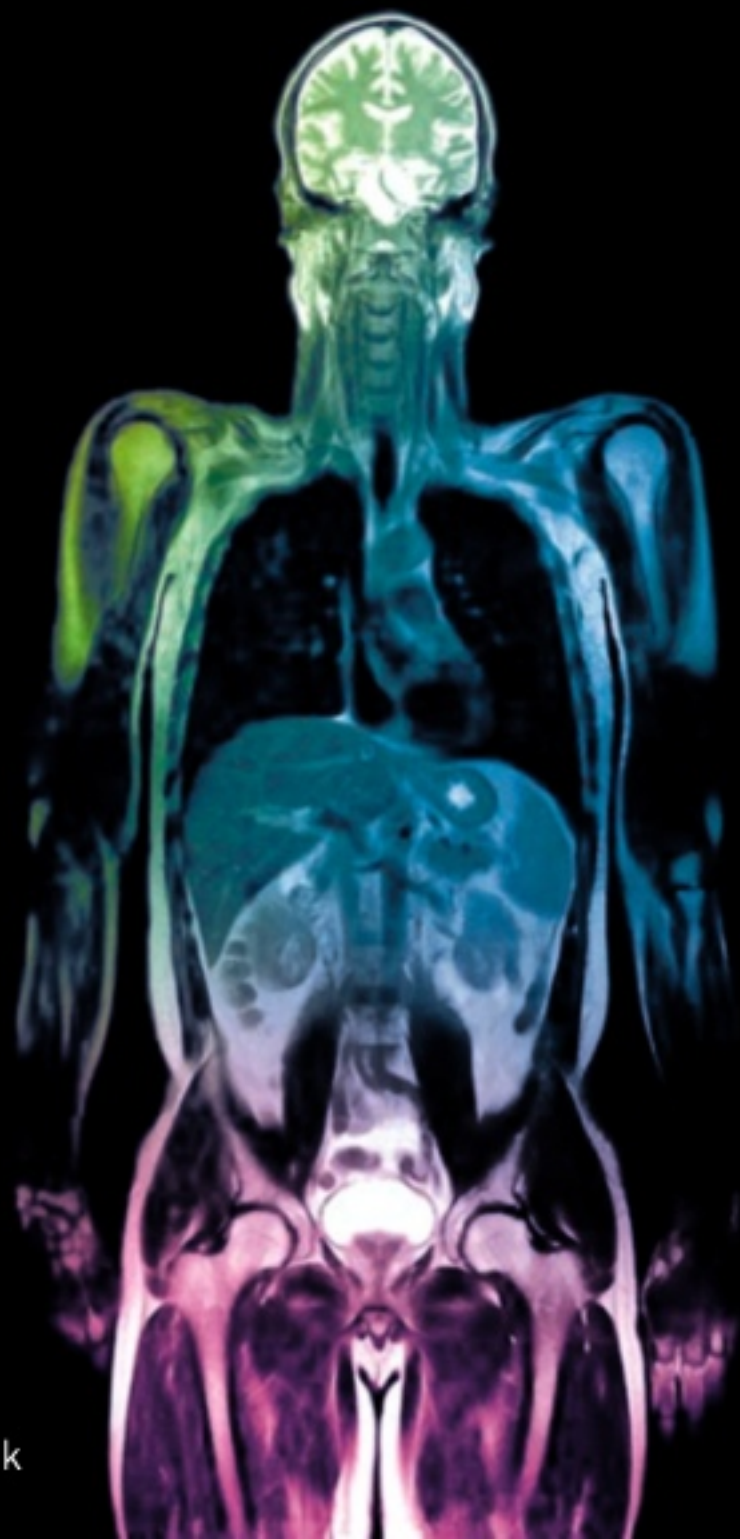


MRI

IN PRACTICE THE COURSE

Catherine Westbrook
John Talbot

The World's biggest MRI course, based on the World's best selling MRI book



MRI in Practice

Welcome to MRI in Practice - The Course

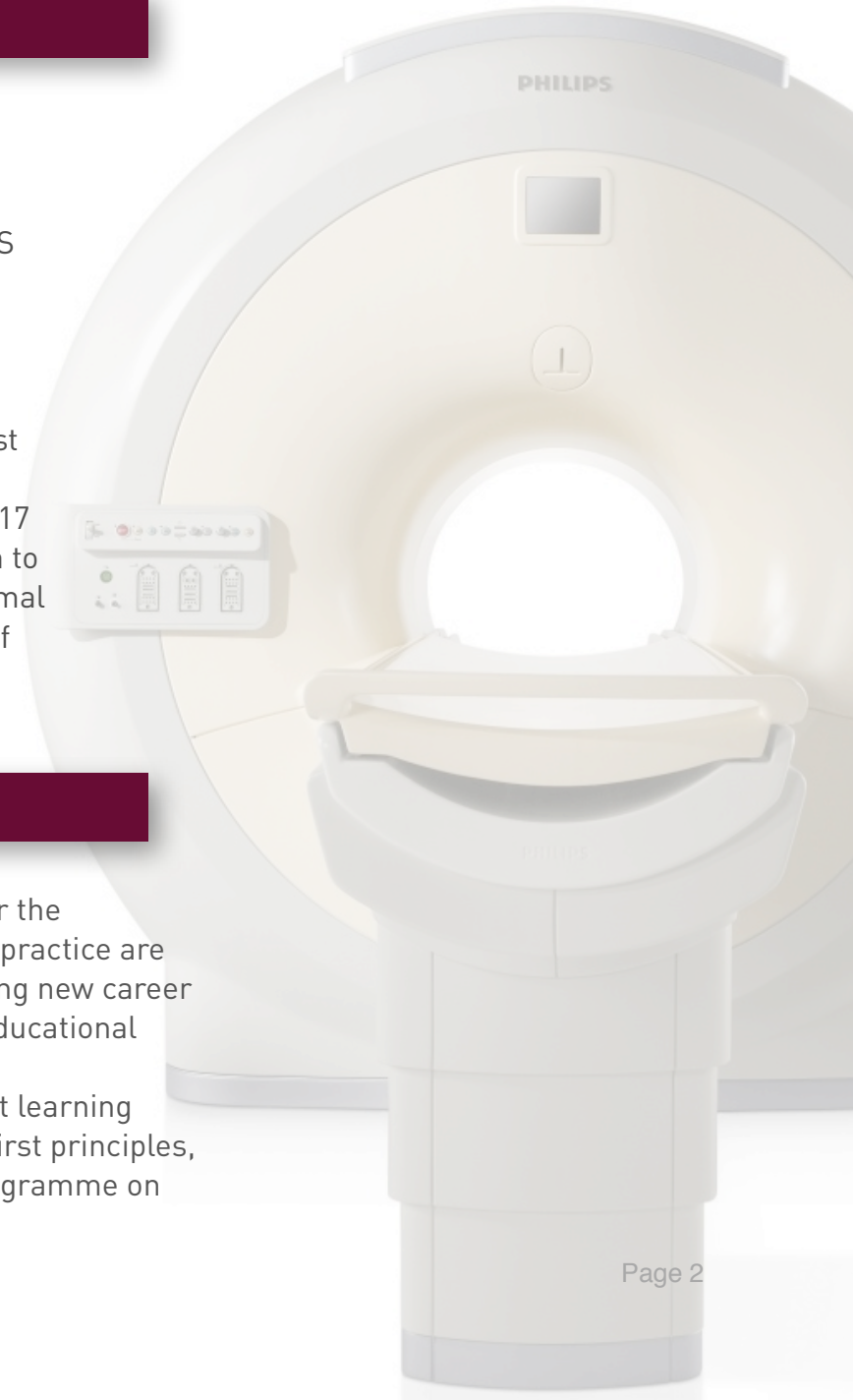
“MRI in Practice” the book, was first published in 1993. Now in its fourth edition, it is considered an essential text for many MRI courses including the registry exam in the US and for post graduate MRI programmes in the UK. The amazing success of this book, which is the World’s best-seller in its genre, mainly lies in its clarity and logicity. It clearly provides clinical MRI practitioners relevant information at the right level.

With this philosophy in mind MRI in Practice is now the basis for one of the World's most popular **MRI Courses** and a range of **mobile apps**. Presented by authors Cathy Westbrook and John Talbot, the course is now delivered in 17 countries across 5 continents, and teaches hundreds of delegates each year. In addition to these impressive figures, the course has a well deserved reputation for having an informal approach that allows delegates to enjoy the learning experience - and take advantage of the networking opportunities that are fostered by this model.

A Fresh Approach to Learning MRI

