New technologies and safety in radiotherapy: study of appropriation during training

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1. Introduction

The study presented here is part of a larger research on patient safety in radiotherapy. This medical method consists of treating cancer by means of advanced technologies using beams of ionizing irradiation. The use of such technologies has given rise to risks which can cause great damage on patients. Mastering these risks is therefore a major concern and it is all the more important that technological developments in radiotherapy are constant and new devices are often implemented in the units (Giraud, 2008 ; Nyssen, 2004). This has an impact on healthcare professionals’ work performance and the development of their skills (Cuvelier & Caroly, 2009 ; Ouni & Mhamdi, 2001).

The purpose of our research is to better understand the real impact of new technologies on radiotherapy technologists’ activity and patient safety. We seek to identify the risks related to their use and better understand their appropriation by the workers.

2. Practice innovation

The common meaning of the verb “appropriate” refers to the idea of "taking something for oneself" or "taking possession of something". In ergonomics, the concept of appropriation can be addressed through the instrumentation theory (Rabardel & Béguin, 2005). In this theory, “human activity is mediated by tools in a broad sense” (Kaptelinin & Nardi, 2006). Appropriation is considered as a development and an adaptation process. To perform their practices, people can transform and create objects.

In the process of appropriation, training has a special status (Moricot, 1997). It refers to a period of learning which is necessary for workers to fully understand the artifacts, their operation and their use to serve future activity. First interactions with new artifacts can partly condition the use that will later be made of them and ultimately have an impact on the process of appropriation. Training constructs the first understanding and representations of the workers about the artifacts they will further use on a regular basis.

The main goal of this study is to access the appropriation of a new technology by radiotherapy technologist trainees. We therefore try to capture the appropriation “in live”. Another aim of this paper is to access “past” appropriation of the same technology by trained radiotherapy technologists.

3. Method

The study was conducted in a radiotherapy unit of a French public oncology center that implemented a new advanced linear accelerator. A training period was provided to the medical professionals of the unit that were to use the technology. Among them, five radiotherapy technologists had the opportunity to work during one week each with peers of another team that had already been using the technology since one year.

The study is based on the analysis of the verbal exchanges between the trainers and the trainees regarding the use of the technology. The training makes trainers explain their past experience with the technology. Verbalizations were recorded and transcribed. On the whole, fourteen trainers-trainee teams were observed and recorded during twenty-five hours.

Simultaneously, individual interviews were conducted with five of the trainees that were previously observed. The records of both the verbal exchanges between the trainers and the trainees and the individual interviews were transcribed. A content analysis is currently being carried out.

4. Findings

The analysis is still in progress. However, we highlight that transformations are starting to occur during the training period. First analyses of trainees’ verbalizations show a modification of their representations and
abilities. In particular, we observe that radiotherapy technologists begin to anticipate the use of the technology in their future activities.

Likewise, trainers’ verbalizations reveal “past” appropriation of the technology. For instance, for one given situation, not only do they communicate the practice they perform, but they also explain the reason why they came to choose this practice. In this case, the reason is time efficiency.

5. Discussion

The results obtained will serve to provide recommendations about technology-oriented trainings in radiotherapy. In a broader extent and from a scientific viewpoint, the study will contribute to the understanding on appropriation of new artefacts.

References


