

Continuous professional development for physicians

Desarrollo profesional continuo para médicos

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Abstract

Maintenance of professional competence remains an exercise of permanent learning and an essential requirement for evidence-based medical practice. Physicians attend continuing professional development (CPD) programs to acquire new knowledge. Often CPD programs remain the main source for updates of information. CPD organizers have a considerable responsibility in determining appropriate curriculum for their conferences. Organizing an effective CPD activity often requires understanding of the principles of adult education. Prior to deciding on the curriculum for a CPD, course organizers should conduct needs assessment of physicians. CPD planners should create activities that would consistently improve physician competence. CPD sessions that are interactive, using multiple methods of instructions for small groups of physicians from a single specialty are more likely to change physician knowledge and behavior. The effectiveness of a CPD program should be evaluated at a level beyond measuring physician satisfaction. CPD planners should incorporate methods to determine the course attendees' improvement of knowledge, skills and attitudes during the CPD activities. Pre and post conference evaluations of physicians using multiple choice questions may form a useful method of assessment. [Ghosh, AK. *Continuous professional development for physicians. MedUNAB 2013; 16(2):71-76*].

Keywords: Continuing, Education, Professional formation, Education, Medical, Professional competence, Educational measurement.

Resumen

Mantener la competencia profesional sigue siendo un ejercicio de aprendizaje permanente y un requisito esencial para la práctica de la medicina basada en la evidencia. Los médicos asisten a programas de educación médica continua o desarrollo profesional continuo *continuing professional development (CPD)* para la adquisición de nuevos conocimientos. A menudo los programas *CPD* siguen siendo la principal fuente de actualización. Los organizadores de la educación médica continua (*CPD*) tienen una gran responsabilidad en la determinación de contenidos apropiados para sus conferencias. Organizar una actividad de educación continua (*CPD*) efectiva requiere a menudo la comprensión de los principios de la educación de adultos. Antes de decidir sobre los contenidos de la (*CPD*) los organizadores del curso deben llevar a cabo la evaluación de las necesidades de los médicos. Los planificadores de (*CPD*) deben crear actividades que mejoren constantemente la competencia médica. Sesiones de (*CPD*) interactivas y el uso de múltiples métodos de instrucción para pequeños grupos de médicos de una sola especialidad son más propensos a cambiar el conocimiento y la conducta de los médicos. La eficacia de un (*CPD*) debe ser evaluada en un nivel más allá de la medición de la satisfacción del médico. Planificadores de (*CPD*) deben incorporar métodos para determinar la mejora de los asistentes al curso de conocimientos, habilidades y actitudes en las actividades de (*CPD*). Las evaluaciones pre y post conferencia con preguntas de opción múltiple puede formar un método útil para la evaluación. [Ghosh, AK. *Desarrollo profesional continuo para los médicos. MedUNAB 2013; 16:71-76*].

Palabras clave: Educación continua, formación profesional, educación médica, competencia profesional, evaluación educacional.

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Introduction

Medical knowledge continues to grow at an enormous pace. Physicians often find information taught during their postgraduate training either obsolete or substantially modified with the availability of newer evidence. The problems lie wherein after graduation from medical institutions most physicians lack a formal method of acquiring new knowledge. Maintenance of professional competence remains an exercise of lifelong learning and an essential requirement for evidence-based medical practice.¹ Physicians adopt different methods to update their knowledge including reading journals, attending continuous medical education (CPD) sessions and participating in hands-on workshops that focuses on updating a skill or learning newer techniques. Physicians traditionally attend CPD programs to meet their educational needs, however CPD lectures alone have not shown to change physician behavior¹ Medical licensing organizations are increasing pressure to ensure to the public, payers and media, that physicians are engaging in meaningful activities of life long learning and self assessment in the field of medical education that provide competency based education.² CPD organizers have considerable responsibility in determining appropriate curriculum for their meeting.

In the following review, we summarize essential requirements for organizing CPD activity based on recent evidence. The current review is not meant to provide an exhaustive step by step guideline for developing a CPD program, but meant to serve as a review of the current evidence on adult learning behavior and provide direction to enhance physician competence. We present an evidence-based summary of 1) the principles of adult learning, 2) needs assessment of CPD, 3) emerging guidelines for CPD instruction and 4) assessment of CPD programs.

Principles of adult learning

Adult learning presumes that the adult will assess their lifelong learning needs and identify topics for their personal development.³ Background experience and prior learning are essential components for adults in their assessment and application of new information in their work situations. Malcolm Knowles^{4,5} describes this form of learner centric adult learning as 'andragogy,' to differentiate it from teacher centric learning, 'pedagogy' (Figure 1).

