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For over two centuries, resuscitation has had an intriguing and complicated relationship with the general public. London Middlesex and St. Bartholomew's hospitals purchased their first therapeutic electrical apparatus in 1767 and 1777, respectively (1). However, the first report of attempted therapy of "apparently dead" came from the community (2). Although performed naively, it still resulted in the formulation of the first published "guidelines" on resuscitation: "In the treatment of persons apparently dead by drowning, etc. our first attention should be directed to the inflation of the patient's lungs. When the distension of the lungs is accomplished, let the powerful stimulus of electricity be applied, by passing a shock through the heart..." (3). During the transition from the XVIII to XIX centuries there was a range of discharge devices, like the Leyden Jar, from which therapy was delivered by physicians and individuals outside the medical profession. However, falling victim to infamous quacks, irrational prescription of electrotherapy for a vast array of ailments and over exaggerated descriptions of success led to a stagnant period of ill repute by the end of the XIX century (1). It would be almost a century before external defibrillation was again suggested as a therapeutic methodology in 1899 (4) and another half-a-century when it was finally demonstrated in 1946 in the operating room on an open chest patient (5) and, finally, in 1956 transthoracically (6).

Fast forwarding to current times, external defibrillation has finally gained its deserved credit as an essential lifesaving tool. With advancements in arrhythmia detection algorithms, AHA ECC guidelines stated in 2000 that public access defibrillators (PAD) "has the potential to be the single greatest advance in the treatment of VF cardiac arrest since the development of CPR" (7). However, fifteen years after that statement was published it remains challenging to quantify the effects of Automated External Defibrillation (AED) placement in the hands of the general community. In March of this year the FDA released a proposed change in

approval of AEDs requiring a pre-market approval to increase the safety and reliability requirements of the devices (8).

In this issue of JACC, Page et al. present an epidemiological study on the response to sudden cardiac arrests (SCA) in the Seattle and King county regions (9). The study is limited to indoor exercise facilities but still contains valuable information on arrest survival with the use of PAD. The study refocuses our attention on current methods of deploying a critical lifesaving technology to the public to maximize effectiveness. The paper by Page et al. provides a platform to address any efficacy concerns of PAD use unrelated to device failure. The benefit of use by trained first responders is essentially irrefutable (10-13). Unfortunately, numerous studies have confirmed that the time delay from arrest to deployment is the most critical factor in survival (14,15). It is not possible for the ideal collapse-to-shock interval threshold to be met with these devices in the hands of only EMS personnel. Therefore it becomes essential to optimize the interface between these devices and the lay community who will use them in an emergency. Studies such as the one by Page et al. do an enormous service towards this aim by quantifying the use and effectiveness of PAD, even if it is limited to a narrow population.

Sifting through over a decade of arrests in the region, the authors were able to tease out details of arrhythmia incidence by form of exertion and survival rates associated with type of indoor facility. The group must be commended for extracting a great deal of information from local registries, which can be applied to alterations in public health policies. There was no surprise in the correlation with the dynamics of exercise, with a larger percentage of SCA occurring while performing high dynamic exercises. The most interesting results of the study are the higher survival rates to hospital discharge if the SCA occurred at traditional and alternative exercise facilities and the frequency of PAD deployment. The higher survival rates may be due to a number of factors that cannot be clarified from this data set. Does it

depend on the population who frequents exercise facilities, training and familiarity with the devices, or availability? More significantly, PAD was applied in less than 25% of arrests, even though >90% of the VF/VT cases were witnessed, across all facilities. Still high survival rates are reported. The arrest cases in this area may be exceptional due to the impressively low EMS response time of less than 5 minutes. It would be valuable to have data on the collapse-to-shock interval regardless of whether the shock was applied by the public or EMS personnel. These data do not seem to be available in the current registry but perhaps should be something that communities aim to record in order to identify areas of weakness in current AED deployment strategies. Additionally, 136 SCA events out of 849 occurred at facilities included in this study. This accounts for a relatively small percentage of total SCA in the region- where are the rest taking place? The current recommendation to place AED in exercise facilities may not be substantial enough to reach 80% of SCA victims in this cohort. This is a gap in information that needs to be addressed in many communities. This study highlights the need for collecting and distributing more data on PAD. On the distribution side, advancements in technology and the abundance of mobile Internet devices should encourage the development of free apps to locate the nearest AED and contact emergency personnel when a cardiac arrest occurs. Similar apps have been released but there is not a complete nationwide registry of the location and condition of every AED in the city. A comprehensive study in 2010 of state by state laws pertaining to AEDs found that more than 40% of jurisdictions did not require location registration (15). This information should be provided in order to help convert more witnesses of SCA to lifesavers. There should also be an easy way to facilitate direct communication between the witness and emergency personnel en route to aid them in delivery of the defibrillation shocks. As of the 2009-2010 school year, 36 states have compulsory resuscitation training as part of their high school graduation requirements (16). A study in Vienna, Austria found that students as young as

nine years old could successfully perform lifesaving AED deployment with only six hours of training (17). Therefore, there is a vast percentage of the general community who could perform this task if we can increase training and facilitate easily locating a device.

On the data collection side, it would be beneficial for more communities to keep a registry of PAD use and survival rates associated with it so that deployment weaknesses can be addressed without being resource-intensive. Collapse-to-shock time is a critical criterion to try to record in any registry of SCA events in order to optimize AED placement. Organizing the location and monitoring of PAD could help push this treatment to reach its full potential of being the most significant advance since CPR and bring successful defibrillation back to the field in the hands of the community as it was originally conceived.

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