MRI as a modality is still expanding and evolving rapidly, and poses many challenges for the radiographer and radiologist. An in-depth understanding of the technology and clinical practice are necessary to exploit the full potential of the MR system. To take advantage of this exciting new career direction, many practitioners are advancing their knowledge of MRI using a variety of educational pathways.

Here at MRI in Practice, we appreciate that everyone is different, and have very different learning needs. For this reason we have given the course a gentle learning curve, starting with first principles, and each day building on the concepts covered on the day before. Take a look at our programme on the next page...



The Course Programme (length, content and timing may vary by country/organiser)

Day One	Day Two	Day Three	Day four
Basic Course		Advanced Course	
Basic Principles Westbrook	Spin Echo Pulse Sequences Talbot	Flying Through k-Space Westbrook	Flow and MRA Talbot
Image Contrast Westbrook	Image Optimisation Westbrook		Gradient Echo Pulse Sequences Westbrook
Equipment Talbot	Image Production Talbot	Revision Session Talbot	Artefacts 02 Workshop Talbot & Group
Safety Talbot	Image Artefacts 01 Talbot	Principles of Gradient Echo Westbrook	The Big MRI Quiz Talbot

The UK course is available as a two day basic course or a two day advanced course. They run consecutively so delegates can attend all for days if required. Non-UK versions of the course are run as one single course.

