



Extended Research Article

Software with artificial intelligence-derived algorithms for detecting and analysing lung nodules in CT scans: systematic review and economic evaluation

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Plain language summary

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Plain language summary

Lung cancer is one of the most common types of cancer in the UK. In the early stages, people may not have symptoms and so lung cancer is often diagnosed late. Identifying and monitoring lung nodules using computed tomography scans are the primary means of detecting lung cancer at earlier stages. If a nodule is found, it needs to be measured accurately so that the cancer risk can be assessed. Currently, images from computed tomography scans are interpreted without artificial intelligence software.

Artificial intelligence could help to detect and measure nodules more accurately and quickly. This report looks at the evidence on the benefits and harms of artificial intelligence in helping healthcare professionals to find and measure lung nodules. The report also looks at whether artificial intelligence offers value for money.

We did not find any studies that directly compared radiologists' performance with and without the help of artificial intelligence in the UK. All of the studies we did find were of low quality. Findings from these studies suggest pros and cons of using artificial intelligence:

- Artificial intelligence could improve nodule detection, with bigger improvements seen in detecting smaller nodules. However, artificial intelligence might increase the detection of both cancer as well as harmless nodules.
- With artificial intelligence, measuring nodule size and assessing cancer risk could be more consistent.
- In up to half of nodules, automatic size measurement needs manual adjustment.
- Radiologists' reading time could be reduced with artificial intelligence.

It has not yet been established how artificial intelligence would affect radiologists' performance in United Kingdom practice. Whether artificial intelligence offers good value for money is also uncertain because we lack good evidence. Our early assessment suggests that artificial intelligence software might be cost-effective for lung cancer screening but might not be cost-effective for people who have symptoms or who have a computed tomography scan for other reasons. This is because the balance between the benefit of detecting more cancers and the harm of worrying people with incorrect test results and adding unnecessary regular follow-ups may be different in different populations.

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This article

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