

ESMRMB School of MRI
Body DWI 2017: Solving Clinical Problems and Diagnostic Dilemmas

Date: 8th to 10th November 2017

Venue: Brussels, Belgium

Local organizer: Dr. Maria Bali

Proposed program

- 1. DWI: Principles, theory, nomenclature and beyond ADC**
Frederik deKeyzer (Leuven, Belgium)
- 2. Getting the best body DWI at 1.5T and 3.0T: A practical approach**
David J Collins (Sutton, UK)
- 3. Problem solving in the liver and upper abdomen**
Celso Matos (Lisbon, Portugal)
- 4. What is the role of DWI for pancreatic and biliary diseases?**
Maria Bali (Brussels, Belgium)
- 5. Renal pathologies: The added value of DWI**
Nicolas Grenier (Bordeaux, France)
- 6. Improving the assessment of the uterus and adnexal masses**
Isabelle Thomassin-Naggara (Paris, France)
- 7. Peritoneal disease: Improving detection and patient management**
Laura Fournier (Paris, France)
- 8. Assessing and directing treatment of bone disease**
Anwar Padhani (London, UK)
- 9. Tumour heterogeneity in the era of targeted treatments: What can MRI and DWI tell us?**
Dow-Mu Koh (Sutton, UK)
- 10. Advanced DWI methods and use with other quantitative and hybrid imaging technologies**
Hersh Chandarana (New York, USA)

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The aim of this course:

Diffusion-weighted MR imaging is now widely used in the body to improve patient management. In this newly revised course, we will emphasize on the practical aspects of using diffusion-weighted MRI to solve common clinical problems and diagnostic dilemmas in the body. We will review both the basic and advanced theories of body diffusion-weighted MRI, as well as the implementation of imaging protocols at 1.5T and 3.0T, including whole body imaging. The growing use of diffusion-weighted MRI for evaluating disease heterogeneity will be discussed, as well as the complimentary role of the technique on a hybrid MR-PET imaging system.

Learning Objectives

DWI: Principles, theory, nomenclature and beyond ADC

- Principles of DW-MRI
- Diffusion-weightings: b-values
- Monoexponential ADC quantification
- Non-monoexponential diffusion models: IVIM, Stretched exponential, diffusion kurtosis imaging
- Measurement repeatability of DWI quantification

Getting the best body DWI at 1.5T and 3.0T: A practical approach

- Imaging sequences for body imaging
- Technical implementation at 1.5T and 3.0T
- Pros and Cons of DWI at 1.5T and 3.0T
- Strategies to improve image signal-to-noise and reduce artefacts for DWI

Problem solving in the liver and upper abdomen

- Clinical protocols of DWI in the liver and upper abdomen
- Evaluation of focal lesions in the cirrhotic and non-cirrhotic liver
- Applications in the small bowel and colon
- The value of DWI for tumour detection, disease characterization and assessment of treatment response

What is the role of DWI for pancreatic and biliary diseases?

- Technical implementation of DWI for evaluating the pancreas and biliary tree
- Combining DWI with conventional MRI for disease detection and characterization
- Advanced DWI models for pancreatic diseases
- Assessing treatment response using DWI
- Diagnostic pitfalls

Renal pathologies: The added value of DWI

- Clinical implementation of DWI in the kidneys and upper urinary tract
- Clinical applications of DWI for diffuse renal disease and assessment of renal function
- The application of DWI for the assessment of focal renal lesions
- Advanced DWI models for evaluating the kidneys

Improving the assessment of the uterus and adnexal masses

- Technical implementation for evaluating the female pelvis
- DWI evaluation of the uterus and adnexal masses
- Application of DWI for tumour detection, disease characterization and the assessment of treatment response
- Potential diagnostic pitfalls

Peritoneal disease: Improving detection and patient management

- Current limitations of peritoneal disease assessment using CT and PET imaging
- Impact of peritoneal disease in cancer management
- Role of DWI for detecting peritoneal disease, evaluation for debulking surgery and assessing treatment response in ovarian cancer
- Unmet challenges

Assessing and directing treatment of bone disease

- Current challenges of evaluating metastatic bone disease and diffuse marrow involvement
- Implementation of whole body DWI to assess marrow disease
- Image interpretation (including MET-RADS-P reporting system)
- Understanding bone marrow ADC and fat fraction quantification
- Avoidance of pitfalls

Tumour heterogeneity in the era of targeted treatments: What can MRI and DWI tell us?

- Understand tumour heterogeneity as a major challenge in oncology
- Techniques to describe inter-tumour and intra-tumour heterogeneity
- Applying MRI and DWI to demonstrate tumour heterogeneity linked to tumour biology
- The role of radiomics in assessing tumour heterogeneity

Advanced DWI methods and use with other quantitative and hybrid imaging technologies

- Understand the emerging use of advanced DWI methods in oncology
- Role of hybrid PET/MRI in Oncologic Imaging.
- Combining DWI with hybrid Imaging (including PET-MRI) as potential one-stop-shop for cancer assessment