

PERSPECTIVES OF TUMOUR RADIOTHERAPY IN THE CZECH REPUBLIC AND "ONCOLOGY 2000" FOUNDATION

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SUMMARY

The incidence of tumours has still an increasing tendency. A great effort is being devoted to prevention as well as to improving early diagnosis and treatment. It is the radiotherapy which seems to bring new treatment possibilities at the present. Its goal consists in destroying all tumour cells in the target volume while all normal cells being damaged unsubstantially only. That is being achieved with standard available means only with rather great difficulties.

However, in the last time two radiotherapy methods have been developed which are based on the use of the so called hadrons (i.e. particles exhibiting strong mutual interactions) and come nearer to the mentioned ideal goal of any tumour therapy. The first method consists in the application of beams of charged hadrons having a suitable characteristic of energy transfer; the most energy being transferred to the matter in the end of hadron tracks. Thus, by a suitable choice of initial energy of beam particles this maximum may lie in a tumour volume, while all other tissues obtain a smaller dose; the difference being greater when a multiple-field technique is used. The other approach (neutron capture therapy – NCT) makes use of epithermal (or thermal) neutrons captured by special isotopes accumulated in tumour cells with the help of suitable chemical carriers. Both the methods are now being introduced into clinical use in many countries.

The "Oncology 2000" Foundation was grounded to introduce these methods into clinical use also in the Czech Republic. It proceeds with activities started by an interdisciplinary group of specialists formed approximately 20 years ago and having prepared some necessary conditions. As to the NCT a corresponding facility is now being finished and clinical tests are expected to be started in 1997. The main attention is now devoted to building up an oncology center based on the use of hadron beams.

Key words: particle radiotherapy, protons, heavy ions, neutrons, neutron capture therapy, radiobiology

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