Continuing Education Radiology: Perspectives towards a Model Based On Competences

Educación continuada en Radiología: Perspectivas hacia un modelo basado en competencias

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Summary

The continuing medical education (CME) refers to the planning, organization, development and implementation of various academic activities, in order to update knowledge and develop skills throughout the professional life of postgraduates. In the specialty of Radiology and Diagnostic Imaging, renewal of knowledge goes hand in hand with technological advances and the best scientific evidence, which implies a high dynamism in the validity thereof. In this article we review what the purpose and justification of a recertification program in radiology with a view to improving the quality and professional performance, different international models of continuing education are discussed as well as the most efficient methodologies for the acquisition of competencies, tailored to the learning needs and perspectives of the radiologist in our country.

Resumen

La educación médica continuada hace referencia a la planeación, organización, desarrollo y ejecución de diversas actividades académicas, con el fin de actualizar los conocimientos y desarrollar competencias a lo largo de la vida profesional de los posgraduados. En la especialidad de radiología e imágenes diagnósticas, la renovación del conocimiento va de la mano de los adelantos tecnológicos y la mejor evidencia científica, lo que implica un alto dinamismo en la validez de los mismos. En el presente artículo se revisa cuál es el propósito y justificación de un programa de recertificación en radiología con miras al mejoramiento de la calidad y el desempeño profesional, se discuten diferentes modelos internacionales de formación continuada, así como las metodologías más eficientes para la adquisición de competencias, ajustado a las necesidades y perspectivas de aprendizaje del radiólogo en nuestro país.

Introduction

Continuing medical education has a fundamental role in Radiology, taking into account the rapid evolution of the specialty and the constant renewal of knowledge. The main objective is to continue the postgraduate training in the correct professional practice, maintaining high standards of quality, according to technological advances, the progress of diagnostic images and the challenges of professional practice (1).

Lifelong learning has become one of the main challenges of the knowledge society in the world. It is estimated that in the most dynamic specialties such as pharmacology or biochemistry, the validity of scientific knowledge ranges from 3 to 4 years; for the less changing specialties is 7-8 years (2).

In a report summarizing 31 systematic reviews, Cervero and colleagues conclude that continuing medical education has demonstrated its effectiveness in improving the performance of specialist physicians and the results obtained in patients (3). Data from a survey sent to representatives of radiology societies in 34 countries indicate that 67 % have continuing medical education programs, usually at 5-year intervals, and is mandatory in 54 % of countries with structured monitoring and self-evaluation (4). In Latin America, it is voluntary in most countries (77.8 %); it is only mandatory in Brazil and Mexico (5). In these countries, scientific societies play an important role in continuing medical education with the development of a large number of academic activities for its members. Its contribution is the strategic direction of the content of the programs in partnership with universities, with the financing by industry of a large number of training activities (2).

Concept of professional competence

The term *competence* is polysemic and the subject of debate in the educational field. In a simple way it can be defined as the ability to respond successfully to a problematic situation of professional practice in a given context (6). From a broader perspective, the concept of professional competence under a socioconstructivist educational model can be defined as "a set of specific abilities that an autonomous student-professional develops and integrates for effective performance in action according to changing contexts (academic, scientific, cultural, economic, labor, political, social, among others). The competent professional shows that he can solve problems (real, particular, unpredictable) of different complexity in creating a specific solution for each case and according to his profession "(7). Being professional implies having a tacit contract with society, to put into practice a body of knowledge at the service of individuals and society itself.

International models of continuing education in radiology

With the objective of establishing a theoretical framework that allows us to adjust to our needs the best strategies of continuing training in other countries, we will briefly mention the models in the United States and Canada and the competencies that they seek to train in the radiologist.

Model in the United States

The United States was the earliest country to organize accreditation for the continuing training of medical professionals (8). In 1999 the Accreditation Council for Graduate Medical Education (ACGME) established six core competencies for all medical specialties, which are summarized in table 1.

