Proton therapy (PBT) is a technology for delivering conformal beam radiation with positively charged atomic particles to a well-defined treatment volume. The physical characteristics of the charged particles (Bragg peak) allow sparing of much more normal tissue than is possible using conventional X-rays and for this reason, protons are increasingly used all over the world for the treatment of cancers.

Proton therapy has been underway for many years, actually since the 1950s. However, it is during the past 10–15 years that technology development has taken proton facilities from “in-house” developments to commercially available ‘turn key’ concepts. More centres have opened during the last number of years and there are many more in the pipeline (https://www.ptcog.ch/index.php). As of today, centres are usually in need of large buildings, large financing and a fairly large area for patient recruitment. Under development are smaller and more compact units that might even fit into a large size linear accelerator bunker. This development might subsequently lead to availability for more patients, lower the cost per patient and spreading knowledge of protons and proton treatment.

This will be an exciting time for RTTs as we embrace this technology with new knowledge and experiences. From the development of study protocols, creating comparative treatment plans, evaluating these plans, initiating the start of treating new diagnoses, initiating technical developments and of course making sure the patients perspectives are in focus at all times. Continuous education on proton therapy is crucial. We are heartened to know that discussions are already on going in different work groups, for example within EPTN (European Proton Therapy Network) and PTCOG.

Today, the most common treatment areas are the brain, base of skull, head and neck and prostate. Paediatric patients are treated to a large extent. But there is also a need to expand the diagnoses that are treated. How can that be done in a safe way? By creating study protocols, by comparing not just treatment plans but also side effects, acute and late, hence follow-up of the treatments. RTTs will have a major role to play here. What’s doable in the treatment room? Are the fixation devices used good enough for the precision needed? Some inventions may be needed. What type of IGRT is needed for a specific patient group? What’s considered state-of-the-art in the photon clinic, like surface scanning, breathing control, the use of MLC/blocking to sharpen edges – can this be used in the proton facility where I work? These are just a few of the technical questions being raised for treating new groups of patients. What about our patients, in some countries having to travel quite a distance to reach the proton facility. Where will they stay during the treatment? Can they bring their partner? What’s the cost for the patient, for the referring centre, for the society?

Compared with the most advanced radiation techniques using photons, such as 3D-CRT, Tomotherapy and IMRT, proton therapy has yielded more promising outcomes. Protons deliver superior target dose coverage and sparing of normal structures. These may in turn, allow escalation of tumour doses and greater sparing of normal tissues, thus potentially improving local control and survival while at the same time reducing toxicity and improving quality of life, making it a promising modality of choice for most cancers.

Proton therapy is a growing radiotherapy modality and as RTTs we will have to be prepared for it.

Sharon Wong*

College of Allied Health/SingHealth Academy, National Cancer Centre Singapore, Health and Social Sciences Cluster, Singapore Institute of Technology, 11 Hospital Road, Singapore 169610, Singapore

Corresponding author.

E-mail address: sharon.wong.m.m@nccs.com.sg

Ingrid Kristensan

Department of Clinical Sciences, Oncology, Lund University, Lund, Sweden

Available online 8 November 2019