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**Liverpool Neurological Infectious Diseases Fellowship June 2015**

**Introduction**

The Liverpool Neurological Infectious Diseases Fellowship was established in 2010 to allow an exceptionally talented trainee from a relevant clinical disciplines to have an intensive year of research training and clinical exposure to help develop their expertise in this especially challenging area. Fellowships are intended to run from one to three years; shorter durations may be possible.

“The diagnosis and management of patients with neurological infections is one of the greatest challenges for neurologists and other clinicians. The presenting clinical syndromes are often elusive, establishing the causative organism can be problematic, and determining the best treatment difficult.” *Perhaps nothing better illustrates the challenges in this area, than the fact that during 2004 nearly one quarter of the Case Reports in the Lancet were patients with neurological infections.* Solomon, T & Love, R. The Lancet Neurology 2005 [1](#_ENREF_1)

**Neurological Infectious Diseases in Liverpool**

Liverpool has a long established tradition of expertise in Neurological Science and Infectious Diseases. This stems right from the early 20th century when Sir Ronald Ross won a Nobel Prize for showing that malaria was transmitted by mosquitoes, and Sir Charles Sherrington won a Nobel prize for defining the discoveries regarding the function of neurons

The Liverpool Neurological Infectious Diseases group was established in 2003, and comprises a multidisciplinary research team currently 25 members, studying neurological infectious diseases in the UK and globally. The work has been supported by more than £9M (US$15M) of research funding from Wellcome Trust, UK medical Research Council, National Institute for Health Research, Gates Foundation/Path and others. The group has major active research programmes in UK, Africa and Asia, and strong collaboration with groups in USA. Research disciplines in the group range from basic science through clinical research to public health.

The group also supports a clinical neurological infectious diseases service at the Walton Centre NHS Foundation Trust, Royal Liverpool University Hospital NHS Trust, and Alder Hey Children’s NHS Foundation Trust. This comprises Neurological Infectious Disease clinics, a consult service, multidisciplinary ward rounds, laboratory and academic meetings. Referrals come from hospitals across the UK, and further afield. Liverpool is one of the few places in the UK, or indeed globally to provide such focused clinical, educational, and research opportunities in Neurological Infectious Diseases.

Prior to the establishment of the Liverpool Neurological Infectious Diseases Fellowship, trainees from the UK, Europe, Africa and Asia joined the Liverpool team informally on an ad hoc basis. Few opportunities for formal Fellowship training exist [2](#_ENREF_2). This Fellowship was established to provide a more formal structure.

**Fellowship overview:**

Fellowship Aim: To provide clinicians interested in Neurological Infectious Diseases by providing them the knowledge and skills required for the evaluation and management of patients with neurological infectious diseases by means of a tailored training program.

Fellowship duration: 1 year

Place of work:

Depending on the trainees needs, time can be spent at

* University of Liverpool, Institute of Infection and Global Health
* The Royal Liverpool and Broadgreen University Hospitals NHS Trust
* The Walton Centre NHS Foundation Trust
* Royal Liverpool Children’s Hospital

With the option of potentially spending time with overseas collaborating units, for example:

* College of Medicine, and Malawi-Liverpool-Wellcome Trust Major Overseas programme , Blantyre, Malawi (<http://www.mlw.medcol.mw/>)
* National Institute of Mental health and neuro Sciences, Bangalore, India (<http://www.nimhans.kar.nic.in/>)
* Kanti Children’s Hospital, Kathmandu, Nepal (<http://www.kantichildrenhospital.gov.np/>)
* University Malaysia Sarawak, Kuching, Sarawak, Malaysia (<http://www.unimas.my/>)

Prerequisites

* Adult and Paediatric trainees
* MRCP / MRCPCH or equivalent degree.
* Specialities of Neurology, Infectious Diseases, Microbiology or any other relevant speciality.
* Eligible for registration with the GMC and to hold an honorary NHS contract (for clinical attachments)
* Overseas applicants are welcome

Application

In order to apply for this fellowship you will need to submit the following:

* Full CV including publication list.
* Brief description of the research area/s that interest you, including an explanation of why you want to do the fellowship and what you hope to get out of it.
* Letter of support from current supervisor
* Details of how the fellowship will be funded

 This will then be followed by a Skype interview with Professor Solomon and one or two other members of the team.

Training Programme

The Programme’s content is devised in discussion with the potential Fellow depending on his/her previous experience, skills and needs. It will encompass clinical, educational, research and training activities according to the outlined curriculum and syllabus (Appendix 1)

1. *Clinical activity*

Clinics ward rounds, consults, multi-disciplinary team meetings. This provides exposure to common UK infectious pathologies. Due to geographical limitations exposure to other neurological infections may have to be obtained at a suitable centre abroad.