Course content

Reflecting the pace of evolution in the field of MRI itself, our course is constantly being updated to take advantage of the latest multimedia and presentation technology. Our hardware set-up features high-power Mac computers, screening HD computer-generated imagery projected through crisp, bright and whisper-quiet DVI data projectors, giving the ultimate engaging graphic experience.

No “death-by-PowerPoint” here!

Of course it is the content that is the most important thing - and when it comes to quality you don't have to take our word for it, MRI in Practice is the World's best selling MRI textbook, and has a consistent 5-star customer rating on Amazon.com. Used as the key text across America by technologists studying for the registry exam, our book now in its 4th major edition, has become the THE reference text in the field of MRI.

MRI in Practice | The Course delivers the same trusted content in a slick lecture format that is designed to engage and inform in equal measure.

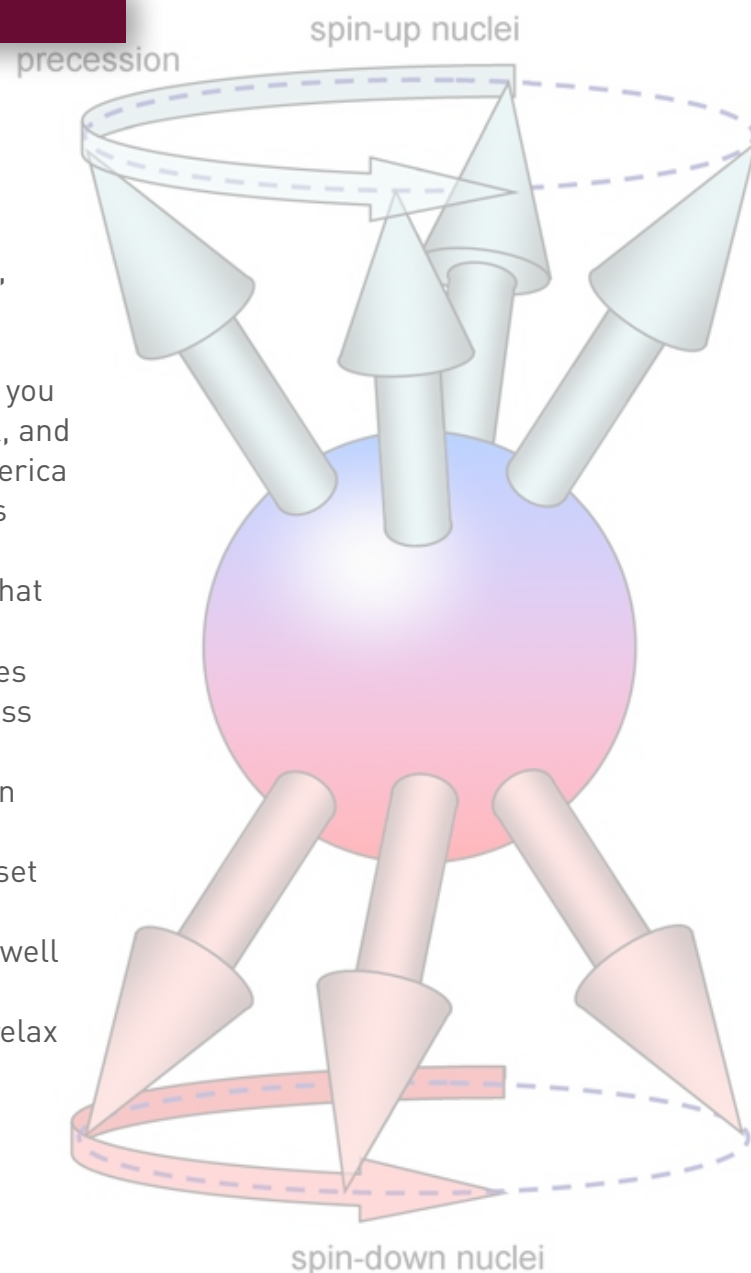
Lectures and quiz sessions are interspersed with revision and discussion so that delegates can put the physics of MRI into a practical context. Every underpinning principle we discuss can be directly applied to how you work at the scanner console.

All sessions are delivered by MRI in Practice authors Cathy Westbrook & John Talbot in an informal atmosphere where audience participation is actively encouraged.

Due to the intensive nature of the course, delegates are often provided with the ultimate set of written course notes - a signed, complimentary copy of MRI in Practice*.

