

## **Automated external defibrillator (AED) installation in the workplace: from recommendations to ADE style international registries?**

Although a large number of international guidelines recommend the installation of automated external defibrillators (AED) in the workplace (1,2), only very few data have been published on this subject, as highlighted by the pilot study presented here (3). Several explanations can be proposed for the very limited number of data published on this subject.

A “publication effect” is very likely, i.e. effective AED installation programs have been set up, but no studies and specific data have been published. Many authors in the field of emergency medicine consider the workplace to be just another public place (4). However, the workplace is radically different from other public places in terms of the incidence and management of out-of-hospital cardiac arrest (OHCA), as OHCA in the workplace represents between 1 to 6% of all OHCA reported in published studies (5–9). Various authors have also reported that patients experiencing cardiac arrest in the workplace present one of the highest hospital discharge survival rates, and appear to be managed more effectively than OHCA occurring in other so-called public places (4,8–10). OHCA in the workplace also tend to occur in younger subjects in good health (9), which implies a large number of years of life saved.

Nevertheless, studies on the subject raise a major problem related to the definition of “workplace”, which can correspond to very different situations, ranging from small shops to large factories, from hospitals to drilling rigs, from amusement parks to construction sites, etc. Workplaces associated with a high risk of cardiac arrest must therefore be identified, by taking into account criteria of feasibility and efficacy of AED programs. On the basis of expert opinions and studies conducted in other settings(11–14), the existing guidelines on installation of AED in the workplace are based on the site-specific incidence of OHCA (with a lower limit of one OHCA every two or five years, depending on the study), or based on the

number of employees on the site and their mean age. However, other parameters also need to be taken into account, such as the number and characteristics of visitors (with the same lower limit or more than 250 people over the age of 50 present for more than 16 hours per day), the presence of occupational risk factors for ventricular fibrillation (high voltage, high cardiac risk situations, etc.), and the medical profile of employees/visitors (high prevalence of risk factors for coronary heart disease or sudden death), as well as the distance from emergency medical services (15).

Consequently, apart from the legal requirements and communication needs, the lack of good quality data on AED installation in the workplace constitutes an obstacle for occupational physicians, emergency physicians, and HSEs to effectively advise decision-makers (employers and policy makers) on the best AED installation program. However, as many programs complying with international guidelines probably already exist, a useful first step would be the creation of an international multicomponent registry of OHCA occurring in the workplace, including details of the AED installation program. The conventional “Utstein style” guidelines are not strictly appropriate (16,17), and must be adapted according to the “ADE style” (Application of Defibrillation in the Enterprise): a conventional OHCA registry with specific details concerning the workplace could therefore be developed in addition to the registry of AED installation programs in companies. Table 1 summarizes the “ADE style” of these registries that should ideally be linked to each other. In this way, an international network integrating these various characteristics in addition to the out-of-hospital emergency system and organization of occupational physicians, could therefore be developed.

In conclusion, the pilot study presented here (3) emphasizes the need to obtain data about AED installation programs and management of OHCA in the workplace, which cannot be simply considered to be just another public place. Apart from the difficulties raised by the heterogeneous definition of the workplace, standardized recording of good quality

supplementary data according to the Utstein style adapted to the workplace (ADE style) could provide valuable information.

## References

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Table 1. “ADE Style” for standardized workplace registry data

Registry Part	Item	Core	Supplementary
<b>AED programs on site:</b> – Workplace characteristics – AED program  <i>(data that should be collected prospectively every one or two years)</i>	Activity sector	X	
	Number of workers	X	
	Estimated number of people/day on site (including visitors)		X (if available)
	Specific occupational risks identified (and which ones)	X	
	Distance from closest EMS		Indicate type of EMS
	Number of public access AEDs on site		
	Number of AEDs used by trained teams	X	
	Number of trained bystanders/ BLS/ ALS on site	X	
	Number of healthcare professionals	X	
	Number of OHCA occurring on site over the last ten years	X	
<b>OHCA management</b> <i>(data that should be collected prospectively for each OHCA)</i>	Time of OHCA	X	
	OHCA in the presence of a bystander	X	
	Time of confirmation of alert/confirmation of OHCA	X	
	Etiology: Presumed cardiac? Trauma? Submersion? Respiratory? Toxicological? Other	X	
	Associated with an industrial risk?	X	
	Suicide?		If possible
	Time of initiation cardiopulmonary resuscitation	X	
	Time of application of the AED	X	
	Number of shocks delivered?	X	
	Time at which team the workplace team trained in the management of OHCA reached the victim	X	
	Time at which the EMS/paramedics reached the victim	X	
	Time of intubation	X	
	Time of return of spontaneous circulation	X	If applicable
	Time of death	X	If deceased
	Dose of adrenaline before return of circulation	X	
	Transfer to hospital alive	X	
Discharged from hospital alive		If possible	
Neurological outcome at discharge (CPC score: 1, 2, 3, 4, or 5)		If possible	
<b>Organization</b>	EMS or paramedics?		If possible
	EMS response time in the department?		If possible
	Number of occupational physicians and nurses in the department/country		If possible

ADE: “Application of Defibrillation in the Enterprise”, AED: Automated External Defibrillator, EMS: Emergency Medical System; OHCA: Out-of-Hospital Cardiac Arrest; BLS: Basic Life Support; ALS: Advanced Life support; CPC = Cerebral Performance Category.