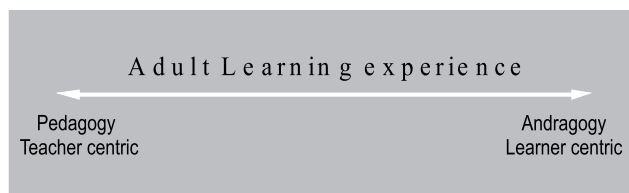


Figure 1. Adult learning-pedagogy versus andragogy.

According to Knowles⁴ adult learning is based on the following seven principles, 1) To promote effective environment for learning, adults should feel that the environment is safe where all opinions are respected, 2) Learners should be self-directed and involved in assessing their gaps in knowledge 3) Learners should be involved in planning their curriculum, 4) Learners accept responsibility for their own learning and design their own learning objectives, 5) Learners need to identify resources and devise strategies for using these sources to achieve their objectives, 6) They need to be supported in an informal and personal environment and 7) Involved in self-reflection and evaluation of their own learning experience. There are other theories of on how adults learn including social cognitive theory,⁶ reflective practice,⁷ transformative learning,⁸ self-directed learning,⁹ experiential learning,¹⁰ situated learning¹¹ and learning in communities of practice.¹² Though many of these principles of adult education would apply in practice based medicine, for our review we will refer on the principles of Knowles adult learning theory⁵ due to its widespread applicability.

Andragogy assumes that adults are independent learners who have already accumulated a great deal of experience. Adults are interested in an immediate problem centered approach and are frequently motivated to learn by internal demands to integrate learning to resolve an emerging work related problem. Adult learning is often problem centered rather than subject centered. The difference between the pedagogy and andragogy are summarized in Table 1.

Prior to embarking on the acquisition of knowledge on a topic, adults often have to recognize that they have a knowledge gap¹³. They then strive to find out whether their knowledge gap is problematic for them to spend time

Table 1. Learning styles- Difference between Pedagogy and Andragogy *

	Pedagogy	Andragogy
Type of learning	Subject centered	Problem centered
Facilitator	Teacher	Individual adult
Prior life experience	Little value	Highly relevant
Student participation	Passive	Active
Experiential learning	Minimal	Moderate to large
Curriculum Design	Rigid	Flexible, redesign based on evaluation

* Table created from data presented in reference 4

addressing it in a manner that would lead to a likely solution. They also have to find out whether they have the necessary resources available at hand to solve the problem and finally need to be willing to change their behavior based on what they learnt.^{4,6,7}

Adults learn in different educational settings. The efficacy of different modalities of education results in varying degree of retention of information.¹³ The retention of information is only 10% of what is read, 20% of what is heard, 30% of what is observed or demonstrated, 50% of what is discussed, 70% of what is practiced and 90% of what is taught.¹³ Hence, adults remember best when they actively involve themselves in learning, practicing and teaching the material.

While designing a strategy to involve adults to gain knowledge developers need to design sessions that would allow the adults to work in groups or have opportunity to discuss topics that concern adults in their work environment.^{5-8,10-12} CPD organizers have to select the topics based on needs assessment (explained in greater detail in the next section) and provide documentation of the adult learners participation in the learning process. CPD organizers would therefore require understanding of the principles of adult education to plan an effective scientific program.

Needs assessment in continuous professional development (CPD)

Continuing professional development strives to improve physician behavior with an ultimate goal of improving health outcomes.¹⁴ CPD programs that are designed on the basis of well conducted needs assessments are more

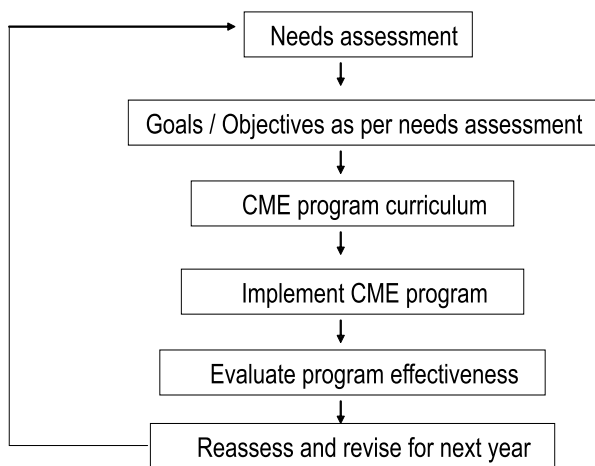


Figure 2. CPD cycle: constructing a CPD program based on need assessment. CME- continuing medical education.

effective in changing physician behavior.¹⁵ The first step in identifying lacunae in physicians' knowledge is to conduct a needs assessment. This process identifies the *gap* between what the physician ought to know to practice effective medicine and what they actually know.

