



# The importance of continuing education in the radiology service: a successful practice at the University Hospital of the Federal University of Maranhão

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## ABSTRACT

The concept of permanent education is materialized in the possibility of exchanging knowledge after initial training. This theme is of great importance to society and needs to be explored to provide a reflection on the reality of health services. This study presents permanent education for radiology services in accordance with current legislation and the project implemented at the University Hospital of the Federal University of Maranhão. The aim is to build a knowledge of continuing education in the health field, identifying the practice of this project and also contributing to the enrichment and theoretical dissemination aimed at diagnostic imaging services that make use of technologies with ionizing and non-ionizing radiation. Thus, improving the assistance and safety to radiology professionals and their users, through a gradual and appropriate knowledge.

***Keywords:* Permanent Education, Radiology, Radiological Protection, Management**

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## 1. INTRODUCTION

Technological evolutions are currently transforming the way individuals live, work and interact; all of this synchronously. The current change is historic in terms of size, speed and scope. These evolve at an exponential rate, to the detriment of the linear one coming from a multifaceted, deep and interconnected world and from the fact that new technologies are more innovative and powerful in a virtuous cycle. In terms of breadth and depth, this revolution combines multiple technologies that are leading an unprecedented paradigm shift in the economy, business, society and individuals. It is not just the change of “what” and “how” things are done, but also “who” we are. Thus, its scope is not limited to a certain market spectrum [1].

Given the technological advances that revolutionized health practices and, consequently, the assistance of radiology professionals and the way in which these technologies have a strong influence on the work and qualification of the worker, it is essential to reflect on radiological technologies and the need for education Permanent (EP) [2]. In the health field, specifically in radiology, the search for a continuous educational process has been constant, in order to guarantee care in the most diverse specialties, striving for safety and radiological protection for professionals and patients

It is noticed that this is also a concern of the Ministry of Health (MS), at the time it instituted the National Policy on Permanent Education in Health (Ordinance No. 198/04 GM/MS), as a strategy of the Unified Health System (SUS) for the training and development of health workers, with ordinance 1996 GM/MS of 20/08/07, which revoked ordinance 198 GM/MS of 13/02/04. It was recently expanded through Ordinance No. 3194, of November 28, 2017, which provides for the Program for the Strengthening of Permanent Health Education Practices in the SUS and ordinance GM n. 2,580, of October 1, 2019, which amends 3,194 [3,4,5]. The Resolution of the Collegiate Board (RDC) No. 330 of the National Health Surveillance Agency (ANVISA), of 12/20/2019 also reinforces the importance and need to implement a Continuing Education Program (PEP) in Diagnostic and Interventional Radiology Services (SRDI)[6]. Several studies support that:

"Although PE is theoretically well grounded, it has not yet been able to bring its pedagogical and methodological assumptions into the practice of services and that this fact is observed in the Radiology and Diagnostic Imaging Services (SRDI), as they have specific knowledge and practices in their work process and, even though they are sectors with special characteristics, little emphasis is given to this specific knowledge" [7].

The concept of permanent education (PE) can be understood as an educational practice, anchored in the work and in the workers' prior knowledge, in the problematization of reality, in meaningful learning and in the transformation of their practices. From the recognition of the reality experienced by the subjects in their workplace and, noting the deficiencies of knowledge and actions for the proper performance of the function, collectively, the resolution of these gaps and the development of new knowledge is sought. Through continuing education, the possibility of a new action is opened, of a new space for action and reaction, and therefore, it becomes possible, in this context, to tread a safer path [8, 2, 9].

It is important to highlight that in the daily life of radiological care, managers/managers face increasing difficulties in developing the practice of the health team due to the use of complex procedures and treatments, which require an adequate physical structure, trained professionals and increasingly modern materials, having considering that the levels of technological complexity reflect the nature of the tasks to be performed. In a globalized view, differentiating health institutions with regard to the quality of care provided means aiming for a hospital structure within the standards recommended by ANVISA, especially with regard to biosafety and occupational health [7,10]. Allied to the PE policy, we have the SUS management pacts that consider the human resources policy for the SUS as a structuring axis for the reduction of conflicts, the valorization of health workers and the humanization of labor relations. In addition, the work management axis provides for the training and qualification of managers and technicians, with a view to strengthening health work [7,11]. The need to maintain an EP is also evidenced to clarify professionals who are exposed to ionizing radiation, not only through the supply of equipment, but also through control and validation of protection procedures, both for the health team and for its users [2].

