



ESMRMB SCHOOL OF MRI Course Programme 2012

**Body Diffusion-weighted MR Imaging:
From Theory to Practice**
April 18–20, London/UK

Advanced MR Imaging of the Musculoskeletal System
April 26–28, Glasgow/UK

Clinical fMRI & DTI – Theory and Practice
May 24–26, Uppsala/SE

Advanced MR Imaging in Paediatric Radiology
June 14–16, Barcelona/ES

Advanced Breast & Female Pelvis MR Imaging
June 28–30, Budapest/HU

Advanced MR Imaging of the Chest
July 5–7, Ljubljana/SI

Advanced MR Imaging of the Abdomen
September 6–8, Ankara/TR

Advanced Cardiac MR Imaging
September 6–8, Florence/IT

From Basic Physics to Improved Imaging Strategies
September 13–15, Tübingen/DE

MR Safety
October 18–20, Vienna/AT

Advanced MR Imaging of the Musculoskeletal System
October 25–27, Cairo/EG

**Advanced Neuro Imaging:
Diffusion, Perfusion, Spectroscopy**
October 25–27, Antwerp/BE

Advanced Head & Neck MR Imaging
November 1–3, Rotterdam/NL

The ESMRMB School of MRI
courses are exclusively
sponsored by Bayer Pharma AG.



Bayer HealthCare

*Education in
partnership*



Introduction



Dear Colleagues,

The School of MRI – one of the ESMRMB's educational programmes – started 2011 on a high note. Between March 24 and 26 the **100th course** of this highly rated programme **took place in Leuven, Belgium**. It was an honour for Stefan Sunaert and his faculty to organise the jubilee course and they enjoyed the unique atmosphere of the event during their course 'Clinical fMRI & DTI – Theory and Practice'. Eight other courses followed in 2011, once again covering the entire clinical spectrum of MRI from advanced neuro imaging to special applications, such as thoracic imaging. Nine faculties with a total of 85 internationally renowned teachers (the best in Europe) were kind enough to pass on their knowledge to a total of 483 participants. Overall, between 2001 and the end of 2011 ESMRMB educated 5016 attendees from 87 countries worldwide. Taking into consideration that the School runs an intense programme with a maximum of 60 participants per course this qualifies as a great success. The School of MRI has clearly accomplished its mission, which is to help physicians and technicians make better clinical use of MRI.

Since MRI is still an evolving modality, over the years the School of MRI had to continuously integrate new imaging methods into their courses. Additionally, some new application fields have become so important that new courses had to be established. The latest of such innovations were the Clinical fMRI and DTI course in 2007 and the course on Advanced MR Imaging of the Chest in 2009. **In 2012** the School of MRI is, once again, offering **two new courses**:

Diffusion-weighted imaging first showed its clinical potential in brain imaging, especially for making very early diagnosis of ischaemic lesions. Then diffusion-weighted images became more and more helpful in assessing the whole body, which motivated us to establish a new course entitled '**Body Diffusion-weighted MR Imaging: From Theory to Practice**'. Dr. Koh, an internationally renowned expert in this field, has been kind enough to organise this course, which will take place from April 18 to 20, 2012 in London.

Safety in MRI is clearly an important issue and is becoming more and more important with increasing field strength and more and more electronic devices being used in medicine. On the other hand, within educational programmes, safety in MRI has been somewhat neglected over the last few years. So we have also decided to offer a course on **MR Safety**, organised by Prof. Trattnig, which will take place from October 18 to 20, 2012 in Vienna for the first time within the School of MRI.

So the School of MRI is still going strong. Nevertheless, the basic concept of all these courses remained the same from the beginning:

- **Didactic concept:** Over the years, we have learned that the interactive character of the courses, including the concept of repeating each topic in interactive repetition classes, is highly appreciated by the participants. The didactic concept is so successful that it has been transferred to other ESMRMB course programmes and has also been adopted by other societies.
- **Quality evaluation and improvement:** The quality of the School of MRI programme is well documented through the constant evaluation of all courses. We know, for example, that in 2011 the course format was ranked 1.6 and the interactive character of the repetition classes 1.7 on a scale of 1 (very good) to 5 (very poor). Additionally, 96% of all participants indicated that they would recommend or have already recommended their particular course to colleagues. We have also ascertained that most participants were attracted to the courses by advice from their colleagues.
- **Multinational composition:** the School of MRI is entirely multinational in terms of teachers as well as participants.

Last but not least, the ESMRMB Office is without doubt the backbone of the School of MRI, which ensures consistency and excellent services. Today, a group of three people are responsible for the educational programmes within the ESMRMB Office and they are happy to answer any questions you may have.

I would be delighted to have the chance to welcome you to some of our courses in 2012. Within the School of MRI programme you will find plenty of opportunities to expand your knowledge within the field of MRI.



Prof. Wolfgang Steinbrich
Director of the ESMRMB School of MRI
University of Basel, Switzerland

Welcome from our sponsor



Thirteen years have passed since the School of MRI was founded. During these years, the School has held classes for numerous participants and has established an excellent training programme in the field of magnetic resonance imaging which owes its success not least to a unique teaching concept: Lectures are held in small groups, and participants benefit from an atmosphere which encourages dialogue with teachers, who are renowned experts in their field.

We at Bayer are delighted to be the exclusive sponsor of this programme and we greatly appreciate the training courses that have been offered over the years.

This work is all the more important since radiologists face constantly changing challenges in their working environment. Radiology is regarded as one of the medical fields most affected by technological advances, but it is not just a matter of choosing the right imaging modality. Radiologists have an important responsibility for patient outcomes. Above all, well-trained medical professionals will be pivotal in meeting this challenge.

As a company with a long tradition in the field of Diagnostic Imaging, Bayer is strongly committed to enhancing the current and future options for radiologists and the therapeutic areas which they serve. It is therefore my great pleasure to inform you that the company has recently merged its Contrast Media business and its MEDRAD Medical Devices affiliate to form a new unit under the name 'Radiology & Interventional'. By integrating the activities and resources of both businesses, Radiology & Interventional will pool the know-how of top experts, who are familiar with the many demands of a modern radiology department.

We have pioneered the use of contrast media in MRI and CT. Moreover, MEDRAD is a global market leader in the field of high-tech medical devices which enable or enhance diagnostic and therapeutic medical procedures for computed tomography, magnetic resonance imaging, and cardiovascular applications.

Both businesses already have a strong customer focus and concentrate on delivering the clinical value and operational efficiency that radiologists need, both today and in the future. Radiology & Interventional will build on these strengths, extend the company's market reach, generate innovation in the competitive healthcare field, and offer radiologists even more comprehensive services than before.

We look forward to continuing to support you in your professional work and providing you with high-quality products and services. This, of course, also includes a sustainable commitment to support you in your future medical training. I would like to encourage you to take advantage of the excellent training courses offered by the School of MRI and wish you every success in your endeavours.

Per Edlund
Head of Region Europe
Bayer HealthCare
Radiology & Interventional

The ESMRMB School of MRI is exclusively sponsored by



Bayer HealthCare

Organisation Committee

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Wolfgang Steinbrich

Director of the School of MRI
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Radiologist, Department of Radiology
Erasme Hospital of Brussels/BE

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and Interventional Radiology
University Hospital of Heidelberg/DE

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Medical Director of the Centre of Excellence for High-field MR
Department of Radiology
Medical University Vienna/AT

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Oswestry/UK

Johan Wikström

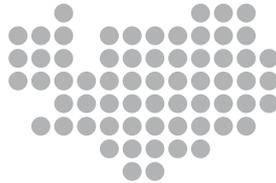
Radiologist, Department of Radiology
Uppsala University Hospital, Uppsala/SE

Klaus Wörtler

Radiologist, Department of Diagnostic Radiology
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Course Secretariat

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IN MEDICINE AND BIOLOGY (ESMRMB)
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All information, including travel times and fares, is
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and cannot be held responsible for any inaccuracies.

Vienna, January 2012
Coordination: Denise Cosulich, Christina Esch
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ESMRMB

European Society for Magnetic Resonance in Medicine and Biology



ESMRMB 2012

**29th Annual Scientific Meeting
October 4–6, Lisbon/PT**

The European Forum for MR research and clinical practice
www.esmrb.org

Goals of the Courses

Do you really know what k-space means, how to optimise contrast in MR images using a FLASH sequence, what a bSSFP sequence can be used for, and how to interpret artefacts in MR images? Do you know what the so-called BOLD effect is and how to apply diffusion imaging? Do you know the best imaging strategies to analyse inborn heart defects and the optimal sequence to visualise cartilage? If you are easily able to answer all these questions, there is perhaps no need for you to sign up for one of the MR teaching courses of ESMRMB. If not, ESMRMB offers you the opportunity to enhance your knowledge and to get prepared for the needs of modern daily MR business.

There are two types of courses available:

- **From Basic Physics to Improved Imaging Strategies**
- **Advanced Clinical Courses**

Attendance at our MR course '**From Basic Physics to Improved Imaging Strategies**' will enable you to

- profoundly understand signal and contrast generation in MR images at different conditions (morphological, biophysical and technical);
- use the right measurement sequence for your clinical questions;
- optimise your MR examination (measurement protocol, sequence timing, ECG gating etc.);
- verify image contrast by modifying measurement sequence or by applying contrast agents;
- interpret MR images back to tissue components and functional activities;
- understand advanced MRI techniques such as MR angiography, diffusion imaging, perfusion sequences etc.

Attendance at one of the **Advanced Clinical Courses** will enable you to

- ensure optimum use of MRI in the relevant field of MR application;
- know the indications and limitations of MRI compared to other imaging modalities;
- acquire an in-depth understanding of measurement strategies in the relevant area;
- optimise imaging strategies for the best visualisation of underlying structures and diseases;
- interpret morphological data correctly back to tissue components and pathologic alterations of tissues;
- interpret functional data back to physiological or pathological activities.

Educational Levels

All courses are held at an advanced educational level.

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From Basic Physics to Improved Imaging Strategies

Participants should be physicians or technicians who have acquired basic knowledge in MRI techniques and are experienced in MRI (6 months minimum).

Advanced Clinical Courses

Participants should be physicians who have either attended the ESMRMB School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or who have acquired knowledge in MRI techniques from other sources. In addition they should have a minimum of 6 months of experience in applied MRI in the relevant field.



The Power of Contrast

- ◆ Highest T1-shortening¹
- ◆ Delivering high diagnostic efficacy²
- ◆ Macrocyclic compound – class with highest stability³

Gadovist® 1.0
Gadobutrol

1. Rohrer M, Bauer H, Mitropoulos I, Reunard M, Wehmann HJ. Comparison of magnetic properties of MRI contrast media solutions at different magnetic field strengths. *Investigative Radiology* 2005; 40(11):715-724.

2. Tombsch B, Boudreau K, Boudreau M, Clausen CD, Düker C, Galassi M, Grabbe E, Gorenfeld G, Kühn M, Goss-Fongestadt M, Hammesring R, Hoppel U, Henzler G, Jung G, Kitzer T, Lagalla R, Langsfeld F, Loose R, Oyen WJ, Pavlicic P, Peinig C, Pozzi-Mucelli R, Priesighe T, Kemner P, Kemner NS, Richter GM, Rummeny EJ, Schäfer F, Szczerbo-Trojnowska M, Urbanik A, Vogl T, Häfke P. Comparison of 1.0 M gadobutrol and 0.5 M gadopentate dimeglumine-enhanced MRI in 471 patients with known or suspected renal lesions: results of a multicenter, single-blind, interindividual, randomized clinical phase III trial. *Eur Radiol* 2008; 43(12):817-828.

3. Fenzel T, Langsfeld P, Schirmer H, Huter J, Wehmann HJ. Stability of gadolinium-based magnetic resonance imaging contrast agents in human serum at 37 degrees C. *Invest Radiol* 2008; 43(12):817-828.

