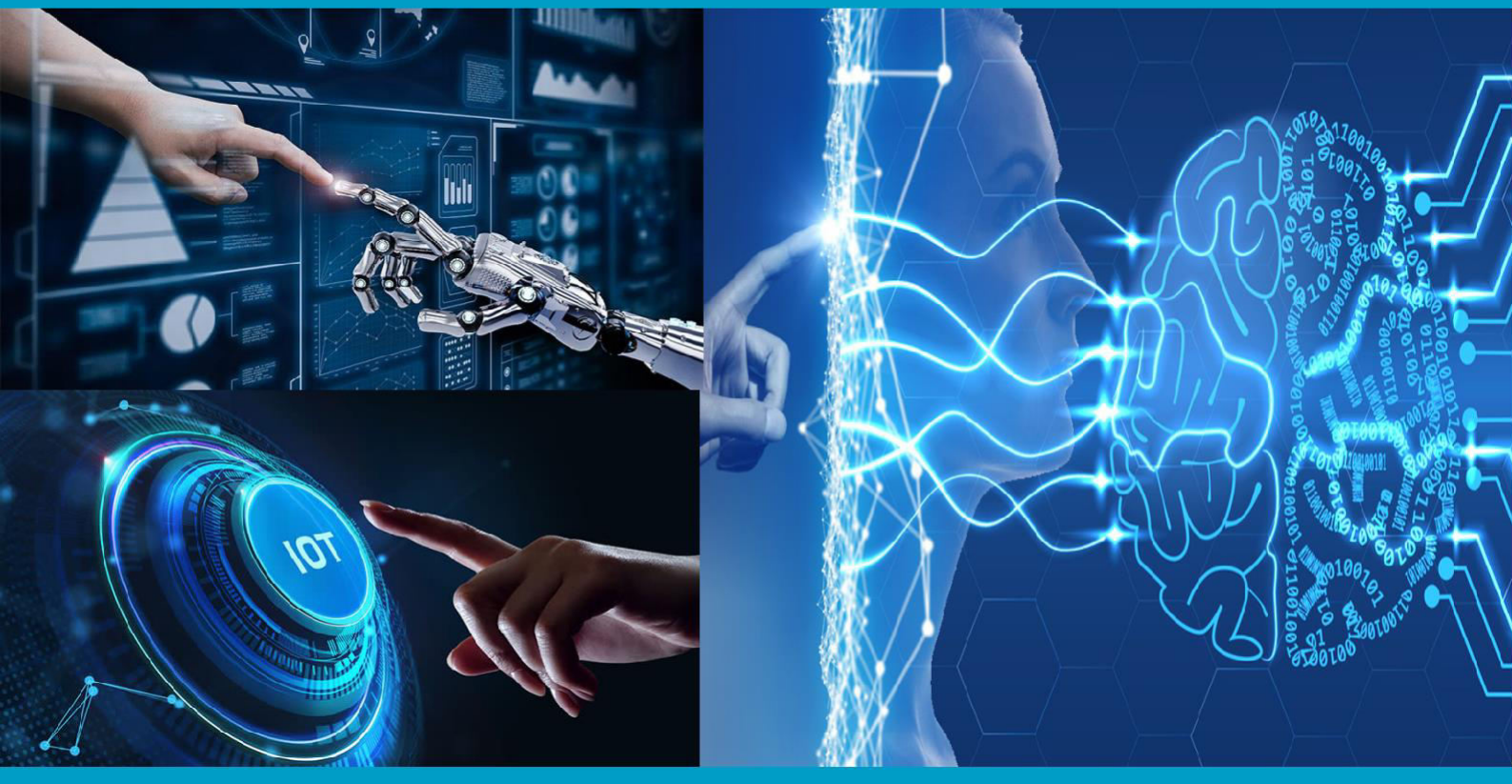
IJMRSETM

e-ISSN: 2395 - 7639



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT

Volume 9, Issue 9, September 2022

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.580

International Journal of Multidisciplinary Research in Science, Engineering, Technology & Management (IJMRSETM)

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 7.580|

| Volume 9, Issue 9, September 2022 |

| DOI: 10.15680/IJMRSETM.2022.0909025|

Assessment of the Quality of Radiation and Hygienic Studies in Radiation Diagnosis

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Annotation.A complete quality control system is just one element of a comprehensive quality assurance (QA) program, so that the quality requirements of a product or service are consistently fulfilled by all links. in accordance with the purpose of this study, 120 medical facilities were inspected in the republic, At the same time, 200 X-ray machines were technically certified, including: 122 general diagnostic (stationary and mobile); 30 fluorography; 0 mammographic; 22 dental; 2 angiographic; 14 tomographic (computer tomographs). The obtained results indicate that among the equipment studied, 12% did not correspond to the declared parameters.

Keywords: radiation diagnostics, quality control, radiation protection, X-ray machine, health care, technical certification.

