

## **Medical Physics Day reflections by a Medical Physicist/ our Chief Science Officer.**

Today is World Medical Physics Day. The date commemorates the birth (in 1867) of Marie Curie, an inspirational scientist and someone who laid the foundations for Radiotherapy. She is well known for her remarkable achievements and being the first woman to win a Nobel prize in 1903; for Physics in 1903 along with her husband Pierre. This was just two years after the first Prizes were awarded, when Wilhelm Roentgen (another of our architects) received the first Physics award. She was the first person, still one of only five and remains the only woman, to have received two Nobel prizes, the second awarded in 1911 for Chemistry. Whilst not strictly a martyr, it is obvious her death (1934) was attributable to her life's work; the cause of her death was given as aplastic pernicious anaemia and will have been developed after years of radiation exposure.

Albeit deviating a little from the Medical Physics theme briefly, as a Physicist I feel we should proudly recognise that all five double prize recipients were Physicists or Chemists. Of course, we all know that Chemistry is fundamentally the study of energy management and therefore merely a sub-branch of Physics – smiley-face and sorry Mum.

On World Medical Physics day, we reflect on the contribution that Medical Physicists make to the Multi-Disciplinary teams in Health care. Our role is to innovate and push the boundaries of the science and technology that contributes, or may contribute, to the improvement of healthcare. In lectures I often refer to us as Techno-junkies and show a picture of Star Trek's Jean-Luc Picard transformed into Locutus of Borg (look it up), before switching to a slide stating 'actually we are improvement junkies'. The point made is that we have a fantastic remit to figure out how to implement improvements to healthcare by integrating technologies, understanding their use and principles, ideally in innovative and imaginative ways.

As a Radiotherapy Physicist, I have been involved with directly, collaboratively and vicariously with some exciting work and been lucky to know incredibly inspiring and great innovators. As the Head of Medical Physics in a large hospital system in the UK, I am also proud and humbled by the amazing work my colleagues do in Nuclear Medicine, Diagnostic Imaging, Clinical Engineering (Engineering being another sub-branch of Physics, the practical bits – second smiley-face). They have all patiently taught me about their areas of clinical expertise to allow me to represent them in the zoo!

In my world outside work, I remember Lemmy (hopefully no reference needed) once saying "I remember the time before Rock and Roll" and thought that was a very interesting reflection. Then I heard myself saying one day that I remembered the time before IMRT; sparking a discussion about all the developments we made clinically, professionally and collaboratively with multi-disciplinary colleagues in the last 25 years. It's been a great trip.

Personally, I have enjoyed my career as a Medical Physicist in Radiotherapy Physics and truly believe that it is still a very relevant and enjoyable career to follow. The opportunity to come to work and be able to learn something new every day from patients, Nurses, Radiographers, Technicians, Oncologists, Radiologists, Surgeons, Computer Scientists, Chemists (Energy Managers), Biologists (I'll figure out the third smiley-face), Managers, .... the list is endless, it is amazing and a privilege. Maybe the opportunity might come via solving a problem (minor or major) for someone else and that is truly rewarding! In my view, if you don't learn something new, it is your own failing!

The VERT story is a nice example of the above. The concept started life when I was teaching at Sheffield-Hallam University on their Therapeutic Radiography BSc as a guest Physicist. I realised we needed better ways to teach and train Radiographers specifically to introduce the new technologies such as IMRT and IGRT in a more efficient and effective manner, as well as the basic concepts. The

original Physics features were introduced following my discussions at University of Liverpool when, as the External Physics examiner, it was obvious some of those failing the first year were doing so as they didn't fully understand 'inverse square' or 'diverging fields' and other fundamentals. As an innovator I quickly realised that drawing bigger pictures, in different colours, on a blackboard or talking slowly wasn't going to help. So, working with my friends who were computer scientists we looked to use different teaching methodologies learnt from the military and airline industries.

So, finally, I'll repeat a challenge I constantly throw out to my students and trainees that I have the pleasure to work with or give lectures to. Look for opportunities to get involved in research, innovation, clinical development. Don't give up when you hit problems, try to figure out how to solve them and look for people who can help you do that. We are not experts in everything, but email and telephones are incredibly useful devices, and we work in a global village. Many years ago, I picked up a great phrase from the shy retiring band leader mentioned above: Born to Lose, Live to Win; a code Lemmy lived his life by, but it isn't a bad mantra for us in Medical Physics either.



Picture taken by Andy Beavis in Park Jordana, Krakow, Poland on Oct 1, 2022, following speaking at the Polish Medical Physics Conference about the Physics applications in VERT.

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