Gadovist® 1.0 macrolactone solution for injection. Composition: 1 ml solution for injection contains 605.22 mg gadobutrol (equivaly 1.0 mmol) as active ingredient. **Excipients:** calcium chloride, tromethamol, hydrochloric acid, water for injections. **Indications:** This medicinal product is for diagnostic use only. Gadovist® 1.0 is indicated in adults, adolescents, and children aged 7 years and older for contrast enhancement in cranial and spinal magnetic resonance imaging (MRI). Contrast enhanced MRI of liver or kidneys in patients with high suspicion or evidence of having focal lesions to classify these lesions as benign or malignant, contrast enhancement in magnetic resonance angiography (CE-MRA). **Contraindications:** Hypersensitivity to the active substance or any of the excipients. **Special warnings and precautions for use:** While injecting Gadovist® into veins with a small lumen there is the possibility of adverse effects such as reddening and swelling. The usual safety requirements for MRI, especially the exclusion of ferromagnetic materials, also apply when using Gadovist®. Hypersensitivity reactions, including anaphylactoid reactions ranging to shock, have been observed after administration of Gadovist®. To be able to react immediately to an emergency, medicinal products and equipment (e.g. endotracheal tube and respirator) should be within hand reach. Hypersensitivity reactions are not predictable; however, in patients with an allergic disposition hypersensitivity may occur more often than in patients without such a disposition. In rare cases delayed anaphylactoid reactions (after hours to days) have been observed; severe cardiovascular disease. In patients with severe cardiovascular disease Gadovist® should only be administered after careful risk/benefit assessment because only limited data are available so far. Gadovist® should be used with special care in patients: 1) with known congenital long QT syndrome; 2) with known previous arrhythmias after taking medicinal products that prolong cardiac repolarisation; 3) who are currently taking a medicinal product that is known to prolong cardiac repolarisation e.g. a class III antiarrhythmic (e.g. amiodarone, sotalol). The possibility that Gadovist® may cause or exacerbate arrhythmias in an individual patient cannot be excluded. Hypokalaemia: Gadovist® should not be used in patients with uncorrected hypokalaemia. Impaired renal function: Prior to administration of Gadovist®, a strict medical history should be taken. Patients at risk of renal dysfunction should undergo laboratory tests. There have been reports of nephrogenic systemic fibrosis (NSF) associated with the use of some gadolinium-containing contrast agents in patients with severe renal impairment (GFR < 30 ml/min/1.73 m²). Patients undergoing non-contrast enhanced MRI. Haemodialysis shortly after Gadovist® administration may be useful at removing Gadovist® from the body. There is no evidence to support the initiation of haemodialysis for prevention or treatment of NSF in patients not already undergoing haemodialysis. Elderly: As the renal clearance of gadobutrol may be impaired in the elderly, it is particularly important to screen patients aged 65 years and older for renal dysfunction. Seizure disorders: Like with other gadolinium-containing contrast agents special precaution is necessary in patients with a low threshold for seizures. **Undesirable effects:** The following adverse reactions have been observed in clinical trials. Uncommon (> 1/1,000 to < 1/100): Cardiac arrest, tachycardia, loss of consciousness, convulsion, conjunctivitis, eyelid oedema, respiratory arrest, bronchospasm, injection site reaction. Rare (< 1/10,000 to < 1/1,000): Anaphylactoid reaction, hypotension, dyspnoea, vomiting, urticaria, rash. The following additional adverse reactions have been reported from postmarketing spontaneous reports. Rare (> 1/10,000 to < 1/1,000): Cardiac arrest, tachycardia, loss of consciousness, convulsion, conjunctivitis, eyelid oedema, respiratory arrest, bronchospasm, cyanosis, oropharyngeal swelling, cough, sneezing, face edema, hyperhidrosis, pruritus, erythema, circulatory collapse, flushing, feeling hot, malaise, anaphylactoid shock. **Additional safety information:** Short-lasting mild to moderate feelings of coldness, warmth or pain at the injection site have been uncommonly observed in association with the venous puncture or contrast medium injection. On paravascular injection Gadovist® may cause tissue pain lasting up to several minutes. Hypersensitivity reactions (e.g. urticaria, rash, vasodilatation) have been uncommonly reported and were mostly of mild to moderate intensity. In rare cases, anaphylactoid reactions (after hours to days) have been observed rarely. Patients with an allergic disposition suffer more frequently than others from hypersensitivity reactions. Isolated cases of renal impairment for renal impairment aggravation have been reported. Isolated cases of nephrogenic systemic fibrosis (NSF) have been reported with Gadovist®. **Date of revision of text:** June 2011. **Please note:** for current prescribing information refer to the package insert and/or contact your local Bayer Healthcare organisation: Bayer Pharma AG, 13352 Berlin, Germany. Adverse reactions can be reported to GVL.CaseProcessing@bayerhealthcare.com

- All courses are held in English language.
- The duration of each course is 5 x 4 hours except of the course on 'Advanced MR Imaging of the Abdomen'. The courses start either on Thursday between 8 and 9 a.m. or between 1 and 2 p.m. and last until Saturday between 1 and 2 p.m. or between 5 or 6 p.m. The course in London will start Wednesday noon and last until Friday evening.
- The detailed programme of each course as well as the exact time schedule are available at the ESMRMB website.
- 50% of the total teaching time is used for repetitions in small groups (maximum 17 people per group) to intensify the learning experience.
- A maximum of 65 places per course is available. **If less than 30 participants register, ESMRMB reserves the right to cancel a course at the latest 4 weeks prior to its beginning.** The course on 'MR Safety' is limited to 30 participants.
- ESMRMB ensures the evaluation of all courses and guarantees professional and didactically experienced teachers.
- The School of MRI programme is accredited by the European Accreditation Council for Continuing Medical Education (EACCME). A certificate of attendance will be handed out on-site for participation in the entire course.
- A voluntary examination will be held at the end of each course. Participants who have successfully passed the examination will be provided with a special confirmation of attendance on-site.

Filming and Recording Policy

Filming and recording during the courses is basically not permitted. Exceptions may be granted by the course organiser on-site. If you wish to record any lecture (for your personal use only), please contact the respective lecturer and course organiser for permission.

Registration Information

For information regarding registration and registration fees, please refer to page 35.

Please note that registration is possible online at www.esmrmmb.org

Grants for Residents offered by Bayer Pharma AG

Further to the exclusive sponsoring of the courses, Bayer Pharma AG offers up to 2 grants per course to residents in less developed countries. The grant covers the course fee and includes a contribution to lodging (€ 120).

Applicants are kindly invited to send:

- a letter of application
- a CV
- an attestation of the head of department confirming their resident status
- the grant application form

no later than **8 weeks** prior to the beginning of the relevant course to the ESMRMB Office.

Please note that it is possible to choose a maximum of three courses for which you would like to apply for a grant. However, you will only be able to receive a grant for one course in 2012.

Notifications of acceptance / rejection will be sent to all applicants 6 weeks prior to the course beginning.

Applicants have to be residents in the first 5 years of clinical radiological training.

Please note that for grant applicants from the host city only the registration fees will be waived (no contribution to lodging).

Please send your grant application to

ESMRMB Office
School of MRI Programme
Neutorgasse 9/2a
AT-1010 Vienna
or by email to office@esmrmmb.org

The grant application form is available online at www.school-of-mri.org

Body Diffusion-weighted MR Imaging: From Theory to Practice

10

April 18–20, 2012
London/UK

Course organiser:
Dow-Mu Koh
London/UK



Local organiser:
Dow-Mu Koh
London/UK

Course venue:
The Royal Marsden Hospital
Education & Conference Centre
Stewart's Grove, Chelsea
London, SW3 6JJ
United Kingdom

Preliminary faculty:
C. de Bazelaire, F. De Keyzer, D-M. Koh, R. Maroldi,
C. Matos, A. Padhani, H.P. Schlemmer, T. Takahara,
H. Thoeny, I. Thomassin-Naggara

Course duration:
Wednesday noon – Friday evening

Diffusion-weighted MR imaging is increasingly utilised in the body in oncology to improve patient management. In this course, an expert panel will review the use of diffusion-weighted MR imaging according to regions of the body, highlighting the current and emerging roles for disease detection, disease characterisation, tumour response assessment, disease prognostication and the evaluation of disease relapse. The technical aspects of performing diffusion-weighted MR imaging in the body will be discussed. Other roles for the technique such as whole body imaging and the evaluation of inflammatory conditions will also be covered.

Participation requirements:
Participants should be physicians or technicians who have basic knowledge in MRI techniques and are experienced in MRI (6 months minimum).



European
Multidisciplinary
for excellence in
teaching

Grants available for
Body Diffusion-
weighted MR
Imaging: From
Theory to Practice
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Learning Objectives

Principles of body diffusion-weighted MR imaging (DW-MRI) and technical optimisation

- Principles of DW-MRI
- Choice of imaging sequence
- Selection of b-values
- ADC quantification
- Sources and types of artefacts
- Technical optimisation to improve signal-to-noise and to reduce artefacts

DW-MRI in the head and neck

- Implementation of DW-MRI in head and neck region
- Detection and characterisation of head and neck tumours
- Nodal assessment
- Treatment response assessment
- Residual and recurrent diseases
- Evaluation of salivary glands

DW-MRI of diseases in the breast

- Performing DW-MRI in the breast
- Disease detection
- Characterisation of benign and malignant lesions
- Assessment of response to chemoradiation therapy
- Using DW-MRI in breast screening
- Avoidance of pitfalls

DW-MRI of the liver and abdomen

- Choice of imaging technique in liver and abdomen
- Implementation of DW-MRI in clinical protocols
- Applications in the cirrhotic and non-cirrhotic liver
- Applications in the pancreas
- Applications in the biliary tract
- Applications in the small bowel and colon
- Tumour detection, characterisation and assessment of treatment response

DW-MRI of the kidney and ureter

- Technical implementation in the kidneys and upper urinary tract
- Evaluation of renal function using DW-MRI
- Clinical applications of DW-MRI in diffuse renal disease
- Application of DW-MRI in the assessment of focal renal lesions
- Potential challenges



DW-MRI of the male pelvis

- Technical implementation in the male pelvis
- Choice of b-values
- Disease of the prostate: tumour versus benign prostatic hypertrophy
- Combining DW-MRI with morphological and other imaging
- Evaluation of diseases of the urinary bladder
- Evaluation of diseases of the rectum

DW-MRI of the female pelvis

- Technical implementation for evaluating the female reproductive organs
- Evaluation of diseases of the vagina
- Evaluation of diseases of the cervix
- Evaluation of diseases of uterus
- Evaluation of adnexal masses and the ovaries
- Tumour detection, characterisation and assessment of treatment response
- Practical usage in clinical routine

DW-MRI for the assessment of treatment response: why, when and how?

- Assessment of tumour response to treatment using validated criteria
- Impetus of using functional imaging techniques to assessment treatment response
- ADC as a quantitative metric for response assessment
- ADC reproducibility
- Evidence of using ADC to asses tumour response to radiotherapy, chemotherapy, radiochemotherapy and minimally invasive treatments
- Unmet challenges

Whole-body MRI including DW-MRI: assessing bone and soft tissues

- Current challenges of evaluating metastatic bone disease and diffuse marrow involvement
- Impetus for whole body MRI and whole body DW-MRI
- Technical implementation
- Image interpretation and avoidance of pitfalls
- Normal evolution of marrow DW-MRI signal and ADC values
- Potential clinical applications

Non-oncological applications of body DW-MRI

- Key non-oncological applications of body DW-MRI
- MR neurography for evaluation of peripheral nerves: technical implementation and clinical application
- Evaluation of infective and inflammatory conditions in the body

City information London

Population:	~7,825,200
Time zone:	CET -1
Currency:	GBP (Pound Sterling)
Country dialling code:	+44
Closest airports:	London Heathrow (LHR), London Gatwick (LGW), London Stansted (STN), London Luton (LTN), London City Airport (LCY)

London – capital city of England and the United Kingdom – is one of the largest cities in Europe. London is not only a financial and educational powerhouse but also renowned for its art and history. London has the highest number of universities and educational institutions of any city within the European Union. Famous sights worth visiting include London Bridge, Buckingham Palace and Big Ben, which has a light in the clock tower which indicates when the House of Commons is in session.

Transport:

Heathrow airport is located to the west of the city and is accessible with the London underground (Piccadilly Line) or Heathrow Express train to Paddington Station. An underground ticket from Heathrow to central London costs about £6 and a one-way ticket with the Heathrow Express around £18. A taxi ride takes approx. 45-60 minutes and costs between £45 and £80.

London Gatwick is the second largest airport in the UK, after Heathrow and is located around 45km south of London. There are direct bus and train services to the city centre of London and fares range from £15 – £25 one-way.

London Stansted is connected to London Liverpool Street by the Stansted Express and a one-way ticket costs approx. £21. London Luton is also served by National Express coaches, trains, buses and taxis. London City Airport is easy to reach by public transport, with the Docklands Light Railway service linking it to London’s underground and national rail stations.