Table 1. ACGME competencies for postgraduate medical specialists

Competency	Description
1. Patient care	Demonstrate capacity for patient care in an appropriate and effective way for the treatment of illness and health promotion, as well as competently perform all diagnostic and interventional procedures considered essential in the area of practice.
2. Medical knowledge	Demonstrate biomedical, clinical, epidemiological and social knowledge, among others, as well as the application of this knowledge for patient care.
3. Learning based on practice	Demonstrate ability to self-evaluate your patient care process. Assimilate the scientific evidence, to continuously improve.
4. Interpersonal communication skills	Demonstrate interpersonal communication skills that result in effective exchange of information and collaboration with patients, their families, and other health professionals.
5. Professionalism	Demonstrate commitment to carry out professional responsibilities and adherence to ethical principles.
6. Practical learning in aspects of clinical management.	Demonstrate knowledge and responsiveness in a broader context within the health system. Caring for and effectively using system resources.

Source: ACGME.

The American Board of Radiology (ABR) is the organization in charge of guaranteeing the excellence of the professionals who practice in the area of diagnostic images. Two types of credits are considered (table 2) in relation to the methodology used for continuing training (9). This is done through the Maintenance of Certification (MOC) program, which is based on the essential skills for postgraduates as defined by ACGME (10) and are evaluated during a continuous process divided into 4 parts with a duration of 10 years (11):

» Part 1. Evidence of professional prestige: Requires demonstrating the license to practice medicine without restrictions in all states of the American union.

» Part 2. Ongoing education and self-assessment: At least 75 credits in category 1, every 3 years, of which 70 % must be in interpretative skills and the remaining 30 % in training in areas such as statistics, quality improvement, health economics, medical informatics, health education, ethics and professionalism, among others.

» Part 3. Cognitive domain: consists of passing the recertification exam.

» Part 4. Quality improvement in practice: is to demonstrate commitment to quality management processes.

In our country, Moreno and Pinilla (12) established the professional competences for the radiologist by means of quantitative and qualitative

research in which the recommendations of organizations such as ACG-ME were taken as reference and compared with the opinions of a community of Colombian radiologists, obtaining a construct of competencies that include: communication, ethics and professionalism, administrative, research and pedagogy.

Table 2. Category of ACGME credits and their characteristics

Category 1	Category 2
In-person activities led by teachers with extensive experience in the area.	Self-directed non-presentiment activities.
They are part of formal education programs supported by ACGME.	They are not part of formal education programs.
In-person component with problem-based learning.	It develops completely in a virtual learning environment.
Blended Learning Methodology.	E-Learning Methodology.

Source: ACGME.

Model in Canada

In this country the university degree and specialization does not imply the possibility of exercising; This is acquired through the certification of professional colleges, which also have the obligation to certify the competencies of the doctor throughout his professional life. The Royal College of Physicians and Surgeons of Canada (RCPSC) designed a certification maintenance program in partnership with medical faculties, medical specialty societies and the federation of medical specialists in Canada. It has been applied since January 2001 in 5 year cycles. This model is practical, aimed at assessing professional competencies, and involves the professionalization of institutions or bodies responsible for conducting training activities (8).

Methodologies for the formation of competencies: from E-learning to Blended Learning

The updating of the knowledge must be acquired by the radiologists in an efficient way, taking into account the limitations of time and spaces of training in the work environment. The implementation of E-Learning seemed, in principle, to meet the educational needs of postgraduates; however, it is seldom used today as the only method for training skills due to limitations of feedback and lack of adherence. In a randomized controlled clinical trial Moreira et al. (13) evaluated a virtual course of mammography with a significant dropout of 25 %. This is explained by the fact that the virtual training practice is often not enough to complete the professional›s learning objectives, which makes a face-to-face component necessary (14). Given the limitations of E-Learning, a new scenario of continuous education with a mixed pedagogical approach, Blended Learning, was born, aiming to combine the teacher›s experience in teaching practical situations (figure 1) with a self-directed learning process of theoretical contents in a virtual environment (15).
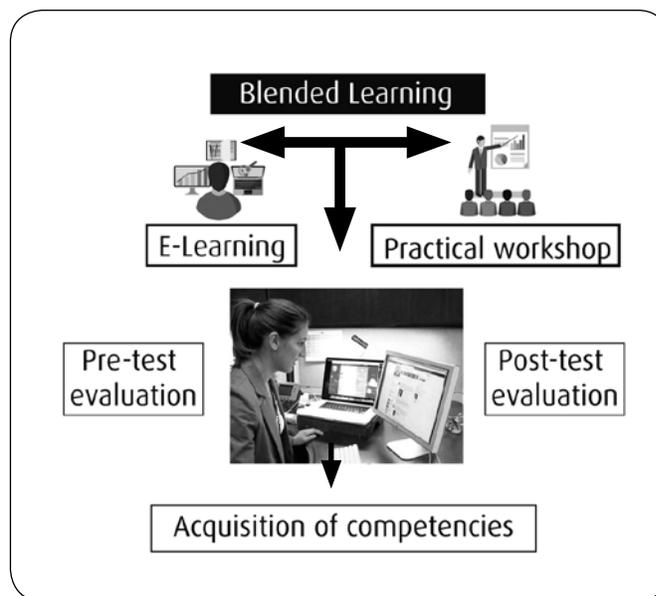

Figure 1. Blended Learning methodology scheme.

