



ERGONOMIC WORK ANALYSIS IN RADIOPHARMACEUTICALS PRODUCTION

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INTRODUCTION

- This work describes the automation of the radiopharmaceuticals dispatch monitoring as a result of an Ergonomic Work Analysis. During the EWA steps the team sought information through observations, conversations, ergonomic tools and records (photos and footage) of physical, cognitive and organizational performance that interfere in the worker at radiopharmaceuticals. dispatch
- Ergonomic Work Analysis (EWA) is a methodological model that allows from the point of view of human activity, to understand the determinants of work situations and its consequences for workers and the production system. The results of EWA naturally vary according to the types of claims, which are: lawsuits, demands for certification, or demands for modernization.
- Radiopharmaceuticals are used for the purpose of diagnosing diseases. To a lesser extent, are applied in the therapy of diseases, particularly in the treatment of tumors. This Research Institute produces two types of radioisotope, iodine-123 and ultrapur fluorine-18, used as markers in the three radiopharmaceuticals supplied sodium iodide, metaiodobenzylguanidine (MIBG) and fluorine-deoxyglucose (FDG). This production enables more than 15,000 medical procedures / year in nuclear medicine in Brazil, reflecting the concern of the Institute to meet the demands of society.

METHOD

- The method was based on Ergonomic Work Analysis (EWA), which enables, through observation and work activity analysis, to understand the determinants and constraints of work situations and their consequences for the workers and the production system. EWA was performed in the dispatch of radiopharmaceuticals according to the steps:
 - Demand identification: the way in which the initial problem described by the management is transformed in the problem that actually has to be solved through ergonomic action.
 - Modeling activities: use of methods and techniques for search, collection and analyses of data and information to produce the positive transformations in work situation.
 - Results: a specification that ensures the positive transformation of labor reality.

RESULTS

- The EWA pointed out to the need of automation in the monitoring the radiopharmaceuticals expedition process. The automation system developed measures the dose rate and stores the data in a computer without the need of people intervention. The positive change in the work situation happens because the workers are far from radiopharmaceuticals, decreasing exposure to radiation. Automation also improved the reliability of the information of the shipping documents, because the measurements of radiation were integrated into reporting. The control system interfaces were developed through user centered automation methods using the LabVIEW software. This study showed that from EWA it is possible to characterize the important work processes situations and support their transformation through technological artifacts, with impacts on workers' health, comfort, and safety. The user centered methods allows the user commitment, bringing benefits to system quality and acceptance.



Monitoring process and automation proposal



Radiopharmaceutical automated support



Human system interfaces

CONCLUSIONS

- It was found that the Ergonomic Work Analysis allowed to model, characterize and describe the activities in the dispatch sector of radiopharmaceuticals of this Research Institute.
- The main positive transformation of the work situation is that after the automation, the workers will be far from radiopharmaceuticals packaged, significantly reducing the radiation exposure. It is also expected, a decrease in runtime monitoring activities and preparation of documentation, reducing the time pressure. With automation, is expected to improve the reliability of the package documents, because the measurements of radiation will be integrated into the package reports. The project was focused on users and their activities. This is the safest way to ensure that an automation system meets the users' explicit and implicit, and thus be accepted by them.