

PE01707/C

Resuscitation Council (UK) submission of 20 March 2019

About us:

Established in 1983, the Resuscitation Council (UK) (RC (UK)) is a UK-wide charity whose purpose is to save lives through effective, appropriate resuscitation. Saving lives underpins and runs through all our activities.

We achieve this by:

- Developing high-quality, scientific guidelines, standards and educational materials for resuscitation
- Influencing resuscitation policy and practice by improving and maintaining standards
- Supporting research into resuscitation
- Building the resuscitation community to foster good working relations between all involved in resuscitation

RC (UK) comments on petition PE01707: Public Access Defibrillators (PAD):

The RC (UK) was saddened to hear of the tragic death of Jayden Orr. We appreciate that bringing this issue to public attention must be very difficult for Jayden's family, and therefore we would like to thank and commend the efforts of his mother Kathleen Orr in raising awareness about and campaigning on this important issue.

Why public access defibrillation is important for Scotland:

- Out-of-hospital cardiac arrest remains a significant healthcare challenge in Scotland.¹ In Scotland, approximately 3,500 people undergo attempted resuscitation each year after OHCA, but currently only around 1 in 20 survive to

¹ The Scottish Government. Out-of-Hospital Cardiac Arrest: A Strategy for Scotland. Edinburgh, 2015. (Accessed 4 March 2019, at: <https://www.gov.scot/publications/out-hospital-cardiac-arrest-strategy-scotland/>). P. 7.

hospital discharge.² Across Europe, the average go-home survival rate is almost twice that of Scotland at around 9%.³

- There is approximately 10% reduction in survival for every minute's delay in providing defibrillation.⁴
- Survival can be increased significantly by the early use of CPR and automated external defibrillators (AEDs), referred to as public access defibrillators (PADs) when made available for use by the public.

² Ibid. PP. 1, 4.

³ Perkins GD, Cooke MW. Variability in cardiac arrest survival: the NHS Ambulance Service Quality Indicators. *Emerg Med J* 2011;29: 3–5.

Note 5 in:

The Scottish Government. *Out-of-Hospital Cardiac Arrest: A Strategy for Scotland*. Edinburgh, 2015. (Accessed 4 March 2019, at: <https://www.gov.scot/publications/out-hospital-cardiac-arrest-strategy-scotland/>). P. 8.

⁴ Out-of-Hospital Cardiac Arrest (OHCA) steering group. *Resuscitation to Recovery: A National Framework to improve care of people with out-of-hospital cardiac arrest (OHCA) in England*. London, Resuscitation Council (UK), 2017. Accessed 4 March 2019, at: <https://www.resus.org.uk/publications/resuscitation-to-recovery/>. P. 6.

The Chain of Survival:

- The 'Chain of Survival', illustrated below, summarises the important components of successful resuscitation:



These elements involve early **recognition** that cardiac arrest has occurred, an immediate **call** to the emergency services, prompt initiation of **CPR and defibrillation**, followed by optimal **post-resuscitation care**.

- Currently only 30-40% of victims of OHCA receive bystander CPR; as this intervention can treble survival, it is a key intervention in improving overall survival.⁵
- The public can use PADs safely and effectively, even if they have had no or minimal training.
- The early use of CPR and defibrillation by bystanders prior to the arrival of the emergency services considerably improves the chance of survival.

⁵ OHCA steering group. Resuscitation to Recovery: A National Framework to improve care of people with out-of-hospital cardiac arrest (OHCA) in England. London, Resuscitation Council (UK), 2017. Accessed 4 March 2019, at: <https://www.resus.org.uk/publications/resuscitation-to-recovery/>. P. 11.

- In Scotland, increasing survival rates after an out of hospital cardiac arrest by just 10% would mean around 300 more lives being saved every year.⁶ More than 1,000 lives could be saved each year in England if more members of the public were trained in CPR and there was earlier and greater access to, and willingness to use, PADs.⁷
- Increasing the use of PADs requires increased public education and availability of PADs, as well as the ability to identify the location of a PAD.

Comments on key issues raised by this petition:

1. Legislating for public access defibrillation (PAD):

The RC (UK) does not have evidence that specifically making PAD a legal requirement would be sufficient to increase rates of bystander CPR, defibrillation and therefore improve rates of survival after cardiac arrest.

Many other factors affect rates of PAD. For example:

'knowledge and awareness; willingness to use; acquisition and maintenance; availability and accessibility; training issues; registration and regulation; medicolegal issues; emergency medical services dispatch-assisted use of automated external defibrillators; automated external defibrillator-locator systems; demographic factors; [and] other behavioural factors'.⁸

In order to increase rates of PAD, other barriers and facilitators, such as raising public awareness, will also need to be addressed for such a proposal to be successful.

In light of this, the RC (UK) recommends that the committee should consider whether mandating PAD installation is the best solution to this issue in comparison to other

⁶ The Scottish Government. Out-of-Hospital Cardiac Arrest: A Strategy for Scotland. Edinburgh, 2015. (Accessed 4 March 2019, at: <https://www.gov.scot/publications/out-hospital-cardiac-arrest-strategy-scotland/>). P. 4.

