

## PROSPECTS AND DIRECTIONS FOR IMPROVING RADIATION STERILIZATION TECHNIQUES

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Sterilization is an essential process to ensure the integrity and safety of bone materials, regardless of whether they are used in medical procedures, in solving forensic tasks, or in conducting research on fossil fragments. However, the use of “monomethods”, such as chemical treatment and even radiation, is not always effective, unlike the use of two-stage combined radiation sterilization methods.

At the first stage of combined radiation sterilization, methods such as chemical treatment, microwave exposure, sterilization with an ozone-oxygen mixture, etc., can be used, depending on factors such as the type and level of initial contamination. After completing the first stage of sterilization, the samples are subjected to a second stage using radiation exposure. Radiation sterilization is effective for eliminating microbial contamination and residual biological load preserved after the first stage [1].

The choice of the type of radiation exposure is crucial to provide the safety and effectiveness of bone implants. Factors to be considered include the type of radiation (e.g. gamma radiation or electron beam treatment), the dose required to achieve the desired level of sterilization, and any potential impact on the physical and mechanical properties of implants.

Choosing the appropriate methods at each stage of combined sterilization is an important step in ensuring the quality of bone implants. Taking into account the specific requirements for each sample and the optimal sterilization options will ensure the manufacture of implants according to the highest standards of safety and efficiency.

1. Rozanov V.V., Matveichuk I.V., Chernyaev A.P., Nikolaeva N.A., Krasnov S.A. Current State and Lines of the Further Development of High-Tech Means of Radiation Sterilization // Bulletin of the Russian Academy of Sciences: Physics. –2020. –V.84. –№ 4. –P. 403-405.

### Section

Applications of nuclear methods in science, technology, medicine and radioecology

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