The book contains all of the important information about the topics within the course, as well as some supplementary reading. This means that delegates do not have to spend hours scribbling frantic notes, but can instead turn their full attention to the lectures, and can relax in the knowledge that their book will provide valuable reference material for the future.

The following pages give some typical course content.



* selected venues only, please check with the course organiser before applying.

Day 1 AM

Introduction to the course (Westbrook Talbot)

Welcome and introduction to the course and the topics.

Basic Principles (Westbrook) 1 hour

Aim: to investigate the fundamental principles of MRI including:

- Nuclear structure
- MR active nuclei
- Alignment
- Precession and resonance
- Signal generation
- Relaxation processes

Image Contrast Mechanisms (Westbrook) 1 hour

Aim: to evaluate the various mechanisms responsible for image contrast in MRI including:

- Molecular make-up of fat and water
- T1 recovery
- T2 decay
- Diffusion Weighting
- Image weighting characteristics
- Introduction to pulse sequences

Day 1 PM

Instrumentation (Talbot) 1 hour

Aim: to investigate types of equipment used in MRI and their safe use including:

- Magnets: principles of, construction, homogeneity.
- Shielding
- Shimming & Gradients
- Radio Frequency: Shielding, transmit/receive coils

This lecture includes high definition computer generated imagery of the magnet components, allowing you to see how they all work together like never before.

Safety (Talbot) 1.5 hours

Aim: to review all MRI safety issues including:

- Static-field dangers - projectiles
- Gradient-field dangers - nerve stimulation
- Secondary (RF) field dangers - heating & antenna effect
- Cryogenics - quenches and anoxia
- Safety screening - who, how, when and why
- Contraindications for MRI

with real-life examples of safety incidents from around the world.

Day 2 AM

Principles of Spin Echo (Talbot) 1.5 hours

Aim: to investigate the basic mechanisms of spin echo imaging including:

- T2* effects
- RF rephasing
- Single and dual echo spin echo
- Fast (Turbo) Spin Echo, advantages and trade-offs
- Driven Equilibrium
- Inversion recovery

Image Optimisation (Westbrook) 2 hours

Aim: to facilitate the understanding of the factors that affect image quality; their mechanisms and trade-offs including:

- Signal to noise ratio (SNR)
- Contrast to noise ratio (CNR)
- Spatial resolution
- Scan time
- Decision making strategies

Day 2 PM

Image Production (Talbot) 1.5 hours

Aim: to facilitate the understanding of gradient functions for the purpose of spatial encoding including:

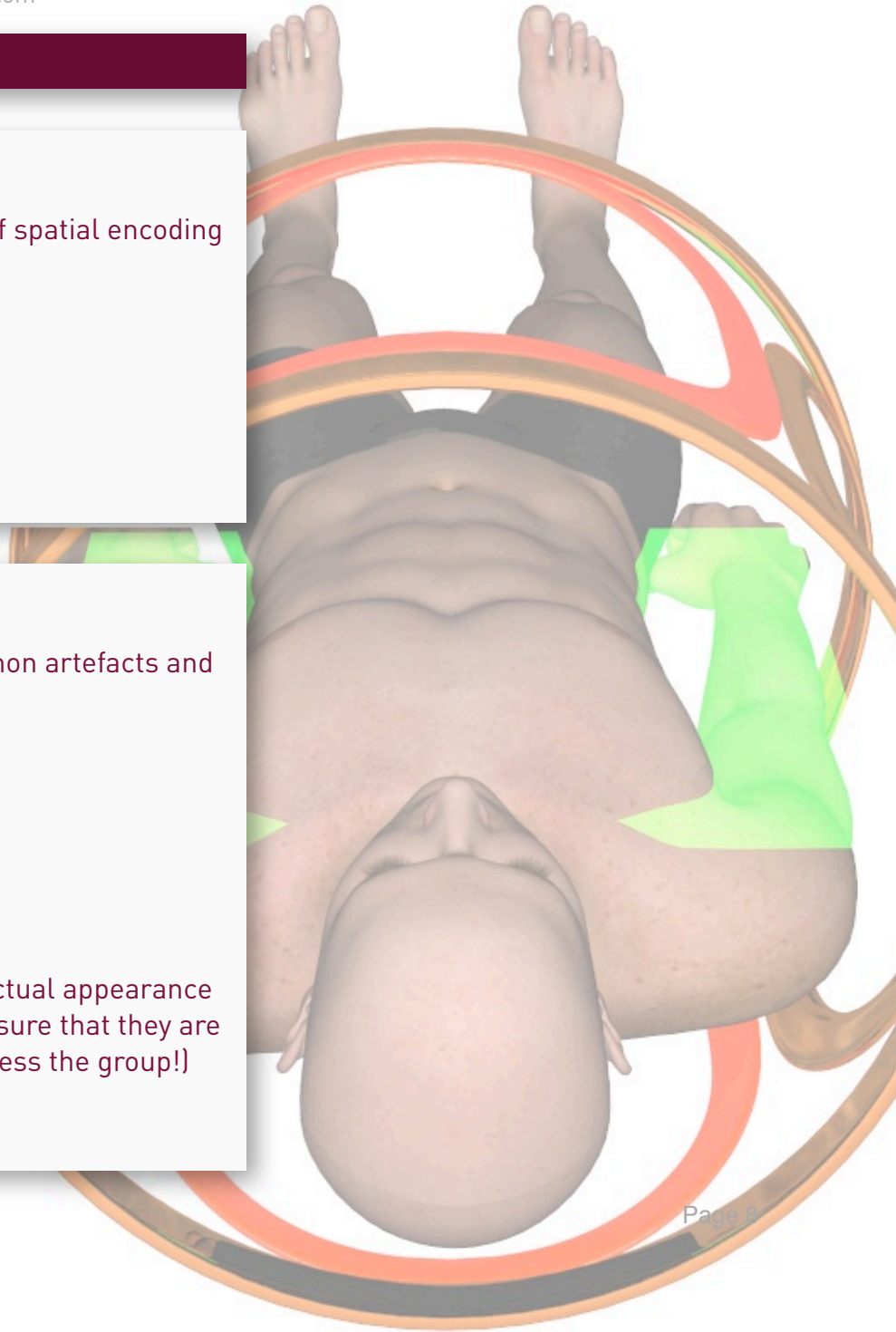
- A brief history of spatial encoding
- Slice selection
- Frequency encoding
- Phase encoding
- Fourier Transformation

