

European Commission conference on advancing applications of nuclear and radiation technology

Feedback from Panelist Dr. Luca Cozzi, Medical Affairs Scientific Senior Manager, Varian Medical Systems & Adjunct Professor of Clinical Medical Physics, Faculty of Medicine, Humanitas University, Milan, Italy

Highlights

- These points were delivered on the panel on behalf of COCIR, the European Trade Association representing the medical imaging, radiotherapy, health ICT and electromedical, and Varian Medical Systems, the world's leading manufacturer of medical technology and software for treating cancer with radiation therapy, radiosurgery, proton therapy, and brachytherapy.
- **Radiotherapy is indicated and utilized in 50-60% of cancer patients** in the process of their care. A single radiotherapy machine treats between 5000 and 10000 patients throughout the expected lifespan of around 10 years.
- Some of the most promising radiation therapy developments for patients and the society of the last few years are:
 1. Recent innovations are making radiation therapy **ever more safe, precise and effective**, while sparing surrounding tissues and organs from radiation and reducing side effects for patients. Safety is primordial, and a plethora of methods are implemented to check the treatment machine and the safety of individual patient treatments. In addition, developments in both treatment planning and delivery of radiation delivery make radiation therapy more effective. For example, knowledge based planning methods (similar to AI) are applied in treatment planning to improve efficiency and quality of these plans.
 2. The **potential of combining big data with radiation therapy** and clinical decision-making software to improve the clinical workflow. New software can integrate big data sources that are currently not connected to enable cancer treatment facilities to more efficiently manage the patient pathway and make decision-making more evidence-based. But there is more that can be done in this space by integrating the entire patient journey and further support clinical decision making; ultimately leading to truly personalised medicine.
- However, **none of these developments will matter if they cannot reach the patients**. Currently, most European countries have insufficient infrastructure and cannot provide treatment to all patients who need it. Moreover, the equipment that exists is often in need of replacement – one in three radiotherapy delivery devices are ten years or older.¹ If we are to bring Europe to a new era of cancer treatment we need support from policymakers in four areas:
 1. modernising radiation therapy infrastructure,
 2. ensuring that radiation therapy is available, accessible and appropriately reimbursed,
 3. ensuring that there are adequately trained professionals to ensure radiotherapy is properly prescribed, planned and delivered, and
 4. supporting manufacturers in researching and bringing these innovations to the market.

Short answers to the questions received

- **Where can Europe make a difference in investing in research and development? How can we facilitate the translation of research outcomes into practice?**

Europe has several distinct advantages when it comes to R&D. First of all, the large number of high-quality academic centres that are concentrated in our region, in geographical proximity but also with a habit of working together across borders. Secondly, the fact that the private sector also chooses to conduct ground-breaking R&D in Europe and is often working with academia and the public sector's centres of excellence.

¹ COCIR, radiotherapy age profile & density, 2018 Edition, version March 2nd, 2018

For example, Varian maintains six R&D sites in Europe, where we have been strongly investing and increasing our presence over the last few decades. Through these sites, we are investing in basic research on physics and engineering, applied research on radiation therapy, as well as R&D in software development for the next generation of digital health. We often work with universities and hospitals from the early stages of discovery and well into the final stages of development into practical applications. Moreover, Varian is involved in consortia that are supported via the EU Horizon 2020, such as the INSPIRE project, which aims to build a joint infrastructure for research, knowledge-sharing and training on proton therapy.

Europe can (and should) leverage these advantages to create a single and coherent strategy for the radiation medicine sector. The strategy should be equipped with a small number of concrete priorities with KPIs that refer back to the value for patients, the society and healthcare systems. It should acknowledge the investment of the private sector in Europe and provide support to researchers and manufacturers, both in terms of funding grants for areas of high potential for the society such as more accurate and safe radiation therapy, imaging and proton therapy. Lastly, such a European strategy should bring together all the relevant parties, from policymakers, to healthcare system administrator, hospitals, academia and the private sector, so as to jointly decide on the key priorities to focus on at the first stage. This multi-stakeholder collaboration will further encourage beneficial networking and cross-pollination of ideas and bring down silos.

▪ **What actions could be taken by the EU to address the issues raised?**

Unfortunately, radiation therapy today is not available or accessible for all the patients who need it today in Europe. At least 1 in 2 patients should receive radiotherapy according to international benchmarks. But unfortunately, a quarter of cancer patients in Europe do not receive the radiation therapy they need.² We can help start bridging that gap if we take the following steps, all of which require policy action and political will:

- Increasing the number of radiotherapy equipment in Europe and replacing or upgrading older devices with state-of-the-art equipment that can delivering high precision, modern RT such as IMRT, IGRT and VMAT. The European Commission could lead the way by providing incentives for encouraging hospitals to renew and update equipment through its funding and innovation sources.
- Ensuring that radiation therapy is available, accessible and appropriately reimbursed across Europe. Currently, reimbursement pathways are patchy, when they exist and in dire need of rationalisation to enable patient to access the treatment they need.
- Radiotherapy also necessitates highly skilled personnel: Radiation Oncologists, Medical Physicists, Dosimetrists radiation therapists and radiotherapy nurses. The EU and member states need to invest in education, training and job retention for these highly-skilled professionals that add value to the health system and the economy.
- Supporting manufacturers in bringing these innovations to the market with R&D grants and funding instruments. An example here is the need to further explore the promising combination of radiotherapy with immunotherapy.
- Supporting the adoption of digital tools, big data and decision-support software to help standardise medical practice and improve patient outcomes.

² Borràs JM, Lievens Y, Dunscombe P, et al. The optimal utilization proportion of external beam radiotherapy in European countries: an ESTRO-HERO analysis. *Radiother Oncol.* 2015;116:38–44