

Medical Student Elective Report

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I am a final-year medical student at the University of Cambridge and have particular interests in neurosurgery and translational research. During my elective over the summer, I visited Massachusetts General Hospital (MGH) in Boston, Massachusetts under the supervision of Professor Dan Cahill and University of California (UC) Davis Medical Center in Sacramento, California with support from Dr Julia Sharma and Professor Kia Shahlaie. At MGH, I spent most of my time with the multidisciplinary neuro-oncology service and at UC Davis, I joined the neurosurgery team. Both experiences were highly informative in different but complementary ways and added to my exposure to clinical and academic neurosurgery in medical school.

At MGH, I learned about a service which is highly specialised and effectively integrates translational research and clinical trials with patient care. I saw a wide range of patients with benign and malignant brain tumours, which provided me with insight into their diverse management options and prognoses. This included watching these tumours being resected, discussing management plans in clinic, observing radiation oncology sessions, and reviewing patients on the ward. At each of these stages, research was made a priority. Resected tissue was used for high-throughput experiments in the lab and patients were routinely offered experimental therapies in clinic. Following residency, fellows were provided with significant funding and support to start their own research groups. In educational seminars, I learned about the history behind key discoveries in molecular neuro-oncology and the outstanding questions which challenge the field today. Two cases of successful translational research stood out to me in particular. First, vorasidenib, an isocitrate dehydrogenase (IDH) inhibitor which over the summer was approved for use in recurrent or residual low-grade IDH-mutant gliomas, was frequently discussed with patients and I learned more about how the IDH mutation was discovered and studied. Second, MGH is currently running a chimeric antigen receptor (CAR) T-cell trial for recurrent glioblastoma, which showed promising first-in-human results but requires extensive coordination between patients, clinicians and laboratory teams. These, along with other stories of research improving care for patients in neuro-oncology, reinforced my aim of pursuing a clinical-academic career path.

At UC Davis, I joined a high-volume neurosurgery practice and learned more about their residency programme. I participated in ward rounds, joined a wide range of operative cases, and took part in clinics. Seeing a large number of patients allowed me to develop my diagnostic reasoning, scan interpretation, and management plans. In addition, I worked closely with visiting sub-interns, who are final-year medical students preparing for the residency application cycle. This provided me with significant insight into the expectations placed upon them, including presenting patients on ward rounds and assisting in theatre. Finally, I became familiar with the Department's significant commitment to teaching and education, both on ward rounds and on academic days. Following ward rounds every Tuesday, we had a series of talks and presentations from attendings, aimed at junior residents, and had the afternoon free to work on research and education projects. This allowed us to discuss specific cases in depth and complemented our learning on the wards. I also had the opportunity to present some of my own work to the Department in my final week.

During my time in California, I visited Dr Russell Andrews, who I first met at a Society of British Neurological Surgeons (SBNS) Meeting a few years ago. We visited Stanford and attended their Neurosurgery Grand Rounds, which hosted Professor Shaan Raza for a talk on his skull base practice at MD Anderson in Houston, Texas. This also allowed me to discuss Stanford's clinical and academic training programmes with their residents and faculty members.

Overall, my elective provided me with complementary experiences which reinforced the importance of both translational research and high-quality training in neurosurgery. I also learned more about how health systems and clinical training models differ between the United States and United Kingdom. I hope to apply these lessons as I pursue a career as an academic clinician.

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Pictures from the Prudential Tower in Boston with MGH in the background, and of the Golden Gate Bridge in San Francisco.