In a study on ionizing radiation emitting technologies and the need for continuing education for a safe praxis, it was found that strict radiological protection measures influence the daily routine of nursing care, making it challenging. In this sense, it requires offering information regarding this

care, so that the user feels welcomed and the worker protected. Thus, it is necessary for these workers to take ownership of this knowledge, both to protect themselves and to provide care in an optimized way, and not in fear, because whoever works with radiation must follow strict radiological protection rules, that is, the radiation must be respected, not feared [2]. Thus, adherence to the PE principles is shown as a possibility for the training of these workers, since, through education and reflection on daily life, the expectation of a new action is established, creating a place of choices and safer access for radiological performance.

According to a study on the nursing work process in radiology, it was found that ionizing radiation is generally ignored in training. Therefore, it is urgent to implement a PEP in services that use radiological technologies, capable of providing patients and professionals involved with safe environments and comprehensive care [12]. In this sense, another study allowed for reflection with workers who work in hemodynamic services, where the findings reaffirm the conviction that workers who practice hemodynamics should do it consciously and PE is the way for can prevent wear and tear resulting from the work process [13].

However, thinking about an overview of the problems and solutions of a radiology sector, it is observed that the "knowledge" factor is preponderant in a service, being highly necessary for professionals to continue education, as well as training and training, in order to involve professionals. For the user, the use of booklets is indicated as a valuable tool for the transmission of knowledge [14]. The PE theme is fundamental to society and needs to be explored as a way to provide reflection on the reality of health services. Therefore, this study sought to present the importance of continuing education for radiology services, according to legislation, and demonstrate the successful experience of the PE project implemented at the University Hospital of the Federal University of Maranhão. In order to collaborate in the knowledge of continuing education in the health field, as well as to contribute to the enrichment and theoretical dissemination aimed at diagnostic imaging services that make use of radiation technologies.

## **2. MATERIALS AND METHODS**

Qualitative, exploratory and descriptive study, carried out in a public hospital in the Northeast of the country, University Hospital of the Federal University of Maranhão, which operates in the

three levels of care and is a state reference in highly complex procedures. It has more than 524 beds, more than 20 operating rooms, two mammographs, a bone densitometry (DO) equipment, four surgical arches, four mobile X-ray machines, two digital and two conventional, three X-ray rooms, one Computed Tomography (CT) equipment, a Magnetic Resonance (MRI) equipment and two hemodynamic equipment.

Research participants are professionals occupationally exposed to ionizing radiation (Technicians and Technologists in Radiology), registered in the service's work schedule. Those who were on leave, on health or maternity leave, during the period of data collection were excluded. Thus, out of a total of 53 professionals working in the service, 36 professionals from radiological techniques and the physician's physician participated. For the sample size, the data saturation criterion was adopted [15].

Prior to data collection, there was a first contact with the head of the sector and the professionals present there. At this point, the research objectives were exposed, seeking to encourage the team to participate in the investigation. Due to the period of pandemic and public calamity, data collection took place through an online and structured form, which sought to verify the point of view and knowledge of radiology professionals about the service's continuing education program. In order to maintain the confidentiality of research participants, they were not identified and so there are citations with names of ionizing radiation. Subsequently, the settlements of the project, participation, certificates and demands of this program were verified, confronting the current legislation that deals with the subject.

Pursuant to Resolution n. 466/2012, the research was evaluated and released by the Research Ethics Committee, under Opinion n. 3,920,218 of 17-03-2020 and Certificate of Presentation for Ethical Appraisal CAAE: 28717620.9.0000.5086. Throughout the study, the anonymity of the participants was preserved.

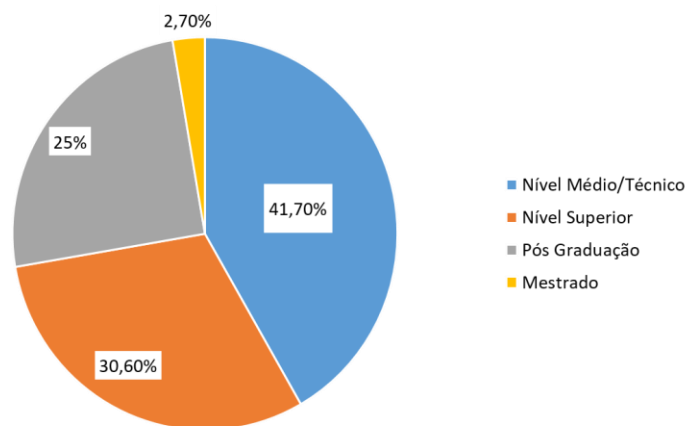
### **3. RESULTS AND DISCUSSION**

The participants in this research were professionals occupationally exposed to ionizing radiation (Technicians and Technologists in Radiology), included in the work schedule of the radiology service of the University Hospital of the Federal University of Maranhão (HU-UFMA). From a total

of 53 professionals working in the service, 36 Professionals of Radiological Techniques (PTR) participated.

