

# Cancer treatment involving microbubbles to go on trial in S'pore



Performed without incisions or radiation, it also leaves surrounding tissues undamaged

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A new cancer treatment that uses bubbles generated by precise ultrasound waves to destroy tumour cells will be trialled here from the second half of 2025.

It is performed without any incisions, radiation or surgery, and without heat or damage to surrounding tissues.

Called histotripsy, the treatment was approved by the US Food and Drug Administration (FDA) for liver tumours in October 2023. In Asia, it has been performed on about 50 cancer patients in Hong Kong.

Singapore will have two histotripsy machines during the trial, which will initially involve liver cancer patients.

The machines are donated by the Li Ka Shing Foundation – which had earlier donated three histotripsy systems to Hong Kong in September 2024 – and Temasek Trust. One will be placed at the National Cancer Centre Singapore (NCCS), and the other at the National University Cancer Institute, Singapore (NCIS).

Both organisations have committed a total of \$12 million to bring histotripsy clinical trials to Singapore, said a joint press statement.

The funding will kick-start trials to extend the treatment to kidney and pancreatic cancers, in addition to liver cancer, said Ms Ho Ching, chairman of Temasek Trust, on April 3 at an event held at NCCS.

In a video address played at the event, billionaire Li Ka Shing said he was deeply impressed by the treatment's ground-breaking potential when he first learnt about histotripsy.

Since the first machine for histotripsy arrived in Hong Kong, about 50 cancer patients with tumours in different sections of the liver have been successfully treated.

Professor Brian Goh, head of the department of hepatopancreatobiliary and transplant surgery at Singapore General Hospital and NCCS, is the trial's principal investigator. He said the research team is preparing the application for the combined trial, which will start with 40 patients with liver cancer who are found to be unsuitable for current treatments.

Many of these patients would have late-stage liver cancer. The rest could include some who are undergoing therapy for other cancers but have one or two lesions in the liver that are not shrinking.

Currently, surgery and local ablative therapies are the main treatments for liver cancers, but these are invasive, and some patients are not suited for these as they are not

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fit or have underlying liver disease, for instance, he said.

The new treatment is a single-session process, similar to ablative treatments using radiofrequency or microwaves. However, unlike those ablative treatments, it uses mechanical energy instead of thermal energy, thus reducing potential side effects, said Prof Goh.

The trial in Singapore will start with those with a tumour size of 3cm and below, the same as in the 2021 histotripsy trial in the US, called Hope4Liver.

After liver cancer patients, the researchers at NCCS and NCIS plan to extend the trial to patients with kidney and pancreatic cancers.

The name of the treatment comes from Greek for “soft tissue”

(*histo*) and “mechanical breakdown” (*tripsy*), said its co-inventor, University of Michigan biomedical engineer Zhen Xu.

She was in Singapore for the April 3 launch event with Mr Mike Blue, president and chief executive of HistoSonics, the company behind the technology.

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The treatment is done in one session, with the actual procedure lasting four minutes. Patients can go home after that, often wondering if they have been treated as there is no pain, Prof Xu said. Patients have to be under general anaesthesia to keep them still during the procedure.

The first liver cancer trial was held in 2019, followed by a multi-centre Hope4Liver trial in 2021 that led to the 2023 FDA approval.

More than 1,000 patients in the US have since been treated with histotripsy, and researchers are studying its use on other cancers, said Prof Xu at the event, where a demonstration of the technology was given.

In 2024, a multi-centre Hope4Kidney trial for kidney pa-

tients in the US and Europe was launched, and in December 2024, a trial on patients with pancreatic cancer started, she said.

A development discovered was that the treatment may stimulate the immune system to attack the non-targeted tumours, she added.

This is something that the Singapore researchers want to study in the trial, as well as how well local patients will respond to it, said Associate Professor David Tan Shao Peng, a senior consultant at NCIS, who was at the event.

There was a low complication rate of 6.8 per cent in the US Hope4Liver study, which was due to the known risks of focal liver therapies and not unique to histotripsy. But that figure involved a small pool of 44 patients, who were all of Caucasian descent, he said.

Histotripsy will not replace current treatments for liver cancers yet, as there is also no long-term data on how safe the treatment is, he said.

The treatment is also not for patients with widespread cancer or systemic cancer, he added.

Prof Goh and Prof Tan said the treatment looks very promising, although medium to longer-term data on its effectiveness from Singapore and around the world is needed.

Ms Ho Ching (centre), chairman of Temasek Trust, watching a demonstration of the histotripsy cancer treatment system at the National Cancer Centre Singapore on April 3. The trial in Singapore will start with those with a tumour size of 3cm and below, the same as in the 2021 histotripsy trial in the US, called Hope4Liver. PHOTO: LIANHE ZAOBAO