Basic Artefacts - Identification and Compensation (Talbot) 1.5 hours

Aim: to facilitate the understanding of the appearances and cause of common artefacts and their remedies. May include:

- Field inhomogeneity
- Aliasing
- Phase Mismatching
- Magnetic susceptibility
- RF anomalies

Delegates are welcome to bring digital images that demonstrate an artefactual appearance from their own department. If you wish to share images with the group, ensure that they are on a USB flash drive, CD or DVD. (note that you will not be required to address the group!)



Day 3 AM

K space and data acquisition (Westbrook) 4 hours

Aim: to explore in-depth the principles that underpin data acquisition in MRI including:

- K space functions and characteristics
- Data sampling techniques
- K space traversal
- K space filling in basic and advanced sequencing
- K space filling modifications including parallel imaging

Day 3 PM

Revision Session 1.5 hours

Aim: to consolidate the basic knowledge gained through self-marked timed evaluation:

- Basic Principles
- Contrast Mechanisms
- Instrumentation
- Safety
- Basic Pulse sequences

Gradient echo sequences (Westbrook) 1 hour

Aim: to provide an introduction to gradient echo sequences

- Principles of Gradient Echo Pulse Sequences
- Weighting in Gradient Echo Pulse Sequences

Day 4 AM

Magnetic Resonance Angiography (Talbot) 1.5 hours

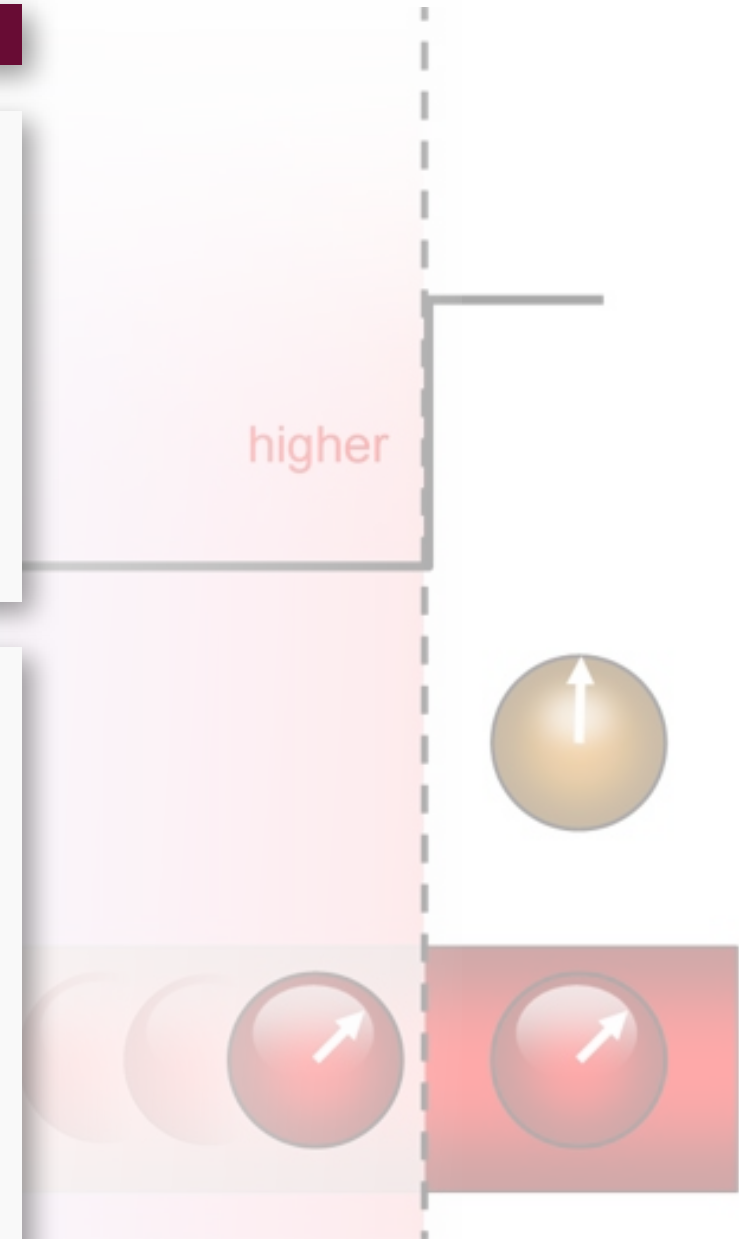
Aim: to provide an overview and basic understanding of the scope of Magnetic Resonance Angiography including:

