A Course in Radiotherapy Physics

6 – 10 November 2018
Radiation Dosimetry, Imaging for Radiotherapy, Treatment Planning and Patient Specific Dosimetry (Sutton Site)

5 – 9 March 2019
Accelerator design and Quality Assurance, Radiobiology, Brachytherapy and Radiotherapy Verification Imaging (Chelsea Site)

This course has been accredited per week by:
The Royal College of Radiologists CPD 26 Credits
EBAMP level 7 ..................................................CPD 36 Credits


Course Organisers: Ms M Bidmead & Dr V Hansen

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Course Lecturers
Dr. H Bainbridge, Dr. J Bedford, Dr S Bhide, Ms. M Bidmead, Mrs. I Blasiak-Wal, Mrs N Bleackley, Mr. P Bownes, Mrs C Brooks, Dr E Castellano, Mrs. H Chejecka-Szczygielska, Dr R Colgan, Mr W Connolly, Dr. V Cosgrove, Professor R Dale, Dr. G Flux, Dr. A Garton, Dr A Gasnier, Dr. S Guildford, Dr. S Hafeez, Dr. V Hansen, Dr. I Hanson, Dr. E Harris, Ms. M Hawkins, Mr. M James, Dr. T Jordan, Mr. D King, Dr. A Kirby, Professor C Kirisits, Dr. S Lalondrelle, Professor P Mayles, Dr. H McNair, Mr D McQuaid, Mrs. C Meehan, Mr. R Moore, Professor A Nahum, Mr M Najem, Mrs. O Naismith, Dr. S Nill, Dr. H Porter, Ms K Roberts, Professor C Rowbottom, Dr. M Schmidt, Mr M Seithel, Dr M Schwarz, Mr. G Smyth, Dr. C South, Dr. A Taylor, Dr. M Thomas, Dr R Thomas, Mr. J Thurston, Mr. R Trouncer, Mrs K Warren-Oseni, Professor M van Herk & Professor F Verhaegen.
This course provides a practical and theoretical background to Radiotherapy with its main focus on Radiotherapy Physics aspects. The curriculum covers many aspects and each course includes hands-on practical session on Saturday. Included in the full cost of the course are a set of lecture notes, a CD of the presentations, lunches, refreshments, cheese & wine and a course dinner.

Radiation Dosimetry, Imaging for Radiotherapy, Treatment Planning and Patient Specific Dosimetry (Sutton site)

Provisional Programmes
Day One: Fundamentals Radiation Dosimetry (Tuesday 6th November 2018)
- Photon Interaction Mechanisms
- Electron Interaction Mechanisms
- Fundamental Principles I & 2 of Dosimetry
- Characteristics & Calculations of Photon Beams
- Radiotherapy & Cancer specifically Lung Cancer
- Ionisation Chamber Design and Measurements
- Practical Implementing of New Techniques in the Clinic
- Course Meal

Day Two: Imaging for Radiotherapy (Wednesday 7th November 2018)
- Applications of Monte-Carlo Methods
- MR Imaging for Radiotherapy Planning
- PET Imaging for Radiotherapy Planning
- Treatment Planning Margins; ICRU 50, 62 & 83
- Stereotactic Body Radiotherapy (SBRT) for Lung Tumours
- Photon Beam Algorithms in Treatment Planning
- Quality Control in Treatment Planning/Checking

Day Three: Treatment Planning (Thursday 8th November 2018)
- Evaluation Tools in Treatment Planning
- Prostate Cancer: XBRT Techniques & Trials
- Intensity Modulated Radiotherapy Optimization Algorithms
- Electron Beam Therapy in Clinical Practice
- Inverse Treatment Planning IMRT & VMAT
- Large Field Techniques in Radiotherapy
- Dosimetry for Molecular Radiotherapy
- Course Meal

Day Four: Patient Specific Dosimetry (Friday 9th November 2018)
- Radiotherapy Head & Neck Cancer
- Radiotherapy for Breast Cancer: Current and Future Practice
- Adaptive Radiotherapy for Bladder Cancer in Clinical Practice
- Radiotherapy for Liver Tumours & Oesophageal
- Radiocromic Film Dosimetry
- In Vivo Dosimetry for Point Dose Measurements
- Verification and Image Based Dosimetry for IMRT
- Radiotherapy with Protons and Heavy Ions
- Cheese & Wine

Accelerator design and Quality Control, Radiobiology, Brachytherapy and Radiotherapy Verification Imaging (Chelsea site)

Provisional Programmes
Day One: Accelerator Design & QA (Tuesday 5th March 2019)
- Medical Electron Linear Accelerators
- Production of a Clinical Beam
- Multileaf Collimators: Characteristics & Commissioning
- Accuracy & Quality in Radiotherapy: An overview
- kV X-ray Units
- Cyberknife
- Tomotherapy & Gamma Knife
- Quality Control in Linacs

Day Two: Radiobiology (Wednesday 6th March 2019)
- Introduction to Cell Biology
- Tumour Cell Radiobiology
- Radiobiology of Normal Tissues
- Fractionation & Iso-effect in Radiotherapy
- Modelling the probability of Tumour Control (TCP)
- Practical use of Radiobiology in Treatment Planning
- Modelling Normal Tissue Complication Probability
- Compensation for Treatment Gaps in Radiotherapy

Day Three: Brachytherapy (Thursday 7th March 2019)
- Calibration and QA of Brachytherapy Sources
- Intracavitary Dosimetry
- The Radiobiology of Brachytherapy
- Gynaecology Cancers
- 3D Image based Brachytherapy Planning
- Transperineal Prostate Brachytherapy
- Radiation Protection issues in Brachytherapy
- Radiation Protection in External Beam Radiotherapy

Day Four: Verification Imaging (Friday 8th March 2019)
- Quality Assurance in Clinical Trials
- IGRT: Accuracy, Frequency & Dose
- Image Handling in Radiotherapy
- IGRT Techniques
- Errors & Margins in IGRT
- EPID Imaging in Routine Practice, Dosimetry & Quality Control
- Clinical Indications for Brachytherapy
- MR Linacs
- Cheese & Wine