

A thyroid uptake system: implications for a portable probe design

Silva, Carlos B., Farias, Marcos S., Fonseca, Antonio C. C.¹

e-mail: borges@ien.gov.br,
msantana@ien.gov.br, afonseca@ien.gov.br

¹ SEINS, IEN

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There is a constant search for developing more portable and easy to use medical equipment. Considering this trend and previous experience, a complete thyroid uptake system has been performed focusing on probe features, user interface, and system mobility. This equipment consist of a probe, a controller module, a mobile base for probe and a computer, and is in a constant upgrade in accordance with the International Atomic Energy Agency (AIEA) recommendations related to the standardized procedure and reliability of uptake measurements [1]. This system is fully operated by means of a specific software: a program for thyroid tests with its graphical user interface on the screen of a personal computer, PC compatible or mobile devices such as "notebooks" and "tablets". In order to enhance system portability, a lighter probe was developed and the connection of the controller module to the computer was simplified and made more flexible as shown in Figure 1. This report presents the current status of the design of this new thyroid uptake system able to be used as in nuclear medicine services as hospital rooms [2].



Figure 1. The lighter probe proposed when compared with the older 2" x 2" scintillation detector probe

Nuclear medicine services are still using thyroid uptake systems for diagnostic and therapy of the gland. However, with the evolution of the electronic technology and the introduction of the computer to control and operation of the systems, the procedure of exams has become more reliable, faster and versatile. For this reason, since 1980 the Nuclear Instrumentation Department of Nuclear Engineering Institute (IEN) has been working in

upgrade the controller module and probe to improve the operation efficiency of thyroid uptake exams, as shown in Figures 1 and 2.



Figure 2. The evolution of the controller module applied to a thyroid uptake system built in the IEN

The most significant benefit offered by this work is related to the weight reduction of the probe, which allows for higher productivity of exams.

Figure 3 shows the results of the improvements implemented in the system, which allow for rapid patient positioning with excellent portability and mobility as compared with the similar imported equipment [3].



Figure 3. New approach of the thyroid uptake system considering portability and mobility

Medical uses of this new system could bring considerable public health benefits once the patients would not need to move to the Nuclear Medicine Service of the hospital to do an exam. The performance of this new system can result in good portability as a result of this portable probe.

References

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