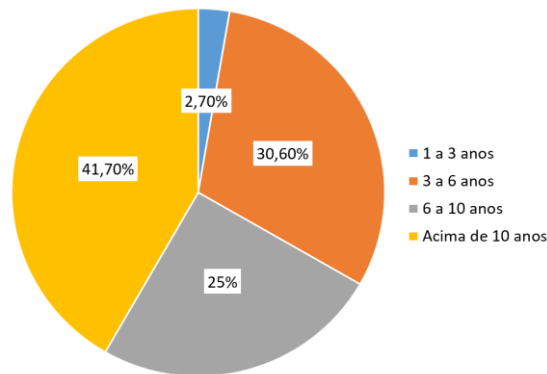
### 3.1. Profile of Professionals

The level of quality of diagnostic imaging services and their consequent role for the country's health system are mainly related to the level of technical, scientific and ethical training of professionals and the community [16]. However, if the team is aware of the basic principles of radiological protection and the precepts of resolution 330/2019, which concern the work team in radiology, periodic training and all safety standards, it will be prepared to effectively participate in its workplace. Thus, through Figures 1, 2 and 3, the profile of the PTR at the HU-UFMA can be observed in reference to the level of training and professional experience.



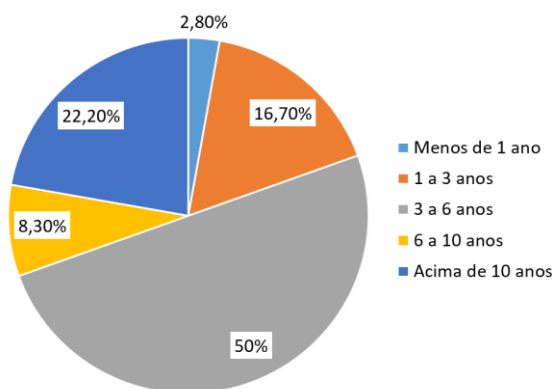
**Figure 1:** *Level of training of professionals*

According to figure 1, it can be seen that the vast majority (41.7%) have secondary/technical education and 30.6% have higher education. It was observed that there is no professional in the respective hospital with a doctorate, 25% have a lato sensu postgraduate degree and only about 2% have a stricto sensu postgraduate degree at the master's level.



**Figure 2:** Length of professional experience in the field of radiology

Regarding the length of experience, 5 ranges were made available, namely: less than 1 year, 1 to 3 years, 3 to 6 years, 6 to 10 years and over 10 years for professional experience time in the field of radiology (Figure 2) and in the field of radiology at HU-UFMA (Figure 3). Graph 2 shows that there are no professionals with less than one year of experience in the field. Where 41.7% have been working for more than 10 years, 30.6% of these professionals already work between 3 and 6 years in the radiology service, 25% between 6 to 10 years and only 2.7% between 1 to 3 years. Proving, in this way, that the greatest number have a long experience in the field in which they work.



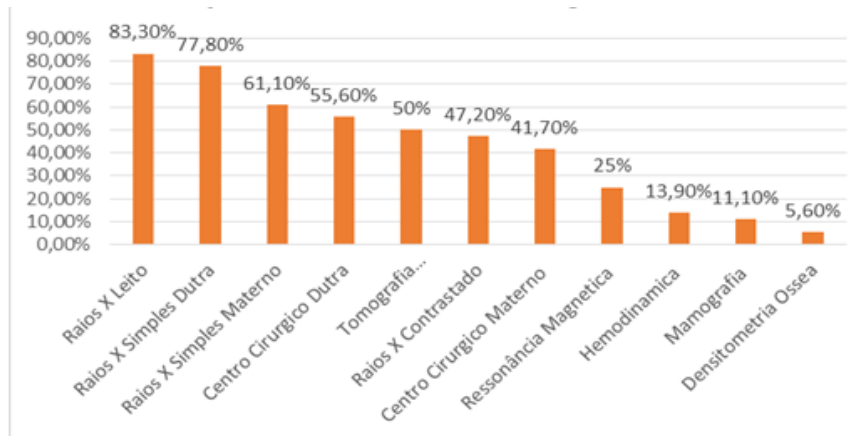
**Figure 3:** Length of professional experience in the field of radiology at HU-UFMA.

