Practical aspects of electron beam dosimetry

Electron beam dosimetry can be a deceptively simple endeavor. On one hand, the process of measuring and using unrestricted electron cone factors is remarkably straightforward. However, making measurements in restricted fields especially at extended treatment distances can prove to be quite a challenge, especially if the field is extremely narrow. Ionization chamber correction coefficients for cylindrical and plane-parallel chambers can depend on many factors and ensuring that the correct factors are applied for measurements at depth in water or solid phantoms can be confusing.

This talk will cover proper measurement set up and technique, problems and pitfalls associated with detector selection for various electron measurement situations, chamber response characteristics that should be known and determined before use for electron dosimetry, and efficient techniques for performing routine commissioning measurements and special dosimetry for electron beams. The influence of TG-51 calibration protocol on routine clinical measurements will also be covered along with some clinical techniques where electron beam measurements are particularly challenging and interesting.

Objectives:
1. Ionization chamber response characteristics in electron beams
2. Selection of detectors for measurements in electron beams
3. Use of ionization chambers and other detectors in electron beams measurements
4. Special measurement situations: restricted field measurements, measurements at extended distances, measurements in non-water phantoms
5. Clinical situations involving special electron beam measurements