

5 December 2012 Last updated at 05:47 GMT

## 'Promising results' for bowel cancer breath-test



Could a breath test detect cancer?

Scientists say they have developed a breath-test that can accurately tell if a person has bowel cancer.

The test, which looks for exhaled chemicals linked to tumour activity, was able to identify a majority of patients with the disease.

The British Journal of Surgery reported an overall accuracy of 76%.

However, another scientist said it was unlikely a fully functioning and reliable breath-test would be available soon for the general public.

Scientists are working on breath-tests for a host of other diseases, including several types of cancer, TB and diabetes.

"These technologies show a great deal of promise, and hopefully we will see larger studies in the future"

Dr Claire Turner The Open University

If diagnosed and treated early, the chances of stopping cancer can be good, but there is often little or no outward sign of the disease until it has progressed significantly.

Chemical 'smell'

The current screening test for bowel cancer looks for signs of blood in the faeces, but only a small proportion of those who test positive actually have colorectal cancer, which means unnecessary and invasive further testing for many people.

The breath-test technology relies on the idea that the biology of tumours can lead to the production of specific "volatile organic compounds", combinations of chemicals unlikely in a healthy person.

These can be found in small amounts in the breath of the patient, and early studies found dogs could be trained to identify them - although the latest study relies on an electronic device to analyse breath gases.

The team from a hospital in Bari, southern Italy, compared the breath of 37 patients known to

have bowel cancer with that of 41 "controls" who were thought to be healthy.

The initial test identified the cancer patients with 85% accuracy, and although, when combined with a follow-up test, the overall result fell to 76%, the researchers were upbeat about its potential.

"The present findings further support the value of breath-testing as a screening tool," they say.

It might be possible that the technique could help identify patients whose cancer was returning after treatment.

Bigger studies with a greater number of patients were now needed to fine-tune the test and confirm it worked, said Dr Donato Altomare and colleagues.

Breath-tests have been suggested for a variety of diseases, including other types of cancer, TB and diabetes, but Dr Claire Turner, a lecturer in analytical chemistry at the Open University, said that it was often difficult to interpret the cocktail of chemicals contained in every breath, as they could be influenced by what the patient had been eating, or even just by being ill or spending time in a hospital environment.

She said: "These technologies show a great deal of promise, and hopefully we will see larger studies in the future.

"However, we are unlikely to see this kind of breath testing available widely in the short term."

20 April 2011 Last updated at 02:42 GMT

## **Cancer breath test 'step closer'**

A breath test that can sniff-out cancer is a step closer to reality, according to a preliminary study.

Researchers found an "electronic nose" was able to identify chemical signals of cancer in the breath of patients with lung or head and neck cancer.

A cancer charity said it would take years of research to see if the breath test could be used in the clinic.

About 80 volunteers took part in the Israeli research, published in the British Journal of Cancer.

Of these 22 had various head-and-neck cancers, 24 had lung cancer and 36 were healthy.

The prototype breath test uses a chemical method to spot markers of cancer present in the breath.

The hope is that one day such a test could be used in a GP's surgery to give an instant diagnosis.

'Urgent need'

Researchers at the Technion - Israel Institute of Technology - are working on a device called

the nano artificial nose.

## Head-and-neck cancer

Around 9,000 people in the UK are diagnosed with head-and-neck cancer each year

Cancers include those of the eye, mouth, voice box and food pipe

They looked at head-and-neck cancer, which is often diagnosed late, making it more difficult to treat successfully.

Lead researcher, Professor Hossam Haick, said: "There's an urgent need to develop new ways to detect head-and-neck cancer because diagnosis of the disease is complicated, requiring specialist examinations.

"We've shown that a simple 'breath test' can spot the patterns of molecules which are found in head-and-neck patients in a small, early study.

"We now need to test these results in larger studies to find if this could lead to a potential screening method for the disease."

