Clinical Oncology
The Royal College of Radiologists

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The Royal College of Radiologists
RCR-Cyclotron Trust Visiting Fellowships 2014/15 (Clinical Oncology)

POST-VISIT REPORT

1. Name of Visiting Fellow	**Dr Sundus Yahya**	
2. Name of joint Visiting Fellow (if applicable)	**Dr Jason Cashmore**	
3. Institution(s) of Visiting Fellow(s)	**University Hospitals Birmingham, NHS Foundation Trust**	
4. Name of Host(s)	**Dr D Indelicato and Team**	
5. Institution(s) of host(s)	**University of Florida Proton Therapy Institute**	
6. Expenses claimed	**£1981.58**	
7. Visit Dates (ACTUAL)	**a. Start Date 06/06/2016**	**b. End Date 18/06/2016**
8. 2nd visit dates (if applicable)	**a. Start date**	**b. End Date**
9. Aims of the visit		

Specific aims of visit
Clinical

- Greater understanding of appropriate use of protons including benefits and limitations (decision making within clinical and tumour board settings).
- Discuss issues of uncertainty in stopping position, BED at the end of Bragg Peak tail.
- Awareness of acute/late toxicity in patients treated with proton therapy.
- Understanding of surface doses and skin reactions.
- Develop an understanding of on-going and upcoming clinical trials and the rationale for these
- On-treatment imaging techniques / frequency .
- Basis for margins used.
- Dose calculations for retreatment, particularly for patients (treated with primary proton therapy) presenting with relapse.
- Establish greater academic collaboration for research projects.

Dosimetry

- Gain knowledge of the principles of proton dosimetry and verification methods.
- Appreciation of methods of proton maintenance and calibration, traceable standards and equipment used for this.
- Experience Cyclotron operation / maintenance.
- Experience patient specific QA process and equipment used.
- Understand methods used for production of range compensators / apertures for scattered beam treatments, and timescales for manufacture Treatment planning.
- Rationale for choice of proton beam over IMRT and PBS over double-scatter.
- Improve knowledge of PBS treatment planning.
- Gain understanding of TPS used and algorithms used for dose calculation.
- Methods for coping with artefacts from metal implants / dental amalgam.

10. Activities undertaken

1. Welcomed by the fellowship and resident programme training administrator.

2. Introduction with the faculty and tour of the department (including treatment rooms, Engineering workshop, PET CT, MR facilities, eye line room, clinical areas).

3. Discussions with fellow residents re: treatment protocols and interesting cases including sent locally from our centre.

4. Attendance at Paediatric Tumour board meetings at Namour General Hospital and Wolfson Children's Hospital as well as Lung, breast, head and neck, sarcoma, Skull base/ neuro, Hepatobiliary/ GI tumour boards.

5. Attendance at Charts round meeting which involved primary physicians presenting all their current on treatment cases and radiotherapy volumes contoured, followed by dosimetry and planning discussions.

6. Attended new patients consult as well as follow up (routine and on treatment) for toxicity review. This included one to one discussion sessions with consultants about specific cases in all tumour sites, treatment indications, delivery, trials available and issues surrounding treatments as well as toxicity.

7. Discussion with consultants re: toxicity patterns seen with proton therapy and its management. In depth discussions re: OAR tolerances and therapeutic doses used in proton therapy.

8. Treatment planning with dosimetrists and proton therapy plan review with chief dosimetrist and oncologist. Discussed planning techniques, beam arrangements, dose constraints/ boost techniques/ metal issues, compensators.

9. Observed paediatric patients treatment delivery, including observing anaesthetists team working procedures used to ally anxieties (children and parental), induction of anaesthesia, treatment delivery and recovery phase of anaesthesia, drugs used and challenges faced by the team.

10. Teaching session with dosimetrists/ physicists re: proton beam planning including beam shaping, patching/ matching technique, working around air spaces, smearing, impact of metal, double / uniform scattering, pencil beam scattering, IMPT and understanding methods used for production of range compensators / apertures for scattered beam treatments.

11. Attendance at organised lectures, "Management of the retrosternal thyroid- Work-up and surgical perspectives" by Head and Neck surgeons.

12. Attended the University of Florida Research Project proposal and trials review meeting.

13. Observed treatment planning and delivery for eye line proton therapy for uveal melanoma.

14. Spent time with IBA engineers to observe the challenges faced at the machines (gantries) and cyclotron itself as well as therapy radiographers to observe treatment delivery/ verification procedures.

15. Attended local fellows and resident teaching sessions and discussed research ideas with international and local fellows.

11. Benefits of the visit (short term)

1. Greater understanding of the utilisation of proton therapy within its indications, benefits of treatment as well as understanding side effects profile and its management.

2. Comparisons of proton plans vs IMRT plans and difficulties/ uncertainties around both and dosimetric constraints.

3. It was valuable to follow through patients sent from my centre for treatment through NHS overseas programme and be involved in the treatment planning, observe consultations and treatment delivery and share their experience.

4. Teaming up with my physicist colleague was very helpful in understanding the principles of QA in proton therapy and comparing local radiotherapy protocols with UFPTI and identifying any areas of improvement and development locally.

5. Established links with the physicians to enhance further collaborations and develop research projects across sites.

6. We plan to share and disseminate the knowledge to colleagues gained through departmental and grand round teaching sessions.

7. Experience gained of different healthcare setup and the challenges faced.

12 Envisaged benefits of the visit (longer term)

This visit has allowed me with more clarity and understanding for appropriate patient selection and referral for proton therapy.

I feel better equipped of the knowledge to discuss the practicalities, benefits and challenges faced with proton therapy. This will enable me to discuss it better with the patients as queries re: proton therapy has been a recurring theme in patient consultations recently since awareness is growing about this modality.

With the development of UK proton centres more of us will be caring for patients treated with protons and hence first hand understanding of dosimetry and potential long term effects will prove valuable in future patient management. This includes issues around IMRT field matching as well as re-irradiation.

Valuable experience gained through the University of Florida Internal research review board meeting which will enable me to progress in my research skills working locally and collaborate with colleagues nationally and internationally.

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

None in particular

14. Any additional comments

Many thanks to the RCR-Cyclotron Trust and CO PSSB for providing us with this opportunity.

I am very grateful to Dr Indelicato and Rozina Behrooz for making this trip extremely organised and educational. Also thanks to Dr Rotondo, Dr Bradley, Dr Nichols, Dr Hoppe, Dr Rutenberg and Dr Dagan for taking the time to discuss the patients, treatment plans and protocols in details.

Special thanks to all physics team especially Debbie, Ralph, Mann, Adam and all others who took the time to explain proton therapy planning, concepts and challenges.

Finally thanks to Dr Adam Holtzman(Resident) for the rides to other hospitals and sharing his patient experiences esp re:UK patients and Dr Babita Jyoti (International Fellow) who made it feel like home and last minute handy tips.

Signed: *Sundus Yahya*	**Date: 27/06/2016**
Report approved by:	**Clinical Oncology Professional Support & Standards Board (CO PSSB)**
Date	**22/09/2016**