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**Full Reference:** Overview of Tracking in Radiation Therapy, **E Hewson**

**Conference/Meeting Name:** American Association of Physicists in Medicine (AAPM) Annual Meeting

**Location** Houston, Texas, The United States of America:

**Dates:** 23<sup>rd</sup> – 27<sup>th</sup> July 2023

**Presentation Type:** Invited talk



The Image X team representing the University of Sydney at the 65<sup>th</sup> Annual AAPM meeting

The American Association of Physicists in Medicine (AAPM) annual meeting is the largest and most prestigious conference in the field of medical physics, attended by over 4,000 international experts. Each year AAPM attracts thousands of world-leaders from a range of specialties including radiation oncologists, medical physicists, engineers, industry specialists, and researchers. The meeting featured a variety of content including scientific sessions, educational symposia, panel discussions, workshops, and a range of vendor exhibitions.

This year's theme for the meeting was "The Art of Science, The Science of Care", which served as a reminder to attendees the "privilege of being a medical physicist, a vocation rooted in ingenuity, imagination, and creativity (the art, if you will), which is then enacted within a field that is one of the highest embodiments of human intelligence (physics), and all that, then translated into a practice with direct benefit to human health". As the majority of the conference attendees are practicing clinical medical physicists who all work toward the goal of effective and safe imaging and radiation therapy delivery, there was a clear emphasis on coming together as a community and sharing our knowledge on what we can do to directly prolong and improve the lives of cancer patients.

Attending this conference allowed me to engage with world-leaders who work toward goals relating to my own research, which is to develop novel technologies to account for organ motion during radiation therapy. Organs and tumours can undergo considerable amounts of motion during radiation therapy delivery which is a major concern as our goal for the patient is to be able to

accurately aim a radiation beam at a tumour to kill the deadly cancer cells, while simultaneously avoid damaging the critical organs surrounding the tumour. New developments and implementations of technology to achieve online adaptive radiation therapy – where treatment plans are adapted on the day of the patient’s treatment to ensure that we are targeting our radiation to up-to-date anatomy – was a heavily discussed topic throughout multiple sessions at the meeting. This involved discussion at every stage of the translational pipeline, ranging from exhibitors from industry who demonstrated the latest systems that have become commercially available, to clinicians discussing their experience with implementing these technologies for patient treatment, and researchers who presented on the novel, cutting edge techniques that they have recently developed.

The session that I was invited to speak in was focussed on accounting for organ motion instantly, in real time, which is the most challenging form of motion compensation for radiation therapy. During my presentation I took the opportunity to highlight the key challenges that the field is facing today, as well as the latest research activities that are looking to address these barriers to bring accurate, real-time adaptive radiation therapy to patients worldwide. Sydney-based researchers have been pioneers in this field, so it was an honour to be able to broadcast our work to a large, international audience. I also had the pleasure of presenting alongside Associate Professor Lei Wang and Dr Kathryn Mittauer, who are leading experts in the clinical use of x-ray and MR imaging to perform target tracking during radiation therapy.

While scientific and technological advancements tend to be the forefront of the medical physics community’s focus, the AAPM meeting went beyond scientific sessions to also include several sessions to spotlight topics that may not be discussed in many workplaces, such as how to provide compassionate care for patients, particularly for gender minorities, what we can do to minimise global health inequalities, and addressing equity issues experience by female medical physics professionals.

Over the course of the five-day conference, I was exposed to a myriad of new ideas, the latest clinical practices, and had the invaluable experience of meeting up with collaborators and world leaders face-to-face, a limited opportunity for researchers based in Australia. The meeting served as a significant reminder of the importance of engaging with others in our field, and it was inspiring to see how strong everyone’s motivation is to work toward the ultimate goal of eliminating the burden that cancer has on our society and individuals.