Therapeutic Ultrasound Team

- Our EPSRC funded project to design and test a new non-invasive clinical HIFU device for use in the treatment of soft-tissue tumours of liver and kidney nears completion with the building of the new Teleson II clinical system finishing.
- Clinical trials for the transrectal treatment of recurrent prostate cancer with high-intensity focused ultrasound (HIFU) using the "Ablatherm" on loan from EDAP Technomed continue. 13 patients have been treated.
- A study of the acoustic properties of fresh prostate tissue has been started. Surgical specimens are characterised immediately after resection.
- Methods for improving the reproducibility of HIFU damage formation, based on standard ultrasound imaging have been successfully tested. These involve both backscatter estimation of tissue attenuation and backscatter temperature imaging to help identify optimal exposure intensities.
- We have been carrying out fundamental HIFU studies in a unique perfused liver model, in collaboration with the Transplant Unit and Engineering Departments of the University of Oxford. This has been used to validate the new methods of monitoring temperature rise and acoustic cavitation in the clinic that we have developed for optimising exposures, thus ensuring greater safety and efficacy.
- We have continued to develop a 3D numerical model that will allow us to model the ultrasonic fields from complex-geometry HIFU sources, including multi-element phased arrays, with the aim of exploring methods of reducing treatment times significantly.
- The collaboration with the HIFU Unit, Churchill Hospital continues with new clinical trials to investigate the treatment of liver, kidney and pancreatic cancer using HIFU.
- A fruitful collaboration continues between the Therapy Ultrasound Team and the Quality of Life Division of the National Physical Laboratory following the successful secondment of Pierre Gelat to work on aspects of HIFU transducer modelling.
- A new, EPSRC funded, project looking at the effects of ultrasound gas bubble contrast agents on blood vessels has been started. This is in collaboration with University College, London and the University Hospital, Amsterdam.
- Quantitative high-field magnetic resonance imaging and detail histological investigation are being investigated as a means of understanding the tissue changes associated with HIFU exposures.
- We were joint organisers with Laboratoire Ondes et Acoustiques, Paris of the successful Workshop on Therapeutic Ultrasound in Cargese, Corsica. This was attended by 40 students from all over the world. We also organised two one-day meetings of the UK Therapy Ultrasound Group in London in 2007. These were attended by ~ 80 delegates from the UK.
- We won two large research grants from EPSRC to continue our HIFU work. These will enable us to develop a new prototype clinical device for HIFU treatment of abdominal tumours (in collaboration with University College, London and University of Oxford), and also to investigate Quality Assurance techniques for clinical HIFU tranducers (in collaboration with National Physical Laboratory, University of Oxford and St Thomas' Hospital). These grants total over £3.1m.

- Gail ter Haar was awarded the 2007 NHS Health Care Science Award for Innovation in Research and Development by the Chief Scientific Officer.