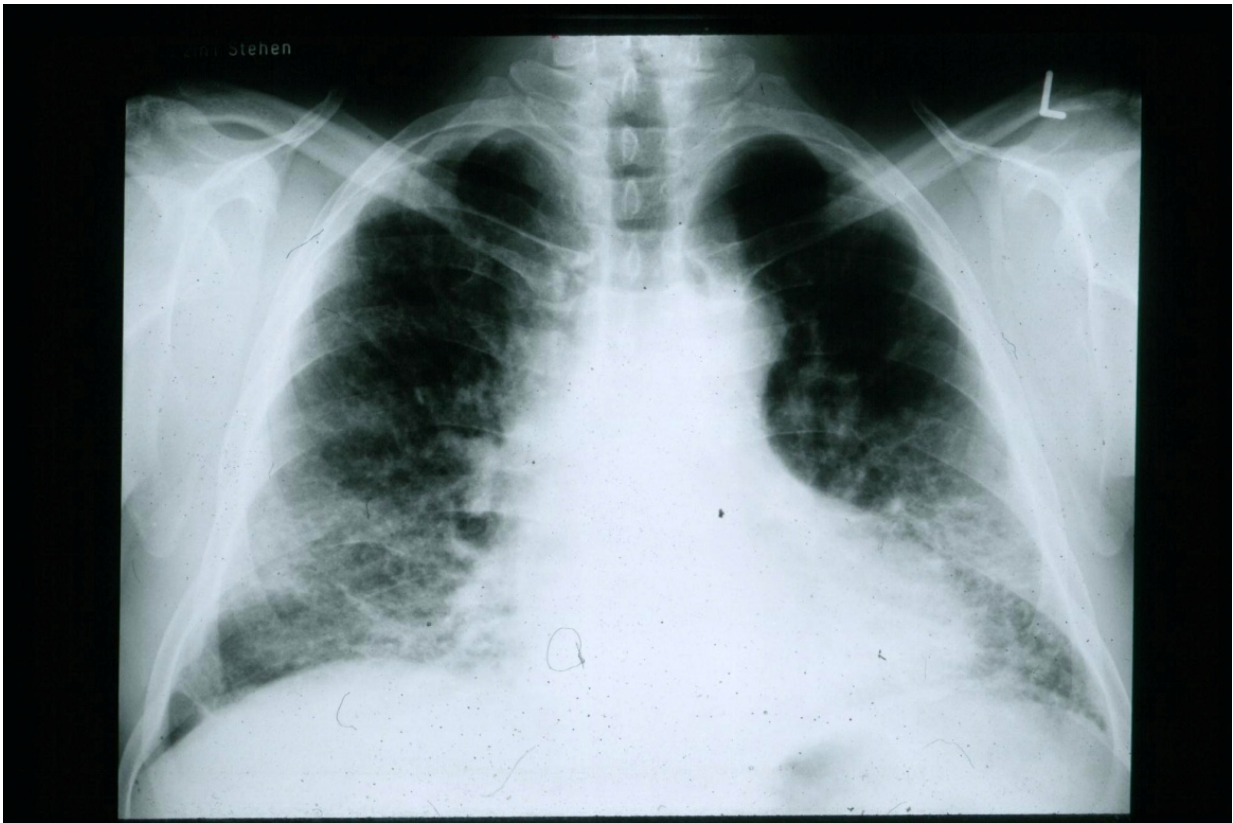


Short or long sleep associated with Pulmonary Fibrosis

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A chest radiograph of a patient with Idiopathic Pulmonary Fibrosis (IPF). Credit: Wikipedia/CC BY-SA 3.0

Scientists have discovered that people who regularly sleep for more than 11 hours or less than 4 hours are 2-3 times more likely to have the

incurable disease, pulmonary fibrosis, compared to those that sleep for 7 hours in a day. They attribute this association to the body clock.

The study also reveals that targeting the [body clock](#) reduces [fibrosis](#) in vitro, revealing a potential target for this [incurable disease](#) that kills about 5,000 people, a year in the U.K., the same number as leukaemia.

The research team members are based at the Universities of Manchester, Oxford, Newcastle, University College London, and Toronto, as well as Manchester University NHS Foundation Trust.

The study is published in *Proceedings of the National Academy of Sciences* and is funded by the Medical Research Council, and the Wellcome Trust.

Our internal body clocks regulate nearly every cell in the [human body](#), driving 24-hour cycles in many processes such as sleeping, hormone secretion and metabolism.

In the lungs, the clock is mainly located in the main air carrying passages—the airways. However, the team discovered that in people with lung fibrosis, these clock oscillations extend out to the small air spaces, called alveoli.

Studies in mice revealed that by altering the clock mechanism it was possible to disrupt the fibrotic process making the animals more likely to develop [pulmonary fibrosis](#).

The researchers then showed, that pulmonary fibrosis is associated with short and long sleep duration using human data from the UK Biobank.

The link between sleep duration and lung fibrosis is similar in strength to other known risk factors for this disease.

People who report they regularly sleep 4 hours or less in a day doubled their chance of having pulmonary fibrosis while those sleeping 11 hours or longer in a day tripled their chance of having the disease, compared to those sleeping 7 hours per day.

Smaller, but still elevated, risks were also seen in people who like to stay up late at night or those who do shift work.

The researchers explain their findings by the discovery that a core clock protein (REVERB α) which alters the production of a key protein in lung fibrosis (collagen).

This is an exciting finding, they say, because chemical compounds can alter the function of REVERB α .

The authors were able to show that one of these REVERB α compounds can reduce collagen in lung slices from people with this disease.

Dr. John Blaikley from The University of Manchester, who led the project said: "Pulmonary fibrosis is a devastating condition which is incurable at present. Therefore, the discovery that the body clock is potentially a key player potentially opens new ways to treat or prevent the condition. More work will need to be done around studying the association between pulmonary fibrosis and [sleep duration](#) to establish both causation and reproducibility. If these results are confirmed, then sleeping for the optimal time may reduce the impact of this devastating disease."

Dr. Peter Cunningham, joint lead author on the paper, said: "It is fascinating to think that clock activity is increased in fibrotic disease. Previous studies have shown that the clock also plays an important role in infection, cancer and diabetes. The discovery that the clock plays a role in fibrosis suggests that altering these oscillations could become an

important therapeutic approach."

More information: Peter S. Cunningham et al. The circadian clock protein REVERB α inhibits pulmonary fibrosis development, *Proceedings of the National Academy of Sciences* (2019). [DOI: 10.1073/pnas.1912109117](https://doi.org/10.1073/pnas.1912109117)

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