Hotel information: www.school-of-mri.org

Advanced MR Imaging of the Musculoskeletal System

Grants available for
Advanced MR
Imaging of the
Musculoskeletal
System
more information on
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12

April 26–28, 2012
Glasgow/UK

Course organiser:
Prudencia Tyrrell
Oswestry/UK



Local organiser:
David Ritchie
Glasgow/UK

Course venue:
Beardmore Hotel and Conference Centre
Beardmore Street
Clydebank
Glasgow, G81 4SA
United Kingdom

Preliminary faculty:
A. Karantanas, F. Lecouvet, E. McNally, I. Nöbauer,
V. Pullicino, N. Theumann, P. Tyrrell, F. Vanhoenacker,
K. Wörtler, M. Zanetti

Course duration:
Thursday morning – Saturday noon

October 25–27, 2012
Cairo/EG

Course organiser:
Klaus Wörtler
Munich/DE



Local organiser:
Yasser Abbas
Cairo/EG

Course venue:
Ain Shams University Hospitals
Centre for training, development and continuing education
Ramses Street – Abbassia
Cairo
Egypt

Preliminary faculty:
C. Glaser, A. Grainger, A. Karantanas, F. Lecouvet,
E. McNally, V. Pullicino, N. Theumann, F. Vanhoenacker,
K. Wörtler, M. Zanetti,

Course duration:
Thursday morning – Saturday noon

MR Imaging of the musculoskeletal system is one of the most common requests in clinical routine work. MRI is more sensitive than x-rays and CT in the detection of tumours, degeneration, inflammation and sports injuries. However, specificity is often low and requires the knowledge of morphologic signs or specific sequence protocols. In this advanced course 10 topics are addressed: bone and soft-tissue tumours, hip/pelvis, bone marrow, knee, sports injuries, shoulder, elbow, hand and wrist, spine and foot/ankle. In each topic 4-5 challenging subjects are presented with anatomy, typical and atypical imaging examples and results from the recent literature. The course will be a combination of lectures and case based repetitions in small groups. We are looking forward to welcoming you to this international course, which is held by renowned clinical experts from Europe.

Participation requirements:

Physicians who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; minimum of 6 months experience in applied MRI of the musculoskeletal system.

City information Glasgow



Population:	~600,000
Currency:	GBP (Pound Sterling)
Time zone:	CET -1
Country dialling code:	+44
Closest airports:	Glasgow International Airport (GLA), Glasgow Prestwick Airport (PIK), Edinburgh Airport (EDI)

Glasgow is one of the liveliest and most cosmopolitan destinations in Europe. The city has been reborn as a centre of style and vitality set against a backdrop of outstanding Victorian architecture. Glasgow boasts world famous art collections, several museums, the best shopping in the United Kingdom outside London, and the most vibrant and exciting nightlife in Scotland.

The four-star Beardmore Hotel and Conference Centre in Clydebank, near Glasgow, has a waterfront location on the banks of the River Clyde. There are quick transfer times to Glasgow city centre (about 11km), as well as the national motorway and rail networks.

Transport:

The Beardmore Hotel and Conference Centre is approximately 15 minutes from the Glasgow International Airport by taxi and offers a courtesy transfer to Glasgow International Airport. This is available on request and subject to availability. For directions from Glasgow Prestwick Airport and Edinburgh Airport to the Beardmore Hotel and Conference Centre, please visit www.school-of-mri.org.

Hotel information: www.school-of-mri.org



Learning Objectives

Bone and Soft-Tissue Tumours

- How to perform an MRI for bone tumours
- How to perform MRI for soft-tissue tumours
- Differential diagnosis of soft-tissue lesions
- Differential diagnosis of bone lesions
- Joint tumours and pseudotumoural lesions

Hip/Pelvis

- How I perform, read and report a hip exam
- Labral anatomy and pathology
- Types of femoro-acetabular impingement (FAI)
- BME in the hip: Transient osteoporosis, Osteoarthritis or Osteonecrosis?

Bone Marrow

- Normal distribution of bone marrow and bone marrow variations
- Principles of focal and diffuse bone marrow replacement
- Benign versus malignant vertebral compression fractures
- Multiple myeloma/whole body Imaging

Knee

- Imaging strategies and sequence protocols
- Cruciate and collateral ligaments and menisci
- Osteochondral defects and osteonecrosis
- Bone marrow oedema

Sports Injuries

- Lesions of the muscle tendon unit including myositis ossificans
- Athletic groin injuries
- Sports injuries of fingers and toes

Shoulder

- How I perform, read and report a shoulder exam
- Classification of Impingement
- Rotator cuff lesions
- Shoulder instability and microinstability

Elbow

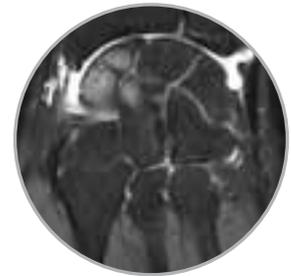
- How I perform, read and report an exam of the elbow
- Anatomic variants: simulating disease
- Lesions in lateral/medial/anterior/posterior pain

Hand + Wrist

- How I perform, read and report an exam of the wrist
- TFCC Lesions
- Carpal instability
- Tumours of the hand and wrist

Spine

- Disc degeneration and disc prolapse
- Spondylodiscitis
- Sero-negative spondylarthropathies
- Sacrum and sacroilitis



Foot/Ankle

- How I perform, read and report a foot exam (including ligaments and tendons)
- Variants sometimes causing disease
- Bone marrow edema: Transient osteoporosis – osteonecrosis – mechanical stress reaction
- Nerve entrapments including Morton's neuroma and its differential

City information Cairo



Population:	~8,000,000
Currency:	EGP (Egyptian Pound)
Time zone:	CET +1
Country dialling code:	+20
Closest airport:	Cairo International Airport (CAI)
Visa:	required

Cairo is situated in northern Egypt, known as Lower Egypt, 165km south of the Mediterranean Sea and 120km west of the Gulf of Suez and Suez Canal. The city is built on both sides of the Nile River. Cairo is the capital of Egypt and one of the largest cities in Africa and the Arab World, as well as one of the most densely populated cities worldwide. Cairo hosts the world's second oldest degree granting university. The city offers famous sights such as the Egyptian Museum,

the Hanging Church, the Citadel and the Sphinx. The Great Pyramids of Giza are also close to the city.

Transport:

The Cairo International Airport is located to the northeast of the city around 20km from the business area of the city. It takes about 30 minutes by taxi to go to the city centre. A bus goes from the airport to the Egyptian museum which is also located in the city centre.

Transportation in Cairo comprises an extensive road network, rail, subway, tram and bus system. Cairo, particularly Ramses Square, is the centre of almost the entire Egyptian transportation network.

Hotel information: www.school-of-mri.org

Clinical fMRI & DTI – Theory and Practice

14

**May 24–26, 2012
Uppsala/SE**

**Course organiser:
Stefan Sunaert
Leuven/BE**



**Local organiser:
Elna-Marie Larsson
Uppsala/SE**

Course venue:
Department of Radiology
Uppsala University Hospital
Akamiska sjukhuset
751 85 Uppsala
Sweden

Preliminary faculty:
D. Jones, E.M. Larsson, S. Lehéricy, A. Leemans, A. Morell,
R. Peeters, M. Smits, S. Sunaert, D. Van Westen, S. Williams

Course duration:
Thursday morning – Saturday noon

The aim of this course is to convey in-depth knowledge about functional MRI (fMRI) and diffusion tensor imaging (DTI). These relatively new MR techniques are increasingly applied to the study of the healthy and pathological human brain and provide information about neuronal network activity and connectivity. The course will offer an overview of present methodologies, an update about functional anatomy and an overview of clinical & research applications. These topics will be taught using a mixture of lectures and small group exercises. Furthermore, there will be a 4-hour practical session on a 1.5T and 3T imager with scanning of volunteers during fMRI/DTI experiments. A hands-on workshop on data analysis will be provided. Finally, special attention is given to the (clinical) interpretation of specific cases. These cases include results from both routine presurgical fMRI examinations and more advanced fMRI (group) studies. We are happy to welcome you to this course in Uppsala!

Participation requirements:
Physicians, technologists and psychologists who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge from other sources; minimum of 3 months experience in applied MRI and/or fMRI or DTI.

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Clinical fMRI &
DTI – Theory and
Practice
more information on
page 9

Learning Objectives

Basics of fMRI

- Physiological principles of fMRI
- Blood oxygen level dependent contrast (BOLD) MR technique and imaging sequences
- Resting state fMRI

Basics of DTI

- Physiological principles of anisotropic diffusion
- DTI technique and imaging sequences
- Concepts of quantification of white matter integrity
- Concepts of fiber tractography

Experimental Design

- Technical set-up for fMRI
- Blocked versus event-related paradigms
- Paradigms: development, implementation and pitfalls

Data Analysis

- Preprocessing
- Statistical analysis
- Fiber tractography

Functional Anatomy

- Motor system
- Language system
- Visual system
- Auditory system
- Applications and (clinical) interpretation

fMRI/DTI in Neurology

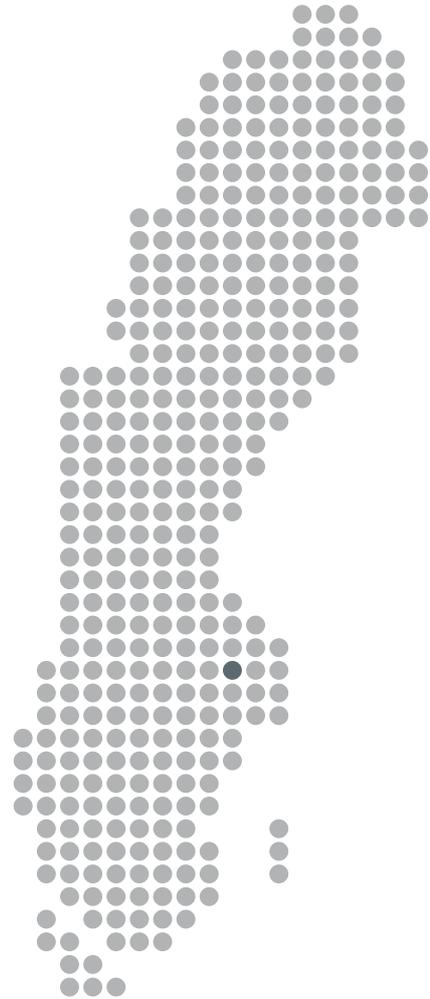
- Application in stroke
- Application in multiple sclerosis
- Application in neurodegenerative diseases
- Plasticity

Presurgical fMRI/DTI

- Risk estimation in brain tumour patients
- Combining fMRI and DTI in brain tumour patients
- Challenges and pitfalls

fMRI/DTI in Psychiatry

- Applications in psychiatric disease
- Pharmacological fMRI
- Pitfalls



City information Uppsala

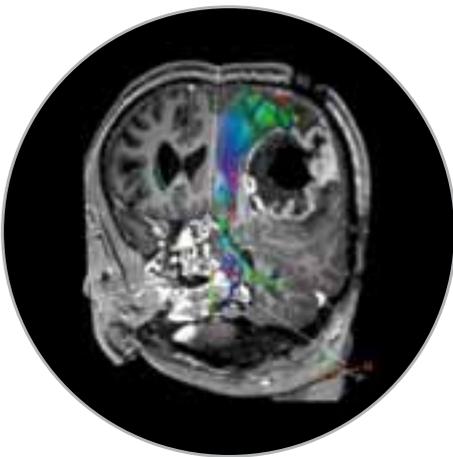
Population:	~200.000
Time zone:	CET +1
Currency:	SEK (Swedish Krona)
Country dialling code:	+46
Closest airport:	Stockholm Arlanda Airport (ARN)

Most of the places of interest are in the western part, dominated by the cathedral, old streets, river views and parks. The most prominent building in Uppsala is the Domkyrka (Uppsala Cathedral), Scandinavia's largest church, which is visible from most parts of the town and from the motorway. Uppsala Slott (Castle) in the centre of the city is a 16th century royal castle which has played a major role in the history of Sweden. In May, the temperature is usually around 20°C in Uppsala.

Transport:

Stockholm Arlanda Airport is located around 35km south of Uppsala. The train to Uppsala departs from a train station inside Arlanda Airport and the duration of the train ride is around 17 minutes. It takes around 10 minutes to walk from the railway station in Uppsala to the hospital and 5-10 minutes to most of the central hotels. There are also frequent city buses from the railway station to the hospital and the bus trip takes about 5 minutes. Uppsala has long been on the northern main line, which allows for excellent train services to the rest of Sweden. The journey to Stockholm city centre takes 40 minutes.

Hotel information: www.school-of-mri.org



Advanced MR Imaging in Paediatric Radiology

Grants available for
Advanced
MR Imaging
in Paediatric
Radiology
more information on
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16

**June 14–16, 2012
Barcelona/ES**

**Course organiser:
Fred Avni
Brussels/BE**



**Local organiser:
Goya Enriquez
Barcelona/ES**

**Course venue:
Universitat Pompeu Fabra
Plaça de la Mercè, 10-12
08002 Barcelona
Spain**

Preliminary faculty:
A. Borthne, M. Cassart, A. Castellote, J.N. Dacher,
R. Nieselstein, O. Olsen, P. Petit, A. Rossi, G. Sebag,
E. Vazquez

Course duration:
Thursday morning – Saturday noon

With this course, we intend to familiarise the attendees with MR Imaging in children so that the indications would be better understood and the examinations optimised. The ten topics that have been chosen cover most of nowadays indications. Experienced lecturers have been chosen according to their technical and pedagogic skills.

