

# MU Calculations: Electrons

$$MU = \frac{D}{PDD_{Electrons} \times IF}$$

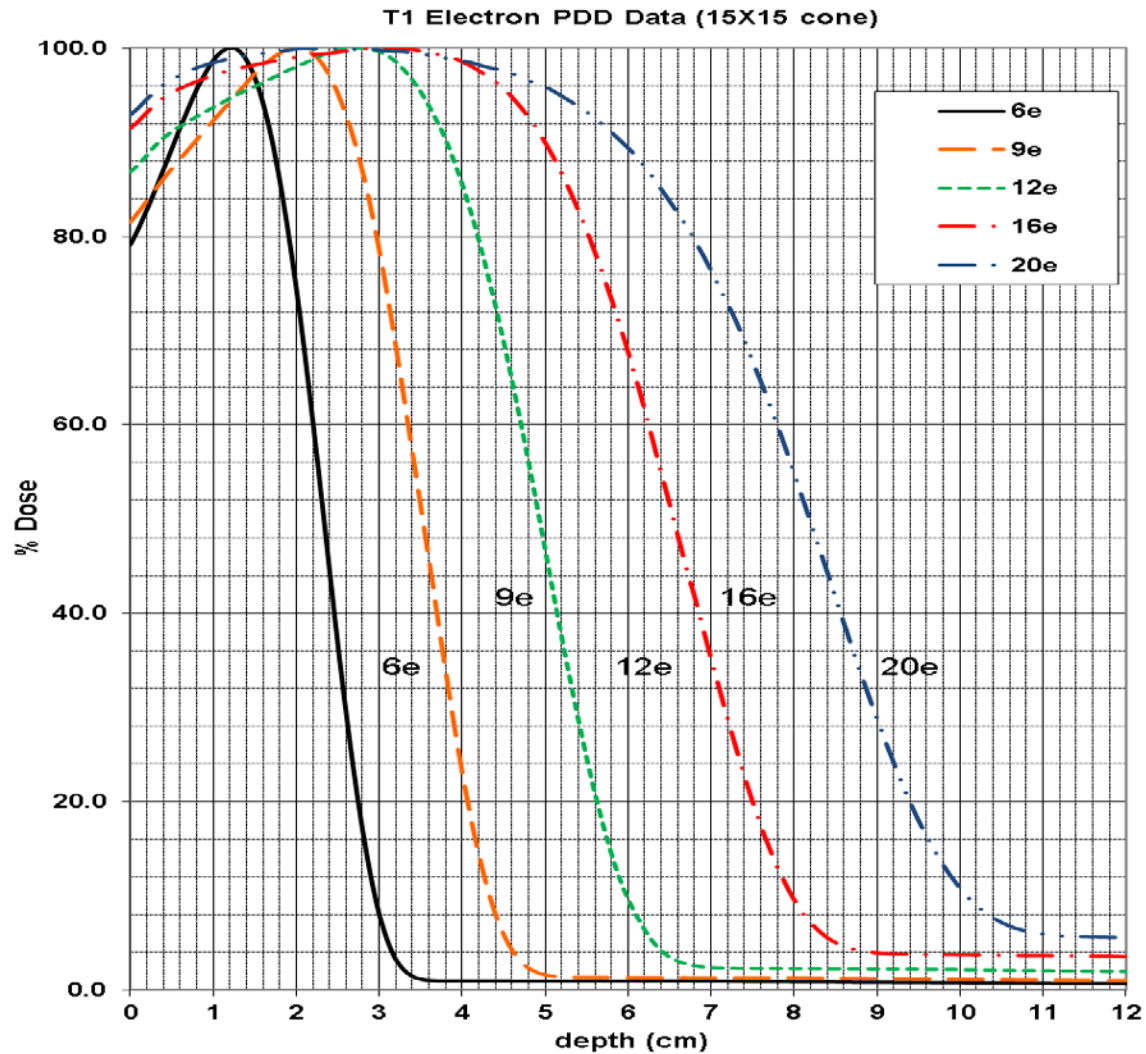
- For electron MU calculations, what does the Insert Factor Depend (IF) on?
- How are these dependencies measured?
- How do PDD curves for electron beams change with:
  - Field Size
  - Energy
  - Extended SSD

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$$MU = \frac{D}{PDD_{Electrons} \times IF(E, CS, CF, G)}$$

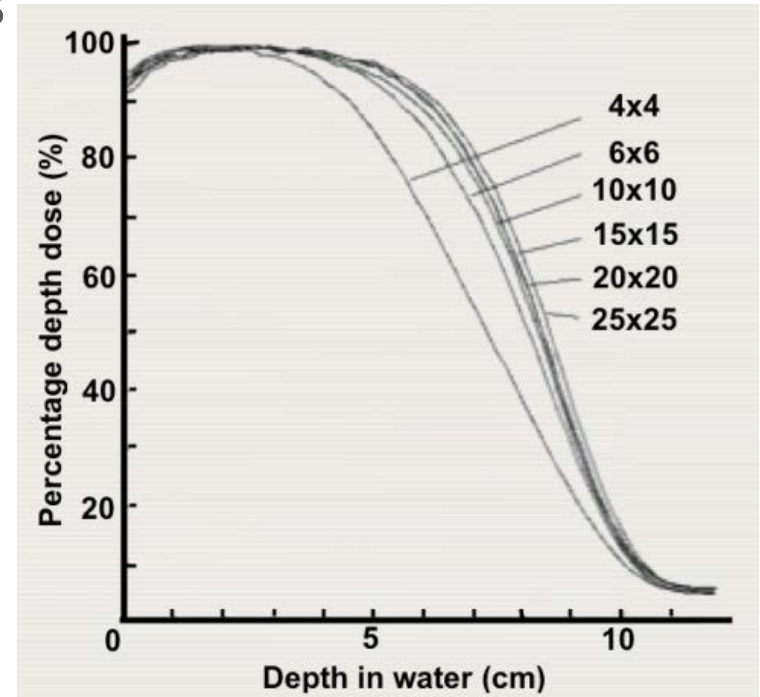
- Insert Factor Dependencies
  - Energy (E)
  - Cone Size (CS)
  - Cutout factor (CF)
  - Gap Factor (G)

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- The PDD curves for electron beams have minimal dependence on field size, except for small fields where the side of the field is smaller than the practical range of the electron beam.
- When lateral scatter equilibrium is not reached at small electron fields:
  - Depth of maximum dose moves closer to the surface



# Electron beam overview

- [http://www-naweb.iaea.org/nahu/DMRP/documents/slides/Chapter\\_08\\_Electron\\_beams.pdf](http://www-naweb.iaea.org/nahu/DMRP/documents/slides/Chapter_08_Electron_beams.pdf)

## 8.3 CLINICAL CONSIDERATIONS

### 8.3.4 Field shaping

- ❑ **Extended SSDs** have various effects on electron beam parameters and are generally not advisable.
- ❑ In comparison with treatment at nominal SSD of 100 cm at extended SSD:
  - Output is significantly lower
  - Beam penumbra is larger
  - PDD distribution changes minimally.
- ❑ An effective SSD based on the virtual source position is used when applying the inverse square law to correct the beam output at  $z_{\max}$  for extended SSD.