

Editorial

Improving training in cardiopulmonary resuscitation: Can we put a price on it?

From the point of view of emergency medicine, training and learning of the necessary skills and knowledge to acquire quality cardiopulmonary resuscitation (CPR) techniques must be a priority with a specific aim: to management of real-life clinical situations. The benefits of teaching cardiopulmonary resuscitation techniques were proved decades ago^{1,2} by both medical and nursing professionals^{3,4}, in urban and rural settings⁵.

In recent decades, CPR training has generated a large amount of documentation dealing with a range of subjects from its justification to, more recently, its cost. Teaching, learning and training are deep-rooted aspects among healthcare professionals. They go hand in hand with the profession and they have their basis in the origin itself of activities related to health and healing, without leaving aside that aspect of the profession where, luckily, the roles of "student" and "teacher" are increasingly more interchangeable, learning and teaching at the same time. It is known that acquisition and retention of knowledge are related to age and to the time elapsed after graduation⁶. This can be changed providing continuing education and training for professionals.

The cost of CPR training is not just financial. There is an intellectual cost (which is seldom, if ever, considered) that is originated by different aspects, some of them already forgotten as they belong to a past time. We had to identify a need, to carry out training programmes for teaching and learning and to develop documentation to support this training. We had to adapt to new technologies regarding teaching and learning techniques and the elements to apply them. We had to develop learning aimed at adults, introducing ourselves in work, academic and scientific settings where students are, in the case of healthcare, qualified professionals. Most of these initiatives were carried out, and I would even dare to say that they are still being carried out, without making a thorough assessment of their cost. On the contrary, they were developed mostly based on the enthusiasm of many professionals and their belief of these initiatives being necessary.

The financial cost of CPR training programmes follows a pattern that is marked by a teaching model in which practical exercises prevail over theoretical presentations with a stu-

dent/teacher ratio an increasingly reduced. This cost is conditioned by methodologies defined according to the recommendations of the European Resuscitation Council (ERC). Is this the only formula for learning? Surely, it is not. Undoubtedly, we must use and benefit from the advantages offered by the new technologies to improve transmission of knowledge achieving a reasonable cost. Universities and schools are doing this. Why can't we apply this to CPR training?

This issue of EMERGENCIAS includes an article analysing the cost-effectiveness of CPR training with simulators, comparing standard training (I would not call it "normal training") with training with simulators⁷.

Iglesias et al. compare the direct and structural costs applied in carrying out training activities aimed at healthcare professionals. They introduce the use of different methodology strategies and demonstrate, the importance of student preparation prior to undertaking the training, regardless of the type of training. This strategy is one of the main aspects of the courses endorsed by the ERC and while we can not say that the data of this study are conclusive, they do confirm the benefits of a specific strategy. The results obtained in the group trained with a simulator are interesting. The simulator allows a better approach to the physiopathology of critical patients as well as a better record of the activities carried out. This area is developed by the companies that manufacture training materials, which have found a source of research and innovation in terms of training improvement. We can also say that, despite not being able to replace classic teaching techniques, the use of simulators and new technologies do complement these techniques and help improve the consolidation of knowledge and skills^{8,10} and therefore, they have proved to be useful even for highly experienced professionals – although experience is not the sole guarantee of a good acquisition of knowledge¹¹. Not all teaching methodologies obtain the same results. We observe teaching alternatives that render different outcomes such as the lack of knowledge retention when using short (1 hour) training programmes for nurses¹², the good results obtained by the students of the present Spanish secondary education programme (ESO)¹³ or the lack of benefits using actors instead of dummies for training⁶.



We must be thankful for this type of analysis, especially when the costs are significant and the resources are limited. We are planning to carry out training campaigns aimed at healthcare professionals that are potentially first providers of attention (primary healthcare) and we even want to introduce more ambitious campaigns aimed at the general population. All this requires the development of techniques that are effective, affordable, reproducible and accessible to the largest possible number of people.

