



Guy's and St Thomas' NHS Foundation Trust

Using the TomoTherapy® Treatment System
to Improve Precision and Efficiency in a Small Space



EXECUTIVE SUMMARY

Guy's and St Thomas' is one of the largest hospital trusts in the United Kingdom, with around 12,500 staff; an annual turnover of more than £1 billion; and over one million patient contacts a year. The hospitals have a long and proud history, dating back almost 900 years, and have been at the forefront of medical progress and innovation since they were founded. They continue to build on these traditions and have a reputation for clinical, teaching and research excellence.

Their key purchasing criteria was fully integrated image-guided, intensity-modulated radiation therapy (IG-IMRT) technology that would allow them to create sophisticated plans more efficiently. But the machine also had to fit in a 5.7 x 6.2-meter former cobalt treatment bunker. The team was delighted that their first choice for IG-IMRT, the *TomoTherapy* treatment system, was able to fit into that space - in fact it was the only advanced system that did.

GUY'S AND ST THOMAS' NHS FOUNDATION TRUST



Institution: Guy's and St Thomas' NHS Foundation Trust
London, England

Number of Linear Accelerators: **7, including 1 *TomoTherapy* treatment system**

Cancer Patients Treated Daily: Approximately 270

Patients Treated Daily with *TomoTherapy*: 38 (8-hour typical workday)

Primary Sites Treated with *TomoTherapy*: Prostate

A TRULY INTEGRATED IG-IMRT SOLUTION

After years of working with equipment that had fragmented IG-IMRT capabilities from multiple vendors, the trust team wanted a truly integrated image-guided and intensity-modulated package.

To date we had not fully utilized the IG-IMRT capability on our conventional linacs, because so many different links in the chain had to be in place," said Physicist Tony Greener.

To spend less time on technical issues and more time focused on patients, the team chose *TomoTherapy* technology. Its central database drives all the IG-IMRT functionality, including optimized treatment planning, delivery quality assurance, imaging technology, helical IMRT delivery, record and verify, and adaptive planning.

"Having the whole system integrated is reassuring for me as a clinician," said Dr. George Mikhaeel, head of Clinical Oncology "There are no data transfer issues. I know the whole program is working together, so we can get the most out of it."

Another advantage of *TomoTherapy's* all-in-one solution is that it can be quickly integrated into an existing environment. "The speed and simplicity are impressive," Greener said. "It took just a fortnight for the machine to be installed and customer acceptance to be completed."

MAXIMIZING EFFICIENCY

Typically, radiation departments use *TomoTherapy* technology for more complex sites, such as head and neck, because of its unparalleled precision. The Trust team chose to use its *TomoTherapy* system to treat prostate cancer exclusively.

"We saw prostate as an ideal focus for our clinical program," said Dr. Mikhaeel. "The *TomoTherapy* system's design helps increase efficiency, and by applying its unique capabilities to prostate cancer cases, we felt we could maximize that efficiency."

Indeed, they have. The team started out with treatments times of 20 minutes. Within two weeks, they had them down to 15-minute slots, and now they regularly treat patients in 12 minutes, so they can accommodate 40 prostate patients a day.

"Our team mastered *TomoTherapy* system operation quickly," said Dr. Mikhaeel. "If you know the basic

principles of IMRT outlining, it's not difficult; it's very easy." He also attributes the ease of adoption to:

- Pre-installation site visits to gain practical experience from other *TomoTherapy* system users
- Comprehensive training, both at *TomoTherapy's* Institute of Learning, and onsite at Guy's and St Thomas' facility
- Integrated treatment planning and delivery workflow

The increased efficiency has helped the trust meet the NHS' cancer care 31-day target for decision to first treatment.

While the addition of *TomoTherapy* technology has proved beneficial from a business standpoint, the ultimate benefit is for the Trust's patients. "We're able to meet dose constraints in more situations than with our 3DCRT or forward planned IMRT methods. We can improve the accuracy of treatments while sparing normal tissue, and patients have responded well," said Dr. Mikhaeel.

BRINGING NEW LIFE TO A FORMER COBALT ROOM

With a major renovation of its Cancer Center a few years away and real estate rates at a premium in the heart of London, the Trust had only one place available for another linac: a former cobalt bunker that was being used as a storage room.

"We didn't think we could get leading-edge IG-IMRT technology that would fit the space," said Dr. George Mikhaeel, head of Clinical Oncology. "But now we have the distinction of having the smallest room in the UK to house the state-of-the-art *TomoTherapy* treatment system."

BEFORE: The 35.3-square-meter room originally housed a cobalt machine.



AFTER: With minimal renovation, including the addition of a shielding wall, the room was transformed to a *TomoTherapy* bunker. The additional shielding consisted of interlocking lead brick walls of various thicknesses up to 80 mm thick in some sections. A false ceiling was constructed using steel girders to support up to 125 mm of lead directly above the unit.



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ADVANCING "YEAR OF RADIOTHERAPY" AWARENESS

In using and advocating for targeted IMRT technology, the Trust team is helping reinforce one of the messages of a national "Year of Radiotherapy" initiative, designed to improve public understanding of the value of radiotherapy. The message: That patients deserve the best cancer treatments, and radiotherapy, especially using advanced technologies like IMRT, is one of the most effective and least expensive cancer treatments available.

"According to the national campaign, 30 percent of people receiving radiotherapy could benefit from IMRT, yet the UK is delivering IMRT to less than 10 percent of patients," said Dr. Mikhaeel. "We certainly see the benefits, as do our patients, so we are sharing our experience with other healthcare professionals at campaign events throughout the year."

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