INNOVATIVE TECHNOLOGIES IN RADIATION ONCOLOGY: ONE CITY BUILDING TWO NEW CANCER RADIOTHERAPY SYSTEMS

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Introduction: It is a golden age for Innovative Technologies in Radiation Oncology. The fusion of low cost fabrication, precision engineering, big data, computational advances and a multidisciplinary focus has created a rich environment to develop solutions to improve how we can image and treat cancer. One nexus of this innovation has been Sydney where two new cancer radiotherapy systems are being built, the MRI-Linac and the Nano-X Linac. This presentation will describe the genesis, progress, discoveries, challenges, applications and synergies of these two radiotherapy systems.

Materials and methods: The MRI-Linac and the Nano-X Linac are being designed and built locally, using a combination of national and international suppliers. Synergies within the software control systems on the imaging system control, linac control and real-time adaption are being leveraged.

Results: Schematics of the MRI-Linac and the Nano-X Linac are shown in Figure 1 and Figure 2 respectively. These systems are being built and installed in Liverpool Hospital and the Nelune Comprehensive Cancer Centre respectively.

Conclusions: Enabled by predominately government funding sources, two new cancer radiotherapy systems are being built in Sydney, with the potential to transform the clinical benefits and cost-effectiveness of cancer care.

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