⁷ OHCA steering group. Resuscitation to Recovery: A National Framework to improve care of people with out-of-hospital cardiac arrest (OHCA) in England. London, Resuscitation Council (UK), 2017. Accessed 4 March 2019, at: <https://www.resus.org.uk/publications/resuscitation-to-recovery/>. P. 6.

⁸ Smith CM, Lim Choi Keung SN, Khan MO et al. Barriers and facilitators to public access defibrillation in out-of-hospital cardiac arrest: a systematic review. European Heart Journal - Quality of Care and Clinical Outcomes 2017; 3: 264-273. P. 264.

methods, which include supporting public campaigning and registration of PADs in the community. The Scottish government can play a valuable role in raising awareness of this important issue.

The committee could also consider the role of community resilience: the ability of communities to help themselves, as part of an integrated network of support and care appropriate to their needs. Central to community resilience for OHCA are community first responders – members of the public who volunteer to help their communities by responding to medical emergencies while the emergency services are on their way. Community first responders are trained in a wide variety of skills including CPR and defibrillation.⁹

2. Requiring all new build or newly renovated buildings with a floorspace of over 7500m² to have a public access defibrillator (PAD):

Although the RC (UK) understands the motivation behind the suggestion to maximise the opportunity for PAD installation presented by new building work or renovation, we do not feel this is the best way to identify where additional PADs are needed in the community. This is because the building's age or renovation status is not a relevant factor for identifying suitable location for PADs, as older or unrenovated buildings may also be suitable for PAD installation.

Local ambulance services, such as the Scottish Ambulance Service, are far better placed to advise on the need for a defibrillator in a specific community and where it should best be placed. When deciding on the location and placement of a new AED, the existence of other defibrillators in nearby locations should also be considered, and local ambulance services are able to take this into account when advising on AED placement.

⁹ The Scottish Government. Out-of-Hospital Cardiac Arrest: A Strategy for Scotland. Edinburgh, 2015. (Accessed 4 March 2019, at: <https://www.gov.scot/publications/out-hospital-cardiac-arrest-strategy-scotland/>). P. 20.

PADs are best placed in strategic locations, where they are most needed, and floorspace or building size alone is not sufficient to determine the need for a defibrillator in a particular location.

The suggested floorspace requirement does not appear to be based on evidence, and so we suggest that this part of the petition's proposals would require amendment.

However, the building size suggestion does relate to a relevant factor in determining whether an AED is required in a specific location, which is footfall. Although buildings with a large footprint may indicate a large footfall, the building size alone is not always sufficient as a measure of footfall, as large office buildings may be unattended at evenings and weekends. Therefore, it is footfall that is more relevant than building size in identifying where a defibrillator is needed.

To determine the likelihood of a cardiac arrest occurring in a specific location, the following factors should be considered to identify whether an AED is needed:

- 'The number of people passing through the site/footfall. In most cases, the larger the number present, the greater the risk.
- The age of those present (as cardiac arrest is more common with increasing age).
- The nature of the location. Some places are higher risk than others. Experience has shown that where large numbers of the public are present in busy places like transport hubs (e.g. airports and railway stations) cardiac arrests are more likely to occur. In other places, the nature of the work undertaken (e.g. the use of toxic chemicals) may be relevant to deciding on the need to invest in an AED.¹⁰

3. Defibrillators to be placed on the exterior of buildings for public use:

The Community Resuscitation Steering Group for England highlighted that:

'Studies have shown that a shock given within 3 minutes of cardiac arrest provides the best chance of survival, and that even one minute of further delay

¹⁰ BLS Subcommittee of the Resuscitation Council (UK). Defibrillators: Do I need an AED? The first aid needs assessment. London, Resuscitation Council (UK), 2015. (Accessed 5 March 2019 at <https://www.resus.org.uk/defibrillators/do-i-need-an-aed/>).

reduces that chance substantially. In most situations, ambulance services would be unable to reach the scene of a cardiac arrest and deliver a shock within three minutes. Further studies have shown that immediate delivery of CPR combined with early use of an automated external defibrillator by members of the public gives a person in cardiac arrest the best chance of surviving.¹¹

Therefore, accessibility is key for successful PAD, due to the impact of any delay in accessing the defibrillator when it is needed.

We recognise that making PADs accessible out of hours can be challenging for some buildings, such as offices and schools, due to the issues this raises relating to ownership, responsibility for and maintenance of the AED out of hours. However, the RC (UK) strongly supports this proposal, and recommends that PADs are placed on the exterior of buildings, where they are accessible to the public at all times, including outside of office hours.

The RC (UK) also recommends that, where conditions allow, defibrillators are placed in unlocked cabinets, in order to reduce any avoidable delay in accessing the defibrillator in an emergency.