The Blended Learning methodology implies an additional motivation given by educational activities designed by the teacher that seek greater interest and adherence of the student: the teacher clearly explains to the participant the competencies that they must develop after the course and how these will influence positively in their daily practice. Then, it presents a schedule of self-directed learning with theoretical contents online. Finally, knowledge is strengthened in workshops and face-to-face practices. The self-assessment is done during the development of the training activities to identify critical learning points, which must be reinforced during the practical section. The acquisition of competences is evidenced by theoretical-practical exams (16). This methodology is based on problem-based learning, which was initially developed to teach basic science contents in the clinical context to medical students (17). It consists of performing academic activities integrating theory and practice to develop skills in solving a specific problem (18). A systematic review of the effectiveness of problem-based learning in continuing medical education (19) concludes that this methodology is as effective as traditional learning methods. However, when asked about how best to implement this methodology (virtual vs. face-to-face), 67 % of respondents prefer to use physical media, despite the wide use of virtual tools (20).

In the United Kingdom, a study (21) was designed with Blended Learning that included the monitoring of each student through a virtual platform. A better performance was found in the final exams in the group of students with greater participation in virtual activi-

ties and face-to-face counseling, with an average of 169 completed radiological cases per student. The degree of satisfaction and efficiency in the use of teaching time were also significant. Figure 2 summarizes a proposal for the structuring of continuing education courses with Blended Learning methodology, based on the experience of different authors (14-16,21) and according to the needs of the radiologist in our country.
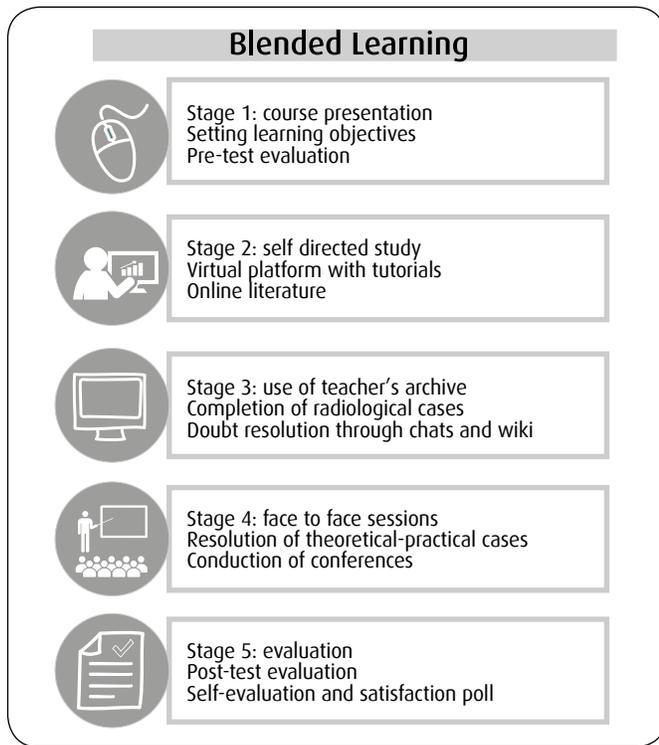

Figure 2. Structuring of courses with Blended Learning methodology

Conclusions

The evolution of the diagnostic images, the exchange of knowledge, the technological advances and the tensions of the professional practice justify a program of continuous training and recertification of the graduated radiologist in Colombia.

The current trend is to use formal education programs that seek the continuous training of the radiologist throughout life to maintain high standards of quality in their professional practice. These are mainly based on category 1 credits, coordinated by scientific societies in alliance with universities. The Blended Learning methodology and problem-based learning has proven to be effective in developing competencies that improve the daily practice of the radiologist. This educational approach combines E-learning with face-to-face workshops led by experienced teachers, where the student becomes the center of their training, obtaining better results and high degrees of satisfaction.

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