



*Others*

## **BNCT implementation in an existing clinical facilities – preliminary experience of Blokhin National Medical Research Center of Oncology**

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Most known AB-BNCT facilities are situated in newly built, specially designed and standalone buildings. However, constructing a new building is very expensive, time demanding and in some cases is even not possible or allowed. In N.N. Blokhin National Medical Research Center of Oncology, the leading oncological institution in Russia, it was decided to install VITA accelerator based neutron source, developed by Budker Institute of Nuclear Physics for BNCT, in an existing room for distant beam radiotherapy (RT), which originally was meant for radiotherapy linear electron accelerators up to 24 MV. Placing VITA AB neutron source to the existing RT canyon requires significant rearrangement and reconstruction of the canyon. A corresponding engineering project was developed. Radiation safety assessment showed that VITA AB neutron source can be safely installed in an existing RT room. Serious issue for operating AB neutron sources with lithium target in a conventional radiotherapy department is recycling the used lithium target which gets highly radioactive while operating.

For prognostic evaluation of BNCT efficacy for a particular patients and thus proper selection of patients for BNCT Clinical Trials <sup>18</sup>F-boron-phenylalanine (<sup>18</sup>F-BPA) is being introduced to the clinical practice as radiopharmaceutical for positron emission tomography (PET). A laboratory manufacture regulations were developed and preclinical studies of <sup>18</sup>F-BPA as radiopharmaceutical has been performed.

Thought boron-phenylalanine (BPA) is well known as a boron carrier for BNCT all around the world, however it does not present in Russian drugs registry and thus for the Russian Healthcare it is a brand new drug. Any new pharmaceutical requires preclinical studies to be approved for usage in Clinical Trials. This studies were performed in N.N. Blokhin National Medical Research Center of Oncology.

Clinical protocols and operating procedures of BNCT conducting yet must be developed and approved by local scientific and ethic committees.