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- ; 2.3 Energy Loss ; 2.3.1 Nuclear Energy Loss
- ; 2.3.2 Electronic Energy Loss ; 2.3.3 Range and Bragg Curves
- 2.3.4 Track Formation and Radial Dose Distribution
- 2.4 Interaction of Hadrons with Biological Matter
 - ; 2.4.1 Cellular Organization and the Target of Radiation Action
 - ; 2.4.2 Hadrons' Track in Biological Matter
 - ; 2.4.3 RBE of Hadrons ; 2.4.4 Fractionation and Oxygen Effect

CHAPTER 3 STATUS OF CLINICAL RESEARCH IN PROTONTHERAPY

Sommario/riassunto

Hadronic radiotherapy uses particle beams to treat tumors located near critical body structures and tumors that respond poorly to conventional photon and electron beam radiotherapy. Initial research in hadronic radiotherapy was performed using accelerators built for physics research. The good results of the proton and ion therapy programs have enhanced the tendency to use protontherapy as a routine method. There are about 20 working protontherapy facilities (first, second and third generation) and more than 30 centers are planned. This book presents the first comprehensive overview of the fi