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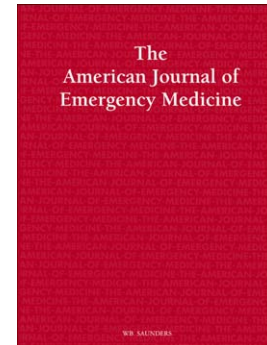
Are firefighters able to recognize ventricular fibrillation? Preliminary data

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Title page

Are firefighters able to recognize ventricular fibrillation? Preliminary data**Authors:****Andrzej KUROWSKI**, PhD, MD

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Sir,

firefighters are now equipped with automated external defibrillators (AED), applied in cases of sudden cardiac arrest. However, in the era of increasingly emerging “hybrid” AEDs, allowing to switch to the manual mode, the ability to recognize cardiac arrest rhythms seems very important. As shown by scientific research, even a short interruption in chest compressions preceding a defibrillation attempt reduces the effectiveness of defibrillation and thereby the effectiveness of cardiopulmonary resuscitation [1]. The medical personnel operating within the Emergency Medical Services (EMS) or Emergency Departments (ED) should have the ability to interpret electrocardiography (ECG) results, particularly regarding cardiac arrest rhythms. It is therefore crucial for all medical personnel operating in prehospital settings, with access to AEDs offering an option to switch to the manual mode, to be able to recognize basic ECG rhythms, in particular those of ventricular fibrillation and pulseless ventricular tachycardia.

The aim of the study was to evaluate the ability to recognize ventricular fibrillation in ECG by firefighters. The study was approved by the Institutional Review Board of International Institute of Rescue Research and Education (approval No.: 05.03.2016.31) and was conducted in the period of April-May 2016.

The study involved 47 firefighters of the National Fire Service. None of the participants had medical education. Everyone held a Qualified First Aid course, mandatory in Poland. At the beginning of the training, the participants filled in a questionnaire, which allowed to determine that none of them had any knowledge on diagnosing ventricular fibrillation. Before the study, all the participants took part in Basic Life Support and Automated External Defibrillation training according to the European Resuscitation Council 2015 guidelines [2]. The training was expanded with contents related to diagnosing shockable rhythms (ventricular fibrillation and pulseless ventricular tachycardia). The pathophysiology of ventricular fibrillation and pulseless ventricular tachycardia was discussed, as well as methods of defibrillation and post-defibrillation procedures. Then the participants were trained in the life-saving procedures with the use of the SimMan 3G advanced patient simulator (Laerdal, Stavanger, Norway) and a Lifepak 1000 defibrillator (Physio-Control, CT, USA).

During the preliminary test, various ECGs with ventricular fibrillation of different amplitude (Figure 1), ventricular tachycardia, and normal ECGs were shown to the firefighters. None of the firefighters could correctly interpret the ECG recordings. After the

training, the firefighters received a questionnaire in which ECG recordings were randomly presented. During the re-evaluation, high-voltage ventricular fibrillation was correctly identified by 100% of the participants, low-voltage ventricular fibrillation by 70,2%, ventricular tachycardia by 100%, and asystole by 100%. The firefighters pointed at the need for training with reference to recognizing cardiac arrest rhythms and implementing new technologies in the National Fire Service, including defibrillators with the possibility to switch to the manual mode.

In summary, after a short training, firefighters are able to correctly interpret the ECG rhythms associated with cardiac arrest. Further studies are needed to confirm the results and evaluate the firefighters' knowledge gained during the training.

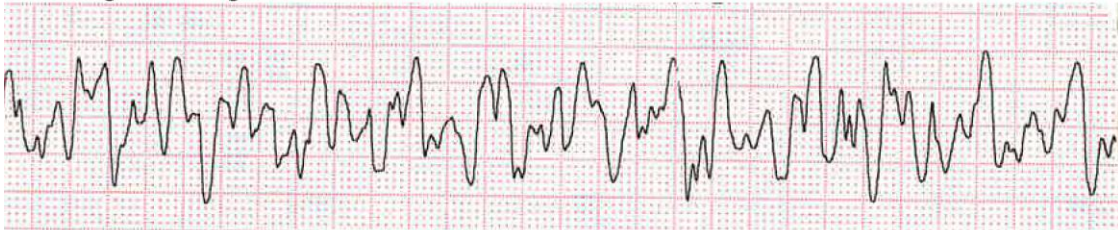
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Figure legend:

Figure 1. Examples of ventricular fibrillation ECG recordings included in the test.

(A) high-voltage ventricular fibrillation



(B) low-voltage ventricular fibrillation

