The Royal College of Radiologists
RCR-Cyclotron Trust Visiting Fellowships 2015/16 (Clinical Oncology)

POST-VISIT REPORT

1. Name of Visiting Fellow	Dr Muhammad Fawad Ul Qamar	
2. Name of joint Visiting Fellow (if applicable)	Mr Ellis Marshall	
3. Institution(s) of Visiting Fellow(s)	Oxford University Hospitals NHS Foundation Trust	
4. Name of Host(s)	Dr Roi Dagan	
5. Institution(s) of host(s)	University of Florida Health Proton Institute	
6. Expenses claimed	£ 1202.73	
7. Visit Dates (ACTUAL)	a. 02/08/2016	b. 12/08/2016
8. 2nd visit dates (if applicable)	a. Start date	b. End Date

9. Aims of the visit

* To understand the principles of patient selection pathways and the criteria for referring patients for proton beam therapy.

* To improve my understanding of the multi-disciplinary approach involved in the treatment of patients with proton beam therapy.

* Develop my knowledge of the different types of proton beam for delivering treatment and the variation in dosimetry achieved by using these different techniques.

* To understand the radiobiology of proton beam therapy, how this is incorporated into treatment planning and how this compares with conventional MV Photon techniques, e.g. VMAT.

* To understand the challenges involved in planning proton beam therapy especially with regards to organ motion (both inter fraction and intra fraction) and the processes in place to overcome those issues. Also to understand the factors which influence selecting different margins for treating different tumour types.

* To observe and interact with the radiographers involved in delivery of the proton beam therapy. Looking in particular at the setup and treatment verification process

* To evaluate the potential role of proton beam therapy in more common tumour sites e.g. breast, prostate and lung cancer.

10. Activities undertaken

- Attendance at the chart rounds. This was a great opportunity for different clinicians and residents to look at each other's radiotherapy plans and to discuss complex cases especially those of re-irradiation.
- Attendance at tumour board meetings including paediatric neuro-oncology case conference at the Wolfston's hospital. Excellent opportunity to observe the discussion between different disciplines and a broad overview of the management principles across different tumour sites.
- Attendance at new patient consultations especially those being referred for proton therapy for certain rare tumours including paediatric CNS and adult skull base tumours and medulloblastomas. I also attended consultations for more common tumour types referred for PBT i.e. prostate and breast cancer.
- Observing proton beam dosimetric planning and discussion on the pros and cons of the use of the two main techniques in PBT (i.e. passive scattering and pencil beam scanning).
- Observation of the patient set up, immobilisation techniques, image verification and treatment delivery in the treatment areas. This included observing some complex treatment deliveries (i.e. for cranio-spinal and skull base irradiation). I also developed a good understanding of the use of brass apertures and Lucite compensators in passive scattering technique.
- Observing treatment of paediatric patients at the "Blue gantry". This enabled me to observe treatment of children under general anaesthesia and the challenges involved.
- Observing children receiving proton beam radiotherapy for different tumour types. This enabled me to develop an understanding of the complex issues involved around consent, radiotherapy planning, delivery, doses and short term and long term follow up of children.
- Observing simulation of patients being treated for ocular melanomas. UFPTI has a dedicated fixed gantry used solely for patients having PBT for ocular melanomas. A highly useful experience enabling me to understand the pathways involved in PBT planning for these patients, patient set up, immobilisation techniques dose delivery and avoidance of critical intraocular structures.
- Attending private presentations arranged by the physicists and dosimetrists on the basics of proton beam therapy including beam characteristics, beam modification and delivery and certain challenges involved in PBT. Also learnt about the different delivery systems including passive scattering, uniform scanning and pencil beam scanning techniques. Learnt about "smearing and smoothing techniques" used in the beam delivery systems and the use of distal blocking and patch and through fields to avoid critical organs at risk.
- Attending follow up clinics with the clinicians and observing patients for early and late toxicities from PBT.
- Attendance at patient drop in lunch sessions – an excellent opportunity for patients and their carers to express their views and experiences on the treatments being received, useful interaction between staff and the patients in a very friendly atmosphere.
- I also had a unique opportunity to attend the 10th anniversary of the opening of the UFPTI. Great opportunity to interact staff from various disciplines and make useful contacts.
- Observed a unique "Arts in medicine" programme. This programme allows the patients and relatives to participate in various arts related activities whilst waiting for their treatment slot allowing them to gain and enhance valuable skills and interact with other people.

11. Benefits of the visit (short term)

- Developed good understanding of the principles of proton beam generation in the cyclotron and its subsequent modulation.
- Excellent understanding of the various types of proton beam delivery systems and their pros and cons.
- Understanding of basic principles of dosimetry in PBT and some of the challenges involved including their solutions.
- An overview of the patient treatment pathway at the centre from the time of registration and consent to being followed up post treatment.
- Learnt about the different dose fractionations used in PBT across a variety of tumour sites.
- Understanding of the role of protons to deliver a boost (concurrent or sequential to photon based IMRT) to escalate dose delivery to the target volume whilst maintaining the dose to critical structures at an acceptable level.

12. Envisaged benefits of the visit (longer term)

- Developed useful contacts with different members of the team at Jacksonville which will not only be useful to keep my knowledge and skills up to date but will also help my patients if they need to be referred for PBT in future.
- Gained a useful idea of organising “Chart rounds” to discuss complex cases and gathering views from colleagues about how to overcome certain dosimetric challenges.
- Good insight into the ways to develop a better relationship between staff, patients and their carers during difficult times through interactive lunches and presentations.
- The knowledge gained about the overall principles governing proton therapy will go a long way towards shaping my views and approach to this treatment modality especially as we are getting this facility in the U.K in the very near future.

13. Please outline any problems you encountered before, during or after your visit

None.

14. Any additional comments

Our fellowship co-ordinator Rozina Behrooz at Jacksonville Centre was very welcoming and friendly and made our fellowship experience all the more interactive and enjoyable!
I would also like to thank RCR for giving me this great opportunity to enhance my learning about proton therapy in this highly prestigious and welcoming centre at Jacksonville, Florida.

Signed: Dr Muhammad Fawad Ul Qamar Date: 22/8/2016	
Report approved by:	Clinical Oncology Professional Support and Standards Board (CO PSSB)
Date	22.09.16