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# NEW CANCER TREATMENT

Unlike most conventional cancer treatments, high intensity focused ultrasound (HIFU) involves no surgery, causes negligible side effects and requires no lengthy hospital stay. Cancers are killed with without the need for radiotherapy or chemotherapy, although those treatments may still be recommended where there are other affected areas that cannot be treated with HIFU.

**Too good to be true?** No says**.** John Madden. "In 2004 I needed a tumour removing from my right kidney and the consultant explained that I could have it removed by surgery, with the likelihood that I could be on dialysis for the rest of my life, or I could be treated with HIFU. I chose HIFU and the procedure was so simple, I didn't know it was done. They tell me that the MRI scans since show that the tumour is no longer a problem, and eighteen months on I am enjoying a dialysis-free lifestyle thanks to HIFU."

Low intensity ultrasound has been in use for imaging and certain therapies for many years. But it is not to be confused with HIFU, which is now being successfully used to treat cancer tumours.

It has been known for many years that high power, high intensity ultrasound can affect human cells and many people have tried to harness this effect to treat cancer. The problem of how to kill cancer cells without harming healthy ones has been solved by focussing the ultrasound in such a way that the energy level is only sufficient to harm cells at the focal point. This technology has now moved on to provide a safe, reliable, versatile means of treatment; and HIFU has been shown to be effective and cause very minimal side effects.

A Consultant Surgeon at the Oxford Radcliffe Hospitals NHS Trust, a world-leading healthcare and medical training institution, said "HIFU is a very exciting new technology that may lead to the rewriting of text books on cancer treatment in the future."

Oxford is leading the Western World in the introduction of HIFU treatments for cancer. They have been using HIFU to treat prostate cancer for some time**,** and the team now operates a Haifu Model JC machine, supplied by Ultrasound Therapeutics Ltd. This latest equipment gives doctors what they need to kill a wide range of soft-tissue cancers affecting internal organs, using HIFU. The team have initially concentrated on cancers in the kidneys and liver. Not all cancers are suitable for HIFU, although, following successful treatments in the Far East, tumours affecting the pancreas, bone and soft tissue may also be suitable.

HIFU doesn't involve cutting the patient open (it is non-invasive) and so there is no external scarring and dramatically less recovery time. The cancer is looked at with a high quality but low power ultrasound scanner giving the doctor a continuous view of the tumour during treatment. For that, a high power ultrasound beam is focused on a point within the tumour to heat the cancer cells to a temperature where they die. The threshold temperature needed to kill cancer cells is only 56ºC, dependent on the exposure time, though in practice we aim for a temperature of at least 70ºC for a very short time. During treatment the focus of the beam is moved across the tumour until its whole volume has been covered. Tissue through which the HIFU passes to reach its focal point within the cancer is not affected. A computer monitors and records the treatment

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A general anaesthetic is used during treatment, mainly to ensure that the patient remains still. Therefore the patient has to spend one night in hospital as is normal practice after a general anaesthetic. Thereafter most patients have no sensation of an operation having taken place, and only sometimes is a mild pain-reliever such as aspirin needed. Sometimes, an effect similar to sunburn is experienced, but this soon disappears. For patients with a localised cancer, HIFU may be all the treatment they need. In other cases it may form part of a series of treatments.

This exciting new HIFU has been in use in several countries in the Far East, where upwards of 8000 patients have been treated for a variety of cancers. In the UK the Oxford team has been working with the new HIFU equipment for the last four years. This treatment is not currently funded in the NHS, but having received CE approval, HIFU can be used to treat privately funded patients.

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