

## WILDERNESS INSTRUCTOR

# Wilderness First Responder: Are Skills Soon Forgotten?

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Wilderness first responders are trained to provide competent medical care in wilderness settings or until evacuation for more advanced treatment can be obtained. In light of the isolated environments in which they are called upon to respond to illnesses and injuries, their ability to effectively apply their training is crucial. Despite the responsibility assigned to them, there is an absence of research assessing the skill and knowledge retention of wilderness first responders, creating a gap in understanding whether a deficit in their ability to perform exists between certifications. Without such research, it is important to review knowledge and skill retention in related responder groups. The literature over the past 4 decades documents the loss over time of skills and knowledge across an array of trained responders, both professional and laypeople. Although the findings reviewed suggest that WFRs will exhibit a similar pattern of increasing skill loss beginning shortly after certification and a slower, but concurrent, decrease in knowledge, research is needed to document or refute this assumption.

*Keywords:* knowledge and skill retention, self-efficacy, certification

## Introduction

Knowledge and skill retention among first responders and medical professionals is a topic of research interest in numerous studies conducted across 4 decades. These studies include the evaluation of those trained in first aid/cardiopulmonary resuscitation (CPR), wilderness first aid (WFA), and automated external defibrillators (AEDs), as well as emergency medical technicians (EMTs), paramedics, nurses, medical students, residents, and physicians. Missing from this body of research are studies examining the knowledge and skill retention of wilderness first responders (WFRs). As described in a group consensus position paper formulated by experts in the field, the WFR “care(s) for patients in remote locations, in challenging weather, with questionable communication and support, limited equipment and may need to make independent decisions on patient care and transport.”<sup>1</sup>

WFR certification is often required by for-profit, nonprofit, and public enterprises when hiring instructors, guides, and staff for outdoor trips and expeditions because of its training in responding to emergencies in

remote settings. Although certifications are valid for a period of 2 to 3 years, it is unclear whether WFRs retain the skills and knowledge to proficiently assess and treat medical emergencies. In light of the isolated settings in which they are called upon to respond to illnesses and injuries, their ability to effectively apply their training is crucial. A lack of research has created a void of critical information regarding WFR skill and knowledge retention. The purpose of this article is to review the research findings on lay and professional medical responders and to focus attention on the need for similar WFR research.

## Method

The peer-reviewed and published scientific research used in this article was located using the following search engines: Google, Google Scholar, PubMed, and Medline. Keywords included first aid, wilderness first aid, CPR, AED, basic life support (BLS), advanced cardiac life support (ACLS), resuscitation, medical skill retention, knowledge retention, wilderness first responder (WFR), emergency medical technician (EMT), paramedic, recertification of emergency skills, nursing first aid, intubation, self-efficacy, and skill confidence. Inclusion criteria involved peer reviewed articles on first responder skills and knowledge retention among those trained and certified by recognized training programs, in medical device use, and in life-saving techniques.

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A review of research examining whether first responders' confidence in their life-saving skills matches the performance of those skills is included. This information provides a basis for interpreting findings on first responders.

## Results

### WILDERNESS FIRST RESPONDER CERTIFICATION

WFR is a widely recognized certification within the outdoor recreation and education field. Often cited as the industry standard, WFR programs are designed to train individuals working in remote settings to respond to medical emergencies. In addition to training on assessment and treatment skills, emphasis is placed on prevention and critical decision making. Certification requires successful completion of a 72- to 80-h course. A standard set of topics has been published for WFR training, although adherence to it by various training programs has not been evaluated.<sup>1</sup> Course time is spent both inside and outside the classroom, learning and completing practical skills, case studies, and scenarios. Participants in WFR programs are evaluated on their written knowledge and applied skills, although final certification criteria are not standardized across training programs.

### FORGETTING/LOSS OF SKILLS FOLLOWING TRAINING IN MEDICAL CARE PROVIDERS

In view of the current deficit in research on skills and knowledge retention among WFRs, it is important to evaluate the results of studies examining related responder groups. The following review of research on lay responders and healthcare professionals provides an overview of findings that have relevance to WFR skill and knowledge retention.

#### *Lay individuals trained in CPR/AED*

Millions of adults in the United States and other countries have been trained in CPR in an attempt to provide lay individuals with the skills to save lives. Because they are often the first to encounter ill or injured victims in emergency situations, the ability to apply lifesaving CPR techniques is of critical importance. Spanning several decades, research examining the retention of CPR training for lay individuals has produced a consistent body of findings. Skills begin to deteriorate quickly, often within weeks to months of certification, and continue to decline over time.<sup>2-12</sup> In studies in which it was assessed, knowledge retention declined more slowly than skills and, in some cases, remained

high.<sup>4,7,12</sup> When lay individuals received training in both CPR and AED use, the pattern of skill loss in both areas was similar to that found for CPR training only.<sup>11,12</sup> Practice and more frequent reassessment were recommended for lay individuals trained in CPR.<sup>2-4</sup>

Even among groups that are highly motivated or operate in environments isolated from medical care, CPR and AED skills deteriorate. Parents of infants at risk for cardiac arrest receive CPR training in the hospital setting before taking their infants home. In addition to instruction, practice, and demonstration of skills, instructors worked with parents to reach 100% proficiency in CPR performance. When retested in their homes 6 months later, only one third of parents successfully demonstrated CPR skills.<sup>3</sup> Relatedly, airline flight crews, often hours away from accessing emergency medical care, receive training in CPR and AED use. Crews were tested on skills and knowledge 12 months later. Using a resuscitation scenario, skill performance was poor on CPR and AED use, but theoretical knowledge remained high. Review of training and reassessment guidelines was recommended.<sup>12</sup>

#### *Healthcare professionals trained in CPR/AED, BLS, and ACLS*

**Paramedics/EMTs.** Paramedics and EMTs are often called upon to respond to emergency situations involving serious illness and injury. As such, they are thought to possess the strongest CPR and resuscitation skills among healthcare professionals.<sup>13</sup> However, research reveals a pattern of decreasing CPR skill after certification.<sup>14-19</sup> Errors documented in a number of studies assessing paramedic and EMT skill retention revealed inadequate compressions, misplacement of hands, and/or incorrectly performed ventilations in CPR performance.<sup>13,14,16-19</sup> Knowledge decline was slower than skill decline and, in some cases, knowledge remained adequate.<sup>14,15</sup>

In addition to CPR skills, EMTs and paramedics are trained to provide a variety of less frequently performed and complex lifesaving skills. These advanced skills are the subject of a number of research investigations. Several studies examining pediatric skill retention and errors among EMTs and paramedics revealed skill and/or knowledge losses in performing infant CPR, pediatric resuscitation, advanced pediatric life support, and endotracheal intubation.<sup>20-24</sup> Confidence in their abilities to perform skills led paramedics to overrate their actual performance.<sup>20-23</sup> Errors evaluated in 45 teams of EMS providers operating in simulated prehospital pediatric emergencies occurred in oxygen delivery, equipment use, glucose assessment, administration of drugs, CPR,

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