Needs assessment planning forms the basis of a successful CPD. There are several sources of needs assessment, 1) inferred need assessment based on current evidence, 2) specific practice needs, 3) proven need assessment based on objective external data.¹⁵ Table 2 summarizes the various sources of need assessment. In a learner centered CPD, the course and objectives of all sessions should reflect topics that have been selected on the basis of prior needs assessment (Figure 2).

There is also variability in the learning methods adopted by physicians to meet their individual educational needs. McClaren and colleagues¹⁶ studied 366 primary care providers who had to use a new knowledge or skill to solve a recent clinical problems. Physicians used 55 different learning methods to resolve their issues.¹⁶ Hence multiple interventions might be required to target positive change in a specific behavior.¹⁷

Guidelines for continuous professional development activity

Most medical institutions have a rigorous under and postgraduate curriculum for education of medical students¹⁸ and residents respectively. Every step of the medical education is supervised and graded to assess and establish the competence of the students and their readiness to advance into clinical practice. Experts however have been concerned about a lack of formal course of study in the last 30 to 40 years of a physician's professional career.¹ Most experts agree that lifelong learning constitute the longest phase of medical education.¹

In the past continuous medical education (CME) activities were felt to be sufficient to meet the learning needs of the physician. CME activities suffer from few drawbacks as they are episodic interventions designed to address the needs of groups of learners, teacher centered and driven, encompass clinical domain, lecture based and conducted in formal settings, e.g., lecture halls and conference rooms.¹⁹ CME lectures alone are insufficient in changing physician behavior.²⁰ Continuous professional development stresses lifelong learning based on ongoing self-assessments that address individual needs, is learner centered and driven, comprehensive in scope, including clinical domain, practice management, leadership, administration, education and spectrum of professional activities, includes a variety of learning formats and media used in educational activities and can be conducted in a variety of venues, including one's office.¹⁹

Physicians attend CPD lectures with a goal to update their knowledge, learn new skills and obtain CPD credits. Davis et.al²⁰ showed that CME activities differ in their ability to increase physician competence, and performance and have variable effect on health care outcomes.²⁰ In a meta-analysis of 14 studies on the effect of CME on physician performance and health care outcomes, it was found that interactive CME sessions that included opportunities to practice and learn new skills, interact with each other brought a change in clinical practice and occasionally changed health outcomes. CME sessions that included lecture format as their chief source of providing instructions did not appear to change physician performance.²⁰

A more recent meta-analysis included 31 studies on the effectiveness of CME suggested a medium increase in physician knowledge and small increase in physician performance and patients outcomes.²¹ The effectiveness was increased when the CME sessions were interactive, using multiple methods of instructions for small groups of physicians from a single discipline.²¹

Most physicians determine which CPD sessions to attend based on their perceived needs for increased competency in their specialty. Often these activities are triggered by external pressures from certifying or state licensing boards.²² Physicians often possess a limited ability to accurately self assess their competency and maybe inaccurate in evaluating their own competency.²³ Davis and colleagues in a systematic review of 17 articles studied the relation of self-assessment of physicians compared with external observation of their competence.²³ Thirteen out of the 20 comparisons between self and external assessments revealed little, no or inverse relationship. Physicians who were least skilled and over confident had the worst accuracy in self-assessment. Hence educators who plan CPD activities need to plan a diverse group of education activities to ensure that they address strategies of improve physician competence and performance in these educational sessions.

Many accreditation organizations like the Accreditation Council for Continuing Medical Education (ACCME) in United States mandate that CPD providers need to provide physicians with learning activities that update their existing skills and lead to continuous professional development.²⁴ The ACCME suggested that CPD activities should include Miller's framework of clinical assessment (knowledge, competence, performance and action).²⁵ The ACCME model suggests that physicians should start by asking a question that they encounter in practice and seek relevant information.²⁴ Through analysis, synthesis and reflection , the information is processed to new knowledge. Physicians then use their best judgment to process this knowledge into wisdom and use the new strategy to enhance their competence. This competence when put into practice could enhance physician performance.

