Edinburgh Imaging
www.ed.ac.uk/edinburgh-imaging

Course: Hybrid radionuclide imaging - PET-MR

Semester 2/ Spring **10 Credits**

Each Course is composed of Modules & Activities.

Modules:

PET imaging techniques & physics	HPMR
Radiotracers	HPMR
PET-MR practicalities	HPMR

Each Module is composed of Lectures, Reading Lists & Discussion Boards.

These Modules are taught on the following Programmes, or are incorporated into blended Courses which teach students enrolled outwith the Edinburgh Imaging Academy:

- IMSc - Imaging programme

Edinburgh Imaging
www.ed.ac.uk/edinburgh-imaging

Course: Hybrid radionuclide imaging - PET-MR

Modules include:

PET imaging techniques & physics
- Fundamentals of PET imaging
- Acquisition & reconstruction of PET images
- Principles of PET quality control (QC)

Radiotracers
- The cyclotron
- Radiochemistry

PET-MR practicalities
- Enrolment & consent in PET-MR
- Health & safety for PET-MR
- PET-MR artefacts & pitfalls
- Standardisation & governance

Edinburgh Imaging
www.ed.ac.uk/edinburgh-imaging

PET imaging techniques & physics

Lecture 1
Title: Fundamentals of PET imaging
Description: Key principles associated with Positron Emission Tomography (PET)
Author(s): Dr Adriana Tavares
Learning Objectives

- Define PET imaging
- Explain the radiotracer principle
- Describe the physics & fundamental principles associated with PET imaging

Lecture 2
Title: Acquisition & reconstruction of PET images
Description: The different acquisition & reconstruction methods in PET.
Author(s): Dr Adriana Tavares
Learning Objectives

- Identify & describe different acquistion protocols commonly used in clinical PET imaging
- Explain basic principles of PET image reconstruction

Lecture 3
Title: Principles of PET quality control (QC)
Description: An outline of the importance of PET QC with some examples
Author(s): Dr Adriana Tavares
Learning Objectives

- Explain the importance of QC programmes in PET
- Identify & describe routine QC procedures in PET

Edinburgh Imaging
www.ed.ac.uk/edinburgh-imaging

Radiotracers

Lecture 1
Title: The cyclotron
Description: Generating radioisotopes - from source to target
Author(s): Prof AJ Farrall & Dr Christophe Lucatelli
Learning Objectives

- Describe the cyclotron's role in radiotracer generation
- List key principles which underpin how a cyclotron works

Lecture 2
Title: Radiochemistry
Description: Overview of radiotracer compositions & applications
Author(s): Prof AJ Farrall & Dr Christophe Lucatelli
Learning Objectives

- List several radiotracers
- Discuss radiotracer applications

PET-MR practicalities

Lecture 1
Title: Enrolment & consent in PET-MR
Description: Information and preparation required for informed consent prior to the PET-MR examination
Author(s): David Brian
Learning Objectives

- Describe the core information required to be given to patients and volunteers
- Discuss the key risks to be communicated to the subject (both MR and PET)
- Describe the patient/volunteer preparation, with specific tracer requirements
- Describe the consent process and how this relates to the specific examination

Lecture 2
Title: Health & safety for PET-MR
Description: Health & safety overview in PET-MR plus practical methods to minimise hazards
Author(s): David Brian
Learning Objectives

- Discuss potential PET & MR hazards
- Describe how best to minimize hazards
- State key legislation related to each modality
- Describe how legislation is put into practice
- Outline adverse event management

Edinburgh Imaging
www.ed.ac.uk/edinburgh-imaging

Lecture 3
PET-MR artefacts & pitfalls
Description: Example of PET-MR artefacts & pitfalls
Author(s): David Brian
Learning Objectives

- Describe examples of attenuation correction method differences for PET-MR
- State how coil attenuation may affect the image
- List common pitfalls in PET-MR imaging
- Describe how to deal with artefacts & pitfalls

Lecture 4
Title: Standardisation & governance
Description: Principles of regulation & quality in PET-MR
Author(s): Sean Denham
Learning Objectives

- Discuss PET-MR regulations
- Outline requirements for:
    - Recording radiation doses
    - Reporting radiation incidents
- Describe quality management system components
- State principles behind writing effective