- Phase Contrast, Inflow, Gated, FBI and CEMRA techniques .
- Mechanism of flow-dependent MRA sequences
- Time of flight, entry slice phenomenon, and flow anomalies
- Post processing and the maximum intensity projection algorithm
- Advantages & disadvantages in clinical use
- Bolus Tracking and automation of CEMRA

Gradient echo sequences (Westbrook) 2 hours

Aim: to investigate the advanced mechanisms of gradient echo imaging and their clinical uses including:

- The steady state (advanced concepts)
- Coherent gradient echo
- Balanced Gradient Echo
- Incoherent gradient echo
- Steady state free precession
- Fast gradient echo
- Echo planar imaging
- Diffusion Weighting
- Sequence comparisons



Day 4 PM

Artefacts II (Talbot) lecture timing varies

Aim: To explore the appearances, causes and remedies in relation to complex MRI artefacts including:

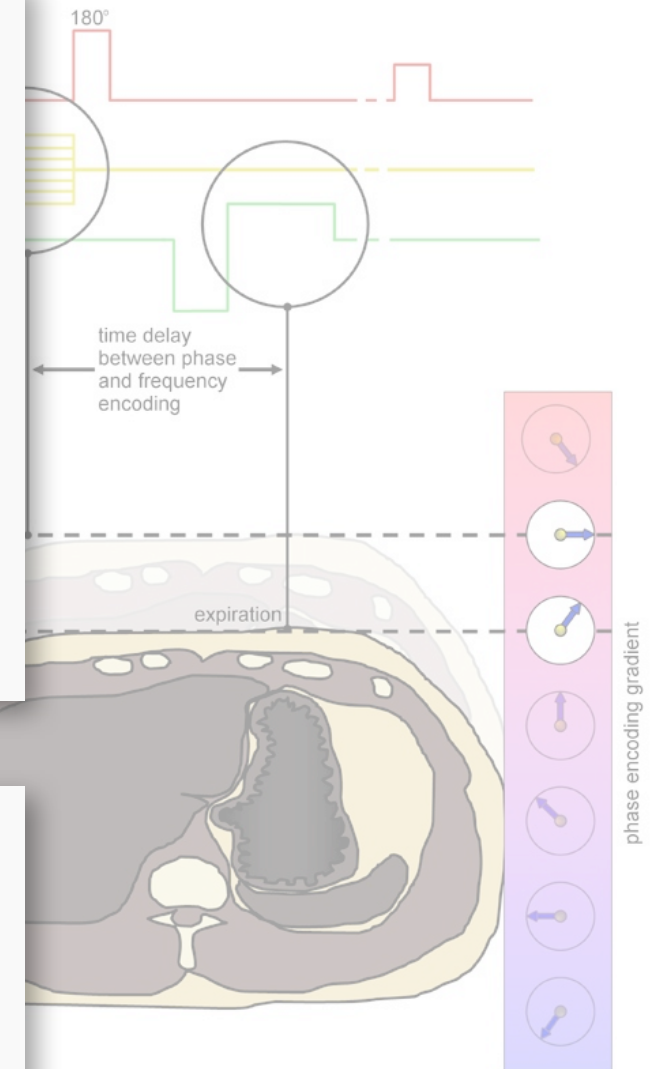
- Flow
- Truncation
- Frequency wrap
- Gradient errors
- The magic angle
- Moiré fringing
- Chemical Misregistration

Delegates are welcome to bring digital images that demonstrate an artefactual appearance from their own department. If you wish to share images with the group, ensure that they are on a USB flash drive, CD or DVD. (note that you will not be required to address the group!)

