International Journal of Radiology Research
www.radiologyjournal.in
E-ISSN: 2663-4562, P-ISSN: 2663-4554
Received: 09-06-2019 Accepted: 27-06-2019; published: 08-07-2020
Volume 2; Issue 1; 2020; Page No. 11-13

Quality assurance and patient safety in nuclear medicine

Lucio Mango
Director of Higher Education in Healthcare, University of International Studies (UNINT), Rome, cc, Italy

Abstract
As is known, Risk Management implies the identification of errors in patient care and the related reasons, with the aim of learning from such events to ensure that the necessary actions are taken to prevent them from recurring in the future. Nuclear medicine must address this problem according to a multidimensional logic, proposing in addition to the traditional clinical risk management tools, skills developed over time about the protection of workers and the safe use of health technologies. Also security, understood in the broadest sense of the term, is a problem that has a strong impact on the reality of the sanitary structures. Particular attention to all aspects related to security management, with particular regard to those sectors of health care that more than others could be instrumentally "hit" for no medical purpose, as threatening.

Keywords: Quality, Patient, medicine, according

Introduction

Safety is a content of the quality of assistance. As part of the Clinical Governance, Risk Management policies are a tool to ensure patient and operator safety [1].

As is known, Risk Management implies the identification of errors in patient care and the related reasons, with the aim of learning from such events to ensure that the necessary actions are taken to prevent them from recurring in the future [2, 3].

Therefore, clinical risk management consists of guidelines, protocols, pathways, organizational and clinical procedures and practices adopted within a hospital to reduce the probability of events and actions potentially capable of producing negative or unexpected effects on the state of patient health [4].

Also the use of EBM procedures can limit the occurrence of adverse events [5].

Nuclear medicine must address this problem according to a multidimensional logic, proposing in addition to the traditional clinical risk management tools, skills developed over time about the protection of workers and the safe use of health technologies.

In any case, it is necessary to guarantee that clinical teams have the appropriate skills, that individual team members are aware of their role and responsibilities and that the environment in which the team operates is safe [6].

Nuclear Medicine

The responsibility for the error may depend on causes related to the human factor and the technical quality of the performance, but more often than not it must be attributed to the organization of company systems and to the paths of diagnosis, treatment and assistance. It follows that the person who actually commits the mistake is not necessarily the most responsible.

In order to ensure that their skills and competences are maintained, it is necessary to ensure that all clinical staff, including specialists, undergo regular evaluation. This can be achieved by participating in professional updating meetings and this appears even more important in consideration of staff turnover.

"No one has yet learned how to make the inevitable avoidable" [7], but a key to minimizing the risk of accidents is both for the organization and for the clinical activity and a great ability to communicate between the various operators working together is required.

It is well known to insiders that risk management procedures are developed in different phases such as, error approach and error knowledge, error correction, error analysis of the causes of error and last monitoring and implementation of the measures taken to prevent the recurrence of the error [8].

In diagnostic imaging procedures, there are several possibilities of the occurrence of an error such as inadequate technique, failure of understanding, wrong diagnostic judgment, combination of several factors, wrongs in report and communication [9].

In the hospital environment, possible nuclear emergencies may occur whenever the use of radioisotopes in sealed and unsealed form is used, both for diagnostic purposes and for therapeutic purposes. Therefore in the case of nuclear medicine, alongside risk management procedures aimed at safeguarding errors and clinical accidents, there is a whole series of safety procedures for patients and operators for the protection from "radiant" errors and accidents, which are included in the radiation protection procedures in the broad sense.

The phases in which the risk can occur in nuclear medicine practice can be divided in relation to the various phases of performance.

When prescribing the exam, various moments are identified such as, identification of the patient, evaluation of the opportunity to perform the service (justification), identification of

appropriateness, the coexistence of any contraindications, the correct preparation of the patient.

In the preparation phase of the diagnostic or therapeutic procedure it is possible to identify the moment of drafting and printing the daily program, the process of identifying the patient and the type of service, the drafting of the anamnesis and the consequent forecast of adverse reactions, the compilation of labels, the preparation of the radiopharmaceutical and its identification in relation to the patient and the service to be performed, the time of administration of the radiopharmaceutical.

When the diagnostic or therapeutic procedure is performed, the possible error lurks when identifying the patient, when checking the time and type of service, during the distance to and from the diagnostic section, when positioning the patient, the technical management of the service, the data processing phase, the iconographic reproduction and the identification of labels.

Finally, in the reporting and delivery phases of the report, when analyzing the images and quantitative data, drafting, recording, transcription and printing of reports, approval and signing of reports, enveloping of reports and iconographic data, delivery of reports.

In each of the mentioned points you can verify the presence of an error, which suitably identified and reported in an auditing system, will allow to avoid the repetition.