Many questions arise when we suggest CPR training aimed at professional groups that do not normally carry out this task for obvious reasons, but to are very often the first professionals to act and are therefore the first links of the life chain and the patient's prognosis depend on them. It is an objective fact that CPR skills and knowledge can be acquired by healthcare professionals and by the general public through standard training programmes. Likewise, it is easy to determine their cost as we know the expenses per student, we know that when we teach we do it well, that students learn and that their skills and knowledge persist for a period of time. However, is this investment profitable in the medium and the long term? How long are the acquired skills and knowledge retained? How often must they be updated? How many deaths have been prevented by these programmes? It is true that we have numerous experiences in relation to this, that we provide updates and we try to maintain skills and it is at this point where the doubt arises again and at this point the problem grows and acquires astronomic dimensions: is it feasible to maintain continuing education programmes in this field? Is it sustainable?

There is nothing more important than life and we all make efforts to contribute to improving its quality among our patients. However, we must also – even if it is becoming a cliché – make efforts to find financial solutions that have continuity over time and that are supported by studies that include terms of effectiveness, avoidable deaths, years of life lost (or gained) and allow us to rationalise and justify

the necessary investments in CPR training in the near future.

REFERENCES

- 1- Curry L, Gass D. Effects of training in cardiopulmonary resuscitation on competence and patient outcomes. *CMAJ* 1987;137:491-6.
- 2- Camp BN, Parish DC, Andrews RH. Effect of advanced cardiac life support training on resuscitation efforts and survival in a rural hospital. *Ann Emerg Med* 1997;29:529-33.
- 3- Dane FC, Russell-Lindgren KS, Parish DC, Durham MD, Brown TD. In-hospital resuscitation: association between ACLS training and survival to discharge. *Resuscitation* 2000;47:83-7.
- 4- Hamilton R. Nurses knowledge and skill retention following cardiopulmonary resuscitation training: a review of the literature. *J Adv Nurs* 2005;51:288-97.
- 5- Sanders AB, Berg RA, Burrell M, Genova RT, Kern KB, Ewy GA. The efficacy of an ACLS training program for resuscitation from cardiac arrest in a rural community. *Ann Emerg Med* 1994;23:56-9.
- 6- Miotto HC, Couto BR, Goulart EM, Amaral CF, Moreira MD. Advanced Cardiac Life Support Courses: Live actors do not improve training results compared with conventional manikins. *Resuscitation* 2007 Sept 4.
- 7- Iglesias JA, Penas M, Rodríguez A, Cegarra M, Barreiro V, Varela-Portas J. Estudio coste-efectividad de la enseñanza de la reanimación cardiopulmonar con simuladores. *Emergencias* 2007;19:312-8.
- 8- Wayne DB, Didwania A, Feinglass J, Fudala MJ, Barsuk JH, McGaghie WC. Simulation-Based Education improves quality of care during cardiac arrest team responses at an academic teaching hospital: A case-control study. *Chest*. 2007 Jun 15.
- 9- Wayne DB, Butter J, Siddal VJ, Fudala MJ, Wade LD, Feinglass J, et al. Mastery learning of advanced cardiac life support skills by internal medicine residents using simulation technology and deliberate practice. *J Gen Intern Med* 2006;21:251-6.
- 10- Wayne DB, Butter J, Siddal VJ, Fudala MJ, Wade LD, Feinglass J, et al. A longitudinal study of internal medicine residents retention of advanced cardiac life support skills. *Acad Med* 2006;81:S9-S12.
- 11- Wayne DB, Butter J, Siddal VJ, Fudala MJ, Wade LD, Feinglass J, et al. Simulation Based Training of internal medicine residents in ACLS protocols: A randomized trial. *Teach Learn Med* 2005;17:202-8.
- 12- Boonmak P, Boonmak S, Srichaipanha S, Poomsawat S. Knowledge and skill after brief ACLS training. *J Med Assoc Thai* 2004;87:1311-4.
- 13- Miró O, Jiménez-Fàbrega X, Espigol G, Culla A, Escalada-Roig X, Díaz N, et al. Teaching basic life support to 12-16 year olds in Barcelona schools: views of head teachers. *Resuscitation* 2006;70:107-16.

X. Jiménez Fàbrega* y X. Escalada Roig**

**Coordinator of the Emergency Department in Hospital Universitario de Bellvitge (HUB). **Physician in Sistema d'Emergències Mèdiques de Catalunya (SEM)*