Dr Lesley Walker, of Cancer Research UK, said it was incredibly important to spot the disease as soon as possible when it was easier to treat successfully.

She added: "These interesting initial results show promise for the development of a breath test to detect head-and-neck cancers which are often diagnosed at an advanced stage.

"But it's important to be clear that this is a small study, at a very early stage, so many more years of research with patients will be needed to see if a breath test could be used in the clinic."

The BBC is not responsible for the content of external Internet sites

1 February 2011 Last updated at 03:34 GMT

## Early bowel cancer detected by dogs in Japan

By James Gallagher Health reporter, BBC news



Dogs sniffed out bowel cancer in more than nine out of 10 cases.

A Labrador retriever has sniffed out bowel cancer in breath and stool samples during a study in Japan.

[The research, in the journal Gut](#), showed the dog was able to identify early stages of the disease.

It has already been suggested that dogs can use their noses to detect skin, bladder, lung, ovarian and breast cancers.

Cancer Research UK said it would be extremely difficult to use dogs for routine cancer testing.

The biology of a tumour is thought to include a distinct smell and a series of studies have used dogs to try to detect it.

Notoriously difficult

The researchers at Kyushu University used Marine, an eight-year-old black Labrador.

She was asked to pick from five samples, one of which was from a cancer patient and four from healthy people.

In the breath tests she picked out the cancer sample 33 out of 36 times.

"The specific cancer scent indeed exists, but the chemical compounds are not clear. Only the dog knows the true answer"

Dr Hideto Sonoda Kyushu University

She was even more successful with the stool samples, finding 37 out of 38 cancers.

Even early bowel cancers were detected, which is notoriously difficult.

The NHS screening programme tests for small amounts of blood in faeces, but the researchers believe it picks up only one in 10 early cases.

One in 20 people in the UK develop bowel cancer during their lifetime and more than 16,000 die each year.

Dr Hideto Sonoda, from Kyushu University, said: "It may be difficult to introduce canine scent judgement into clinical practice owing to the expense and time required for the dog trainer and dog education.

"Scent ability and concentration vary between dogs and also within the same dog on different days.

Electronic nose

Some [early research](#) on developing an "electronic dog's nose" has taken place, which shows the potential for a cancer breath test.

Dr Sonoda told the BBC: "The specific cancer scent indeed exists, but the chemical compounds are not clear. Only the dog knows the true answer."

"It is therefore necessary to identify the cancer specific volatile organic compounds [smells] detected by dogs and to develop an early cancer detection sensor that can be substituted for

canine scent judgement.

"To complete the sensor useful in clinical practice as a new diagnostic method is still expected to take some time."

Nell Barrie, science information officer at Cancer Research UK, said: "Although some dogs seem to be able to smell cancer in certain situations, we're still a long way from understanding exactly what they are detecting and this small study in one dog doesn't give us any new clues.

"It would be extremely difficult to use dogs as part of routine testing for cancer, and that's why further research in this area is concentrating on finding out more about the molecules given out by tumours, to see if they could be detected in other ways."

Mark Flanagan, chief executive of Beating Bowel Cancer, said: "This study looks interesting but it is for the scientists to verify whether these findings could lead to future developments for screening.

"The clear message is that screening saves lives and we encourage everyone eligible to take part in the existing NHS bowel cancer screening programme."

30 July 2012 Last updated at 15:30 GMT

## **Dog 'sniffed out cancer' in her owner's breast**



Mrs Rawlinson's husband Brian said Penny was amazing

A woman discovered she had a cancerous tumour in her breast after her dog started sniffing and pawing at it.

Sharon Rawlinson ignored her Cavalier King Charles Spaniel for months, but went for tests after Penny stepped on her chest, causing pain.

Mrs Rawlinson, from Newark, then examined herself and found a lump.

Penny was a surprise Christmas present which her husband almost did not buy, because he said his wife was not allowed to have another dog.

Mrs Rawlinson said 18-month-old Penny was her guardian angel.