Participation requirements:
Physicians who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; minimum of 6 months experience in applied Paediatric MRI.

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Learning Objectives

MRI in children: Optimal Preparation and Techniques

- To describe the environment and monitoring that is indispensable for the success of the examination
- To optimise the sequences for paediatric examinations

Neuro MRI 1

- Techniques of neuro MRI
- Neonatal lesions & infections

Neuro MRI 2

- Malformations (brain & spine), tumours
- Presentation, sequences, strategy

Cardiovascular MRI in children

- To discuss the strategy of imaging cardiovascular anomalies in children
- To illustrate the strengths and limitations of the technique

Musculoskeletal MRI in children 1

- To optimise musculoskeletal sequences for their use in children trauma (mainly focused on sports injuries), tumours and osteonecrosis

Musculoskeletal MRI in children 2

- Infections, soft tissues pathology: differential diagnostics, typical and atypical features
- Notion of whole body

MR Urography in children

- To discuss the strategy for the work-up of congenital urinary tract malformations
- To discuss the role of Uro-MRI in the assessment of renal function

Fetal MRI

- To discuss the best indications and sequences of fetal MR imaging
- To illustrate anomalies affecting the fetal brain, chest and abdomen

Abdominal MRI: Tumours

- To discuss the best strategy for the work-up of paediatric abdominal tumours
- To illustrate the features of most common tumours of the child's abdomen (liver, adrenal, kidneys, etc.)

Abdominal MRI: Digestive Tract

- To illustrate more recent MRI applications in the paediatric abdomen, including biliary tract evaluation and entero MRI



City information Barcelona

Population:	~1,621,500
Time zone:	CET
Currency:	EUR
Country dialling code:	+34
Closest airport:	Barcelona Airport (BCN)

Barcelona is the second largest city in Spain and the most famous city in Catalonia. It is also the largest city on the Mediterranean coast. Barcelona has a lot of cultural heritage and is, therefore, a major tourist destination. The architectural works of Antoni Gaudí and Lluís Domènech i Montaner have been designated as UNESCO World Heritage Sites. Gaudí's masterpiece La Sagrada Família, which is still under construction, is the international symbol of Barcelona. Among Barcelona's many other attractions is its coastal location, which gives visitors the chance to go sightseeing or simply relax on the beach.

Transport:

Barcelona airport is 17km from the city centre and the second largest airport in Spain. The airport is accessible via motorway, train (Barcelona Airport Railway Station) or bus. The TMB (Transports Metropolitans de Barcelona) – line 46 – runs every 16 minutes and terminates at Plaça Espanya. A one-way ticket costs around €1.45. Taxis are available at both terminals I & II. For further information about transfer options from Barcelona airport to the city centre of Barcelona, please visit the following website: <http://www.barcelona-tourist-guide.com/en/airport/barcelona-airport-transport.html>

Hotel information: www.school-of-mri.org

Advanced Breast & Female Pelvis MR Imaging

18

**June 28–30, 2012
Budapest/HU**

**Course organiser:
Rahel Kubik
Baden/CH**



**Local organisers:
Viktor Bérczi & Gábor Forrai
Budapest/HU**

**Course venue:
Semmelweis University
Tűzoltó utca 37-47
1094 Budapest
Hungary**

Preliminary faculty:
V. Bérczi, G. Forrai, B. Hamm, R. Kubik, R. Manfredi,
V. Martinez de Vega, T. Metens, M. Müller-Schimpfle,
A. Rieber-Brambs, A. Rockall, D. Weishaupt

Course duration:
Thursday morning – Saturday noon

Technical advances have opened up new diagnostic applications in female MR imaging with MRI gaining an increasing role in this patient population also in a clinical routine setting. This course will offer an overview of current MR imaging strategies for the diagnosis of breast and pelvic pathologies including fetal imaging and pelvic floor MRI. Established as well as potential future indications will be reviewed compared to other imaging examinations. We will discuss hard- and software requirements of MR systems for optimal clinical use as well as the optimisation of imaging strategies and diagnostic advantages arising from the application of contrast agents. The aim of the course is furthermore to convey indepth knowledge of morphological changes of the breast and pelvic female organs under pathological conditions. We would like to welcome you to this course in Budapest, HU, where European experts in the field of female MR imaging will be given the opportunity to share their knowledge with you in plenary lectures and small group exercises.

Participation requirements:
Physicians who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; some experience in applied MRI of the breast and pelvis.

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Grants available for
Advanced
Breast & Female
Pelvis MR Imaging
more information on
page 9

Learning Objectives

MR Imaging Techniques (Breast & Female Pelvis)

- Hard- and software requirements
- Basic pulse sequences for breast and pelvic MRI
- Advanced pulse sequences (including ultrafast sequences)
- Image post processing
- Recent and future developments

Female Pelvis: Protocol Optimisation, Benign Disease of the Uterus

- Optimised MR imaging strategy
- Normal MR appearance of the female pelvis according to age and menstrual cycle
- Mullerian duct abnormalities: indication for MRI compared to HSG and US
- To diagnose and differentiate leiomyoma from adenomyosis
- Questions to be answered by MRI before and after leiomyoma embolisation

MR Imaging of the Cervix and the Uterus: Malignant Lesions

- Optimised MR imaging strategy
- MR appearance of malignant lesions of the cervix
- MR appearance of malignant lesions of the uterus
- Staging of malignancies
- Follow-up of malignant tumours

MR Imaging of the Ovaries

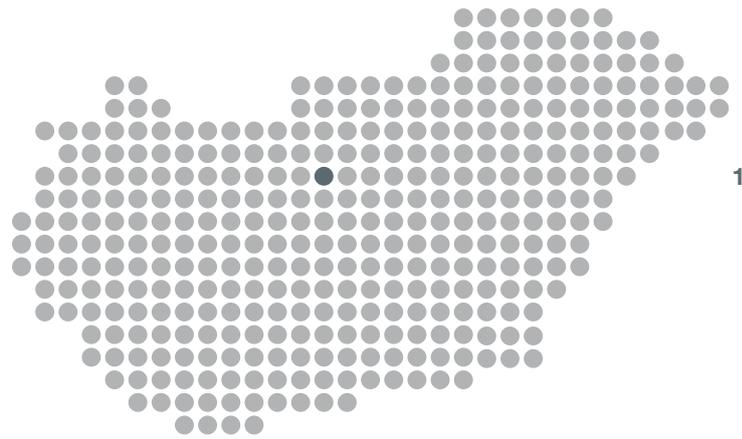
- Optimised MR imaging strategy including DWI
- Appearance of the normal ovaries on T1-, and T2-weighted images and the enhancement patterns
- Indications for MRI compared to US and CT for imaging in patients with adnexal masses
- Benign and malignant lesions
- Staging and follow-up of ovarian carcinoma

MR Imaging of the Pelvic Floor

- Hard- and software requirements
- Application of open magnet systems
- Optimised MR imaging strategy
- Anatomy of the pelvic floor
- Indications for MRI in the incontinent patient
- Anorectal diseases

MRI in the Obstetric Patient/Fetal MRI

- Safety considerations
- Contrast agents in the pregnant and nursing patient
- Optimised MR imaging strategy, including ultrafast sequences
- Indications for MRI in the obstetric population
- MRI of the healthy fetus and the uteroplacental unit
- Morphological changes in fetal malformation and pathology



Technical Aspects of Breast MRI

- Hard- and software requirements
- Currently used 2D and 3D techniques
- Post-processing of the source images
- Importance of temporal and spatial resolution
- New sequences: Diffusion-weighted image (DWI) and spectroscopy of the breast

MR Imaging of the Breast

- Breast imaging protocol
- BIRADS-classification for breast MRI
- Indications of breast
- Pitfalls & limitations
- Interventional techniques in breast MRI
- Breast MRI following breast surgery
- Breast implants and implant failure

MRI of the Breast: Screening the high Risk Population

- Pros and Cons of breast cancer screening using MRI
- How to select women who benefit most?
- How and when to perform MRI?

MRI: Lymph node Staging

- Imaging strategy
- Plain MRI
- Contrast-enhanced MRI
- Lymphatic spread in uterine tumours

City information Budapest

Population:	~1,700,000
Time zone:	CET
Currency:	HUF (Hungarian Forint)
Country dialling code:	+36
Closest airport:	Budapest Ferihegy ('Franz Liszt') Airport (BUD)

Budapest, the capital of Hungary, is widely regarded as one of the most beautiful cities in Europe, and it is also known as the Queen of the Danube or the Paris of the East.

The city, full of historical monuments, possesses a rich and fascinating history as well as a vibrant cultural heritage. Budapest was created through the union of three separate towns Buda, Óbuda and Pest.

Budapest is divided by the River Danube which flows right through the heart of the city. The Chain Bridge, which is perhaps the most recognisable symbol of the city, besides the Parliament, connects Buda with Pest and was the first permanent bridge built over the River Danube, symbolising the unification.

Buda hill with the Palace on its summit creates a mediaeval atmosphere. It is home to several museums including the National Gallery, the Ludwig Museum of Modern Art and the Budapest Palace Museum. A large part of the centre of the city enjoys UNESCO World Heritage status, including the famous Heroes' Square. There are two dozen baths and thirteen medicinal baths, which make the city the largest spa centre in the world.

Transport:

Budapest's international airport is located at Ferihegy, which is 16km south-east of the city. The official taxi operator for Budapest Airport is the Fötaxi. You can order a cab at their desk in the airport or by telephone (+36-1-222-22-22) for a fixed and reasonable price (HUF ~5,200).

Buses (service no. 200E) run from Köbánya-Kispest terminus, metro line 3 to Ferihegy terminals 1 and 2, every 15 minutes during the day. Passengers can also reach Ferihegy terminal 1 by train from the Western Railway Station in Budapest.

The Airport Shuttle service has a desk at the airport. Tickets can be purchased in the customs area or at the LRI Airport Passenger Service desk in the waiting area (HUF ~3,000, usual waiting time is 15-20 minutes).

Hotel information: www.school-of-mri.org

Advanced MR Imaging of the Chest

20

July 5–7, 2012
Ljubljana/SI

Course organiser:
Hans-Ulrich Kauczor
Heidelberg/DE



Local organiser:
Dimitrij Kuhelj
Ljubljana/SI

Course venue:
University Clinical Centre Ljubljana
Zaloška 7
1552 Ljubljana
Slovenia

Preliminary faculty:
J. Biederer, M. Bock, F. Laurent, S. Ley, F. Molinari,
M. Puderbach, E. van Beek, J. Wild

Course duration:
Thursday morning – Saturday noon

Technical advances have opened up more and more diagnostic applications in MRI of the chest. It plays an increasing role in chest radiology even in a routine clinical setting. This course will offer an overview of current and easy-to-use MRI strategies including morphological and functional imaging for the diagnosis of pulmonary diseases as well as pulmonary and mediastinal vascular diseases and congenital anomalies. Established as well as potential future indications will be reviewed and compared to other imaging techniques. Since MRI of the chest is still a rather infrequent request in clinical routine work, there are some deficits of expertise and lack of confidence when MRI of the chest is to be performed. Although MRI has a lower spatial resolution than CT, which is the gold standard for imaging the pulmonary parenchyma, MRI offers a unique package combining structural and functional image-based information. MRI provides images and quantitative data about the different aspects of pulmonary disease, lung function and cardiopulmonary interaction. The course will be a combination of lectures and case-based interactive teaching in small groups. We are looking forward to welcoming you to this international course, which is held by renowned clinical experts from Europe in the beautiful city of Ljubljana.

Participation requirements:

Physicians who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; minimum of 6 months experience in applied MRI of the abdomen, heart or vascular system.

