

UPMC RADIATION ONCOLOGY RESIDENCY
Physics Lecture Series

TOPICS
Basic Physics
Nuclear Structure and Decay
Mathematics of Nuclear Decay
Brachytherapy I
Photon Interactions with Matter
Photon Beams, Dose, and Kerma
Particle Interactions with Matter
Review
X-ray tubes and linear accelerators
Medical Linear Accelerators
Megavoltage photon beams
Megavoltage photon beams: TMR and dose calculations
Photon beam treatment planning: part I
Photon beam treatment planning: part II
Midterm Exam

Part II – Radiation Therapy Physics

IMRT and VMAT
Megavoltage Electron beams
Radiation Measurement: ionization chambers
Other radiation measurement devices
Quality assurance (QA)
Radiographic imaging
Non-radiographic imaging
Review
Image-guided radiation therapy and motion management
Stereotactic treatments
Total Body Irradiation (TBI) and total Skin Electron Therapy (TSET)
Particle therapy
Radiation Protection
Brachytherapy applications and radiopharmaceuticals
Patient Safety and Quality Improvement
Review
Final Exam

