

# Discussion on Nuclear Medical Imaging Technology and Its Radiological Protection Strategy

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**Abstract:** The continuous progress and development of medicine has effectively promoted the continuous progress of nuclear medicine imaging technology. At present, nuclear medicine imaging technology has been widely used in clinic. The application of this technology needs to be carried out in open radioactive places, and there will be some radioactive damage, which is concerned and valued by more and more medical workers. In order to ensure the effective protection of radioactive work, it is necessary to have perfect, safe and reliable prevention and control measures, so as to effectively ensure the health of medical workers and patients, And it can effectively promote the long-term and stable development of nuclear medicine. This article will elaborate the nuclear medical imaging technology in detail, and elaborate the specific radioactive protection strategy of nuclear medical imaging technology, hoping to provide reference for everyone.

**Keywords:** Nuclear Medicine; Imaging Technology; Radiation Protection; Strategy

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## Introduction

With the continuous progress of science and technology, the continuous development of medicine, the effective combination of computer technology and positron emission technology, nuclear medicine technology has been widely used in the medical community, and the continuous updating of radioactive drugs has made nuclear medicine technology achieve good achievements and breakthroughs. Nuclear medicine effectively combines radioactive elements and related compounds, and can diagnose and evaluate human volume. It belongs to the medical discipline, and can fully judge the liver function and specific condition of patients. With the continuous development of nuclear medical imaging technology, it has developed from the original diagnosis stage to treatment, and has been widely used. Nuclear medical imaging technology is a non closed radioactive source. In the process of technology application, external radiation will appear, and its injection and pollution behavior belongs to internal radiation. If it is not properly handled in the process of technology application, it will easily cause physical injury and impact to medical staff and patients, so, It is very necessary to study nuclear medical imaging technology and protect its radioactivity.<sup>[1]</sup>

## 1. Analysis of nuclear medical imaging technology

Nuclear medicine is an important part of modern medical technology, which has a direct impact on the development of hospitals. It belongs to an independent discipline technology. Nuclear medicine imaging technology has the characteristics of simple operation and clear image. It is an important clinical medical diagnosis technology in China, and it is an important foundation and guarantee for clinical diagnosis and quality in China. Generally, the images formed by MRI and ultrasound serve for the structure, The formed image is relatively clear, and the accuracy is guaranteed. Nuclear medical imaging technology applies nuclide tracing technology. In the specific diagnosis process, the difference of absorption function will be used as the basis, and the radioactive concentration will be used as the reconstruction variable. When the labeled radioactive molecule probe and imaging agent enter the inspection machine, they will be introduced into the tissues and organs inside the body, and then the radioactive tracer will be emitted, and then presented as an image, which can accurately detect the liver The accurate presentation of the location, volume and specific shape of the lesion can effectively reflect the blood flow and metabolism of the liver and the location of the lesion. <sup>[2]</sup> The changes of many other molecules will also be displayed through

the image, which can check the physical condition as soon as possible, and if there is a problem, it can be treated in time. With the continuous progress of medical technology, new and advanced nuclear medical imaging technology is widely used in clinic, which can effectively present the anatomical morphology and functional metabolism of patients. The electronic reflection diagnostic instrument is effectively combined with the emission computer technology, which can effectively make up for the defects of the traditional medical imaging technology and effectively improve the resolution of the instrument, It has effectively promoted the continuous progress of nuclear medicine technology.

## **2. Radiological protection strategy of nuclear medical imaging technology**

Generally, nuclear medicine staff usually contact with the content of using nuclear radiation to treat patients' diseases. Diagnosis and treatment, and carry out various medical research according to nuclear medicine technology, will be exposed to radiation in the specific work process, which is easy to cause physical and psychological damage to medical staff. Therefore, we should attach great importance to the effective protection of radiation of nuclear medicine imaging technology.