Clinics in Neurological Infectious Diseases, HIV, neuroinflammation, epilepsy, neuroradiology sessions, and laboratory experience in diagnostic microbiology and virology, pharmaco- therapeutics.

1. *Educational activity*

The Fellow attends the Liverpool Neurological Infectious Diseases Course, weekly academic meetings, journal club, Neuro ID multidisciplinary meeting and laboratory meetings.

1. *Research*

The Fellow has the opportunity to undertake or support a clinical research project within the year. There may also be the possibility of seeking funding for further research leading to a higher degree.

1. *Teaching*

Undergraduate teaching and teaching for foundation and core medical trainees can be incorporated depending on the Fellow’s experience and desire.

Various other opportunities exist e.g. previous Fellows have been involved in the development of low cost educational aids and have contributed to online e-learning projects.

Curriculum

1. Learning Objectives:

At the end of the fellowship, the learner will:

* + 1. Achieve greater clinical competence in the recognition, evaluation and treatment of patients with neurological infectious diseases.
    2. Develop an understanding of the laboratory methods used for diagnosing neurological infections, the interpretation of results and their limitations in order to optimise patient management.
    3. Interpret radiological and neurophysiology results in relation to neurological infections.
    4. Achieve a deep understanding of the various neurological infectious diseases in the immunocompromised host.
    5. Understand the principles of antimicrobial and antiretroviral use, antimicrobial economics and the risk benefit analysis of treatment options in neurological infectious diseases.
    6. Be familiar with the process of notification of communicable diseases and be able to liaise with the public health agencies.
    7. Acquire the skills necessary to contribute to a neurological infectious diseases service along with multidisciplinary teams.

1. Syllabus

Please refer to Appendix 1.

1. Learning and teaching methodology
2. Experiential learning
3. Didactic Teaching –Liverpool NeuroID course, weekly academic meetings, Grand round and Neuro ID Multi-Disciplinary Team meeting (mandatory), attendance at national and international meetings is encouraged.
4. Self-Directed Learning
5. One to one learning (supervised outpatient clinics)
6. Small group discussions (inpatients service)
7. Assessment
   * 1. Formative assessment by supervisor/s.
     2. Self-assessment by refection and use of online MCQ’s, CME’s, case analysis.
8. Supervision and Mentoring.
9. Prof Tom Solomon (Neurology)
10. Dr Alistair Miller (Infectious Diseases)
11. Dr Rachel Kneen (Paediatrics)

Additional supervision and mentoring is available depending on the Fellows background and needs

Consultation for Project development This project has been drafted in consultation with colleagues at the John Hopkins University, USA who have an ongoing fellowship program in Neurological Infectious Diseases and the American Academy of Neurology.

References

1. Solomon T, Love R. Editorial: Neurological infection in The Lancet Neurology. Lancet neurology. 2005; **4**(3): 139.

2. Millichap JJ, Epstein LG. Emerging subspecialties in neurology: neuroinfectious diseases. Neurology. 2009; **73**(4): e14-5.

Sample Yearly timetable

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2 months | | 4 months | 4 months | 2 months |
|  | | * Clinical * Develop research program | Research program | * Clinical * Overseas placement | * Clinical * Completion of research |

Sample weekly timetable

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| AM | Research | Clinical /  Lab /  Radiology /  Pharmacotherapeutics  Fortnightly Lab meeting | Grand round  Academic meeting  Journal club | Neuro ID ward round  Ward Referrals | Research |
| PM | Research | Speciality clinic –  ID / HIV / epilepsy  Neuro rehab / dementia | Audit  Teaching  Neuradiology session  Clinic | Clinic | Research |

Sample of Ongoing research projects for Neuro ID Fellow to consider

* 1. Viral Meningitis (UK)
  2. TB Meningitis (UK)
  3. Encephalitis Study (UK)
  4. Stroke and HIV study (Malawi)
  5. Japanese Encephalitis study (India and Nepal)

Appendix 1 – Syllabus for the Neurological Infectious Diseases Fellowship

Appendix 2 – Hypothetical costing for a Research Fellow starting Sept 2011

Appendix 3 – Documents for completion of fellowship (pre CCT holders only)

1. Formal Educational opportunities attended
2. Summary of Clinical Experience
3. Audit project undertaken
4. Research project undertaken
5. Educational supervisor’s report

