

Chapter 9: Medical applications of Accelerators and impact on humanity and society

- ▶ In short, what is our Chapter about?
 - ▶ Use of accelerators in medicine
 - ▶ Human centric techniques in external beam radiotherapy
 - ▶ New technology that is emerging from the convergence of technologies that have failed to make an impact

Chapter 9: Summary Status

- ▶ Our estimate of current level of completion: 90%
- ▶ The following additions/revisions will be completed by July 31st
 - ▶ Restructure the listed accelerators to reflect the therapeutic beam requirements; this requires a review of all existing text and references for coherent reading
 - ▶ Complete final sections on convergence and overall impact on society
 - ▶ Compare the content with other chapters and see if the narrative is correct.
- ▶ (if) our chapter includes direct quotes or images/figures used from other sources, permission needs to be asked from them as follows (examples!):
 - ▶ Maps of global distribution of radiological and nuclear medicine processes, extracted from the IAEA database; maps are currently produced using their engine – if necessary we can produce these maps from raw data and GIS
 - ▶ Table 1 is reproduced from the following book Chapter: Murshed et al., 2019 “ Chapter 3 – Radiation Biology”, in Fundamentals of Radiation Oecology, 3rd Edition, 2019 pp 57-59, <https://doi.org/10.1016/B978-0-12-814128-1.00003-9>
 - ▶ Above list is non-exhaustive and more will be added (will be completed by the end June).

Chapter 9: Key messages, insights (possible input for other chapters)

- ▶ Accelerators have been used in medicine for a long time
- ▶ Technology has a long adoption curve due to high capital costs.
- ▶ Step change in impact once new technology is adopted, and then a long tail of continuous improvement
- ▶ In this area, technologies that have failed to reach clinical use, are becoming relevant to address the evolving requirements of existing and emerging sectors
- ▶ Advances in accelerator technology are making them cheaper and lowering the capital costs, making these treatment type available to greater numbers of people (democratisation of access).