



MEASUREMENT OF IODINE-131 CONTAMINATION IN A NUCLEAR MEDICINE DEPARTMENT

Caen-Normandie University Hospital Center (CHU), France

/ CONTEXT

Nuclear medicine is the medical specialty using radioactive isotopes for research, diagnosis & treatment of sick tissues & organs. Due to the exposure of patients & health personnel to unsealed radioisotopes, resorting to nuclear medicine is not without risk. And yet, every year, thousands of patients suffering from tumors, cancers, & bone pains resulting from cancer, are treated with iodine-131, whose dose is variable depending on the type of intervention to perform & the body part to examine. As it is a fission product, the risk of accidental release & contamination of the surrounding environment, is extremely feared. To stick to the ALARA principle (*As Low as Reasonably Achievable*), the Health Physics Department of the Caen-Normandie University Hospital Center (CHU) thus decided to provide oneself with Bertin Technologies' alpha & beta contamination meter SaphyRAD C.

/ TESTIMONY

In this case study, an iodine 131 capsule was taken by a patient to treat his cancer of thyroid.

As a therapeutic agent, the radioactive iodine is indeed detected by the thyroid cells, in which it masses & radiates, thus destroying them.

Following iodine 131 intake, the patient regurgitated the drug, thus causing instant fluid contamination on the floor's surface.

In order to decontaminate the soiled area, the alpha & beta contamination meter SaphyRAD C was used to search for the slightest trace of contamination on the floor.

Thanks to the device's ease of use & ergonomic design, the operator was able to control a large surface by taking a direct measure & hence to decontaminate the area with the appropriate cleaning agents.

/ CONCLUSION

Designed by Bertin Technologies, the alpha & beta contamination meter SaphyRAD C was able to efficiently fulfil the needs of direct measurement expressed by the Radiation Protection Department of the Caen-Normandie University Hospital Center, France. Thanks to the large surface A/B100 probe, the risk of accidental release & contamination of the surrounding environment was avoided, with the utmost respect for the ALARA principle. The reactivity, reliability & ergonomic design of the device allow the operators to react quickly to instant radioactive contamination.

/ MATERIAL

To control the radioactive contamination of a soiled surface, a SaphyRAD C device equipped with a A/B100 probe was used by the Radiation Protection Department of the Caen-Normandie University Hospital Center.

Being medium-sized, the A/B100 probe has 2 measurement channels - 1 for α , 1 for β - allowing for an effective alpha/beta discrimination. To take a direct measure, the ^{131}I radionuclide was selected beforehand: this sensitivity being stored in the device's memory, a reliable measurement was therefore conducted from the probe's first passages.

Characteristics of the A/B100 probe

- Surface of detection: 100 cm²

- Sensitivity

- α : 0.14 c/s/Bq (^{241}Am)

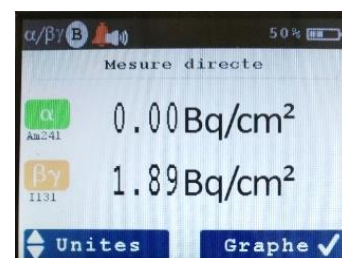
- β : 0.23 c/s/Bq (^{36}Cl)

- Measurement range

- α : from 0.01 to 100 Bq/cm²

- β : from 0.1 to 1,000 Bq/cm²

There are two visual indicators on the probe: one to trigger the alarm, the other to signal the correct distance for a fast & efficient control.



/ CUSTOMER

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