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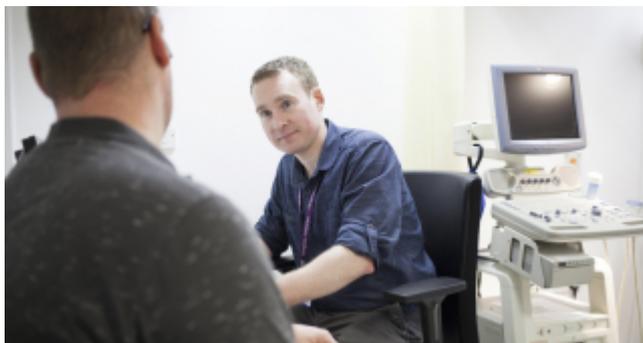
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# World first treatment with ?acoustic cluster therapy? to improve chemotherapy delivery

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18 December 2019

The first patient has been treated with an innovative new technology that uses microscopic clusters of bubbles and liquid droplets to enhance the delivery of chemotherapy drugs to

tumours.

World first treatment with 'acoustic cluster therapy' to improve chemotherapy delivery

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Karen Childs, the first patient to receive 'acoustic cluster therapy'

The first patient has been treated with an innovative new technology that uses microscopic clusters of bubbles and liquid droplets to enhance the delivery of chemotherapy drugs to tumours.

The clusters of microdroplets and microbubbles are injected along with the patient's chemotherapy and the technology, called acoustic cluster therapy, uses a standard ultrasound scan to convert the clusters into an activated form within the tumour.

Once activated, with further ultrasound the clusters help to 'pump' the drug into the tumour, greatly increasing the amount of drug which reaches the cancer cells.

## Improving the effectiveness of chemotherapy

This new treatment, which is now being trialled by **The Institute of Cancer Research, London** [8], and **The Royal Marsden NHS Foundation Trust** [9], promises to improve the effectiveness of the chemotherapy by better targeting it to the cancer site, and could potentially be explored with reduced doses of drug in order to reduce the severity of side effects.

**Acoustic cluster therapy** [10] was invented by the Norwegian company **Phoenix Solutions** [11]. It was further developed with proof-of-concept studies by scientists at The Institute of Cancer Research (ICR) and the **Norwegian University of Science and Technology (NTNU)** [12], Trondheim.

## Overcoming barriers to drug delivery

**Professor Jeffrey Bamber** [13], Professor in **Physics Applied to Medicine** [14], who led the work to further develop and evaluate the technology at the ICR, said:

*'We're delighted that our work on innovative acoustic cluster therapy which is designed to overcome barriers to drug delivery that tumours develop has progressed to the point where the technology is now being assessed in patients for the first time. It's a very exciting 'door opening' technology which concentrates more of the drug in the tumour.'*

*?We expect eventually to be able to both treat tumours more effectively and reduce the rate and severity of side effects. In the long term we hope this technology will be of particular benefit in difficult-to-treat tumours, such as those of the pancreas. It may also assist new types of treatments such as immunotherapy.*

*?The joint development and evaluation of this technology is testament to the strength of **the ICR's industry collaborations** <sup>[15]</sup> in medical imaging, within an environment where we're able to bring our research discoveries into clinical trials. The trial itself is yet another example of the ICR's strength in working with The Royal Marsden to take research from ?bench to bedside?.*

## **Working together to develop new options for patients**

**Professor Udai Banerji** <sup>[16]</sup>, Deputy Director of the **Oak Foundation Drug Development Unit** <sup>[17]</sup> at The Institute of Cancer Research, London, and The Royal Marsden NHS Foundation Trust, said:

*?Our new clinical trial follows on from promising preclinical research that shows this acoustic cluster technology could help to increase the dose of chemotherapy to tumours, potentially allowing a reduced dose to the rest of the body. We're hopeful we can help open up a much-needed new option for patients with hard-to-treat advanced cancers.?*

*?This trial is a real cross-team effort involving radiologists, physicists and nurses who all work together to provide the treatment and support the patient throughout the process.?*

## **Improving patients' lives with more targeted treatments**

Karen Childs, from North West London is the first patient to receive this innovative new treatment, as part of a new clinical trial. She is currently being treated at The Royal Marsden for secondary cancer in her liver following her diagnosis in November 2013. Karen said:

I'm not sure it's sunk in yet that I'm the very first patient in the world to be receiving this new treatment! This trial is an exciting step for the hospital and a huge step for patients like me. It really would make a big difference to patients' lives if side effects could be reduced in the future using more targeted treatments like this.

"It's an incredible opportunity to be on this trial and the staff at The Royal Marsden have been amazing and very supportive."

## Moving to the next phase

**Dr Per Sontum** [18], Chief Executive of Phoenix Solutions, which invented the technology, said:

*"We are extremely pleased to announce that Phoenix Solutions has initiated the clinical development of Acoustic Cluster Therapy (ACT®). After six years of technical work and pre-clinical development with Professor Jeff Bamber's Ultrasound and Optics Team, our partners at the ICR and The Royal Marsden, the transition to clinical phase is a very exciting moment for all of us, team and collaborators.*

*We look forward to moving to the next phase of the ACTivate study whose goal is to evaluate the clinical benefits of ACT."*

## Our research [19]

The BRC supports six research themes and two cross-cutting themes bring together internationally renowned clinicians, scientists and allied health professionals, allowing us to ensure that novel diagnostics and physical and systemic therapies are rapidly available to all cancer patients.

Find out more [19]

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