"I can't explain how she knew. I just can't get my head around it," she said.

Penny began her unusual behaviour in November, and stepped on her owner's chest in January.

## Can dogs detect cancer?

- The first serious suggestion that dogs could "sniff out" cancer appeared [in a letter to The Lancet](#) in April 1989
- It contained anecdotal evidence of a dog that kept sniffing a lesion on its owner that was later confirmed as an early [malignant melanoma](#)
- A subsequent study by Dr John Church, published in 2004, [claimed to prove in principle that dogs could detect bladder cancer](#) in urine
- Further separate studies carried out suggest dogs can also detect [lung](#), [bladder](#) and [bowel cancer](#)
- [Read BBC Health's advice on what to do if you find a lump](#)

Mrs Rawlinson went to her GP and then Nottingham City Hospital for tests, and Penny continued to paw her while she waited for the results.

Mrs Rawlinson began chemotherapy in March and went into hospital for an operation to remove the tumour this week.

"As soon as I started chemotherapy she's not gone near the breast since," Mrs Rawlinson said.

Her husband Brian said the dog was "amazing".

"There's a long, long way to go but at least we've got half a chance," he said.

"If we had left it for any longer, because the tumour was already 33mm, I think we would have had problems."

Martin Ledwick, head information nurse at Cancer Research UK, said: "A few anecdotal cases have suggested that dogs may sometimes be aware that their owner has cancer.

"No reliable research has given a scientific explanation of how this could work."

Last Updated: Monday, 26 February 2007, 01:32 GMT

---

## Lung cancer 'colour breath test'





The sensor, slightly bigger than a coin, is inexpensive

**US scientists have devised a colour test which shows up unique chemical changes in the breath of people with lung cancer.**

The hues of a series of 36 dots detect lung cancer accurately in just under three out of four people with the disease, the researchers told Thorax.

The concept of a "gas fingerprint" for lung cancer is not new, but the kit is.

The sensor, which is slightly bigger than a quarter dollar or a two pound coin, is inexpensive and easy to use.

It could revolutionise the way cancer is detected and potentially save lives, say the Cleveland Clinic doctors.

Experts have known for many years that the chemical composition of a person's breath changes when they develop lung cancer.

Dogs - animals with a very keen sense of smell - are able to distinguish the breath of patients with lung cancer from that of healthy people, for example.

#### **Volatile organic compounds**

This is because lung cancer cells give off chemicals, called volatile organic compounds or VOCs, which are then breathed out.

In the past, scientists have used highly sensitive machines such as gas chromatography and mass spectroscopy to "read" these VOCs with extreme accuracy.

But the machines are expensive to use and require specially trained experts to interpret the results.

In comparison, the colour sensor is cheap and easy to read, say the researchers.

The spots on the sensor change colour according to the chemicals with which they come into contact.

The researchers used the colour sensor to test the breath of 122 people with different types of lung disease, including 49 with cancer, and 21 healthy people.

It was able to accurately predict the presence of cancer in just under three out of four of those with lung cancer, including very early tumours.

This is crucial because lung cancer is often silent in its early stages, making it difficult to pick up at a stage when it could be treated effectively, explained lead researcher Dr Peter Mazzone and his team.

"Ultimately, this line of investigation could lead to an inexpensive, non-invasive screening or diagnostic test for lung cancer," they explained.

Dr Jesme Fox, medical oncologist and medical director at the Roy Castle Lung Cancer Foundation, said:

"There is a desperate need to get people diagnosed earlier.

"At the moment we rely on people coming forward with symptoms, or a suspect chest x-ray picked up purely by chance.

"In the UK our five-year survival for lung cancer is about seven out of 100.

"That's appalling. Within one year from diagnosis almost 80% are dead. That's because people are picked up when the disease is advanced.

"If you pick it up early these people have a good chance of survival.

"This breath test certainly looks promising, being easy to use and non-invasive."

She said the test would require more development before it could become available clinically.