

## MANAGING SERVICE EXPANSION AND TECHNOLOGY CHANGE OVER 10 YEARS OF OPERATIONS

22 March 2016

The Northern Ireland Cancer Centre opened on the 20<sup>th</sup> of March 2006 with 8 Varian Clinacs, which at the time were considered state-of-the-art in linear accelerators. The project also involved a fully integrated Varian ARIA network as well as an Acuity Simulator, a GE Lightspeed RT CT Simulator and a Nucletron (now Elekta) Integrated Brachytherapy Unit. Since 2011 radiotherapy has been undergoing an expansion programme driven by a growing need for cancer treatment services in Northern Ireland. The fleet has been extended and now consists of 10 linear accelerators including 4 Varian TrueBeams, with an additional 6 replacements coming up that will create a full fleet of TrueBeam systems, supported by Eclipse Treatment Planning.

Most notably, Medipass have been instrumental in bringing one of the most advanced linear accelerators in the UK to Belfast – the Varian TrueBeam™ STx system. This is particularly noteworthy as the Varian TrueBeam™ STx system is paving the way for the introduction of a Stereotactic Radiosurgery Service, the first of its kind in Northern Ireland. Keeping pace with technology has enabled implementation of such advanced radiotherapy techniques as the introduction of SABR and the current development of a neuro-stereotactic service.

The TrueBeams that are now being installed by Medipass involved a complete re-design by Varian from its earlier Clinac platform, having been designed from the ground up to optimize radiotherapy and radiosurgery. This new equipment has provided more clinical options for the Cancer Centre in treating complex cancer cases including lung, breast, liver, abdomen, head and neck. The synchronised imaging and delivery of treatment has also improved speed and efficiency of radiotherapy treatments. The added imaging functionality can allow for 25% less dose in some cases and the TrueBeam also provides pinpoint accuracy, minimizing damage to surrounding tissue.

The STx system itself uses sophisticated imaging and respiration synchronization tools to visualize soft tissue during treatment and make changes accordingly. With new beam-shaping capabilities used with the High-Intensity Mode, it enables the delivery of large doses in small places.

An additional GE Optima 580WCT Simulator has also been installed, greatly enhancing the CT Sim fleet from its original configuration. Ms Gaile Smyth, MES Manager for Medipass Belfast, explained, “Having a rolling equipment refresh programme in place has meant much of the original equipment has already been replaced with technology upgraded to keep pace with clinical needs in both radiotherapy and radiology.” She went on to say, “All of the 4 TrueBeams already installed, have IGRT and RapidArc capability. One TrueBeam is a high spec STX with BrainLab Exactrac patient positioning and planning systems.”

Expansion of capacity and upgrading of technology in both radiotherapy and radiology departments continues to improve access to cancer services and promote wider participation in cancer clinical trials. Much like the radiotherapy equipment, the radiology fleet has also experienced significant upgrades in technology over the ten years of operations years based on changing clinical requirements. The original radiology equipment consisted of 2 GE Lightspeed CT scanners, a GE Signa Excite XTE MR, 2 GE Infinia Gamma Cameras, GE Interventional Precision MPI, Centricity RIS/PACS and a range of general x-ray equipment.

The radiology fleet now includes a GE CT750HD, GE Optima 640 Gamma Camera, GE Optima 450WGEM MR and Innova IGS 540 interventional unit. Radiology equipment has been upgraded with digital functionality; the integrated brachytherapy unit has also had a digital imaging chain upgrade. ARIA and RIS/PACS systems have ongoing hardware and software refresh programmes in place. Both systems have expanded in line with service needs.



From Left : Robin Rezende Operations Director Medipass Healthcare and Gaile Smyth, Medipass MES Manager for Northern Ireland view the Varian Truebeam STX.



Gaile Smyth, Medipass MES Manager for Northern Ireland, with the Innova 540 interventional unit installed in September 2015.