**Appendix 1. Syllabus for Neurological Infectious Diseases Fellowship**

|  |
| --- |
| **Overview** |

1. Global Burden

Terminology: meningitis / encephalitis / encephalopathy / myelitis / discitis / radiculitis / myositis /cerebral abscess / ventriculitis / granuloma / cyst

|  |
| --- |
| **Meningitis** |

* + - 1. Clinical approach to the patient with acute meningitis
      2. Acute management of meningitis
      3. Recurrent and chronic meningitis
      4. Pneumococcal meningitis
      5. Meningococcal meningitis
      6. Tuberculous meningitis
      7. Syphilitic meningitis
      8. Lyme neuroborreliosis
      9. Enterovirus meningitis
      10. Mumps meningitis
      11. Herpes virus meningitis
      12. Fungal meningitis
      13. Listeria meningitis
      14. Eosinophilic angiostrongylus cantonensis meningitis

|  |
| --- |
| **Encephalitis** |

* + - 1. Clinical approach to the patient with encephalitis
      2. Investigations for the patient with encephalitis
      3. Acute management of encephalitis
      4. Herpes simplex virus encephalitis
      5. Varicella zoster infection
      6. Cytomegalovirus infection
      7. Other viral encephalitides
         1. Human herpes viruses 6&7
         2. Parvovirus and measles
      8. Arboviruses
         1. West Nile virus,
         2. Japanese encephalitis virus
         3. Dengue virus
         4. Alphaviruses
      9. Arboviruses
         1. Rabies
         2. Nipah viruses
      10. Progressive multifocal leucoencephalopathy
      11. Syphilis
      12. Tetanus and Botulism
      13. Septic encephalopathy and Infective Endocarditis
      14. Rarer bacterial
          1. Whipple’s
          2. Brucellosis
          3. Leptospirosis
          4. Mycolpasma,
          5. Chlamydia
          6. Ricketssia
      15. Malaria
      16. Trypanosomiasis and other parasitic encephalitis
      17. Prion diseases
      18. Antibody mediated encephalitis
      19. Post infectious encephalitis and encephalopathy

|  |
| --- |
| **Intracranial Suppuration** |

* + - 1. Brain abscess

Subdural empyema and extradural abscess

Investigations, sequelae, management and outcomes.

Infections associated with shunts and extra-ventricular drains

|  |
| --- |
| **Intracranial Granulomas and Cysts** |

* + - 1. Tuberculoma
      2. Fungal Granulomas-
         1. Nocardia,
         2. Actinomycosis,
         3. Aspergillosis,
         4. Blastomycosis,
         5. Coccidioidomycosis
         6. Mucormycosis
      3. Toxoplasmosis
      4. Cysticercosis
      5. Other granuloma and cysts –
         1. Schistosomiasis,
         2. Parogonimiasis,
         3. Echinococcosis,
         4. Amoebial cyst

|  |
| --- |
| **Human Immunodeficiency Virus** |

* + - 1. Historical aspects, Profile of HIV, Neurological diseases and investigations associated with HIV
      2. HIV associated dementia
      3. HIV Myelopathy
      4. HIV neuropathy and myopathy
      5. Secondary complications of HIV
      6. The role of anti-retroviral therapies***.***

|  |
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| **Spine Infections** |

* + - 1. Viral myelitis and myelopathy
         1. HTLV1 associated myelopathy
         2. Poliomyelitis
      2. Extradural abscess
      3. Discitis and osteomyelitis***.***

**Appendix 2. Hypothetical costing for a Research Fellow starting Sept 2015 for 3 years**

**Appendix 3. Documentation for Pre CCT holders**

**NEUROLOGICAL INFECTIONS FORMAL EDUCATIONAL OPPORTUNITIES ATTENDED**

|  |
| --- |
| The trainee is expected to spend at least 2 hours per week and preferably 4 hours per week in formal education opportunities. |
| Dates of post/clinical attachment from to |

|  |  |
| --- | --- |
| TYPE OF EXPERIENCE | Hours per week or dates |
| Unit/audit |  |
| Case conference/grand rounds |  |
| Seminars/lectures (as part of a teaching programme) |  |
| Journal club |  |
| Radiology meeting |  |
| Clinical Pathology conference |  |
| Other (please specify) |  |
| Study leave (list courses/meetings |  |
| Formal educational opportunities attended |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Educational Supervisor’s Signature |  | Date |  |
| Trainee’s Signature |  | Date |  |

1. **Summary of Clinical experience**

|  |  |
| --- | --- |
| Average no. of patients seen in Consults service per week |  |
| Average no. of patients seen in General ID clinic per week |  |
| Average no. of patients seen in Neuro-ID clinic per week |  |
| Average no.of patients seen in HIV service per week |  |
| Average no. of MDT’s attended |  |
| Average no. of Neuropathology sessions attended per week |  |
| Average no. of lab sessions attended |  |
| Average no. of Neuroradiology reporting sessions attended |  |
| Average no. of Public Health sessions attended |  |
| Average no. of acute neurological infectious diseases emergencies attended. |  |