Quiz (Talbot) 1 hour

To end the course we have a fun quiz, (not an exam).

Can you beat the MRI quizmaster and win a fabulous prize?



Delegate Feedback

The following testimonials are genuine comments taken from the anonymous delegate satisfaction survey forms handed in at the end of each course, and from unsolicited letters that we receive from delegates.

"its quite obvious that the quality of lecture delivery reflects the knowledge-base of the 2 lecturers, and it comes across at a level that I can understand."

"I thought the course was brilliant. All topics were covered and explained very well. I will definitely recommend this to others."

"Finally MRI physics makes sense to me. Thank you!"

"An excellent course. I am new to MRI and having completed the course, things have now started to fall into place"

"Excellent lectures, loved the use of analogies to explain complex processes - especially the spatial encoding lecture."

"An intensive course, but VERY useful in helping to apply some of the more complex theoretical elements of MRI. Well presented and very informative."

"In addition to competent teaching, you have a real gift for developing witty and animated graphics. Your work is absolutely exceptional - the resource you have developed is better by far than anything I have come across before."

Good lectures - very useful visuals, lots of information".

"Excellent".

"Good delivery, easy to understand. Very detailed slides. I now understand K space".

"Very good - delivered really well".

"Excellent, I was very pleased, the animated slides are much easier to understand than still pictures".

"I enjoyed the casual approach - this helped to make the difficulties in understanding MRI concepts very much easier to take on board."

"All the lectures and the contents within those lectures were absolutely terrific."

As a teacher myself, the thing that I have learned is that in MRI education we need genuine experts to teach it, because this fascinating modality deserves nothing less. For my part, your job is safe for the foreseeable future! Many thanks.

Enrolment Information

MRI in Practice is organised on our behalf by various individuals and companies around the World. You can always get the latest info on course dates, reserve a place etc. by visiting our website www.mrieducation.com or subscribing to our RSS feed on [Twitter](#).

Australia	contact Dr Peter Cox	email peter@moonpython.com
Belgium	contact Mr Erik Van Landuyt	email erik.van.landuyt@telenet.be
Croatia	contact Mr Alun Jones (Philips Medical)	email alun.a.c.jones@philips.com
Denmark	contact Engesgaard Consulting	email info@mri-academy.dk
Emirates	contact under review	
Ireland	contact under review	
Malta	contact Mr Joseph Castillo	email joseph.castillo@gov.mt
Norway	contact Mr Hans Flaata	email hans@radiograf.no
Romania	contact Ms Veronica Alecsa	email veronica.alecsa@gadagroup.com
Saudi Arabia	contact Mr Nabeel Misha	email nabeel747@hotmail.com
South Africa	contact Ms Lee Roering	email lee.roering@philips.com
Sweden	contact under review	
UK	contact Cobalt UK	email education@cobalthhealth.co.uk



If your country is not listed above and you would like us to run a course, why not consider a partnership with MRI in Practice - [contact us!](#)

MRI in Practice is not available in the USA.

For up-to-the-minute venue location info, you can access our world venue map [here](#).

Why Choose MRI in Practice?



If you are trying to decide between MRI in Practice and another course, you will want to make a sound, evidence-based decision. please print out this quick summary to see how we compare to other courses on the following important points:

The Course MRI in Practice has been running continuously for over 20 years (formerly known as the Oxford MRI Course) and is taught in 15 countries across 5 continents. We have presented in the UK since 1992, mainland Europe since 2005, Australia since 2004 and our first American courses were over ten years ago. We engage and educate hundreds of delegates per year, and their feedback sheets consistently rate our lectures as being excellent. Unlike many other MRI courses, MRI in Practice is completely independent of any private company or institution. This is most important, because we can guarantee that our delivery is unbiased and we are free to say what we want to say. In the UK, any profits made by the course, go to the good causes of our partner-charity Cobalt UK - not into the coffers of a private medical company.

The Content MRI in Practice - The Course is based on the the World's best selling MRI book*. MRI in Practice is consistently at the top of its league on the Amazon.com bookstore and overwhelmingly attracts five star reviews from the public, which for us, are the ones that count. It outsells its next closest rival (Handbook of MRI Technique) many times over (in case you wondered - that book is also one of ours). MRI in Practice is famed as the reference text for practitioners taking the US registry exam - so you can rest assured that our course content is tried, trusted and relevant. You don't have to take our word for it though - this course has been accredited/endorsed by The UK College of Radiographers (CPD NOW), The British Institute of Radiology, Trinity College Dublin, The Australian Institute of Radiology, The University of Sharjah (Emirates), The Romanian Radiology Society/College of Physicians, the American Society of Radiologic Technologists and many other respected institutions.