According to figure 3, it can be seen that only 2.8% of the participants have worked for less than a year in that hospital, 50% have worked for between 3 to 6 years and 22.2% have already

worked for more than 10 years in the service of radiology at the HU-UFMA. Showing that more than 30% of PTR have more than 6 years of experience in the hospital.

A study on “culture of safety: perception of health professionals” emphasized that the Climate of safety is linked to the relationship between professionals and the institution. With this, professionals who have been in the organization for a longer time are able to better understand this domain. These findings corroborate studies conducted in hospitals in China and Lithuania, which showed a more positive perception of Safety Climate among more experienced professionals, as it offers them a broader view of patient safety issues [17].

When asked about the sectors that work or have worked in the radiology service of this hospital, it is evident from Figure 4 that the conventional radiology sector (X-Rays-Bed) and (Single-Room X-Rays) in this sequence were the sectors of greater performance and expertise. The contrasted X-ray, operating room (maternal and child unit), magnetic resonance, hemodynamic, mammography and bone densitometry sectors have a representation of less than 50%, with the magnetic resonance (MRI), Mammography, Hemodynamics and Bone Densitometry sectors ( DO) the least active sectors between 25% and 5%.



**Figure 4:** Performance in the radiology sectors of the HU-UFMA

The offer of the bone densitometry exam at the HU-UFMA started in June 2018, while few professionals were trained to assume this sector (5.6%). However, the PEP has already included three professionals as apprentices in the OD service, in order to expand their performance in this environment, which is currently the sector with the lowest participation by employees. The



mammography sector only works with women, which can justify the number (11.10%) of professionals working in this field.

Thus, it is observed that the training of practices in the SRDI takes place in the context of work rather than in school. There is also a need for a greater number of health workers who master knowledge and are able to correctly handle the equipment in the SRDI [2, 11]. Thus, analyzing the results through Graph 4, it can be seen that the sector with the highest occupation is conventional radiology (83% and 77%), followed by intervention radiology (Surgical Center-55%) and CT (50%). The performance of functions in RM expressed only (25%). In this sense, it is noteworthy that the PEP of the radiology service at the HU-UFMA should focus more on sectors that had a performance of less than 50% to expand the assistance and participation of PTRs in these environments.

Corroborating this result, a study carried out in Portugal verified the autonomy of PTRs in the SRDI and confirmed that Conventional Radiology, Interventional Radiology and CT are the field that most occupy radiology technicians in their daily professional activities. The field of activity that PTRs consider the most complex is Magnetic Resonance (60.3%), with the second most common option being Interventional Radiology. Not obtaining any frequency for the “Conventional Radiology” option, it is observed that for PTR this field of activity is the least complex. Respondents reveal that the field of radiology in which they have greater autonomy is precisely Conventional Radiology (87.7%). This is followed by Intervention Radiology with 6.8% of the sample and with the same weighting as MRI and CT, both with 2.7% [19].

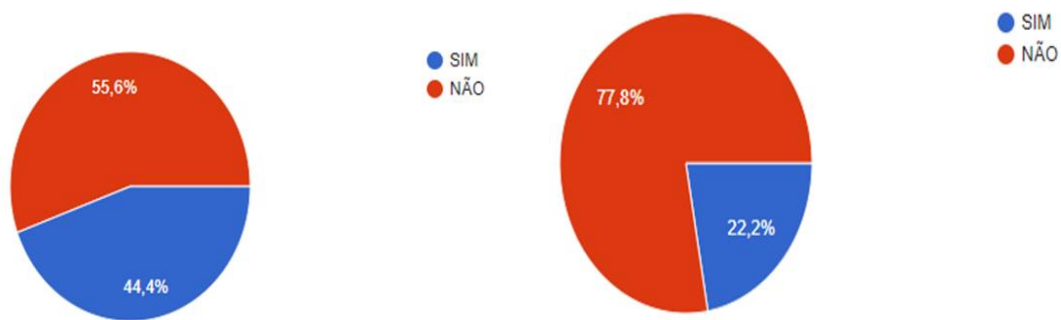
The sources of professional power are centered on the advantages of autonomy and power over the work itself, conferred by knowledge (expertise) and by gatekeeping (credentials). Thus, it appears that the representativeness of PTRs in each sector varies according to the level of complexity, practical knowledge, affinity and autonomy.

