‘Devices: MRI Compatibility’ Course
University College London, London, United Kingdom
10-12 April 2019
Programme
Course organisers: Louis Lemieux and Nick Donaldson (UCL)
Course committee: Louis Lemieux, Nick Donaldson, John Thornton (UCL), David Carmichael (KCL) and Xavier Golay (UCL)

Day 1: Wednesday 10.04.2019
Theme: Can I Put this Person with this Thing in the Scanner?

AM1.1 09:30-10:00 - General introduction (20 min) - Louis Lemieux (UCL)

AM1.2 10:00-11:30 - Overview of MRI: how it works, its E/M fields and their bioeffects (1.5h) - John Thornton (UCLH and UCL) & Karin Shmueli (UCL)

AM1.3 11:45-12:30 - Introduction to devices and the MR compatibility problem (45 min) - Nick Donaldson (UCL)

PM1.1 13:30-15:30 - Current regulation, application and clinical management of devices in MRI used in clinical medicine and research, and of their relevant regulatory frameworks (2h) - Geoff Charles-Edwards (KCL) & John Spensley (Finetech Medical Ltd.)

PM1.2 15:45-16:45 - Clinical and research governance: principles and practice in clinical and research settings (1h) - Anastasia Papadaki (UCLH and UCL) and Andrea Hill (UCL and Epilepsy Society)

Day 2: Thursday 11.04.2019
Theme: Physical Principles for Device Design and Applications

AM2.1 09:30-10:30 - Basic theory of MR scanners (1h) - David Carmichael (KCL) and John Thornton (UCLH and UCL)

AM2.2 10:45-12:45 – E/M hazards associated with devices in the MR environment (2h) - Louis Lemieux & Nick Donaldson (UCL)

PM2.1 13:45-15:15 - MR and device performance: data quality and functional integrity (1.5h)
    Passive devices and MR data quality degradation - David Carmichael (KCL)
    Active devices in the MR environment: practical challenges - Joerg Magerkurth (UCL)

PM2.2 15:30-17:00 - Device characterisation case studies (1.5h)
    EEG recording inside the scanner: passive and active device, safety and data quality (0.5h) – Louis Lemieux (UCL)
    Cardiac stimulation devices and their MRI conditional status (1h) - Kruno Lopandic (Medtronic)

Day 3: Friday 12.04.2019
Theme: Towards Getting a Device Approved: Standards and Regulations

AM3.1 09:30-11:00 - Passive vs. Active devices in the MRI scanner and its environment (1.5h) - David Grainger (MHRA) / David Dunham (Medtronic)

AM3.2 11:30-13:00 - Formal evaluation of interactions (1.5h)
    The ASTM test methodology standard (1h) - Aaron Oliver-Taylor (Gold Standard Phantoms)
    RF simulation / evaluation of active devices according to ISO TS 10974 (0.5h) – Shaihan Malik (KCL)

PM3.1 14:00-16:30 - Implementation: reducing/mitigating interactions (2.5h)
    Case study: MRI of patients with neurostimulators at NHNN (0.3h) – John Thornton (UCLH and UCL)
    Data quality / Device performance: in-depth look (2h)
    - Intra-MRI EEG data quality - Mario Bartolo (Brain Products UK)
    - MRI data quality - Xavier Golay (UCL), A Oliver-Taylor (Gold Standard Phantoms)

PM3.2 16:45-17:30 – ‘Dessert’ (1h)
    Funding opportunities - Laura Fenner (UCL BEAMS team)
    Meet the speakers & special refreshments