The Presentation MRI in Practice - The Course has evolved over the years, always taking advantage of the very latest technology. We were using data projection before anyone else (as long ago as 1997), and our computer graphics have also developed in line with broadcast production values. Having taken advice from experts in the cinema and TV industries, the latest version of the course utilises over 300 computer generated imagery models, rendered into photo-realistic HD - you can see some small teasers in this brochure (pages 6, 8 and 10). The lectures are screened using state-of-the-art presentation software and hardware over a bright, sharp, digital projector. Delegates repeatedly tell us that our 3D graphics help to clarify difficult concepts, by bringing them to life in a way that a conventional book or PowerPoint lecture can never achieve. That said - to give you the best of both worlds - we usually throw in a free copy of our book* so you won't need to sit and scribble copious course notes.

The Presenters Some courses rely on the good-will of amateur external speakers, so the quality can vary from course-to-course. MRI in Practice is always presented by authors Catherine Westbrook and John Talbot. We firmly believe that radiographers should be taught by radiographers; it seems obvious, we speak the same language, and can apply the basic principles to the real world of scanning and patient care. It goes without saying that the presenters should know their subject, Cathy and John are both clinical MRI specialists, but are also both educated in MRI to masters level. It doesn't stop there. We also believe that credible course presenters should be qualified in teaching and learning - after all, if a presenter cannot facilitate learning, all is wasted! As academics, Cathy and John have formal post-graduate qualifications in teaching and learning, and are both Fellows of the Higher Education Academy. We share The HEA vision - which is for students to enjoy the highest quality learning experience in the world and we strive to bring this philosophy to everything we do - including MRI in Practice - The Course.

...there's an app for that

One of the most popular requests by our MRI in Practice course delegates is "why don't you release the lectures on DVD?" Well we have always thought that it was a great idea - but with our cutting-edge philosophy we thought DVD was a bit "last-century". Instead we are introducing a range of interactive iPhone/iPod apps will allow users to purchase a series of electronic presentations that summarise some of the popular topics from the live course.

In addition to a fact-packed multimedia lecture featuring some of our trademark course graphics, each app also contains the written lecture notes, accompanied by some all-new diagrams PLUS a self assessment MCQ quiz that you can take before and after watching the tutorial to check your learning - all for the price of a coffee. The great thing about a mobile app is that you can access your content wherever and whenever you choose. To download one right now visit The MRI Education Company in the iTunes App store.



Please note that these apps do not provide you with the entire course - just short selected excerpts for revision purposes or as a short introduction to what we offer on the full course!

*The names MRI in Practice, and MRI in Practice / The Course are copyright 1992-2014 Blackwell Science (Wiley Books) & Catherine Westbrook.

All graphics in this brochure and in the course materials are copyright (2013) Blackwell Science (Wiley Books) and John Talbot. The course content is also protected by copyright, and as such, audio and video recording of the live course content is strictly prohibited (including, but not limited to the use of mobile phones, voice recorders and digital cameras).

Course pricing may vary according to venue charges, location, AV charges, catering etc. and is set by the individual organisers. MRI in Practice (The Book) may be offered inclusive of the course fee in certain venues. Please check with the course organiser at the time of application. In the unlikely event of a course cancellation the organiser is not responsible for reimbursing any pre-paid travel costs or accommodation costs incurred by delegates. These are not included in the course price and are the sole responsibility of the delegates. We recommend that you take out personal insurance to cover such losses.

The course materials are updated constantly, to keep pace with changes within the field of MRI and to take advantage of the latest presentation technology and as such the course content may vary over time. The example programme provided on page 3 is indicative of a typical UK course delivery. The length, order, content and timing may vary slightly from country to country depending on the requirements of the local organiser, sponsors, climate and cultural norms. The international versions of the course are not usually offered on a flexible attendance basis.

MRI in Practice was formerly known as "The Oxford MRI course", but is not connected with the currently running course of that name. The new Oxford MRI Course is a clinical course, principally aimed at radiologists. Cathy Westbrook and John Talbot both lecture on the new Oxford MRI Course, but note that this is NOT the same course as MRI in Practice.

Some deliveries of the MRI in Practice course are kindly sponsored and organised by Philips Medical Systems, under the title of The Essentials of Philips in MRI - a version of the course that is contextualised for Philips MRI users. Some of our international course organisers also rely on sponsorship from private medical companies however MRI in Practice - The Course is completely independent of any private company, healthcare provider or equipment/consumables manufacturer.

As senior lecturers in under-graduate and post-graduate MRI pathways, Cathy and John are well placed to provide delegates with information about CPD and formal post-graduate education options. MRI in Practice is NOT formally affiliated with any educational institutions.

Statements relating to the popularity of the book MRI in Practice are based on sales figures from Amazon.com.

MRI in Practice is a eco-conscious course, we always seek to offset our carbon footprint and would encourage you not to print this brochure, but to share it electronically with anyone you feel might be interested.