### **3.2. Engagement with the Continuing Education Program at HU-UFMA**

The HU-UFMA PEP is structured with general and specific training (by sector) dividing the participation of PTRs into three axes: apprentices, instructors and coordinators. The “apprentices” participation axis is aimed at those who seek knowledge in relation to the practice and routine of a

particular sector. The program's instructors are professionals who are already qualified in the sector, know the routine and have the expertise to share the practice with the apprentices, accompanied by physicians, managers and the service's medical physicist.

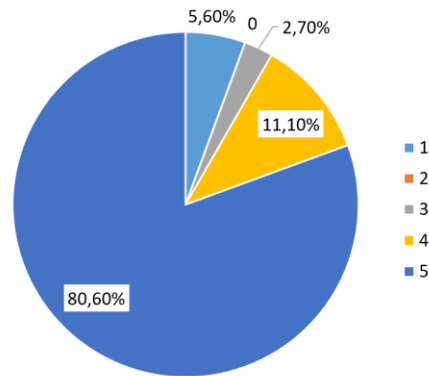
The coordinator organizes the scales for participation according to the course load, checks availability by sector and certifies graduates, both as learners and instructors. Thus, together with the managers and medical physicist, the coordinator is responsible for developing the project. Of the 36 PTR who participated in the survey, 44.4% have already provided the opportunity to participate in the PEP as apprentices and 22.2% as instructors in specific sectors, as shown in Figures 5 and 6.



**Figure 5:** Participated in the PEP as an apprentice.

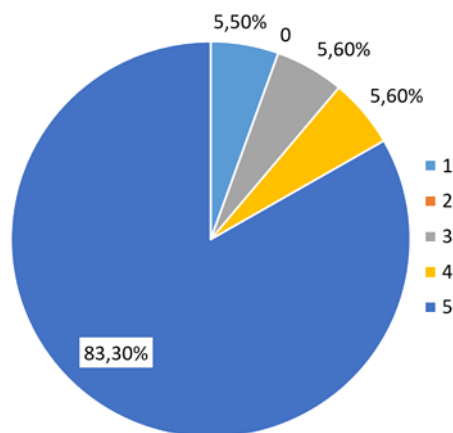
**Figure 6:** Participated in the PEP as an instructor.

The PE program at this hospital aims to make good use of the staff to contribute to the quality of care provided to users. However, the articulation and distribution of PTR in the PEP (within its work schedule) is one of the biggest challenges, since the availability of a professional for the program must be reconciled without harming the service routine. In addition to these training carried out by sectors, PTRs receive general safety and radiological protection training organized and instructed by the medical physicist. As noted (figures 5 and 6) many professionals have not yet participated in training in specific sectors, however they participate in general training carried out by the medical physicist. Asked about the degree of relevance of the PE program (Figures 7, 8 and 9), 5 answer options were distributed, being: (5) Extremely relevant, (4) Very relevant, (3) Median relevance, (2) Relevant and (1) Not very relevant.



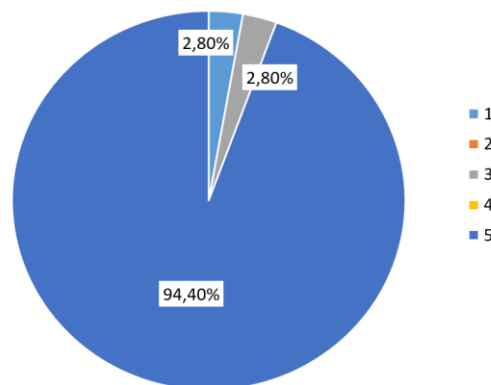
**Figure 7:** Degree of relevance of PE as an apprentice.

It is observed in Figure 7, with regard to the degree of relevance of the program for professionals as apprentices, that 91.7% of the PTR classified the PEP as extremely relevant (80.6%) or Very relevant (11.1%), (5.6%) classified it as little relevant and 2.7% as medium. No professional labeled grade 2.



**Figure 8:** Relevance degree of PE as an instructor.

It can be seen in Figure 8 regarding the degree of relevance of the program for instructors, that 83.3% of the PTR classified it as extremely relevant, (5.6%) labeled it as grade 4 and 3, (5.5%) in 1. No professional considered grade 2 for this question.



