
Editorial

Criteria-Based Evaluation and Continuing Medical Education

John P. Geyman, MD
Seattle, Washington

Some years ago, Miller¹ formulated five basic conditions that must be met for meaningful learning by adults:

1. Students must be adequately motivated to change their behavior.
2. They must be aware of the inadequacy of their present behavior.
3. They must have a clear picture of the new behavior.
4. They must have opportunities to practice the new behavior with a sequence of appropriate materials.
5. They must get continuing reinforcement of the new behavior.

Today the continued relevance of these principles of learning seems obvious for all teaching and learning programs for adults. These principles hold special value for addressing physicians' needs for continuing medical education. Once having learned a specific body of knowledge and skills in the past, many physicians have difficulty in identifying their individual future learning needs,

in becoming motivated to address them, and in finding ways to practice and gain new skills. Erosion inevitably takes place over time in cognitive knowledge and psychomotor skills, so that periodic reinforcement is needed for continued competence in any particular area.

The problem of maintaining competency in cardiopulmonary resuscitation provides a good illustration of how accepted learning principles can be applied effectively in continuing medical education. The American Heart Association has developed specific performance criteria for each step of both basic and advanced life support. In this issue of the *Journal*, Goldman² describes a study based in a family practice residency program assessing physician performance of cardiopulmonary resuscitation. Some modifications were made of the American Heart Association evaluation process, resulting in an objective, readily applicable evaluation of performance for four standardized clinical scenarios, each including asystole, ventricular fibrillation, and ventricular tachycardia. Pass-fail criteria were established on the basis of major and

minor errors. Twenty-three residents and two senior medical students were evaluated by this technique. Only 11 of the 25 achieved passing scores. Regardless of scores, however, each participant identified his or her specific learning needs by completing these clinical simulations. The extent of previous training was clearly correlated with performance level. Physicians previously certified in advanced life support made the fewest errors, while senior house staff made fewer errors than first-year residents.

All reported studies of performance levels for cardiopulmonary resuscitation (whether involving physicians, other health care professionals, or laymen) have shown major performance problems and have identified specific individual needs for continued learning. For example, in one study only 22 percent of internal medicine residents in a university-affiliated teaching hospital were able to compress and ventilate the mannequin adequately in a simulated cardiac arrest.³ In another study, no house officer in a university medical center received a passing score in basic life support, and

only one third of advanced life support participants could intubate the trachea in 35 seconds or less.⁴

Rather than focusing on performance deficits in a negative way, these criteria-based evaluation approaches represent an excellent continuing medical education technique incorporating all of Miller's learning principles and affording a direct and individual approach to the problem of progressive erosion of cognitive and psychomotor skills over time. These simulations are practical, relevant to each physician's practice, and allow both reinforcement of old knowledge and skills and practice of new ones based on identified needs. It is laudable that these efforts are being made in residency programs, and they could be extended readily by such programs to larger groups during periodic continuing medical education programs. Further, the concept of criteria-based evaluation so successfully developed for cardiopulmonary resuscitation could well be extended, again through the involvement and leadership of residency training programs, to many other important areas of knowledge and skill.

References

1. Miller HL: Teaching and Learning in Adult Education. New York, McMillan, 1964, p 33
2. Goldman SL: Assessment of physician performance of cardiopulmonary resuscitation. *J Fam Pract* 1985; 20: 173-178
3. Webb DD, Lambrew CT: Evaluation of physician skills in cardiopulmonary resuscitation. *JACEP* 1978; 7: 387-389
4. Lowenstein SR, Libby LS, Mountain RD, et al: Cardiopulmonary resuscitation by medical and surgical house officers. *Lancet* 1981; 2:679-681