Course Report

IMRT/VMAT and other highly conformal techniques in practice

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Course directors

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Could you please briefly introduce yourself?

I am a radiation oncologist currently in my tenth year of clinical practice. I have experience in the use of a range of linear accelerator technologies including gantry-based, robotic arm, and helical linacs to help patients. My department is planning upgrades to and new acquisitions for our treatment machine line-up.

Why did you choose to attend this course?

I wanted to help my radiation oncology department successfully:

1. to upgrade our linear accelerator line-up; and
2. to bring on board a new medical physics team.

To enhance the cancer care of our patients, my department plans to acquire new linear accelerators and add surface-guided radiotherapy, multifocal stereotactic brain radiotherapy and triggered imaging for prostate cancer stereotactic body radiation therapy (SBRT). Our medical physics team has recently retired, and this year my department has been fortunate to hire two highly experienced medical physicists from Memorial Sloan Kettering Cancer Center (MSKCC). They plan to integrate some innovative and sophisticated practices that they will adapt from MSKCC into our department.

To offer a physician's point of view to help with these decisions and discussions, I sought to attend this ESTRO course to refresh my understanding of the technical facets of radiation oncology and their influences on the clinical care of our patients, and to survey the latest developments in image-guided radiation therapy (IMRT)/volumetric modulated arc therapy (VMAT).

Did the course activities improve your knowledge and skills in the relevant subject? What aspects of the course were most interesting to you and why?

The 2023 ESTRO VMAT/IMRT course exceeded my expectations. From my perspective, there were several highlights.

- A demonstration of real-time dosimetry planning by expert ESTRO faculty, followed by interactive practical sessions in which course attendees showcased their departmental planning approaches to head and neck (H&N), breast and prostate cancers.

- An in-person tour of the University of Torino radiation oncology department, which included their new helical linear accelerator platform and demonstration of continuous positive airway pressure to enhance the sparing of organs at risk in thoracic radiotherapy.

- Discussions regarding state-of-the-art linear accelerator options with ESTRO expert faculty and peer course attendees. I was able to hear their experiences and impressions regarding the advantages and downsides of these various machines.

- Excellent didactic lectures included discussions of:

    - key technical and planning considerations for disease-site-specific scenarios. These were presented by expert ESTRO physician teachers, who covered H&N, lung, breast, thoracic lymphomas, upper/lower gastrointestinal tract, gynaecological and prostate cancers.
    - potential improvements to produce higher quality prostate SBRT, such as through the use of triggered kilovolt imaging or rectal balloons (instead of perirectal hydrogel spacers), and ways to spare the urethra.
    - geometrical uncertainties in IMRT dose distributions, such as through uneven target dosing caused by the interplay effect between multi-leaf collimators and tumour motion.

- Experience of adaptive radiotherapy presented by a representative of Aarhus University. This excellent lecture covered the technical details of building an adaptive radiotherapy programme and its potential clinical benefits across different disease sites. A good programme of this type requires major departmental commitment, a prospectively designed standardised approach with concrete goals, a dedicated research programme, and sufficient staff and personnel.

- An in-depth physics refresher from expert ESTRO faculty. This refined my understanding of concepts such as dose-volume relationships including the HyTEC (high dose per fraction, hypofractionated treatment effects in clinic) initiative; motion management techniques; IMRT optimisation algorithms and cost functions; static vs. rotational IMRT; dose calculation algorithms; Van Herk planning target volume (PTV) margins and common PTV misconceptions; and quality assurance of equipment and individual patient plans.

How will what you have learned be implemented in your daily clinical practice?

- The knowledge from attending this course will help my radiation oncology department to select the appropriate linear accelerator upgrades. I am now much more informed about what specific state-of-the-art technologies would best meet my patients' clinical needs.

- The physics refresher from this course undoubtedly will enhance my technical discussions with my new medical physicist team on how we can best shape our cancer centre's future to benefit our patients.

- The IMRT/VMAT treatment planning and clinical teachings from this course will improve my daily work with my dosimetry and radiotherapist teams to design robust, high-quality plans for our patients.

How would you encourage someone who has never been to an ESTRO course to join this course?

The courses at the ESTRO School are an outstanding way to continue medical education. You will have the opportunity to learn from world-class clinical teachers who are international experts in oncology, physics, radiation therapy and dosimetry. Also, you have the opportunity to socialise with motivated peers who attend the courses from across the globe. These international peers can broaden your understanding of how cancer is treated in different parts of the world and help to enhance the care you give your patients.

In the evenings or days before/after each ESTRO course, you and your fellow course participants can enjoy the inspiring culture and history of the venue city. Exploring Torino in the evenings with fellow course attendees was a great way to relax and make new friends.

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