Relevance. Radiation diagnostics today is an independent, rather specific area of medicine, which is a combination of imaging technologies: X-ray diagnostics, computed tomography, magnetic resonance imaging, ultrasound, positron emission tomography, etc. [1, 7]

With all the variety of available equipment, the development and implementation of a quality control program (QCP – quality control program) in medical institutions, which are aimed at obtaining high-quality medical images, minimizing costs and radiation dose, and are determined as part of organizational measures, is of key importance. All monitoring programs and procedures in the field of radiological protection are aimed at: identifying the main sources of ionizing radiation, assessing occupational exposure and compliance with dose limits, as well as implementing current hardware controls and collecting information to improve control measures.

However, a complete quality assurance system is just one element of a comprehensive quality assurance (QA–qualityassurance) program that aims to ensure that the quality requirements of a product or service are consistently met by all links. It should be noted that a comprehensive quality system begins even before the purchase of any equipment, since needs analysis and specification development are important components within QA [2].

The European Union adopted the Luxembourg Declaration of April 5, 2005, calling on states to develop a culture of patient safety and stated that the health sector is a high-risk area due to adverse conditions caused by some diagnostic and treatment methods [3]. Quality control programs in diagnostic radiology are recognized as the most effective means of managing the visualization environment. Public institutions providing health care services should focus on user/customer satisfaction and prioritize competence and quality. Given the nature of the public good, diagnostic radiology is a powerful medical tool that needs to take into account the philosophy of safety culture and radiation protection. [4, 8]. recently the world has developed rules, guidelines and laws for the implementation of quality control programs in radiodiagnostic centers around the world, including the United Kingdom, Germany, the United States of America, the World Health Organization and the European Union.[5]

Purpose of the study. This study was aimed at assessing the implementation of the quality control program and radiation protection criteria in the medical institutions of the republic.

Materials and methods. In total, throughout the republic, the study was conducted in 120 medical institutions, 200 X-ray devices were technically certified, including: 122 general diagnostic (stationary and mobile); 30fluorographic; 10 mammographic; 22 dental; 2 angiographic; 14 tomographic (computer tomographs).

In this case, the following devices and auxiliary equipment were used:

- analytical equipment (quality control system) for quality control of operating parameters of X-ray machines: UNFORS Xi multipurpose dosimeter; multipurpose dosimeter ACCU-PRO RADCAL; multi-purpose dosimeter DIAset MULTI, dosimeter RaySafe with a set of detectors.
- phantoms - CATPHAN 600 CTP600 for CT quality control; T40027 - head and body phantom for CT;

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- test objects - ACR 156 for mammography; TOR 18 FG for fluoroscopy; L659005 for high contrast resolution; GM 151 for low contrast resolution; L659041 X-ray set; L659092 for mammography;
- two-channel devices for measuring the dose of the patient (DAP -) - DIAMENTOR CX DAP/dosemeters; DIAMENTOR M4-KDK.
- kits - NORMI DENT; L659039 - high resolution templates for mammography; L981246 NORMI 13 focus;

The following indicators were evaluated for compliance with the requirements of SanPiN No. 0194-06 [6, 9]:
- Accuracy of fulfilling the settings of the anode voltage, anode current strength, amount of electricity, exposure duration and linearity of the radiation dose at a given anode voltage;
- Radiation output and total filtration of the X-ray emitter beam;
- The shape of the curve and the ripple of the anode voltage;
- The repeatability of the radiation dose in the snapshot mode and the departure of the central X-ray beam when changing the position of the tripod and changing the focal length;
- Coincidence of optical (light) and x-ray fields of radiation;
- Control of the parameters of the image converter (X-ray dose rate in the plane of the radiation receiver at given values of threshold contrast and resolution; image quality; auxiliary functions; system for stabilizing brightness or exposure metering.
- Radiation protection of the X-ray emitter in the presence of a plug.

Research results. The obtained results indicate that among the studied equipment, 12% did not meet the declared parameters. So, in terms of the accuracy of fulfilling the settings of the anode voltage, the strength of the anode current, the duration of exposure and the linearity of the radiation dose at a given anode voltage, it did not correspond to the indicators of SanPiN No. 0194-06 24 X-ray apparatus.

Analysis of the data showed that 24 of the studied devices were morally and physically obsolete, which means that the main priority for reducing patient doses is to replace the existing film X-ray devices with low-dose digital ones, which reduces exposure levels by 5-10 times.

A survey of medical and engineering personnel showed that in medical institutions, the majority are not familiar with the program for ensuring quality control, although its implementation is considered very important throughout the world

Conclusions. An evaluation of the implementation of the quality control program and radiation protection criteria in medical institutions of the republic showed that the complete quality control system was not consistently implemented. A complete quality control system is just one element of a comprehensive quality assurance program that aims to ensure that the quality requirements of a product or service are consistently met.

A comprehensive quality system begins even before any equipment is purchased, as needs analysis and specification development are important components of quality assurance.

Comprehensive components of daily quality control of ongoing research are needed, incl. Procedures for visual control of equipment performed by X-ray laboratory technicians. To ensure a safety culture at the proper level, it is necessary to use standard operating procedures, incl. To monitor the elements of radiation safety, and its implementation should be a motivating factor.

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Impact Factor: 7.580

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