

of the planned individual dose distributions to cancer patients and aimed at optimizing the actions performed by a medical physicist in typical clinical situations during his job in radiological departments. These guidelines will include regulations related to labor protection and radiation protection standards, which will increase the safety of specialists who work directly in the field of exposure to ionizing radiation.

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### DEVELOPMENT OF METHODOLOGICAL RECOMMENDATIONS REGULATING THE SELECTION OF EXTERNAL BEAM RADIATION THERAPY TECHNIQUE AND PARAMETERS OF TREATMENT PLANNING

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The main requirement for radiation protection of cancer patients during radiation therapy is the maximal possible reduction of the absorbed dose to normal tissues and organs surrounding the tumor while high dose values are still cover the irradiated target itself. The aim of the work is to develop the relevant regulatory documentation, the introduction of which in the clinical practice of radiological departments will improve the quality of the treatment process and reduce the time of unintended stay of staff and patients in the area of exposure to ionizing radiation.

*Keywords:* oncology, radiation therapy, medical physics, treatment planning, medical linear accelerator.

According the International Agency for Research on Cancer (IARC) and the World Health Organization (WHO), every year around ten million new cases of cancer are registered in the world and this number will only increase over time. It should be noted that more than half of all cancer patients are should undergo radiation therapy. For the safe and effective implementation of high-tech methods of radiation therapy, all procedures related to the physical and technical aspects of patient irradiation should be strictly regulated and adequate guidelines should be used when choosing methods and parameters for dosimetric planning of external beam radiation therapy[1].

Nowadays, the process of external beam radiation therapy includes pre-radiation preparation of the patient, dosimetric planning of the conditions of radiation treatment, verification of the treatment plan and irradiation of the patient using the radiotherapy machine. At the stage of preradiation preparation, computed tomography is performed, and the volumes of radiation and critical organs are contoured using the reconstructed three-dimensional CT images obtained. Next, treatment plans are created and verified, after which the patient is irradiated according to the calculated parameters (Figure 1).

The patient's preradiation preparation and radiation treatment procedures are carried out using sources of ionizing radiation. Ionizing radiation is an environmental factor that negatively affects human health. The rationale for its use in oncology is the fact that with the same absorbed dose, cancer cells are destroyed faster than healthy ones. Consequently during the radiation treatment, the patient is exposed to radiation exposure, the benefit of which at the moment exceeds the harm.

However, when providing radiation therapy, the main requirement is to ensure local tumor control, while avoiding exceeding tolerant doses to healthy tissues and organs. To fulfill these requirements, a medical physicist should be guided by methodological recommendations that regulate the conditions and clinical situations for which it is necessary to apply various methods of radiation planning, including relying on the maximum permissible absorbed dose values for the patient's healthy organs. When implementing an irradiation plan, a patient is in the area of ionizing radiation for 1 to 20 minutes depending on the chosen radiation therapy technique, which should also be taken into account during treatment planning.

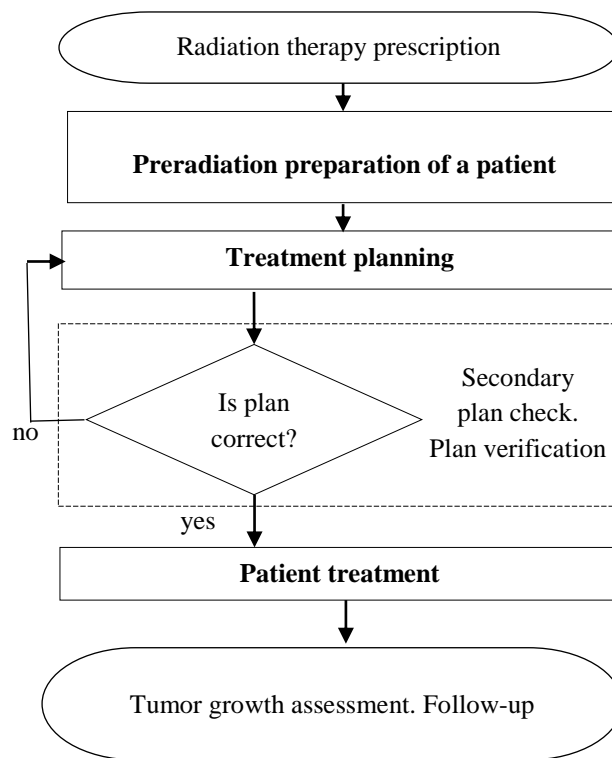


Fig. 1. – The process of radiation therapy

To prevent healthy tissues exceeding maximum permissible absorbed dose values during radiation therapy, as well as to reduce them as much as possible, the radiotherapy personnel need to choose the optimal irradiation methods at the dosimetric planning stage and correctly evaluate the dose levels delivered to the risk organs and normal tissues. With the aim of improving the quality of the treatment process, optimizing the work of the medical physicists and reducing the time of the unintended stay of the staff and the patient in the area of ionizing radiation in N.N. The Alexandrov National Cancer Center of Belarus, the authors decided to develop methodological recommendations regulating the proper choice of methods and parameters of dosimetric planning of external beam radiation therapy, describing the algorithms of the actions of a medical physicist during all stages of patient's preradiation preparation of the radiation therapy aimed at making the accurate and adequate decisions in the variety of clinical situations.

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#### DEVELOPMENT OF DOCUMENTATION ON WASTE MANAGEMENT FOR ENTERPRISE JSC “ECOVER PRO”

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In recent years due to the constant development of industry and the transition of the Belarusian economy to the principles of sustainable development considerable attention has been given to the issue of waste management. The Republic of Belarus is constantly working on the implementation of state control over waste management. In order to comply with the legislation, each enterprise dealing with waste management is obliged to keep the relevant documentation up to date.

**Keywords:** legislation, waste management, waste accounting, waste inventory, waste generation standards, waste processing, rubber-containing waste.