How a blood test may help cancer patients avoid chemotherapy

Hugh McDermott says the test has given him peace of mind and speeded his recovery.

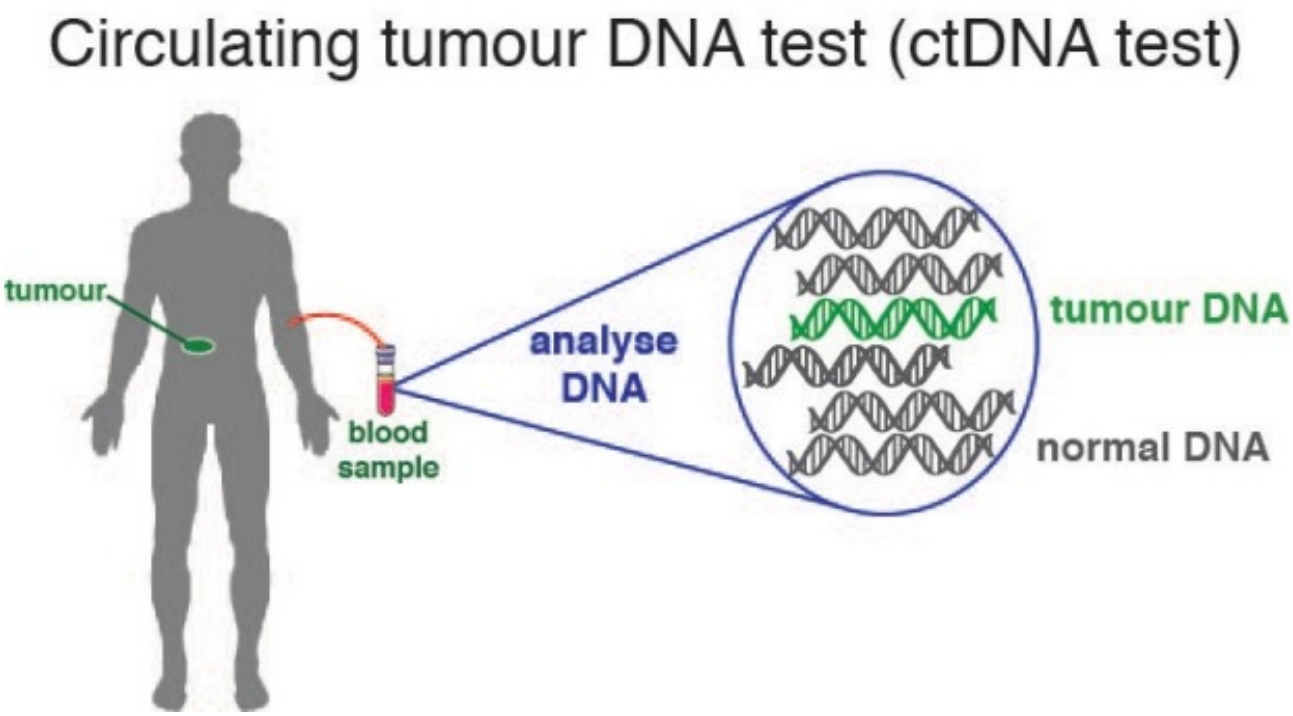
by **Jill Margo** in AFR on 16 Oct 2018

To keep safe from a recurrence of his cancer, Australian scientist Professor Hugh McDermott took an educated risk. He took a simple blood test.

McDermott had surgery last year for early stage colon cancer, and his oncologist could not say definitively afterwards whether chemotherapy would offer him further protection.

The oncologist had no way of telling if stray cells had been left behind and needed to be mopped up with chemotherapy, or whether the cancer was gone and no further treatment was necessary.

This made McDermott – an inventor, chief technology officer at The Bionics Institute and professorial fellow at Melbourne University – uncomfortable.



The test, known as a liquid biopsy, checks for DNA from tumour cells floating in the blood.

Should he commit to months of chemotherapy – with its side effects and significant impact on his family, friends and work – on the off-chance he needed it?

He had spent his career in medical research, so when his oncologist said there was a trial that could help him decide, he took a good look.

Led from Melbourne, the trial was using a blood test to determine if chemotherapy was necessary after bowel surgery and, if it was, what size dose a patient should have.

This test, known as a liquid biopsy, checked for DNA from tumour cells floating in the blood.

Having done his homework, McDermott, then 58, signed up.