I confirm that the experience above has been acquired and that a satisfactory level of competence has been demonstrated.

|  |  |  |  |
| --- | --- | --- | --- |
| Educational Supervisors Signature |  | Date |  |
| Trainee’s Signature |  | Date |  |

1. **NEUROLOGICAL INFECTIONS AUDIT PROJECTS**

Briefly describe audit projects undertaken during sub-specialty training

|  |
| --- |
|  |

I confirm that the experience above has been acquired and that a satisfactory level of competence has been demonstrated.

|  |  |  |  |
| --- | --- | --- | --- |
| Educational Supervisors Signature |  | Date |  |
| Trainee’s Signature |  | Date |  |

1. **NEUROLOGICAL INFECTIONS RESEARCH PROJECT/S**

Briefly describe research project/s undertaken during fellowship.

|  |
| --- |
|  |

I confirm that the experience above has been acquired and that a satisfactory level of competence has been demonstrated.

|  |  |  |  |
| --- | --- | --- | --- |
| Educational Supervisor’s Signature |  | Date |  |
| Trainee’s Signature |  | Date |  |

1. **NEUROLOGICAL INFECTIONS – ORGANISATION OF SERVICES**

|  |
| --- |
| * Describe your experience in SERVICE planning * What management skills have you acquired during the fellowship to enable you to set up a neurological Infections service? |

|  |  |  |  |
| --- | --- | --- | --- |
| Comments | | | |
| Evidence of Competencies Gained  I confirm that the experience above has been acquired and that a satisfactory level of competence has been demonstrated. | | | |
| Educational Supervisor’s Signature |  | Date |  | |
| Trainee’s Signature |  | Date |  | |

1. **NEUROLOGICAL INFECTIONS** **- EDUCATIONAL SUPERVISOR’S REPORT**

Please comment on the trainee’s knowledge, skills and attitudes in the following modules of the curriculum.

1. **Acute management of patients with a suspected neurological infection**

Trainee is competent in the *assessment and management* of acutely ill patients with a suspected neurological infection.

He/ she is able to devise a sound *management plan* based on scientific principles.

He / she can demonstrate the need to safely *assess contacts* of these patients and provide them with information and resources.

Trainee demonstrates *empathy* and *cultural competence*

1. **Non-emergency management of patients with a suspected neurological infection**

Trainee is competent in the specialist *assessment*, investigation and treatment of patients with a wide range of neurological infections.

They can come up with a wide range of *differential diagnosis*.

They can evaluate the various *laboratory and radiological* parameters used as an adjunct to diagnose various neurological infections

Trainee is competent to contribute to a comprehensive, multidisciplinary, co-ordinated and goal orientated neurological infections *service.*

Trainee is competent to contribute to *re-integration / rehabilitation* of the patients with neuropsychological sequelae in their family, society and occupation.

Trainee is aware of the components and requirement for a comprehensive *service* for neurological infections in hospital and the community.

Trainee understands the role of various *charities* in the dissemination of information and provision of support to patients with neuropsychological sequelae secondary to neurological infections.

Trainee is aware of the *stigma* associated with some neurological infections.

Trainee is able to demonstrate *cultural competence*.

1. **Epidemiology and Public Health**

Trainee is competent in his / her understanding of the basic principles of epidemiology of neurological infections.

Trainee is competent regarding notification of communicable diseases and is aware of the functioning and role of the Health Protection Agency.

Trainee understands the principles of contact tracing, confidentiality and safety issues for the contacts and society.

|  |  |  |  |
| --- | --- | --- | --- |
| Educational Supervisor’s Signature |  | Date |  |

**Project Costs for 1 year fellowship**

|  |  |
| --- | --- |
|  | **£** |
| **Fellow’s Salary Cost to be provided by Fellow** | **0** |
| **Travel:** | **1,000** |
| **Neuro ID Conference** | **350** |
| **Supervisory Time: (Solomon)** | **6,806** |
| **Departmental Costs** | **5,000** |
| **Sub Total** | **13,156** |
|  | |
|
| **Additional costs dependant on Project (lab based)** |  |
| **Project Costs up to** | **10,000** |
| **Technical support (10%)** | **6,150** |
| **Sub Total** | **16,150** |
|  | |
|
| **Grand Total** | **29,306** |

For more information regarding the cost please contact

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