**Figure 9:** Degree of relevance of PE for the radiology service at HU-UFMA.

As shown in figure 9 it is observed that no professional considered grades 4 and 2 for this question, 94.4% of the PTR find the PEP extremely relevant for the service and 2.8% consider grade 3 (mediated relevance) and 1 (little relevant) for the service. It is noticed, through the questions, a good receptivity of the professionals to the PEP, as well as the interest with its vision. The professionals involved express their conviction that the PEP contributes to professional development, in the performance of activities carried out and in patient care. The PE policy is regulated in the territories through the Integrated Health Education Center (CIES). Its biggest challenge consists of defining strategic objectives and goals based on the plans of the health regions, and deployed to the needs and plans of each municipality and each team. In the field of radiology, there is an urgent need to implement a continuing education program in services that use radiological technologies, capable of providing patients and professionals with safe environments and comprehensive care [11,12].

Table 01 identifies the main laws that deal with continuing education of health services in general and in the field of radiology.

**Table 01- Legislation (on PE in health), Objective, Year and Competent Agency.**

<b>LEGISLATION</b>	<b>OBJECTIVE</b>	<b>YEAR</b>	<b>ORGAN</b>
LAW 8080/90	Conditions for the promotion, protection and recovery of health, the organization and operation of the corresponding services.	1990	MINISTRY OF HEALTH
Ordinance 1996 GM/MS de 20/08/07	Guidelines for the implementation of the National Policy on Continuing Health Education.	2007	MINISTRY OF HEALTH
National Policy on Continuing Health Education	Guide the construction and monitoring of the terms of commitment for the Management of States, Municipalities and the DF relating to the management of Health Education.	2009	MINISTRY OF HEALTH
Resolution Nº 2 de 04.05.2012.	Establishes and regulates the attributions, competences and functions of the Professional Technologist in Radiology	2012	CONTER
Ordinance GM 3194 de 28/11/2017.	Provides for the Program for the Strengthening of Continuing Health Education Practices in SUS-PRO-EPS-SUS.	2017	MINISTRY OF HEALTH
Ordinance GM 2.580, de 01/10/2019.	Makes changes to Ordinance No. 3.194/GM/MS, of November 28, 2017.	2019	MINISTRY OF HEALTH
Resolution RDC/330 de 2019.	Organization and Operation of diagnostic or interventional radiology services; and Regulate the control of medical, occupational and public exposures arising from the use of diagnostic or interventional radiological technologies.	2019	ANVISA

After verifying the settlements of the PEP at the HU-UFMA, it is noted that it was implemented in 2016 by the service managers with the participation of professionals in radiological techniques. Since then, this program has substantially benefited the service with more qualified and qualified professionals, thus achieving a better distribution of professionals in the radiology sectors and increasing assistance in patient care. Table 2 shows some sectors of the SRDI of the HU-UFMA and the number of professionals who participated in training through the PEP in the respective sector.

**Table 2- Training by sectors in the SRDI of the HU-UFMA, number of professionals in radiological techniques who participated as apprentices and workload.**

<b>SECTOR</b>	<b>LEARNED</b>	<b>WORKLOAD</b>
Conventional Radiology ( RX- Exam room and RX in bed)	5	80 h
Computer tomography	6	120 h
Magnetic Resonance	6	120 h
Bone Densitometry	3	80 h
Mammography	4	80 h

Professionals are trained to master a particular specialty, thus, it is passed on in detail to the clinical practices, protocols, positions, standard operating procedure and the principles of biosafety and radiological protection in that sector. Thus, the PTR experiences the entire routine of the environment within the workload provided by the PEP, enriching their skills to better develop activities in that location. Regarding this experience in health care environments, observing the behavior and attitudes of health professionals in hospitals and radiological clinics, it is understood that people have individual protection actions, but knowledge and training is not perceived, supporting them with the other professionals present in the environment and with users [19]. Thus, of the 36 professionals who participated in the data collection, 24 indicated that they had already acted as apprentices in the program, according to sectors observed in table 2. Thus, it is inferred that these professionals are able to provide a safer environment for users and for the whole multidisciplinary team that works in that environment, as they acquire more solid knowledge within each sector.

With the training of professionals in the CT and MR sectors, managers were able to expand the care of outpatients by opening the agenda on Saturdays (7:00 am to 7:00 pm) and in the night shift (Monday to Friday). What was not possible before the training was possible, as they did not have a sufficient number of properly qualified professionals for such practices.

On the other hand, it is clear that the intervention radiology sectors (CC and hemodynamics) have not yet entered the training individually. And due to the risks inherent in the use of radiation, it

is important that professionals in these sectors have adequate conditions to perform their functions, with minimal exposure and with a radioprotection service that follows the established standards.

