



THE UNIVERSITY OF  
MELBOURNE

Faculty of Medicine,  
Dentistry & Health Sciences



# Clinical Neuroscience & Neuroimaging Research Short Courses

## Nine Day Short Course: **Week 2: Neuroimaging For**

### **Specialist Certificate in Clinical Research (Neuroscience)**

#### **Week 1: Clinical Neuroscience**

##### **Research Outcomes**

Developing a high level of competency in clinical research relies on two main capacities:

1. being able to read, understand and interpret the research literature and
2. asking the right questions in order to formulate appropriate research hypotheses and answer them appropriately.

By exploring a range of specific research methodologies applicable to neurological disorders you will develop the skills to pose relevant questions to produce quality clinical research. Through stimulating discussions of the current research questions with expert researchers in clinical neuroscience and your peers, you will develop the ability to critically appraise the literature and formulate new research questions. You will build confidence to communicate your research and interact with basic neuroscientists, as well as researchers in other health disciplines.

Topics covered include: clinical trials, genetics, mechanisms of disease, epidemiology, health economics, rehabilitation and translation into clinical practice.

##### **Clinical Research Outcomes**

Professor Alan Connelly (Head of Imaging Division, Florey Institute of Neuroscience and Mental Health) leads this more advanced subject which builds on clinical research methodology and skills acquired in Week 1. A major emphasis is cutting-edge MR imaging techniques applied to the human brain. Through face-to-face interaction with multidisciplinary researchers, you will develop a critical understanding of the latest neuroimaging methods, as well as the confidence to design your own research project in clinical neuroscience.

Through individual feedback, you will improve the quality of your research proposals an essential skill for successful researchers.

##### **Academic Coordinator**

###### **Professor Sam Berkovic**

Professor Berkovic AC MD FAA FRACP FAHMS FRS is an internationally recognised clinical neurologist and one of the first Australia Fellow researchers. He is Laureate Professor at the University's Department of Medicine and Radiology; Director, Epilepsy Research Centre; Director, Comprehensive Epilepsy Program at Austin Health.

##### **Presenters include:**

Professors Geoffrey Donnan AO, Graeme Jackson, Alan Connelly, Leonid Churilov, Mandy Thrift, Trevor Kilpatrick, Terry O'Brien, Steven Petrou, Ingrid Scheffer AO, Leeanne Carey, Richard Macdonell, Julie Bernhardt, Chris Rowe and Fernando Calamante. Associate Professors David Abbott, Dominique Cadilhac, Brian Chambers and many more.

##### **Who should attend?**

Anyone currently working or studying in neurology, psychiatry, neurosurgery, radiology, neurorehabilitation or other health services.

This course will prove useful to advanced trainees, new or emerging clinical researchers, allied health and clinical trial coordinators.

More experienced clinical researchers, scientists or those working in the pharmaceutical industry are also welcome. This course was developed by the NHMRC Centre of Clinical Research Excellence in Neurosciences in partnership with the Florey Institute of Neuroscience and Mental Health and The University of Melbourne's Faculty of Medicine, Dentistry and Health Sciences and has been delivered annually since 2006.



# Specialist Certificate in Clinical Research (Neuroscience)

Course Dates: August 13th to 24th , 2018

## WEEK 1: 13th - 17th August Clinical Neuroscience Research

### Day 1

- Stroke: The current clinical research questions
- Clinical trials methods
- Statistics essentials for good study design
- Critical appraisal of research literature and review

### Day 2

- Epilepsy: The current clinical research questions
- Genetics in clinical neurological research
- Interface of basic science with clinical research: from basic scientist perspective
- Clinical neuropharmacology research methodology
- Neurorehabilitation research methodology

### Day 3

- Neuro-epidemiology: disease burden and measures
- Neuro-epidemiology: study types
- Neuro-epidemiology: disease causation and prevention
- An introduction to health economics
- Translating clinical research findings into practice

### Day 4

- Multiple sclerosis: The current clinical research questions
- Research methods of neuromuscular disorders
- Clinical research applications of TMS
- Current clinical research questions and methodology of autism and intellectual disability
- Group presentations

*Additional half day includes: Searching Electronic Databases Tutorial & Endnote Reference Management Tutorial (b/w Day 2 & 3)*

### On completion you will

- Achieve a high level of competency enabling you to design and conduct quality clinical neuroscience research from the original concept through to submission of competitive research proposals
- Demonstrate a high level of understanding of advanced clinical research techniques in neuroimaging and neurophysiology, with broad applications in neuroscience
- Be able to design research projects using cutting-edge brain imaging or other advanced techniques as research tools
- Have developed the skills to write quality research proposals and grant applications
- Be able to establish multi-disciplinary collaborations with experts in the field of clinical neuroscience to conduct innovative clinical research

## WEEK 2: 20th-24th August Neuroimaging For Clinical Research

### Day 1

- Frontiers of Neuroimaging
- How does MRI work?
- What can we see with MRI?
- Quantitative imaging in neuroscience research
- EEG/MEG and clinical research applications

### Day 2

- Neurodegenerative diseases: The current clinical research questions
- Cognitive functioning and behavioural research methods
- Principles of MRI: How can we image brain function?
- Designing functional neuroimaging paradigms and interpretation (cognitive perspective)
- Designing functional MRI studies for allied health research

### Day 3

- Clinical research methodology and applications of PET/SPECT imaging
- Psychiatry: current clinical research questions
- Simultaneous electrophysiology and neuroimaging
- Using ultrasound methodologies in clinical neuroscience research
- Practical MR demonstration: MR safety, language and motor fMRI

### Day 4

- Diffusion imaging - How does it work and what can it tell us?
- Measuring tracts with diffusion fibre tracking
- Measuring blood perfusion through brain tissue
- Interactive functional MRI workshop

### Day 5

- Research design group activity
- Grantmanship workshop

### On completion you will

- Have developed a high level of competency in clinical research methodologies applicable to neurological disorders
- Demonstrate an understanding of the current research questions and challenges in neuroscience
- Have gained the essential skills to be able to formulate relevant research hypotheses to generate useful clinical outcomes
- Be able to read, understand and interpret the research literature critically
- Be able to generate new ideas and interact with experienced clinical researchers, neuroscientists and research peers from other health disciplines
- Be able to communicate your research findings effectively

### For further information contact:

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<http://go.unimelb.edu.au/jz9a>

[lefevere@unimelb.edu.au](mailto:lefevere@unimelb.edu.au)

### Applications:

<http://go.unimelb.edu.au/jz9a>

[TL-ClinicalResearch@unimelb.edu.au](mailto:TL-ClinicalResearch@unimelb.edu.au)

### Venue:

Melbourne Brain Centre at  
Austin Health  
245 Burgundy Street  
Heidelberg VIC 3084  
Australia

Each week can be taken separately as a four and a half day short course, with (credit transfer possible) or without assessment.