But a further reason for risk concerns, in addition to the safety procedures understood as "safety", just reported, those of safety understood as "security", that is, the prevention of anomalous events for the purpose of threatening, in nuclear medicine departments. We speak here of the eventuality in which the sources of ionizing radiation normally used for medical purposes are used improperly. The goal to be set is to raise the level of the "safety standard" relating to the management of ionizing radiation sources used in the medical field through the reduction of risk margins by inspiring procedures that allow to optimize security, or to prevent anomalous events, for the purpose of threat, which can be implemented through improper use of these sources. The major safety problems are related to radioactive contamination and possible internal radiation caused by radioactive isotopes in unsealed form that are used in nuclear medicine [10].

Considering the characteristics of radionuclides used in nuclear medicine, it is clear that, in effect, any improper use of these substances is not accompanied by a real risk for the population, in deterministic terms; energies emitted by both the photonic and electronic components, the half-life and the quantities normally held or produced of the radioactive isotopes used, are not such as to cause concern in this sense. The problem is that any news of subtraction, and then perhaps the discovery in a public place, of a source of ionizing radiation stolen inside a health facility, could have psychological consequences on the population that are certainly not insignificant.

Three critical moments can be identified in the management of ionizing radiation sources within health facilities, the handling of incoming radioactive material, the use of this material according to the consolidated diagnostic-therapeutic procedures and the disposal of outgoing radioactive waste.

Conclusion

The safety of patients and operators in the nuclear medicine branch passes through the use of absolute safety procedures that affect many sectors of the management of healthcare companies. Equipment cannot be ignored, they must be carefully maintained, but also registered throughout the national territory [11]. But operators must also be carefully selected [12] and evaluated and they must be able to operate in adequately built and equipped structures [13]. Beyond these, registration and traceability of the presence of sources in the Nuclear Medicine Service regarding arrival, storage, usage, delivery of the remains in controlled waste, disposal (vector removal) and notification of disposal (final storage), represent the most accredited procedures to remove the risk of errors in the nuclear medicine departments.

"... Security, understood in the broadest sense of the term, is a problem that has a strong impact on the reality of the sanitary structures present in the national territory. The particular historical moment, characterized by the attention to the aspects of prevention of possible terrorist matrix, requires particular attention to all aspects related to security management, with particular regard to those sectors of health care that more than others could be instrumentally "hit" for this purpose. "[10].

References

1. Mango L, Ascoli G. Clinical Governance: Application in Nuclear Medicine. ARC Journal of Radiology and Medical Imaging. 2018; 3(1):1-6,
2. La Pietra L, Calligaris L, Molendini L, Quattrin R, Brusaferro S. (Medical errors and clinical risk management: state of the art. Acta otorhinolaryngologica Italica. 2005; 25(6):339-346.
3. Wolf ZR, Hughes RG. Error Reporting and Disclosure. In: Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US). Chapter 35, 2008.
4. Alam AY. Steps in the Process of Risk Management in Healthcare. J Epid Prev Med. 2016; 2(2):118
5. Zegers M, Hesselink G, Geense W, Vincent C, Wollersheim H. Evidence-based interventions to reduce adverse events in hospitals: a systematic review of systematic reviews. BMJ open, 2016, 6(9).
6. Mango L. Moderne strategie di risk management in ambito sanitario; Notiziario Elettronico di Medicina Nucleare ed Imaging Molecolare. 2007; 3(4):51-56.
7. Roberts KH, Bea R. Must accidents happen? Lessons from high-reliability organizations. Academy of Management Perspectives. 2001; 15(3):70-78.
8. Mango L. Assicurazione di qualità e sicurezza del paziente in medicina nucleare; Q. J of Nucl. Med. Mol. Imaging. 2011; 55(2):55-58.
9. Robinson PJ. Radiology's Achilles' heel: error and variation in the interpretation of the Röntgen image. The British Journal of Radiology. 1997; 70(839):1085-1098.
10. Campanella F, Panebianco A, Salatti M, De Crescenzo S, Mango L, *et al*. Indicazioni per l'applicazione di una strategia di sicurezza finalizzata alla prevenzione di eventi anomali a fini di minaccia nelle strutture sanitarie che utilizzano radiazioni ionizzanti. Risultanze del Gruppo di Lavoro costituito dall'ISPESL "Gestione in sicurezza delle fonti di rischio radiologico in campo medico" Report

ISPESL, 2007. DOI: 10.13140/RG.2.2.12874.18889
11. Gori C, Mango L. L'archivio radiologico e il censimento delle apparecchiature, in Il Libro bianco della Medicina Nucleare in Italia a cura di L. Maffioli, N. Mazzuca, E.Bombardieri, AIMN. 2005; 4(06):172-173.
12. Mango L. L'area professionale, in Il Libro bianco della Medicina Nucleare in Italia a cura di L. Maffioli, N. Mazzuca, E.Bombardieri, AIMN. 2006; 1(08):36-38.
13. Mango L, Manzara A, Claudiani F, Canevarollo N. La struttura del Reparto di Medicina Nucleare, in Il Radiologo e il Management. 2010; Cap. 8:127-141, Omicron Editrice Genova