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Grants available for
Advanced MR
Imaging of the
Chest
more information on
page 9

Learning Objectives

Techniques

- Signal and contrast optimisation
- Respiratory motion and pulsation
- Suggested standard protocol
- MRA and perfusion imaging
- Flow measurements and cardiopulmonary interaction
- Proton-based ventilation imaging
- Non-proton imaging
- Paediatric and prenatal protocol

Vascular Disease

- Acute pulmonary embolism
- Pulmonary hypertension
- Vascular anomalies

Airway Disease

- Cystic Fibrosis
- Obstructive lung disease: asthma, COPD
- Paediatric lung diseases

Inflammatory Disease

- Pneumonia
- Tuberculosis
- Pneumonitis

Neoplastic Disease

- Pulmonary nodules
- Lung cancer staging
- Pleural and chest wall tumours
- Mediastinal tumours
- Pulmonary staging in whole body MRI





City information Ljubljana

Population:	~280,000
Time zone:	CET
Currency:	EUR
Country dialling code:	+386
Closest airport:	Ljubljana Jože Pučnik Airport (LJU)

Ljubljana is a central European city which lies between the Alps and the Adriatic Sea, in a basin where the Ljubljanica river flows into the Sava. It is the capital of Slovenia and also the largest city. It has all the amenities of a modern capital, but it has preserved its small-town friendliness and relaxed atmosphere. It is a vibrant city full of surprises. Its surrounding areas, packed with natural beauty and cultural sights, testimony to the city's dynamic history, are renowned for their walking, hiking and cycling trails and a wide variety of culinary delights. Ljubljana combines tradition and cultural heritage with modern life in a harmonic way. It hosts 14 international festivals a year, which focus on classical music, art, theatre and much more. Most places are likely to be within walking distance, however, the bus network has been extended over the last few years.

Transport:

Ljubljana Jože Pučnik Airport, located in Brnik near Ljubljana, is the country's main airport. It is less than 26 kilometres from the capital and is only a 20 minute drive. There are shuttle buses available which cost around € 4.10 and the journey takes approximately 45 minutes. Tickets can be purchased on the bus. Furthermore, there are frequent bus services to Slovenia's main railway station in Ljubljana.

Hotel information: www.school-of-mri.org



Advanced MR Imaging of the Abdomen

Grants available for
Advanced MR
Imaging of the
Abdomen
more information on
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22

September 6–8, 2012
Ankara/TR

Course organiser:
Nicholas Gourtsoyiannis
Iraklion/GR



Local organiser:
Deniz Akata
Ankara/TR

Course venue:
Hacettepe University Congress Center
Sihhiye, Ankara
Turkey

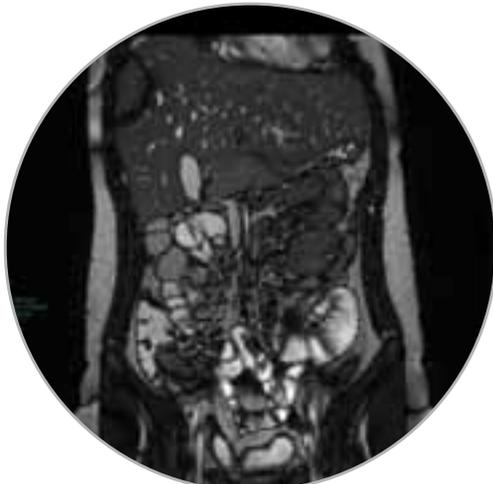
Preliminary faculty:
F. Caseiro-Alves, N. Gourtsoyiannis, C. Matos,
N. Papanikolaou, R. Pozzi-Mucelli, A. Sahdev,
H.P. Schlemmer, Ch. Triantopoulou, M. Zins

Course duration:
Thursday noon – Saturday noon

The course aims to convey an in-depth knowledge about MR imaging of the abdomen. The topics covered include modern MRI techniques and updated MR applications for diagnosing focal and diffuse liver disease as well as recent developments in MR imaging of the pancreas and biliary tract. The course also focuses on MR imaging of the GI tract, the kidneys, adrenal glands, prostate and bladder. A team of renowned teachers with expert knowledge in abdominal imaging ensures a high quality teaching programme and looks forward to welcoming you in Ankara.

Participation requirements:

Physicians who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; minimum of 6 months experience in applied MRI of the Abdomen.



Learning Objectives

Technical Advances in abdominal MR Imaging

- To review diffusion-weighted imaging technical aspects and clinical challenges
- To review perfusion-weighted imaging technical aspects and clinical challenges
- To present technical advances and clinical applications of abdominal MR Spectroscopy

Diffusion-weighted Imaging and MR perfusion studies: Clinical applications in the abdomen

- To present the different options to acquire diffusion-weighted imaging data
- To explain how to interpret diffusion-weighted images and ADC maps
- To provide the results for the detection and the characterisation of abdominal tumours and inflammatory masses
- To comment on the potential of diffusion-weighted imaging to predict and to evaluate the response to therapy

MR Imaging of the Focal Liver Lesions

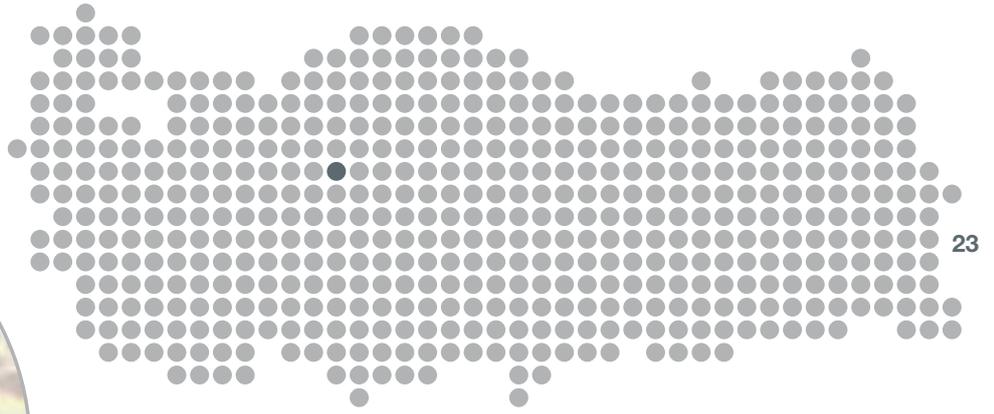
- Appearance on T1 and T2-w sequences
- Contribution of chemical shift imaging and T2* effects
- Role of DWI on detection and characterisation
- Differential diagnosis based on enhancement patterns
- Role of hepatocyte-specific contrast agents

MR Imaging of Diffuse Hepatic Parenchymal Disease and HCC

- Diffuse fatty infiltration, focal non-steatosis, hemosiderosis, hemochromatosis, cirrhosis, portal hypertension, collateral routes, ascites, regenerative nodules, dysplastic nodules, diffuse and focal manifestations of HCC
- Appearance on T1-weighted sequences
- Role of in- and opposed phase imaging
- Role of T1-weighted sequences with long TE
- Appearance on T2-weighted sequences
- Enhancement patterns of cysts, hemangiomas, metastases, FNH, adenomas, and HCC
- Role of SPIO- and Manganese-enhanced imaging

MR Imaging of Pancreatic Lesions

- Appearance of the normal pancreas and tumours on T1-weighted sequences
- Appearance of the normal pancreas and tumours on T2-weighted sequences with short TE
- Enhancement patterns of focal pancreatitis versus pancreatic tumours
- Staging of pancreatic tumours
- Contribution of diffusion-weighted imaging



MR Imaging of the Small Intestine

- Intraluminal contrast agents
- Route of contrast administration
- MR enteroclysis technique
- Normal appearances
- Familiarity with MRE imaging findings in inflammatory and neoplastic diseases
- Crohn disease activity

MR Imaging of the Prostate and Bladder

- Appearance of the normal prostate and tumours on T1-, and T2-weighted images
- The enhancement patterns of benign and malignant lesions
- Prostate carcinoma and the relationship to PSA: current concepts and controversies
- MR spectroscopy

MR Imaging of Anorectal Diseases

- To understand the evidence and perspectives in anal sepsis and rectal cancer MRI
- To understand the role of MR staging in respect to other imaging modalities
- To understand the MR anal and rectal protocol and what clinicians want to know from us

Evolving role of MRI in gynaecology malignancies

- To know the current application of MRI in cervical, endometrial and ovarian cancer
- To understand the limitations of imaging with conventional MRI
- To know future clinical requirements from imaging
- To evaluate the role of dynamic contrast enhanced MRI and diffusion-weighted imaging in ovarian, cervical and endometrial cancer
- To discuss emerging use of spectroscopy in ovarian cancer

City information Ankara

Population:	~4,443,720
Time zone:	CET +1
Currency:	TRY (Turkish Lira)
Country dialling code:	+90
Closest airport:	Ankara Esenboğa International Airport (ESB)

Turkey's capital city Ankara is the second largest city in Turkey, after Istanbul. Centrally located in Anatolia, Ankara is an important commercial and industrial city. It is the seat of the Turkish Government, and houses all foreign embassies. It is an important crossroads for trade, as it is strategically located at the centre of Turkey's highway and railway networks, and serves as the market centre for the surrounding agricultural regions. The name Ankara was chosen in 1930, prior to which it was called Angora for many years.

The ancient city of Ankara offers hundreds of beautiful sights dating back to Hellenistic, Roman and Byzantine times. The remains of the Temple of Augustus and Rome (20BC) – also known as Monumentum Acyranum – is one of Ankara's most famous sights and contains the official records of the Acts of Augustus, known as the Res Gestae Divi Augusti, which are inscribed on the marble walls of the temple.

In antiquity Ankara was famous for the production of Mohair, from the Angora goat, and Angora wool, from the Angora rabbit.

Transport:

Ankara Esenboğa International Airport is located about 28km north-east of the city. The airport is served by the city bus and Havaş bus line. A ticket for the Havaş costs approximately TRY 12.5 one-way. By taxi it takes 30 minutes to reach the city centre and costs about TRY 45.

Hotel information: www.school-of-mri.org

Advanced Cardiac MR Imaging

24

September 6–8, 2012
Sesto Fiorentino (Florence)/IT

Course organiser:
Jens Bremerich
Basel/CH



Local organiser:
Luigi Natale
Sesto Fiorentino (Florence)/IT

Course venue:
Learning and Research Center
Centro Oncologico Fiorentino
Catholic University of Sacred Heart
Via Attilio Ragonieri 101
50019 Sesto Fiorentino (Florence)
Italy

Preliminary faculty:
H. Arheden, J. Bremerich, P. Buser, A. de Roos, D. Didier,
P. Hunold, A. Jacquier, G. Lund, L. Natale, O. Weber

Course duration:
Thursday morning – Saturday noon

MRI has evolved to a valid clinical tool in everyday practice. Its unique capabilities of imaging cardiac morphology and function with excellent spatial, temporal and contrast resolution explain its outstanding role in imaging cardiac disease. Successful cardiac imaging requires thorough knowledge of both, pathology and modality. Beginners and advanced course participants learn basic principles of cardiac MR and review dedicated protocols. Clinical topics provide deep insight into congenital, valvular, ischemic, inflammatory, and pericardial disease as well as storage disorders, masses and cardiomyopathy. Participants discuss these disorders with respect to relevant clinical questions. Strengths and limitations of MR and CT will be highlighted. The focus of this course is MR, but CT and its role for coronary imaging and cardiovascular risk assessment are also addressed.

Participation requirements:
Physicians who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; minimum of 6 months experience in applied Cardiac MRI.



Grants available for
**Advanced Cardiac
MR Imaging**
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**European
Multidisciplinary
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Learning Objectives

Infiltration, Deposition, Inflammation

- T2*-weighted sequences, Late enhancement
- Sarcoidosis
- Amyloidosis
- Hemosiderosis, Thalassemia
- Myocarditis

Heart Failure

- Definition
- Pathophysiology
- Clinical presentation
- Treatment options

Protocols Step-by-Step: Safety, Set-up for Stress

- Set-up for stress test
- Safety considerations
- Dedicated protocols
- Cooperation Radiology/Cardiology/Physics

MRI or CT

- Role of MRI as compared to CT
- Interactive case review

Basic Principles of Cardiac MRI

- Spin-echo, Gradient-echo
- Triggering, gating
- Resolution of time, space, contrast
- Coronaries
- Contrast modulation by preparation pulses

Cardiac CT

- Basic principles
- Coronaries
- Calcium Score
- Valves
- Postprocessing

Congenital and Valvular Heart Disease

- Segmental analysis
- Grown up congenital heart disease
- MR or CT
- Regurgitation, Insufficiency



City information Florence / Sesto Fiorentino

Population:	~370,702 (Florence) / ~47.000 (Sesto Fiorentino)
Time zone:	CET
Currency:	EUR
Country dialling code:	+39
Closest airports:	Florence Airport (FLR), Galileo Galilei Airport Pisa (PSA)

Florence is the capital city of Tuscany in Italy and located on the River Arno. In the past it was known as a financial hub and was once ruled by the powerful Medici family. Every year millions of tourists are attracted by its architecture and cultural heritage such as the Accademia, the Uffizi Gallery and the Pitti Palace. Florence is, furthermore, part of a renowned wine producing region. The famous wine region Chianti lies to the south of the city and is famed for its Sangiovese grapes.

Its many museums display masterpieces by artists such as Donatello, Leonardo da Vinci and Michelangelo.

The city Sesto Fiorentino is situated next to the city Florence. In 1735 one of the first porcelain plants in Europe, the Manifattura di Doccia, was founded in this city. Attractive sights of Sesto Fiorentino are the Pieve di San Martino (a church), the Palazzo Pretorio and the Santa Maria a Quinto.

