



**Clinical  
Oncology**

The Royal College of Radiologists

**The Royal College of Radiologists  
RCR-Cyclotron Trust Visiting Fellowships 2011/12 (Clinical Oncology)**

**POST-VISIT REPORT**

**Date for Return: This report must be completed and emailed to the RCR within 2 months of the end of your visit**

Please complete all sections of this form.

<b>1. Name of Visiting Fellow</b>	<b>Henry Mandeville</b>	
<b>2. Name of joint Visiting Fellow (if applicable)</b>		
<b>3. Institution(s) of Visiting Fellow(s)</b>	<b>The Royal Marsden Hospital</b>	
<b>4. Name of Host(s)</b>	<b>Dr Torunn Yock</b>	
<b>5. Institution(s) of host(s)</b>	<b>Massachusetts General Hospital</b>	
<b>6. Expenses claimed</b>	<b>£2000</b>	
<b>7. Visit Dates (ACTUAL)</b>	<b>a. Start Date 04 Feb 13</b>	<b>b. End Date 15 Feb 13</b>
<b>8. 2<sup>nd</sup> visit dates (if applicable)</b>	<b>a. Start date</b>	<b>b. End Date</b>
<b>9. Aims of the visit</b>	<p>I elected to undertake this RCR- Cyclotron Trust Visiting Fellowship at Massachusetts General Hospital, where they have been treating paediatric cancers with proton beam radiotherapy since September 2002. The aims of this 2 week visit were threefold:</p> <ul style="list-style-type: none"><li>• To gain experience of the processes involved in treating children with proton beam therapy.</li><li>• To ascertain the specific challenges in treating cranial and extra-cranial tumours</li><li>• To see the benefits and limitations of protons</li></ul>	
<b>10. Activities undertaken</b>		

After arriving, and being welcomed warmly by Dr Torunn Yock, I had an introduction to the facility at MGH. Initially I spent time learning more regarding the background to Proton therapy; from a historical perspective and also the different radiobiology of protons. In particular I learned of the importance of the variation in relative biological effectiveness (RBE) across the spread out bragg peak (SOBP) and how this requires to be taken into account when planning treatment delivery.

During the visit I was able to spend time with Dr Yock, her proton fellow and the departmental full time post-doc CT/MRI anatomist, to observe target volume and OAR delineation on their planning software. The image fusion there was particularly impressive. I was interested to note that no PTV is delineated, as the theoretical PTV margin is incorporated by the planner. Cases included a recurrent parameningeal embryonal rhabdomyosarcoma of the nasopharynx, which had been irradiated to 50.4CGE in 28f previously, and was being planned for focal reirradiation of the recurrence to the same dose again.

Time was also allocated for me to spend with the physicists and dosimetrists, where I observed the planning of a number of tumours, including a posterior fossa ependymoma and an orbital rhabdomyosarcoma. In addition to this I spent a very enjoyable day with the radiographers, physicists, nurses and technicians on the treatment floor and in the workshop, which gave me experience of delivery of both passive scatter and pencil beam techniques of proton therapy. For the passive scatter technique, which is used for the majority of treatments, each field requires an aperture to be cut from a brass plate and a plexiglass compensator be shaped, to vary the intensity across the beam. For a complex craniospinal treatment, treating the likes of medulloblastoma, they typically have between 18 and 30 fields (and the same number of heavy brass apertures!), with each aperture costing approximately \$210.

When seeing patients in the on treat clinic with Dr Yock it became apparent that the extent of skin reactions was generally more severe than what would be expected from standard conformal radiotherapy. Also there was more frequent consideration to using gaps in treatment to allow recovery of acute skin desquamation. Dr Yock and Dr Nancy Tarbell ensured I also had the opportunity to see patients previously treated with protons in their follow up clinics. This included a very well and disease free 7 year old boy who had been treated for metastatic medulloblastoma aged 2 years, receiving 18CGE to the craniospinal axis and 50.4Gy to the posterior fossa tumour bed.

Throughout my time I was made to feel part of the team and was included in all the departmental meetings and teaching sessions. The highlight of the trip for me was being able to contribute to their ongoing proton research, particularly in the treatment of paediatric sarcomas, and I was able to submit an abstract for this year's ASTRO meeting from work I undertook there.

#### **11. Benefits of the visit (short term)**

- **In keeping with the aims of the RCR- Cyclotron Trust Visiting Fellowship, this visit has developed my knowledge and expertise in proton therapy**
- **It has given me the experience to provide a better informed discussion of the potential role of particle therapy with patients and their families.**
- **I gained an invaluable insight into proton therapy, including the range of diagnoses where protons may offer benefits in terms of improved outcomes, and also the potential limitations for the treatment of paediatric cases.**
- **In addition I have submitted an abstract to ASTRO regarding proton therapy for parameningeal embryonal rhabdomyosarcoma, and following on from this I plan to submit this for publication in the near future**

#### **12. Envisaged benefits of the visit (longer term)**

- This experience has provided a platform for me to develop my understanding and experience in proton therapy for paediatric malignancies
- It has re-emphasised to me the importance of measuring quality of life in survivors of paediatric malignancies who have received radiotherapy, and I now plan to implement this locally
- It is my intention to build upon the relationship with Dr Yock and the team at MGH, that this visit allowed me to develop. In particular I plan to continue to collaborate with them on current and future research projects, looking to determine the actual differences between proton therapy and IMRT.

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

**2 feet of snow in 24 hours! This was a real experience in itself. Otherwise none**

**14. When do you intend to submit an article for the RCR Newsletter?**

**In the next 3 to 4 months**

**15. Any additional comments**

**None**

**Signed: Henry C. Mandeville Date: 12/04/2013**

**Report approved by:**

**Date**

**Please return this form to Mrs Nan Parkinson, Professional Standards Administrator at:  
nan\_parkinson@rcr.ac.uk**