Dr Alexander Davidson BSc (Hons) MBBS (AICSM)

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Education

PhD - Artificial Intelligence for Health, Imperial College London **Oct 2024 - Oct 2027**

- Working at the Institute of Global Health Innovation and Artificial Intelligence Centre for Value Based Healthcare.
- Thesis title: "Multimodal Machine Learning Pipelines for Risk Stratification in Two Neurological Disorders".
- Developing a Machine Learning model to risk stratify for progression from Relapsing Remitting Multiple Sclerosis (MS) into Secondary progressive MS. Alongside this working on an ML risk model for clinical decision support app used in Neonatal Encephalopathy.
- Developing a clinical decision support tool to reduce antibiotic resistance rates in meningitis.
- Utilising data from various sources including GP records, investigation results and radiology.
- Significant use of Python, Tensorflow, Pytorch, various Machine Learning architectures.

Bachelor of Medicine Bachelor of Surgery, Imperial College London **Oct 2013 - Jun 2019**

- Merit in Psychiatry clinical and written examinations.
- Skills developed: communication, teamwork, leadership, organisation, empathy, time management, adaptability and flexibility, problem-solving, networking, undertaking academic research, critical appraisal working within a multidisciplinary team.
- Topics taught: biochemistry, chemical pathology, physiology, pharmacology, clinical communication, neurology, cardiology, gastroenterology, haematology, nephrology, oncology and microbiology.

BSc - Neuroscience and Mental Health, Imperial College London **Oct 2016 - Jul 2017**

- Upper Second Class Honours (65%).
- First Class project on transcranial alternating current stimulation affecting spatiotemporal learning.
- Relevant BSc Modules: critical appraisal of research papers, neuropathology, laboratory experience, understanding of the ethics of molecular neuroscience, practical training in experimental design, group negotiation, the use of observation and reporting skills.

Work Experience

Internal Medicine Training doctor, North Central and East London NHS Deanery **Aug 2021 – Aug 2024**

- IMT3 - Cardiology/Respiratory - Royal London Hospital, Barts Health NHS Trust and Barking, Havering and
- Redbridge NHS Trust
- IMT2 - Acute Medicine/Neurology/ICU - Royal London Hospital, Barts Health NHS Trust
- IMT1 - Geriatrics/Endocrinology - Barking, Havering and Redbridge NHS Trust
- Specialty training in internal medicine, providing ward-based and outpatient care.
- Working as part of the Medical Admissions team, diagnosing, investigating and treating a wide range of medical conditions.
- Supervising junior members of the medical team, providing advice to other medical specialties out of hours.
- Regular teaching of medical students on clinical medicine, physiology and biochemistry.

Foundation doctor, Countess of Chester Hospital NHS Trust **Jul 2019 – Aug 2021**

- Rotations included Vascular Surgery, Gastroenterology, Care of the Elderly, Emergency Medicine, General Practice, Trauma and Orthopaedics.
- Responsibilities included ward-based care and on call shifts covering multiple wards out-of-hours. Worked on a COVID-19 ward during the national lockdown, recruited patients to the RECOVERY trail.
- Regular presentations to colleagues on teaching and quality improvement projects.
- Arranged a six-month teaching course for medical students.

Summer Intern, UnitedHealth Group **Jul 2017 – Aug 2017**

- Working with Optum Health, the healthcare provision arm of UnitedHealth Group, America's largest health insurance provider.
- Included a tour of the main US sites: Minneapolis, Connecticut, New York and Las Vegas.

- Presented comparisons between the management of NHS and US healthcare systems.

Officer Cadet, University of London Officers' Training Corps **Oct 2014 – Jun 2016**

- Part-time job while at university, included weekly training and development of leadership and decision-making skills in a highly pressured environment.
- Included leading military exercises, adventurous training, sport, community projects and expeditions.
- Training is equivalent to Sandhurst Territorial Army Officer training over a two-year period.

Positions of Responsibility

Doctors' Mess Co-President, Countess of Chester Hospital **Aug 2019 - Aug 2021**

- Elected role, responsible for maintenance of the Doctors' Mess room to ensure its suitability as a rest area.
- Organised social events for the Doctors' Mess and managing the Mess finances.
- Communicated with colleagues to attract new Mess members and address any existing members' concerns.

Hospital Representative, North West England Foundation Forum **Aug 2019 - Aug 2021**

- Elected role, includes committee meetings on a monthly basis to discuss how Foundation Schools can fully support junior doctors in their work.
- Undertook research on various aspects of foundation doctors work, fed back to foundation deanery on whether junior doctors were having their educational needs met.
- Bringing together representatives from each hospital within the region.

Postgraduate Examinations

Member of the Royal College of Physicians of the United Kingdom **June 2024**

- Examination scaled score - 621/999 (Part 1), 652/999 (Part 2), 136/168 (PACES)
- Topics include: clinical biochemistry and metabolism, clinical physiology, genetics, cell, molecular and membrane biology, clinical pharmacology and therapeutics, infectious diseases, gastroenterology and hepatology, psychiatry, renal medicine, respiratory medicine, cardiology, clinical anatomy, immunology, statistics, epidemiology and evidence-based medicine.

Technical Skills

- **Python and R programming**
    - Undertaken and completed multiple academic research projects using data analysis with python and applying machine learning to medical problems.
    - Data analysis skills using NumPy, Pandas, Matplotlib, R
    - Familiarity with Machine Learning models, Neural Networks, Logistic Regression, Decision trees.
- **Microsoft Office –** Advanced proficiency
- **Full UK driving licence**
- **Podcasting -** Host of The Computational Medicine Podcast interviewing those in academia and business on their work focusing on applying AI in medicine.

Publications

Available via Google Scholar

References

Available upon request