

This presentation is aimed at facilitating participants with the clinical application of Monte Carlo dose calculation algorithms in radiotherapy treatment planning and dosimetry verification. Following a brief introduction to the Monte Carlo radiation transport method, detailed discussions will be given on the clinical implementation and commissioning of the Monte Carlo dose calculation software. Current and potential applications of Monte Carlo dose calculation in conventional electron therapy, energy- and intensity-modulated electron therapy and advanced mixed beam therapy will be presented. Patient treatment plans generated using conventional dose calculation algorithms and Monte Carlo simulations will be compared with the causes of the dose discrepancies discussed.

Educational Objectives:

1. To introduce the basics of Monte Carlo radiation transport simulation
2. To discuss important aspects of clinical implementation and commissioning of Monte Carlo dose calculation algorithms for radiotherapy treatment planning
3. To describe the role of Monte Carlo dose calculation in electron therapy and advanced mixed beam therapy treatment planning and dose verification