Modalities of CPD activities would depend on the specific domains of education that need to be addressed.²⁴ For example Didactic lectures or seminars would be a good venue to review new medical data. Self-assessment activities like self study or taking maintenance of certification modules would apply to answer questions that arise in clinical practice. CPD activities that involved reflection as a group or self would address the domain of judgment, wisdom and improved strategy. Interactive sessions like workshops, group discussion and hand-on-activity like simulation or observed structured clinical examination (OSCE) could be used to assess physician competence. Physician performance in practice can be studied by audits and quality improvement studies.

In order to organize a CPD activity and incorporate the ACCME model of enhanced practice-based learning CPD course organizers have to incorporate different activities that would implement different learning modalities. Properly selected CPD activities could lead to lifelong learning of physicians.²⁴

Assessments of continuous professional development (CPD) programs

There are several assessment tools to determine the effectiveness of learning. Some of the commonly used assessment tools are Miller's pyramid²⁵ and Kirkpatrick criteria of learning.²⁶ When it comes to assessment of CPD programs several questions come to mind namely, 1) what is being measured, 2) what evaluation tools are most appropriate for this task, 3) what are the strengths and limitations of the various tools of assessment.²⁷

Miller's pyramid of clinical competence is commonly used to assess the knowledge, skills and attitudes of the learner. This tool can be used to assess the cognitive (knows, know how) and behavior (shows and does) competence of the learner. The ability to gather facts (knows) can be assessed by traditional multiple choice questions (MCQ's). Interpretation and application of the knowledge (knows how) can be assessed by case presentations, essay type questions and MCQ's that assess for deeper understanding of subject. Demonstration of learning (shows) can be accessed via simulations and OSCE's and integrating knowledge and skills in practice (does) can be assessed by direct observation and work place based assessment.

The four levels of Kirkpatrick's evaluation model²⁶ is often used to evaluate learning. Level 1 reaction to learning and it measures participants satisfaction with the program. Most CPD programs incorporate a post course survey to assess for satisfaction and use the data for post hoc program assessment. The problem with Level 1 evaluation is that a positive reaction by the attendee does not guarantee

Table 2. Sources of Need assessment used for Continuous medication education.

Inferred Need Assessment New diagnostic methods	New medications and indication Development of new technology Recent Advances in medical knowledge Availability of new equipment New regulatory, organization change in patient management
Specific Practice needs Clinical surveys	Gap analysis Observation of physicians Performance on multiple choice test Self assessment Patients complaints and feedbacks Patient unmet needs
Proven needs based on external data	Audit Epidemiological data Quality assurance Professional society requirement News media Literature citations Mortality and Morbidity Multidisciplinary assessment Patient satisfaction surveys

learning. Level 2 assesses learning and goes beyond learners satisfaction and attempts to measure the students change in skills, knowledge and attitude as a result of CPD activity. Examples for this kind of activity would be a pre and post test multiple choice question (MCQ) test to determine knowledge and its application in real life simulated situations. Level 3 measures the change in behavior that occurred as a result of the CPD course and is a post- learning event. Individuals would need to answer if any of the new acquired skills, knowledge and attitudes were being used in their work environment. This form of measurement is difficult due to the inherent uncertainty in determining when the change in behavior occurred and appropriate timings of conducting the follow up evaluation studies. Level 4 evaluation is a measure of outcome evaluation and is highest achievement of a learning session. A level 4 evaluation seeks to determine whether a change in behavior of the physicians as a result to the CPD session improved patient outcomes. Examples of improved patient outcomes could be reduced frequency of adverse effects, and improved quality of life.

Though evaluation of experienced physicians is complex as most practice in dynamic environment that are influenced by many factors, recent recommendations suggest that CPD

course organizers construct programs that would measure learning (Level 2).²⁴ Hence, CPD sessions should have some form pre and post self assessment using MCQ's or evaluation of a skill or task in their program to ensure learning.

In conclusion, CPD activity requires insight on how adults learn and knowledge of needs assessment of physician's based on information gathered from various sources. CPD planners need to be organize activities that would consistently improve physician competence. There is mounting pressure to assess the effectiveness of a CPD program beyond a measure of physician satisfaction and incorporate some measure in the program to assess that physicians have learnt the information discussed during the CPD activities. Pre and post course test of physicians using MCQs form a useful method of assessment, though the course organizers would need to ensure that the questions are appropriately constructed to assess the ability to use knowledge in real life situations.

Conflict of interest

The author freely declares no conflict of interest.

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