In questions to those involved about the program's positive and negative points, the following were cited:

*[...] Before the PEP, the deficit of trained employees in a given sector was greater, therefore, due to the lack of qualified professionals, it was more difficult to organize the scale in situations of vacations, leaves and certificates (X-Rays).*

*[...] I don't see a negative point, after all knowledge is always quite valid. Rather, recognition of the professionals who organize this great teaching method that is EP (Alfa).*

*[...] that the program time in a sector is very long and should be more optimized to expand opportunities (Beta).*

*[...] The number of patients seen in MRI has increased a lot, as the PTR with domain in the sector has increased and thus it was possible to provide a much broader agenda (X-Rays).*

*[...] With the pandemic and the removal of many professionals from the risk group, it was possible to organize the service satisfactorily, even with the smaller staff, due to the training of professionals (Gama).*

The placement of "Beta" in relation to optimizing the time to participate in the program in each sector is pertinent, since many professionals wish to participate and thus the program time must be made available in the best way to reach all professionals in the service.

The project developed at the hospital brought training to several professionals, with the opportunity to learn other skills within their work environment, consequently there is greater follow-up and interaction with institutional protocols, safety standards and greater care in patient care. The knowledge of health professionals about radiological protection and the implementation of educational actions in the search for the creation of a safe environment for both workers and patients and caregivers is essential. Thus, it is observed that even with high knowledge about protection, the lack of knowledge in other fields impacts the safety of both professionals and patients and caregivers, which forces the sector to invest in providing continuing education to all who work in the field and are exposed to radiation in their daily lives.

In addition to knowledge, these professionals are also encouraged by certification, as the program offers a certificate to participants and encourages them to seek this degree. Since the

company encourages employees to seek such merits to participate in progressions and, thus, deliver better services to society.

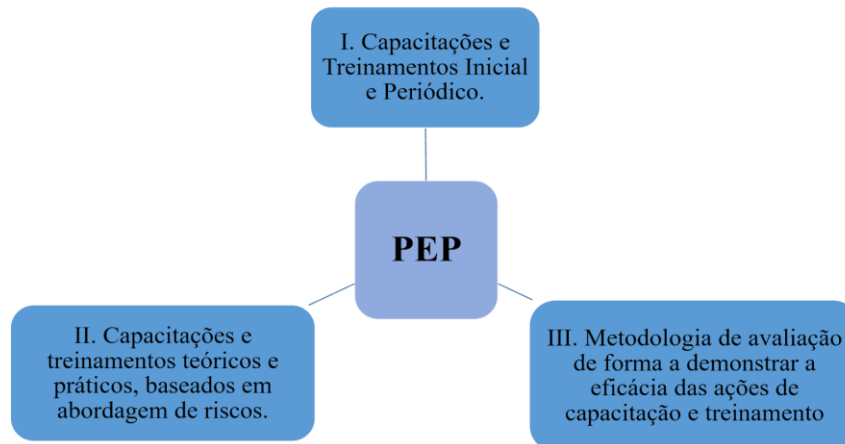
In this way, the service has increasingly qualified professionals to work in different contexts of exercise, as mentioned by “Gama”, in the example of the pandemic, and by “X-Rays” in situations of different need for leave. In this sense, the EP is an important tool for training that expands the possibility of new dynamics and new possible spaces in this scenario of following a more confident and secure path.

According to art. 5 of RESOLUTION - RDC No. 330, OF DECEMBER 20, 2019 of ANVISA, which establishes the sanitary requirements for the organization and operation of diagnostic or interventional radiology services; and regulates the control of medical, occupational and public exposures arising from the use of diagnostic or interventional radiological technologies, diagnostic or interventional radiology services must implement at least the following programs, in addition to those required in other applicable regulations:

- I - Quality Assurance Program;
- II - Continuing Education Program, for all professionals;
- III - Radiological Protection Program, when the service uses ionizing radiation for diagnostic or interventional purposes.

Thus, item II confirms the need to implement a PEP for all professionals in a diagnostic and interventional radiology service. The University Hospital of the Federal University of Maranhão is one of the pioneers within the network of University Hospitals in Brazil to develop such a program. However, this service, as well as other radiology services in the country, needs to adapt to this new resolution. Figure 10 shows what the EP program should include, according to Art 15 of RDC/330 of 2019.





**Figura 10:** *Pilares para Organização do PEP*

Source: Adapted from RDC 330/2019.

The organization of the PEP in the pillars shown (figure 10) is essential, however it requires an excellent articulation and organization of managers and the commitment of the entire team to make it happen. The three items portray that such training must take place at least once a year, and whenever new processes, techniques or technologies are implemented, or before new people integrate the processes. And managers must develop an assessment methodology to prove the achievements of the PEP. The periodic qualifications and training referred to in the second pillar must include, in addition to what is established in the other applicable regulations, at least the following topics:

- I - norms, routines, protocols and operational procedures;
- II - patient safety;
- III - management of risks inherent to the technologies used;
- IV - Quality Assurance Program;
- V - Radiological Protection Program, when applicable; and
- VI - applicable regulations.