### **2.1 Strengthening the protection of clinical staff**

In the process of irradiation of nuclear medicine technology, some radioactive drugs will result in serious harm to the health of clinical staff. Therefore, effective protective measures should be taken for medical protection personnel. When clinical workers are exposed to nuclear radiation, they should wear masks, isolation clothes, sleeves and other protective clothing, which can prevent aerosol, dust and other harmful substances from absorbing the respiratory tract and causing harm to the body. Silicone shoes and latex gloves that have been contaminated should be cleaned and disinfected in time, and their front and back sides should be correctly distinguished to avoid cross contamination, Medical staff should also carry out the detection of instruments with systemic contamination to determine whether they are contaminated by radiation, and deal with them in time. They should also carry out radiation monitoring in the workplace and make sufficient records. conduct  $\gamma$  During the application of radionuclides, relevant medical staff should place some lead bricks for effective protection to avoid radiation damage. conduct  $\beta$  When using radionuclides, effective protective measures should be taken to avoid damage to the face and eyes. Relevant staff should strengthen protective work and avoid physical contact with patients. For patients receiving radionuclide therapy, their activity areas should be reasonably limited. It is best to restrict patients' activities in their wards and have independent toilets. We should also pay attention to adequate radiation protection training for medical workers to improve their awareness of protection. A large number of facts have proved that there is a direct relationship between radioactive medical accidents and the professional quality of medical staff. As nuclear medicine staff, they must take up their posts with certificates. Before taking up their posts, they must do a good job of training, comprehensively master the methods of radiation protection, strictly grasp the operation process of clinical medicine, and operate the process in strict accordance with the relevant clinical medical operation requirements. Hospitals should have sound and perfect radiology department management rules and protection requirements, and strictly follow the relevant management and requirements.<sup>[3]</sup>

### **2.2 Process of enhancing protection against radionuclides**

The process of radiation therapy should meet the conditions of safety, hygiene and convenience. It should be set on the ground floor of the hospital together with the waiting room, examination room and operation room. It is necessary to strengthen the control of the control area and supervision area of the radiotherapy site, and must clearly divide them. Generally, the treatment room will be set in the control area, and the surrounding rooms will be set as the supervision area. This is very convenient for the management of radiation protection, and can better control the effective exposure of nuclear technology. In the treatment room, it is necessary to ensure that the irradiation direction of the useful harness has sufficient protection, and the shielding of the main ray should meet the relevant requirements. <sup>[4]</sup> For the protection of rays in other directions, it is necessary to fully meet the relevant shielding requirements of scattered rays and missed lines. We must pay attention to the effective protection of the radiation direction of the harness in the treatment room, and do a good job in shielding management. In the process of radioactive radiation, we should choose the conditions with good shielding and ventilation. The sub packaging treatment tray of radionuclides should have sufficient disposable absorbent paper to avoid

direct contact with the radioactive source by hands and body. When taking medicine, attention should be paid to maintaining a certain distance. Long handled instruments can be selected to insert into the lead jar to clamp the medicine, and there should be sufficient spacing from the radioactive source, so as to try our best to reduce the radiation and impact on the human body. When injecting radioactive drugs into patients' veins, it is necessary to stand behind the lead screen and complete it as soon as possible to reduce the radiation time. Minimize the impact and damage of radiation on human body.<sup>[5]</sup>

## 2.3 Strengthening the nursing management of nuclide patients

The patient should make an appointment before the examination, and try to inject the examination in batches at different times, explain the examination items and relevant precautions to the patient, strengthen health education, and for the need for systemic bone imaging examination.

The patients examined should make it clear that the radioactive drug injection treatment will not cause damage to the body, and eliminate the patients' ideological concerns. Before the injection of imaging agent, guide the patients to drink more water and urinate to avoid urine pollution. After examination, patients should rest in the waiting area to avoid walking around at will, which will cause mutual irradiation between patients and medical workers.

## Conclusion

With the cooperation of ultrasonic imaging, CT technology and nuclear magnetic resonance technology, the level of diagnosis and treatment of clinical diseases is constantly improving, and nuclear medicine technology has become the core technology of medical imaging diagnosis at this stage. In the process of the application of nuclear medicine technology, we should effectively apply the radioactive protection measures, do well in the protection of patients and medical workers, do well in isolation protection, pay attention to enhancing the awareness of radioactive protection of medical staff, pay attention to the training of nuclear medicine workers, and standardize the operation process of nuclear medicine radiation process, which can not only effectively avoid unnecessary nuclide exposure, It also effectively reduces the physical injury caused to patients and medical staff. It can effectively promote the continuous development of Chinese medicine, better diagnose and improve the quality of diseases for people, shorten the treatment time, improve the treatment effect of patients, effectively improve the medical level of our country, and better serve the people.

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