

## Daisy Mollison SRS Scholarship



I am very grateful to the SRS for assisting with funding towards my recent visit to Boston, Massachusetts, as part of my final year training in diagnostic neuroradiology. I was able to attend the Harvard MRI/CT Update course and spend a week in the neuroradiology department of the Brigham and Women's Hospital.

The Harvard MRI/CT Update course is well-respected for good reason and was certainly an intense experience – talks began at ten past seven every morning and continued till 5pm, with excellent speakers from local hospitals, HarvardMedicalSchool and guest experts from around the world. Mornings began with a fantastic presentation of interesting cases relevant to that session. Lectures then covered a broad

range of related topics, always covering the latest technologies and uses for advanced forms of imaging. Speakers included Dr Hugh Curtin, the author of the 'bible' of Head & Neck imaging, who shared some practical approaches to temporal bone imaging and somehow made complex middle ear imaging seem relatively straightforward. Neuroradiology talks included research and clinical applications for perfusion imaging, spectroscopy, tractography and functional MRI and I was able to see all these being put to use in my second week at the BWH.

Boston has a higher ratio of doctors to people than any other city in the world and the resources to match. This was put to good use earlier in the year after the terrorist bombings at the close of the Boston marathon, as victims (and bombers) were taken to some of the six Level 1 trauma centres within a two mile radius of the event. The Longwood medical area, the site of the BWH, seems like a small city, containing numerous different hospitals, many interconnected, including a specialist children's hospital and the world-renowned Dana-Farber Cancer Institute. While the neuroradiologists wait for the opening of the new 10-storey neurosciences building, currently in construction, imaging is split up around the hospital site. I counted 18 MRI scanners being used for adult imaging, the majority of which are 3T.

The huge difference in their practice is volume – scans are happening all around the hospital, all the time. At least two MRI scanners are in full use 24 hours a day, easily accessible to patients presenting to the Emergency Department. They have 9 neuroradiology fellows to run the on call rota. Follow up scans were more frequent, with cancer patients attending on average every six weeks. To cope with the volume of patients attending, I was interested to see that the vast Cancer Institute operates a 'tagging' system – every patient entering the building is given a key tag, so they can always be located, presumably to help multiple appointments run smoothly. Luckily doctors seem to have escaped this as yet.

Techniques such as functional MRI, spectroscopy, tractography and perfusion imaging are close to routine examinations in the BWH, certainly for all tumour patients. Currently in Edinburgh, these are used on relatively rare occasions for specific patients and take some organisation. It was really useful for me to see cases where these were used for problem solving, helping with the radiological differential diagnosis and planning treatment. In Edinburgh, I've been involved in some of the functional MRI being carried out, mostly still at the research level and it was useful to see their methods for performing fMRIs, for clinical and research purposes. I also got a brief glimpse of their 7T mouse MR scanner, and some of the imaged brains, although they're not on to fMRI yet... I was also taken to see their AMIGO operative suite, set up for intra-operative angiography, MRI, CT and PET.

Other aspects of their work seemed reassuringly familiar. I attended multidisciplinary meetings for epilepsy and neuro-oncology, with a similar range of challenging cases discussed as found in my own tertiary referral centre. Most of their actual structural imaging examinations looked much the same as those I'm used to, with a few differences of specific protocols used.

I was in Boston during the recent government shutdown, triggered by disagreements over the introduction of healthcare reforms and got an interesting insight into the US approach to healthcare from a Grand Rounds radiology lecture by a visiting governmental speaker. Doctors are aware that cutbacks will be necessary in response to the economic downturn and there is early evidence that imaging volume is being affected. The radiology discussion centred on the worrying lack of evidence available for the benefits of imaging, in terms of costs and health, particularly regarding its volume and frequency. This highlighted one of the many differences between US healthcare and our own nationalised system, where much more evidence for new techniques must be accumulated before they are introduced.

I was glad to return to the NHS, but it was fascinating to see a part of what can be done in such a large, well-resourced centre, where the distances between current research and clinical applications are being ever narrowed. I was lucky to be looked after while I was there by Dr Srinivasa Mukundan, who combines clinical neuroradiology with a teaching post at Harvard Medical School and an active research interest in imaging techniques and contrast agents. He also showed me some of the history attached to the site, including the original office of the neurosurgery pioneer Harvey Cushing and the skull of Phineas Gage, who amazingly survived an iron rod being driven through his frontal lobes in the 1840s.

This has been a really useful and interesting experience for me and I'm very grateful to the SRS for its support.