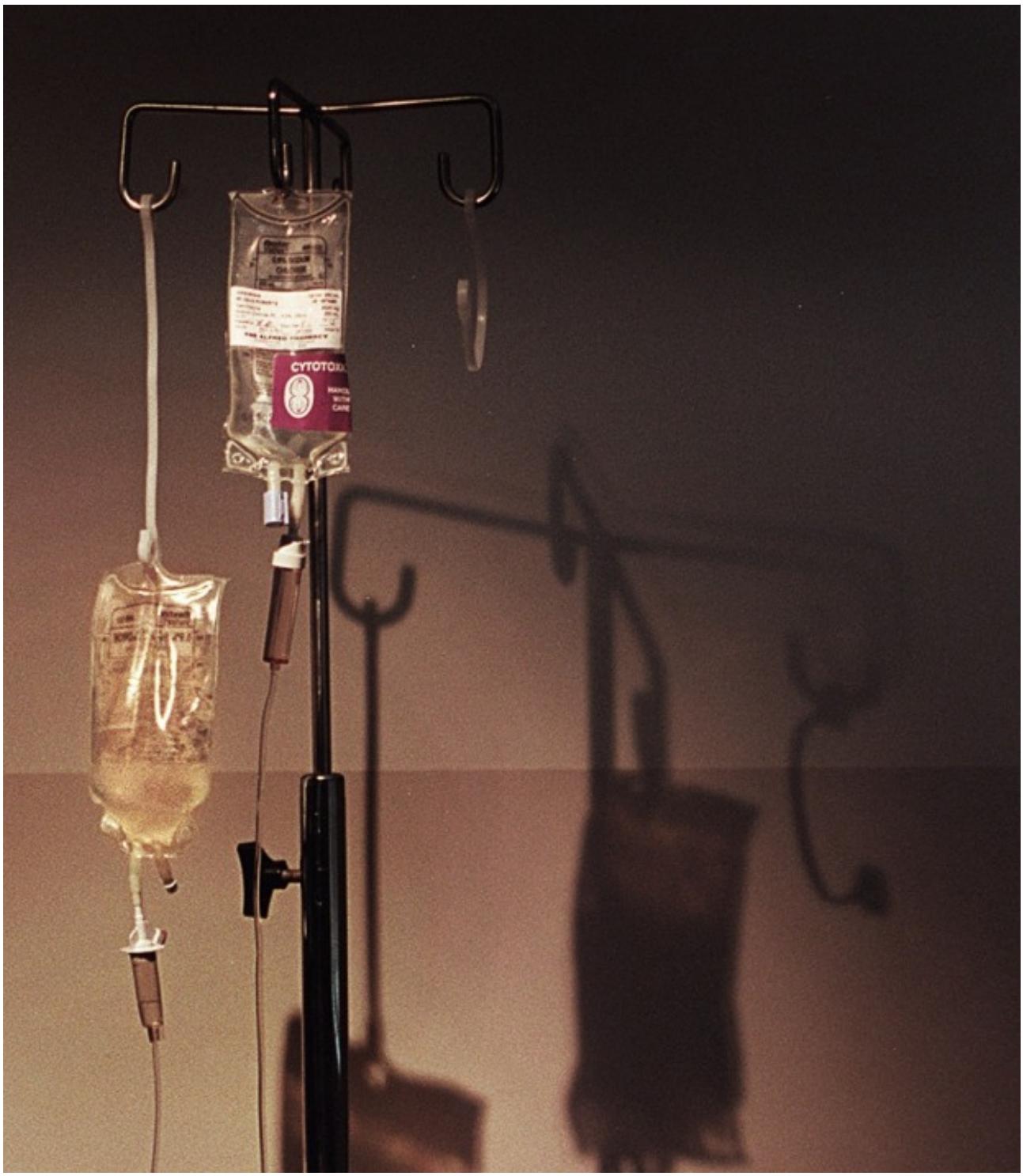
Jeanne Tie says in many cases chemo is "given blindly and is not necessary".

"I had the test immediately after surgery and it was negative. I had no DNA from tumour cells in my blood. To check this, I had the test again, with the same result," he says.

"I went from being very uncertain about whether to choose chemotherapy to having a high level of confidence that it was not necessary in my case."

Routine follow-up

He still receives routine follow-ups with CT scans, colonoscopies and standard blood tests. This takes place within the trial setting and will continue for several years.