Transport:

Every 30 minutes, buses from Florence Airport take you to the city centre of Florence. Taxis are stationed in front of the terminal. The journey from the airport to Florence city centre takes about 15 minutes and costs around €20.

There are train and bus links between Galileo Galilei Airport in Pisa and Florence, and the train line provides a shuttle service between the airport and Florence city terminal. Tickets are available in the airport and must be validated prior to boarding the train (by inserting the ticket into a stamping machine on the terminal).

In order to get from the central station in Florence (Firenze Santa Maria Novella) to Sesto Fiorentino, you can take the regional train to Prato/Pistoia, and exit the second stop called 'Firenze Castello' (~ 11 minutes) or the city bus number 2 or 28, getting off at bus stop 'Termine'.

Hotel information: www.school-of-mri.org

Cardiomyopathy

- Pathophysiology
- ARVC
- Non compaction

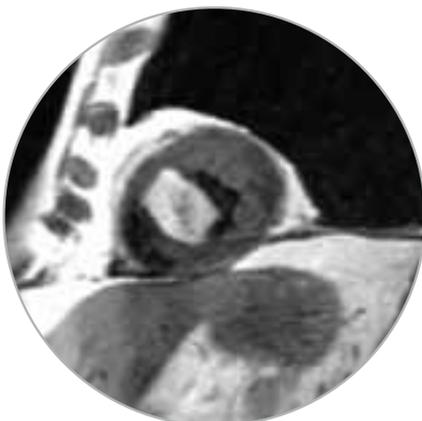
Ischemic Heart Disease:

Infarct, Viability, Perfusion, Stress

- Function
- Perfusion
- Infarct, Viability, Late enhancement

Cardiac Masses, Pericardial Disease

- Systematic approach
- Benign and malignant tumours, metastasis, thrombus
- Acute vs. chronic pericarditis



From Basic Physics to Improved Imaging Strategies

Grants available for
From Basic
Physics to
Improved Imaging
Strategies
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September 13–15, 2012
Tübingen/DE

Course organiser:
Jacques Bittoun
Paris/FR



Local organiser:
Klaus Scheffler
Tübingen/DE

Course venue:
University Hospital Tübingen
Department of Neuroimaging
Hoppe-Seyler-Strasse 3
72076 Tübingen
Germany

Preliminary faculty:
I. Berry, J. Bittoun, S. Kwieciniski, P. Luyten, R. Muller, K. Scheffler,
N. Schwenzler, J. Tintera, S. Ulmer, Ch. Windischberger

Course duration:
Thursday morning – Saturday noon

The aim of the course 'From Basic Physics to Improved Imaging Strategies' is to explain the signification of advanced images in MR imaging and to show how their understanding helps improving imaging strategies in clinical practice. After a reminder of basic imaging principles the lectures explain the numerous advanced methods in MR imaging: contrast agents, angiography, perfusion, diffusion, DWIBS, and fMRI. The last half-day is dedicated to clinical illustrations of the way advanced images improve the diagnosis strategy in neuro and whole-body imaging. Participants will not only learn the mechanisms of such imaging techniques, in simple terms avoiding equations, but also understand the impact of their parameters on contrast and image quality. Participants having daily experience in MR imaging of at least 6 months will benefit most from this course.

Participation requirements:
Participants should be physicians or technicians who have acquired basic knowledge in MRI techniques and are experienced in MRI (6 months minimum).

Learning Objectives

Reminder of the Basic Principles

- Magnetic field – Magnetic moment
- Nuclear spin and nuclear magnetic moment
- Magnetisation of a spin population
- Nuclear Magnetic Resonance (NMR)
- Precession and relaxation – relaxation times
- The NMR signal and its parameters
- Discrimination of space by a magnetic field gradient
- Selective excitation
- Frequency encoding

Theory and Practice of k-space

- Fourier transformation of a time signal
- Notion of spatial frequency
- 2D-Fourier transform of an image
- Definition and properties of k-space
- Rules of k-space scanning
- Examples of k-space scanning
- Frequency and phase encoding

Basic Sequences and Contrast

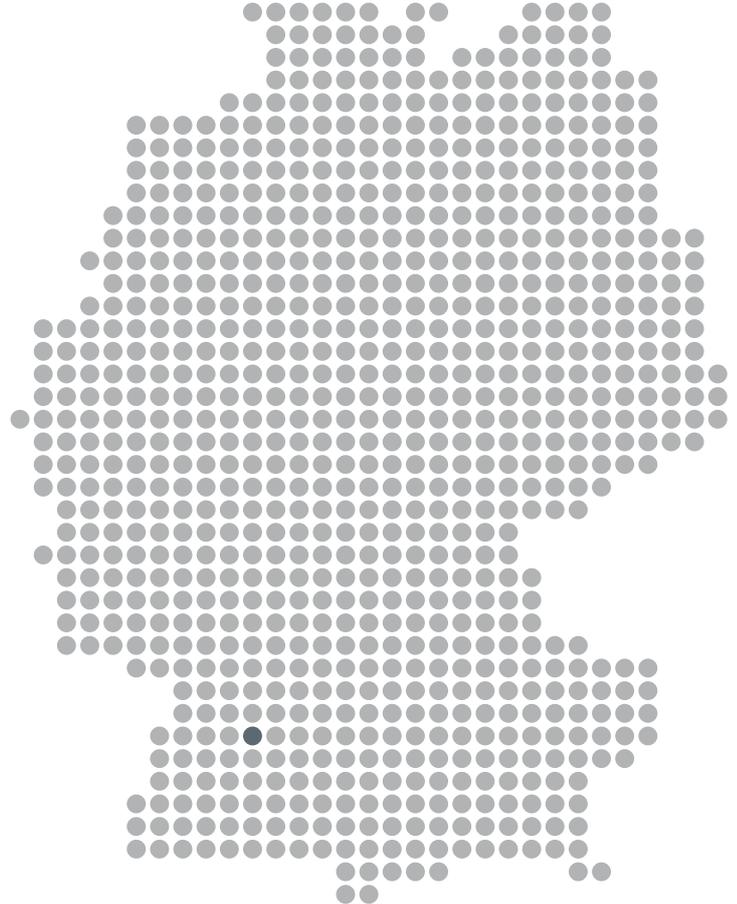
- Spin-echo phenomenon
- Spin-echo sequence, equation and parameters
- Proton density, T1 and T2 weighting
- Gradient echo technique and steady state free precession (SSFP)
- Spoiling techniques and T1 contrast
- Contrast-enhanced-SSFP and T2* contrast
- Saturation pulses

Contrast Agents

- Basic principles of T1 and T2 modification
- Different classes of contrast agents
- Molecules and chelates
- Doses and effects
- Main classes of application

MR Angiography

- Flow phenomena in MRI: time of flight, phase
- Time of flight (TOF) MR angiography
- Phase contrast MR angiography and velocity mapping
- MR angiography using contrast agents:
 - Principles
 - Fast 3D imaging
 - Synchronisation of imaging and injection
 - Methods of bolus chasing
 - Optimisation and k-space



Diffusion and Perfusion

- Principles of diffusion imaging
- Significance of the diffusion tensor
- Main applications of diffusion imaging (fibril orientation, stroke ...)
- Principles of perfusion imaging
- Methods of perfusion imaging using a contrast bolus
- Methods of perfusion imaging using saturation pulses
- Main applications of perfusion imaging

Functional Brain MRI

- Physiological bases of brain activation
- Hemoglobin and T2*: BOLD contrast
- Block and event-like paradigms of activation
- Image processing methods
- Overview of the main results obtained by fMRI of the brain
- Using the BOLD-effect for pharmacological research

DWIBS and Whole-Body MRI

- Dedicated coils for Whole-Body imaging
- Dedicated sequences for Whole-Body imaging
- Whole-Body imaging with diffusion-weighting
- Clinical applications of Whole-Body MRI

Advanced Strategies in Neuroimaging

- Brain tumour mapping – pre-, intra- and postoperative follow-up
- Stroke imaging – from diagnosis to therapy
- Vascular imaging – stenosis of the ACI, dissection, thrombosis of the sinus, AVM and AVF
- Subarachnoidal hemorrhage – acute and follow-up MRI
- Infectious disorders

Advanced Strategies in Body Imaging

- Clinical applications of body MRI
- Clinical case review series
- Integration of body MRI in new hybrid concepts. MR/PET
- Potential applications of MR/PET

City information Tübingen

Population:	~87.000
Time zone:	CET
Currency:	EUR
Country dialling code:	+49
Closest airport:	Stuttgart International Airport (STR)

The ancient Swabian university town of Tübingen is beautifully situated in the middle of the Neckar valley, north-west of the Swabian Alps. Small steps and narrow alleys give the old town of Tübingen its unique character. The Swabian university town combines the charm of a lovingly restored city centre, which dates back to the Middle Ages, with the colourful, bustling and vibrant dynamism of a young and cosmopolitan student city. Numerous street cafés, wine taverns, student pubs, extravagant stores and shops, exquisite restaurants and cosy inns beckon visitors to take a stroll through the city. The most frequently photographed sights in Tübingen are the historical buildings overlooking the Neckar River and the market square with its town hall and Neptune fountain. A trip on one of the renowned Stocherkahn punts along the river Neckar allows for a great view of the picturesque waterfront and Hölderlin tower, named after the German poet Friedrich Hölderlin.

Transport:

Stuttgart Airport is about 40km away from Tübingen. A shuttle-bus called the 'Airport-Sprinter' (Line 828) runs between the airport and Tübingen central bus station. The bus stop is located on the ground floor of the airport building. The bus departs every hour on weekdays and every second hour on Sundays. It takes about 1 hour to reach Tübingen central bus station (in front of the main railway station). The airport is also connected to Stuttgart's main railway station by the 'S-Bahn' (Line S2 and S3). Trains depart for Stuttgart every 10 or 20 minutes. Stuttgart railway station is about 50km away from Tübingen.

Hotel information: www.school-of-mri.org

**October 18–20, 2012
Vienna/AT**

**Course organiser:
Siegfried Trattng
Vienna/AT**

**Local organiser:
Siegfried Trattng
Vienna/AT**

Course venue:
MR Centre of Excellence for High-field MR
Lazarettgasse 14
1090 Vienna
Austria

Preliminary faculty:
P. Bauer, O. Clement, H. Engels, S. Keevil, C. Löwe,
A. Melzer, M. Mühlenweg, G. Schaefer, F. Schick, S. Trattng

Course duration:
Thursday morning – Saturday noon

This course is limited to 30 participants!

The aim of the course is to offer deep insights into the complex physical laws of MR interactions and their dangers with respect to the static magnetic field, the HF field and the gradient fields as well as detailed knowledge of actual laws and norms. In addition the course will provide the training of practical abilities such as to save humans from the control area, behaviour in case of fire and magnetic emergency. We will also focus on competence and the expertise in clinical strategies how to handle implant safety issues in the MR environment, enhance patient safety and improve the MR workflow in daily routine by avoiding unnecessary loss of scanner time. The course will provide a combination of lectures and practical training sessions in smaller groups.