Sector managers must actively participate in the program, among the challenges foreseen to adapt the HU-UFMA PEP to RDC/330 is: to strengthen the points (I to VI) in the training already offered. One possibility to reinforce these points is to expand participation as instructors and apprentices to other assistance groups. Trying to insert more doctors and nursing professionals to consolidate the topics in which these classes have greater knowledge.

Continuing Education (PE) is a pedagogical possibility in the health sector to establish relationships between teaching and service. Consequently, it is learning at work, where learning and teaching are involved in the daily lives of organizations and at work [1].

In radiology, the teaching process in radiological protection must be persevering and continuous so that professionals internalize and apply this process to everyone involved, achieving occupational health and that of their patients. Figure 11 shows the responsibilities of those involved in the radiology service towards the program.

<b>Art. 17. Os SRDI devem manter:</b>	<b>Art. 22. O responsável legal do SRDI deve:</b>	<b>Art. 23. Compete a cada Membro da Equipe:</b>
<ul style="list-style-type: none"> <li>• V - assentamentos que evidenciem a execução dos Programas de EP, de Garantia da Qualidade e de Proteção Radiológica</li> </ul>	<ul style="list-style-type: none"> <li>• V - garantir os recursos necessários para a execução do PEP de toda a equipe, coordená-lo e garantir a sua implementação, conforme estabelecido nesta Resolução e nas demais normativas aplicáveis;</li> </ul>	<ul style="list-style-type: none"> <li>• IV - submeter-se às atividades do PEP;</li> </ul>

**Figure 11:** *Duty of the Service, Legal Responsible and Team Members before the PEP.*  
Source: Adapted from RDC 330/2019.

The training must be registered, containing date, time, workload, content taught, name and the training or professional qualification of the instructor and workers involved. The CONTER Resolution No. 2 OF 05.04.2012 corroborates RDC/330 of 2019, which constitutes the responsibility of the Radiology Technologist: to participate in training and improvement programs for health personnel, particularly in continuing education programs.

However, it is observed that the adoption of modern management policies and practices that involve and encourage a greater degree of employee commitment to organizations should be seen not only as drivers of performance, but also as strategies to keep and attract people with competence in the organization. However, valuing human capital in organizations is an essential factor for achieving organizational success.

## 4. CONCLUSION

The results of this study show that the PEP developed at the University Hospital of the Federal University of Maranhão was well accepted by professionals and they are satisfied with the purpose of the program in general, but not so much with its individual duration. It can be inferred that the workers involved in the program would have less difficulty in taking on certain occupational sectors, as well as greater speed in identifying complications and finding solutions in emergency situations, since they received specific training for such. With the implementation of the program, more than 24 professionals received training directed to a particular sector. There was also an increase in the number of outpatient visits and a better distribution in the staff of this hospital. However, the coordination of the HU-UFMA PEP needs:

- Optimize and organize participation in the program so that all interested parties can get involved;
- Expand the participation of other assistance groups to reach all the minimum topics proposed by RDC/330 of 2019.
- Extend training to sectors not yet covered, such as hemodynamics and the operating room.
- Develop an evaluation methodology for participants to verify the results of participation in the program.

It is noteworthy that the aforementioned program must make adjustments through the new resolution of ANVISA, RDC No. 330/2019, as well as all services that have or wish to implement a PEP, and should also seek greater coverage with regard to the participation of all the professionals.

The PEP brought a healthy environment to reconcile theory and practice and develop successive knowledge in the quality of care through this successful practice. It is also noted the importance of institutions to intercept the needs presented by professionals and develop projects to propose and define methods in order to develop adequate spaces to add knowledge. Based on this awareness, the success and quality of care are improved and occupational biological effects are avoided in radiodiagnostic services.

However, the importance of supervisory bodies for the execution of such projects is highlighted and it is suggested that these bodies act effectively, so that the PEP can achieve the objective of maintaining a growing and continuous learning and preserving the integrity of the

health of the professionals who work in radiodiagnostic services, as well as those who use them. Also noteworthy is the importance of the services performed by committees specialized in occupational medicine, safety engineering and the internal accident prevention committee (among other safety and health committees present in the institutions), to promote the participation of workers in programs and plans of health protection.

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