Side effects from chemotherapy include pain, fatigue, nausea and other digestive issues, bleeding problems and an increased susceptibility to infection.

"This test has given me peace of mind. It also got me back to work and travel quickly."

There is also an important tax aspect to the test, he says.

"Today, after such surgery, a proportion of people have chemotherapy because of the uncertainty. With it, they have all the inconveniences and side effects.

"These come at significant cost over many months, not only in the cost of treatment, but in time away from work and the effect on those close to them.

Sumi Ananda (left) and Jeanne Tie don’t want patients receiving chemo if it can be avoided.

"Then add to this the anxiety, concern and general unhappiness of having ongoing treatment – which for many is probably unnecessary. If this test turns out to be successful, there could be huge savings."

McDermott was one of 400 patients who joined the trial of the liquid biopsy, known as the ctDNA test.

It was developed in collaboration between Melbourne's Walter and Eliza Hall Institute (WEHI) and Johns Hopkins Kimmel Cancer Centre in the US.

Several commercial liquid biopsies are on the market. Generally, they are effective when there is a high burden of disease, as in stage-four bowel cancer, which is accompanied by high presence of markers in the blood.

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But this ctDNA test is one of the few available that detects microscopic signs of disease, and one that can't be detected on CT or PET scans.

Search for subjects

The Melbourne researchers are trying to recruit another 1500 people who have had bowel cancer surgery in the previous six weeks, to see if they can be spared chemotherapy or receive a more tailored dose.

There are trial sites at more than 40 hospitals in cities and regional centres across Australia and in New Zealand.

The bowel cancer trial began in 2015 and is expected to run until 2021. It is open to people with stage-two or three colon cancer or rectal cancer.

Recruitment is also under way for an ovarian cancer trial. It began in 2017, will run to 2019 and has places for another 60 women. This trial is observational and does not intervene in the women's management.

A pancreatic cancer trial is expected to open later this year, with space for 400 people to determine how much chemotherapy they should receive.

This family of studies together constitutes one of the largest attempts, internationally, to investigate a predictive blood test to guide cancer treatment.

Chemotherapy is a blunt instrument and the trials are designed to sharpen it.

'Given blindly'

"In many cases, it is given blindly and is not necessary," says the leader of the bowel trials, Associate Professor Jeanne Tie, a clinician scientist at the WEHI and a medical oncologist at the Peter MacCallum Cancer Centre and Western Health.

"While chemotherapy is a life-saving treatment, we don't want patients receiving it if they don't need it.

"For those at high risk of recurrence, we want to be able to give them a more intensive dose than those with a lower risk.

"When we use it blindly and treat everyone regardless, we reduce the chance of recurrence in a small proportion of patients. But because we can't tell who never needed it, we are essentially over-treating many people."

Tie says that after bowel cancer surgery, people usually have six months of chemotherapy and then a CT scan.

"If the CT shows no cancer, I can't put my hand on my heart and say you're cured. Even when we've followed a patient for five years and there is no cancer, we still don't know if that person needed it in the first place."

Among patients with early stage disease, she says the team is hoping to reduce the need for chemotherapy by 50 per cent.

Short-term side effects from chemotherapy include pain, fatigue, nausea and other digestive issues, bleeding problems and an increased susceptibility to infection.

Long-term effects include heart, lung, nerve and memory problems, and fertility issues.

Curb unnecessary chemo

The bowel cancer trial has already shown, as in McDermott's case, that it can stratify the risk and curb unnecessary chemotherapy.

The ovarian arm is led by WEHI clinician-researcher Associate Professor Sumi Ananda, also a medical oncologist at Peter Mac and Western Health.

"We suspect many women with early stage ovarian cancer can be treated with surgery alone, but we currently treat all as though their cancer may recur, with high-dose chemotherapy," she says.

By identifying women with the highest risk of recurrence, Ananda hopes they can be given the best chance of survival through intensive chemotherapy.

"This test could be an important step towards personalising cancer treatment for individual patients," she says.

Liquid biopsies might have a role in surveillance after cancer treatment.

In the case of bowel cancer, follow-up would still require a colonoscopy, because it picks up early polyps. But a liquid biopsy might eventually reduce the need for CT scans.

While the liquid biopsy can say whether cancer is present in the body, a CT scan is needed to locate it. If the liquid biopsy shows no cancer, there may be no need for a CT scan.

In the early proof-of-concept study, the liquid biopsy was found to have a 10 per cent false positive rate.

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