Participation requirements:

The target group can be subdivided into the following three categories:

Hospital: radiologist, radiological technologist, physician, anaesthesiology staff, nurse, technical or medical researcher, maintenance staff and patient supervisor

Scientific institute: operator / bio-technician, researcher, maintenance staff

MRI manufacturer: application specialists, researcher, developer, system tester, production staff member



Learning Objectives

Statutory framework, standards, responsibilities, EU directive

- MRI in the context of European health and safety legislation
- Existing national and international EMF exposure guidelines and standards
- EC standard 60601-2-33
- The Physical Agents (EMF) Directive: state of play and possible future developments

Introduction to construction and function of an MRI scanner

- Update on MR scanner components
- Update on MR basics

A systematic overview on MR interactions with magnetic and electrically conductive materials

- Characteristics of the static magnetic field inside and around a clinical MR system
- Forces and torques acting on magnetic materials in static magnetic fields
- Characteristics of the radiofrequency electromagnetic transmitter field and of the gradient fields
- Induction of electrical currents by time varying electrical and magnetic RF fields in conductive structures and tissue
- Conditions for undesired heating effects

Risks in MRI I: static B0 field, dangers due to superconductors

- Value of the static magnetic field around the magnet
- Exposure limits for static magnetic fields
- Potential risks for human exposure to static magnetic fields
- Dependency of physiologic effects on relevant parameters of the static magnetic field
- Potential risks of superconducting magnets

Risks in MRI II: MR gradients and RF

- Exposure limits for low frequency gradient fields
- Potential risks for humans with gradient fields
- Exposure limits for high frequency HF fields
- Potential risks of high frequency HF fields
- Dependency of SAR from the static magnetic field

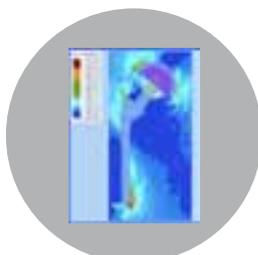
Contrast agents, pregnancy

- Chemical characteristics of Gd chelates
- Risks of Nephrogenic Systemic Fibrosis
- Evaluation of renal function
- Allergic reactions with Gd chelates

Implant problems and optimisation. Researching implants

Impact of implants on clinical MRI, its pitfalls and financial consequences by example of the Department of Radio diagnostic of the General Hospital of Vienna

- Strategies of improvement
- Workflow
- Effective research of MRI-conditions of implants
- Understanding the details of MRI-conditions of implants
- Special implants and future development
- MRI conditional pacemaker
- Fixed Parameter mode
- Exchange of personal experience and strategies by the class



MR safety issue in Interventional MR

- Principles of Interventional MRI
- Potential risks for clinicians and patients
- Technical requirements for safe Interventional MRI
- Limitations of Visualisation and Tracking of interventional Devices
- How to avoid reaching exposure limits during interventions

Cardiovascular implants and cardiac pacemakers in MRI

- To discuss risks and subsequent limitations of MR imaging after stent and stentgraft implantation
- To discuss the risks of conventional, 'old' cardiac pacemakers
- To present the advantages and limitation of new, MR-conditional pacemakers
- To discuss the possibilities of MR examinations after cardiac pacemaker implantation
- To present the newest guidelines of MR safety after stent and pacemaker implantation

Safety basics and quality management

- Pre-MR – Screening Procedures
- Patient MRI Safety Screening Form
- Safety Questions and Information
- Correct patient positioning while measurement
- Safety documents

MR worker training, documentation duties

Documentation provided by the MR manufacturer

- Exposure limits for MR workers
- Potential risks for MR workers
- Training requirements for the MR worker
- Responsibilities of the MR worker

Practical session: Systematic inspection with entering the MR area

- Definition of zones within the MR environment, in particular zone III and IV
- Supervision of entrance to the magnet room and the ways how to control it
- Labelling of equipment with respect to MR safety (MR safe, unsafe)
- To get familiar with the location of emergency equipment

Practical session: Demonstration of MR effects

- Spatial distribution of the static magnetic field of whole-body MR systems
- Forces and torques on different materials. Eddy current effects on moving conductive plates
- Generation of image artefacts by (slightly) magnetic materials
- Generation of image artefacts by conductive ring structures
- Heating in copper rings with different ohmic resistance

Practical session: Emergency situations

- Training of typical medical emergency situations in a live MRI setting
- Recalling and practicing of means of basic life support techniques including Resuscitation
- Emergency evacuation of persons directly out of the MRI scanner

Practical session: Researching implants and apply MR labelling in practice

- To understand the parameter complexity of MR labelling of devices/items
- To differentiate between different MR interactions
- To know the necessities for interpretation of MR labelling
- To apply MR labelling in practice



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City information Vienna

Population:	~1,712,900
Time zone:	CET
Currency:	EUR
Country dialling code:	+43
Closest airport:	Vienna International Airport (VIE)

Vienna – the capital as well as the largest city in Austria – serves as an economic and politic hub, hosting many international organisations like the United Nations and OPEC. There is a lot to see in Vienna, from the gothic Stephansdom cathedral to the Hofburg Imperial Palace, from the Art Nouveau splendour of the Secession to the magnificent late baroque palace of Schönbrunn and the well known Riesenrad (Ferris Wheel) in the Vienna Prater. In Vienna, music is in the air; more famous composers have lived here than in any other city, and it is known as the home of the waltz and operetta. Enjoy the fantastic music of the Vienna Staatsoper, the Volksoper, the Musikverein and the Konzerthaus. Visit unique art collections at the Albertina, the Kunsthistorisches Museum (Museum of Art History), the Belvedere, the Leopold Museum, the Museum of Modern Art, and many more. Visiting Vienna doesn't just mean sightseeing it also means enjoying a 'G'spritzer' (a white wine spritzer), chocolate cake (the unique 'Sacher Torte'), coffee (like the Viennese 'Melange') and the famous 'Wiener Schnitzel'.

Transport:

Vienna is served by the airport near Schwechat, located 18km south-east of the city centre and well connected to all major European cities. The CAT (City-Airport-Train) runs from the airport to the city centre twice an hour. A ticket costs €16 and it takes 16 minutes. The underground as well as bus and tramway network is extensive and within the city limits a one-way ticket costs around €1.80.

Hotel information: www.school-of-mri.org

Advanced Neuro Imaging: Diffusion, Perfusion, Spectroscopy

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**October 25–27, 2012
Antwerp/BE**

**Course organiser:
Johan Wikström
Uppsala/SE**



**Local organiser:
Paul M. Parizel
Antwerp/BE**

Course venue:
Klooster van de Grauwzusters
Lange St. Annastraat 7
2000 Antwerp
Belgium

Preliminary faculty:

A. Björnerud, S. Brockstedt, E.R. Danielsen, J. Hald,
L. Knutsson, R. Kreis, E.M. Larsson, S. Sunaert, J. Wikström,
W. Van Hecke

Course duration:

Thursday morning – Saturday noon

The aim of this course is to convey in-depth knowledge about advanced functional MR techniques for imaging of the central nervous system. The combination of MR physics (at a level for radiologists) and clinical applications in this course provides an excellent opportunity to improve the understanding as well as the clinical interpretation of diffusion- and perfusion-MRI and MR spectroscopy. During the last decade, these techniques have matured and are now frequently incorporated into daily clinical work. Furthermore, significant progress in the development of refined techniques, such as diffusion tensor imaging, has been made during the last few years. The course will offer an overview of present methodology with clinical applications in neuroradiology, as well as promising new methods, using a mixture of lectures and small group exercises. We are happy to welcome you to this course in Antwerp where European experts in the field will share their knowledge with you.

Participation requirements:

Physicians, physicists, radiographers, MRI nurses and others who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; minimum of 6 months experience in applied MRI and/or Neuro Imaging.

Grants available for
**Advanced Neuro
Imaging: Diffusion,
Perfusion,
Spectroscopy**
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Learning Objectives

Diffusion (dMRI: DWI and DTI)

- Basic mechanisms
- Isotropic diffusion
- Anisotropic diffusion
- The ADC concept
- Pulse sequences and acquisition techniques
- Diffusion tensor imaging
- Introduction to axonal fibre tracking and q-space imaging
- Pitfalls, practical issues, implementation

Perfusion (pMRI or PWI)

- Basic Physiology
- Dynamic Susceptibility Contrast (DSC) methods
- Pulse sequences
- Modelling, implementation and pitfalls
- Convolution and deconvolution
- Advanced modelling, heterogeneity, leakage correction
- Arterial spin labelling (ASL)

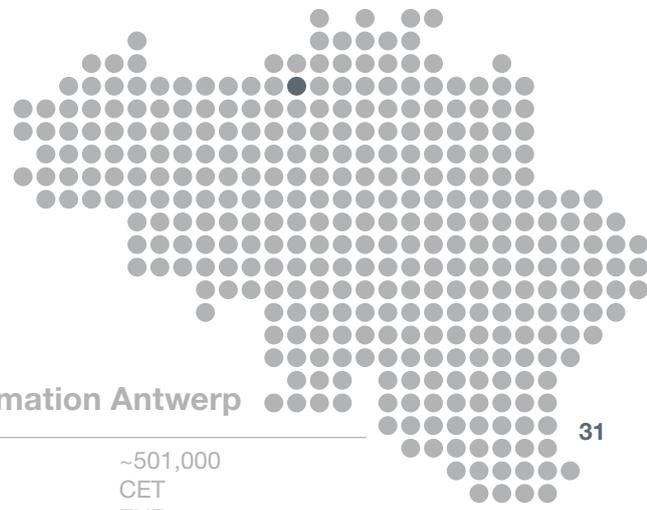
Clinical Applications of dMRI and pMRI

- Stroke
- Epilepsy
- Brain tumours
- Infection/inflammation
- Dementia
- Trauma
- Metabolic diseases

MR Spectroscopy (MRS)

- Basic principles
- Sequences for proton spectroscopy
- Postprocessing
- Metabolite quantification
- Quality Control and artefacts
- Clinical aspects
- Interpretation
- Pitfalls
- Applications

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City information Antwerp

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Population:	~501,000
Time zone:	CET
Currency:	EUR
Country dialling code:	+32
Closest airports:	Brussels International Airport (BRU), Antwerp Airport (ANR)

Antwerp is a vibrant, cosmopolitan city, with a rich cultural and historical heritage. The city has been one of Europe's most important centres of commerce and trade since the 15th century. It is located on the eastern bank of the river Scheldt, which flows into the North Sea, and is home to one of the largest seaports in Europe, with 186 million tons of cargo having passed through it in 2011. Antwerp is the world's leading rough diamond trading hub; over 50% of the world's diamond production, be it rough or polished, industrial or gem quality diamonds, passes through Antwerp. The diamond district and museum are well worth a visit. Its rich cultural heritage stems from the 16th century, when Antwerp knew unparalleled fame, with painters like P.P. Rubens, A. Van Dijck and J. Jordaens. Today, Antwerp is a thriving international city integrating the rich vestiges of its glorious past, with a dynamic approach to the modern world. There are many things to see and do in Antwerp, including the Cathedral of Our Lady, the beautifully renovated Central train station, a wide variety of museums (such as the world-famous Rubens house, the Plantin-Moretus printing museum, and the new Museum aan de Stroom (MAS) as well as outdoor activities such as a boat tour of the harbour or a trip to the zoo. As a major trading centre, Antwerp offers an outstanding array of restaurants, shopping and cultural events. The city has an extensive network of tram and bus lines, operated by De Lijn, which serves the city centre, suburbs and the Left Bank. The tram network has 12 lines, including a large underground section and a tunnel under the river, linking the right and left banks of the city.

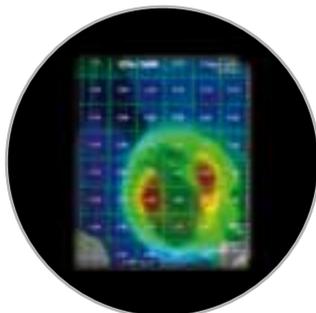
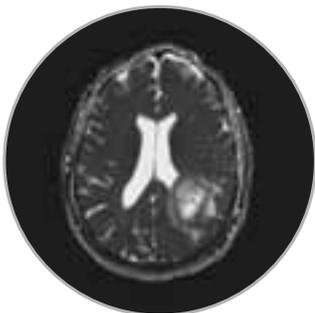
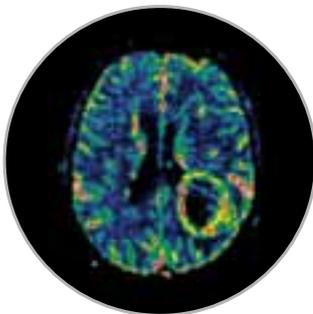
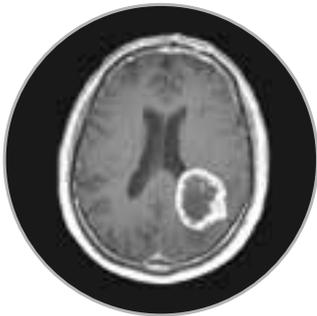
Transport:

Antwerp is served by both Brussels International Airport, which is about 45km from the city centre, and Antwerp Airport (about 7km from the city centre).

Brussels International Airport is a major hub with excellent connections to the most important cities in Europe. There is a direct coach service (<http://www.airportexpress.be/>) which runs from Brussels Airport to the city centre of Antwerp, every hour. The coaches leave from platform B at the bus station (level 0). A ticket costs €10 and it takes around 45 minutes to reach the city centre of Antwerp (the terminal of the coach service is next to Antwerp Central Train Station). The course venue is situated within walking distance of the station (10 minutes).

From Antwerp Airport, the cheapest option (bus fare is €2) is the bus number 14, which brings you to Rooseveltplein (Roosevelt Square), near Antwerpen-Centraal railway station, in 20 minutes. Alternatively, a taxi from Antwerp Airport to the city centre will take, depending on traffic conditions, 15 to 20 minutes, at an estimated cost of €20.

