

A new level of innovation in cancer treatment...

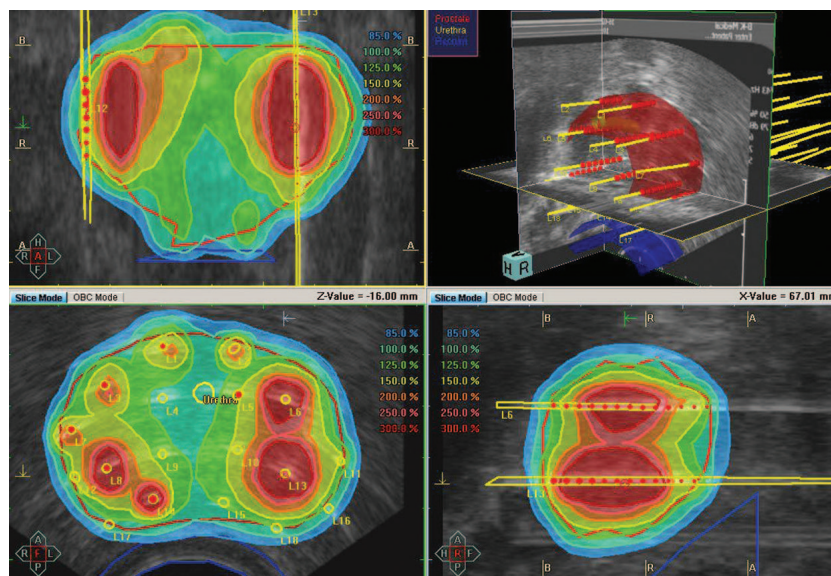
Improving patient care...

Treatment of cancer in the UK is constantly evolving. Cancers are now detected earlier and hence patient numbers are on the increase. The intricacies in treatment are also increased as a result of the early detection, as clinical teams strive to reduce side effects and increase the length and quality of patients' lives. Not only are patients being diagnosed earlier, but patients are also more aware of treatment types and outcomes. This is due to national and international campaigns to raise awareness, and an increase in the quality of education made available for patients and clinical staff.

Nucletron plays an active role in both treatment and education, manufacturing innovative treatment and imaging devices, whilst also providing education forums for clinical staff to share experiences and train with one another on regional, national and global levels. Established in 1975, Nucletron has since grown to be the market leader in brachytherapy, whilst also providing solutions for conventional radiotherapy and imaging within the oncology sector. They have in 16 countries and deliver tailored services and clinical solutions to more than 3,000 institutions across 120 countries. These clinical solutions are used to treat many cancers, including breast, head and neck, skin, lung, oesophageal, gynaecological and prostate. It is these final two treatment sites that seen the most noticeable technological developments of late.

What is brachytherapy?

Treating cancer with brachytherapy requires a radiation dose to be delivered very close to the tumour. This can be achieved via catheters inserted into



Both prostate solutions accurately profile radiation doses and needle positions within the patient. Radiation dose can be seen covering the prostate whilst avoiding the surrounding organs

cavities such as the oesophagus, bronchus or vagina, or by the use of needles to treat areas such as the prostate and breast. Radiation is delivered using the Nucletron 'Selectron' devices. These brachytherapy devices allow radiation oncologists to complete brachytherapy efficiently, in approximately 10-20 minutes for out-patients, or over one to two days for in-patients. This provides more socially acceptable treatment schedules when compared to conventional radiotherapy, where patients will be required to attend daily treatments over a period of up to eight weeks.

Two new treatment options for prostate cancer

More than 34,000 men are diagnosed with prostate cancer in the UK each year, making it the most common male cancer, and representing 24% of all cancers diagnosed in men. Nucletron has developed pioneering systems that utilise existing and proven clinical techniques for treatment: FIRST, for use with Low Dose Rate treatments

(LDR), and Oncentra Prostate, for use with High Dose Rate treatments (HDR).

The FIRST (Fully Integrated Real-Time Seeds Treatment) system implants LDR seeds robotically using a 'SeedSelectron' for superior treatment outcomes in prostate cancer. As a treatment modality to treat prostate cancer, LDR seed brachytherapy has gained wide acceptance due to its minimal invasive nature combined with excellent treatment results. Traditionally, patient outcomes from this form of treatment are dependent on the 'skill and experience' of the clinician. However, FIRST offers an option as a brachytherapy system that enables robotic implants for prostate cancer to take much of the human dependency risk out of the equation, resulting in superior treatment outcomes.

Commonly patients will attend hospital for LDR treatment as a day case. Due to the favourable prognosis of early prostate cancer, local recurrence of the disease is rare. Therefore,

minimising side effects is an important issue for these prostate cancer patients. With the FIRST system radiation dose coverage is superior when compared to the traditional standard seeds treatment using a non-robotic implant. Staff also benefit from the FIRST system, as unnecessary radiation exposure is reduced by using the robotic system to handle and implant the radioactive materials.

HDR treatments differ slightly and are aimed at men with higher risk prostate cancer. The treatment is carried out using the 'Oncentra Prostate' system, with radiation doses being delivered by a single radioactive source within the 'microSelectron'. HDR brachytherapy is combined with conventional radiotherapy as a complete treatment regime. Oncentra Prostate allows higher patient throughput, since HDR treatment normally takes between 10 and 20 minutes to deliver. In addition, the risks to the staff are reduced as the radioactive source being used to treat each patient is delivered remotely, with staff positioned in a shielded area. Overall treatment is improved using Oncentra Prostate, whilst the length of treatment regimes is shortened using HDR. Combining this with the cost-effective reusable radiation source offers a significant financial advantage in the treatment of higher risk prostate cancer patients.

Unique treatment for gynaecological cancer

Cervical cancer is the second most common cancer in women aged under 35 in the UK, with over four million women being screened for this and other abnormalities each year. In addition, endometrial, vaginal and vulvar cancers account for approximately 6% of all female cancers diagnosed in the UK per annum. Nucletron's latest development for the treatment of gynaecological cancers, Oncentra GYN, uses the same therapeutic approach as that for high-risk prostate cancer - conventional radiotherapy combined with HDR brachytherapy.



The 'Selectron' automated treatment delivery systems allow workflow to be streamlined and minimise the number of staff required per procedure

Oncentra GYN has been developed through consultation with radiation oncologists and medical physicist who specialise in the management of gynaecological cancers. The system allows individualised procedures to be implemented swiftly, delivering optimised treatments to patients utilising MRI technology.

"The newly developed tools incorporated into Oncentra GYN for four dimensional brachytherapy treatment planning provide excellent features. They allow us to take full advantage of this new challenging treatment approach in a fast and efficient way," Johannes Dimopoulos MD PhD, Vienna General Hospital.

The Oncentra GYN system is unique within this area of cancer, as it offers a combination of treatments and imaging not previously possible. Ultimately, this aims to reduce the risk of later complications that can be apparent in gynaecological brachytherapy, thus improving the quality of life for those patients treated using the system.

Oncentra GYN, FIRST and Oncentra Prostate all offer greater treatment options to radiation oncologists, and consequently, improve the treatment outcomes for the patient, whilst reducing costs, allowing higher

patient throughput within departments and minimising radiation risks to staff that may have been encountered when using other techniques. These treatment systems will continue to constantly evolve as research is carried out, not only by Nucletron's R&D team, but within medical institutions and university hospitals across the globe. Through this network the treatments will improve, and new methods for cancer treatment can be discovered.

Nucletron's new website details their comprehensive spectrum of solutions within the field of conventional radiotherapy and brachytherapy treatments, all of which are developed in collaboration with clinical professionals to improve patient care.



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