Hotel information: www.school-of-mri.org



Advanced Head & Neck MR Imaging

Grants available for
Advanced
Head & Neck MR
Imaging
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**November 1–3, 2012
Rotterdam/NL**

**Course organiser:
Roberto Maroldi
Brescia/IT**



**Local organiser:
Aad van der Lugt
Rotterdam/NL**

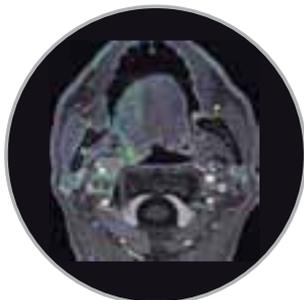
Course venue:
Department of Radiology
Erasmus MC – University Medical Center Rotterdam
's Gravendijkwal 230
3015 CE Rotterdam
The Netherlands

Preliminary faculty:
A. Borges, Ch. Czerny, F. de Keyzer, D. Farina, N. Freling,
R. Maroldi, B. Schuknecht, A. Trojanowska, B. Verbist

Course duration:
Thursday morning – Saturday noon

The aim of this course is to offer an in-depth knowledge of current MR imaging techniques for the diagnosis of head and neck lesions. The course will provide the participant with an update on fundamental and advanced sequence protocols to image the different head and neck regions. A comprehensive coverage of the MR signal of the normal tissues will give the preliminary basis for head and neck anatomy. We will focus on imaging strategies, recent developments and specific MR findings to characterise head and neck congenital, inflammatory, benign and malignant diseases. Special emphasis will be placed on differential diagnosis and on grading tumour extent. The course will provide a combination of lectures and case based interactive teaching in small groups.

Participation requirements:
Physicians who have attended the School of MRI 'From Basic Physics to Improved Imaging Strategies' course (former 'Applied MR Techniques' course) or have good knowledge in MR techniques from other sources; minimum of 6 months experience in applied Head and Neck MRI.



Learning Objectives

Basic and Advanced MR Imaging Techniques

- DW Imaging
- IVIM DW derived perfusion-fraction Imaging (D*)
- Which sequences on head and neck on 3T?
- 3T Isotropic and non-isotropic high-res imaging
- DCE-MR: Which use in the head and neck?
- Isotropic T1w and T2w imaging at 1.5T
- Imaging arteries and veins. Black blood, TOF, PC, CE-MR

MR Signal of Normal and Abnormal Tissues

- Normal and abnormal fat on different sequences
- The signal intensity of water, CSF, mucus, saliva, and 'cysts'
- The cortical and cancellous bone. Erosion, sclerosis, invasion
- The normal mucosa. Edema and scar
- Normal findings of cranial nerves, arteries, veins, and dural sinuses

MR Imaging of the supra and infrahyoid spaces in the neck

- Compartment organisation of the suprahyoid spaces
- Compartment organisation of the infrahyoid spaces
- Patterns of expansile lesions growth: which influence on diagnosis?
- How to image the lower infrahyoid neck?

MR Imaging of the Sinonasal Tract and the Skull Base

- MR anatomy of the anterior skull base floor, orbit, pterygopalatine fossa, cavernous sinus and Meckel's cave
- MR examination of the sinonasal tract and anterior skull base
- Polypoid masses. Feasibility of endonasal surgery. Grading skull base invasion. MR in predicting orbit preservation

MR Imaging of the Nasopharynx and Parapharyngeal Space

- MR anatomy of the nasopharyngeal walls and parapharyngeal space
- How to study the nasopharynx and parapharyngeal space lesions
- Differential diagnosis of submucosal masses
- MR patterns of pre- and post-styloid masses
- Staging nasopharyngeal neoplasms



MR Imaging of the Oropharynx and Oral Cavity

- MR anatomy of key oral cavity structures
- MR strategies to image flaps and post-treatment changes
- Role of DCE-MR and DWI imaging
- Role of MR in detecting mandible invasion. Perineural spread and bone invasion

MR Imaging of Major and Minor Salivary Glands

- MR anatomy of key landmarks
- Fat sat sequences, DCE-MR and DWI imaging. MR Sialography
- Distinguishing parapharyngeal from parotid gland 'deep lobe' tumours

Surface Coil MR Imaging of the Larynx and Hypopharynx

- How to image the larynx and hypopharynx: tips and tricks
- Which sequences? Which study planes?
- New insights on muscles and fat spaces: high-res anatomy
- How to recognise edema of fat, muscles and cartilage

MR Imaging of Lymph Nodes and Lumps in the Neck

- Imaging techniques to detect and characterise neck nodes. Which role for DWI?
- Retrolatero-pharyngeal and parotid nodes
- MR of cystic, vascular and solid masses in the neck
- The unknown primary. Is MR imaging useful?

MR Imaging of Temporal Bone and CPA Lesions

- MR anatomy of VII and VIII cranial nerves. The normal membranous labyrinth. Landmarks for the jugular foramen
- Imaging temporal bone and CPA lesions. 3D T2 sequences
- DWI imaging
- Inner ear malformations: is cochlear implant feasible? Neuro-vascular conflict. Detecting the recurrent cholesteatoma

MR Imaging of the Orbit

- MR anatomy and imaging techniques
- Extra-ocular vascular lesions: cavernous hemangioma, lymphatic malformations, varices, AV malformations
- Inflammatory pseudotumour, lymphoma and orbital metastasis
- Thyroid ophthalmopathy: MR Imaging

City information Rotterdam

Population:	~611,000
Time zone:	CET
Currency:	EUR
Country dialling code:	+31
Closest airports:	Rotterdam The Hague Airport (RTM), Amsterdam Schiphol Airport (AMS)

Rotterdam is the second largest city in the Netherlands and also one of the largest ports in the world. The city is of major importance to international commerce as it is ideally located on the Rhine-Meuse-Scheldt delta which flows into the North Sea. Apart from this, Rotterdam is famous for its Erasmus University which is named after Desiderius Erasmus Roterodamus, who was a humanist and theologian in the 15th century.

The impressive skyline of Rotterdam can be seen from afar, enhancing the city's already imposing appearance characterised by such landmarks as the Euromast observation tower and the swan-like curve of the Erasmus Bridge. Rotterdam is known in the Netherlands and abroad as a city of great architecture, featuring many examples of innovative construction. Rotterdam's museums offer a highly diverse range of collections and exhibits: from modern art to historical artefacts, from architecture to photography and from historical ships to exotic animals.

Transport:

Rotterdam Airport is 6km north-west of the city Rotterdam. It is easily accessible by public transport, by means of the RET bus lines 33, 41, 50 and also line B12. Travellers who need to be at Rotterdam Airport very early in the morning/during the night can take the RET bus line B12.

Amsterdam Schiphol Airport is well connected to Rotterdam and offers frequent train services to Rotterdam central station. The journey takes around 45 minutes and costs approx. €11.

Hotel information: www.school-of-mri.org

ESMRMB Society Journal MAGMA

MAGMA is a multidisciplinary international journal devoted to the publication of articles on all aspects of magnetic resonance techniques and their applications in medicine and biology. In addition to regular issues, the journal also publishes special issues (see below the current special issues):

- **'MR Thermometry'** with Robert Turner as Guest-Editor (February 2012)
- **'Arterial Spin Labelling MRI'** with David Alsop as Guest-Editor (April 2012)
- **NEW in 2012! 'MRI and PET together: friends or foes'** with Thomas Beyer and Ewald Moser as Guest-Editors (see Call for papers on-line)

MAGMA's impact and dissemination as a journal is rapidly increasing:

- **2010 MAGMA ISI = 2,373**
(MAGMA ranks 45th out of 111 journals in the 'Radiology, Nuclear Medicine and Medical Imaging' category)
- **Manuscript submissions:** increase of 35% in 2011
- **Electronic subscriptions:** the journal is currently read by 7626 institutions worldwide through the 368 Springer library consortia
- **Downloads with full text hits:** in 2011, in average 100 articles per day were downloaded from the website
- **The reviewing cycle** (5 weeks) and **time-to-publication on-line after acceptance** (3 weeks) remain the shortest among MR journals

Finally, as a bonus to authors, MAGMA keeps with its policy of not applying charges for colour illustrations!

Become an ESMRMB member now to benefit from

An ESMRMB
Membership is already
available from € 10!

- online access to MAGMA
- printed MAGMA copy
- reduced fees for ESMRMB's annual scientific meetings
- reduced fees for educational activities of ESMRMB
- access to the online membership directory
- access to the Society minutes and documents
- continuous information about the Society and MR in Europe

Please note that membership benefits depend on your membership type.

Registration Information

Reduced
registration fee for
ESR & ESMRMB
members!

35

Registration (online only)

In order to register for your desired course(s), please visit our website at www.esmrmmb.org.

Please note that your registration becomes valid only after the receipt of payment and after confirmation by the ESMRMB Office. The confirmation of payment is available for download in the online 'MyUser Area'. In order to obtain a valid registration as student or resident, a copy of the diploma has to be sent to the Office no later than 10 days after the registration or uploaded during the registration procedure online.

Technicians are asked to provide the Office with an official document from the head of department confirming the technician status no later than 10 days after the registration or to upload the document during the online registration procedure.

Terms of cancellation

In case of written cancellation of the registration by the participant

> 4 weeks before the course date: the registration fee less 20% for administrative costs will be refunded.

< 4 weeks before the course date: no refund will be granted.

If less than 30 participants register, ESMRMB reserves the right to cancel a course at the latest 4 weeks prior to its beginning. Please keep this in mind for your travel arrangements.

Registration Fee

The registration fee includes:

- Course attendance
- Teaching material for the course (syllabus)
- Coffee and Lunch
- Welcome Dinner

Participants are responsible for their travel and hotel arrangements.

A list of suitable hotels for the individual courses is available at the ESMRMB website. When making your flight bookings, please make sure that you will be able to stay for the entire course duration.

Courses either start on Thursday morning or noon and last until Saturday noon or evening except the course in London (Wednesday noon – Friday evening).

Residents in their first 5 years of clinical radiological training from less developed countries may apply for a grant (see page 9).

Early registration fees

(until 8 weeks prior to the course)

Physicists, Physicians, Chemists and other professionals with equivalent university degree:

ESMRMB Members***	€ 350
ESR Members***	€ 460
Non-Members	€ 500

Students*, Residents* and Technicians**:

ESMRMB Members***	€ 200
ESR Members***	€ 250
Non-Members	€ 275

Late registration fees

(after 8 weeks prior to the course)

Physicists, Physicians, Chemists and other professionals with equivalent university degree:

ESMRMB Members***	€ 450
ESR Members***	€ 570
Non-Members	€ 625

Students*, Residents* and Technicians**:

ESMRMB Members***	€ 250
ESR Members***	€ 320
Non-Members	€ 350

* Eligibility for the student and resident status is limited to 6 years following the date of the diploma (bachelor, masters, medical degree; not applicable for PhD degrees!). A copy of the diploma (bachelor, masters, medical degree) has to be sent to the ESMRMB Office no later than 10 days after the registration in order to validate your registration. Please note that for residents an attestation from the head of department is not sufficient! According to the ESMRMB regulations a copy of the diploma is required.

** Technicians are requested to provide a signed attestation from the head of the institution / head of department no later than 10 days after the registration.

*** Reduced course fees are available for members in good standing who have paid their 2012 ESMRMB or ESR membership fee.

Rates refer to one course. If more than one course is booked at once, a 10 % reduction will be granted.

Registration is
possible online at
www.esmrmmb.org

Join the European Forum for MR Research and Clinical Practice

ESMRMB Membership Types

REGULAR MEMBER

€ 140

Benefits: Journal (online and print), reduced member fees for annual scientific meetings and educational activities of ESMRMB, access to the online membership directory and Society minutes and documents.

Become a member of ESMRMB and benefit from reduced registration fees at the School of MRI courses!

STUDENT MEMBER

€ 70

Criteria: Student membership is limited to 6 years following the date of the diploma (bachelor, masters, medical degree). A copy of the diploma (bachelor, masters, medical degree) has to be uploaded during online application or sent to the ESMRMB Office no later than 10 days after membership application in order to validate the membership. Please note that this does not apply for PhD degrees.

Benefits: Journal (online and print), reduced member fees for annual scientific meetings and educational activities of ESMRMB, access to the online membership directory and Society minutes and documents.

STUDENT MEMBER

€ 10

Criteria: Student membership is limited to 6 years following the date of the diploma (bachelor, masters, medical degree). A copy of the diploma (bachelor, masters, medical degree) has to be uploaded during online application or sent to the ESMRMB Office no later than 10 days after membership application in order to validate the membership. Please note that this does not apply for PhD degrees.

Benefits: online Journal, reduced member fees for annual scientific meetings and educational activities of ESMRMB, access to the online membership directory and Society minutes and documents.

ASSOCIATE MEMBER

€ 10

Criteria: Applicant needs to be member of a national society which is a partner society of ESMRMB.

Benefits: online Journal, information on Society news

FREE ASSOCIATE MEMBER

FREE!

Criteria: Applicant needs to be member of a national society which is a partner society of ESMRMB.

Benefits: information on Society news

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