A decision to place a public-access defibrillator in a locked cabinet should be made only on the basis of careful risk assessment in that specific location.¹²

Liaison and collaboration with the local ambulance service is crucial to the success of any public-access defibrillator scheme. It is essential to take their advice on the type of defibrillator and cabinet to install. Some ambulance services have a policy only to work with defibrillators in unlocked cabinets.¹³

4. Registration of PADs:

¹¹ Community Resuscitation Steering Group for England. Defibrillators: Cabinets for public-access defibrillators: to lock or not to lock? London, Resuscitation Council (UK), 2015. (Accessed 5 March 2019 at <https://www.resus.org.uk/defibrillators/cabinets-for-public-access-defibrillators/>).

(Supported by the British Heart Foundation and applicable in all 4 nations of the UK).

¹² Ibid.

¹³ Ibid.

The RC (UK) strongly supports the registration of PADs. It is important for defibrillators to be registered with the local ambulance service so that call handlers can advise callers of the location of their nearest defibrillator in the event of a cardiac arrest. Registration means nearby defibrillators can be located without delay, and therefore increases the chance that an AED can be used within the crucial first three minutes.

Before considering a legislative solution, further public information work could be done to encourage the registration of existing defibrillators.

There is currently no national record of the number or location of defibrillators, outside of those known to each ambulance service at a local level. However, in the meantime, registering a PAD with the local ambulance service will ensure it is also registered on the British Heart Foundation's forthcoming National Defibrillator Network¹⁴ when this becomes active.

Other issues raised in oral evidence sessions:

Maintenance of AEDs/PADs:

The committee's discussion also highlighted the significance of AED readiness and maintenance. As discussed, defibrillators do require little maintenance, although those in exterior cabinets will need power to heat the cabinet, in order to prevent deterioration of the pads. Owners or managers of an AED are not expected to carry out any maintenance tasks other than replacing the battery when necessary (most modern AEDs have a battery life (unused) of around 10 years or more) and replacing used or out-of-date disposable items such as adhesive pads (electrodes), razors and plastic gloves. The shelf life of these items (unused) is usually 3–5 years, so such maintenance tasks are infrequent (unless the AED is used frequently). In all cases, the manufacturer's instructions should be followed.

All AEDs currently on sale perform regular self-checks and if a problem is detected it will be indicated. Those owning or managing an AED should have a process in place for it to be checked regularly and frequently for such a warning, and for appropriate action to

¹⁴ British Heart Foundation. National Defibrillator Network. Accessed 20 March 2019 at <https://www.bhf.org.uk/how-you-can-help/how-to-save-a-life/defibrillators/national-defibrillator-network>).

be taken when necessary. If this task is allocated to one individual, robust arrangements must be in place to ensure that the checks are performed by someone else in their absence. If possible, an annual maintenance programme is recommended.

After the initial purchase, the cost of providing an AED for public access is small, and mostly consists of the cost of replacing disposable items if they are used or become out-of-date. Eventually, there will be an occasional need to replace an AED with a new one, so consideration of this should be included in planning an AED programme.

Public awareness/training:

In addition to identifying the location of the nearest defibrillator, increasing public knowledge and awareness is also paramount for successful PAD schemes. Although no prior training is needed to use a defibrillator, increasing the confidence of bystanders to use a defibrillator can reduce the unfounded fear of doing harm.

Modern AEDs are very reliable and will not allow a shock to be given unless it is needed. They are extremely unlikely to do any harm to a person who has collapsed in suspected sudden cardiac arrest (SCA). They are safe to use and present minimal risk to the rescuer. These features make them suitable for use by members of the public with modest (or even no training), and for use in PAD schemes.

Strategies to address 'capability, opportunity and motivation' are needed to promote successful bystander defibrillation for OHCA.¹⁵

Cardiac arrest in children:

Out-of-hospital cardiac arrest is 'much less common in children than in adults'.¹⁶

Fortunately, cardiac arrest is rare in school-age children, but when it does occur it is a particularly tragic event. Such cases inevitably receive publicity, and specialised charities provide valuable information to increase awareness and promote knowledge on the subject, as well as promoting research and improving recognition and treatment

¹⁵ Smith, CM, Perkins GD. Improving bystander defibrillation for out-of-hospital cardiac arrest: Capability, opportunity and motivation. *Resuscitation* 2018; 124, A15-A16. A15.

¹⁶ OHCA steering group. *Resuscitation to Recovery: A National Framework to improve care of people with out-of-hospital cardiac arrest (OHCA) in England*. London, Resuscitation Council (UK), 2017. Accessed 4 March 2019, at: <https://www.resus.org.uk/publications/resuscitation-to-recovery/>. P. 35.

of the underlying causes. The precise incidence of cardiac arrest in children is not known, as there is no national registry of such events. Autopsies cannot always identify the cause, because many of the heart conditions that cause cardiac arrest in this age group are not detectable after death. However, early use of an AED will improve the chances of survival for a child in cardiac arrest.

Some AEDs require specific (smaller) paediatric pads for use on a child, depending on their body weight. The manufacturer's guidance should be followed and, where necessary, both adult and paediatric pads kept with the AED. Adult pads can be used on a child if no paediatric pads are available.

Defibrillators in schools:

An AED in a school is likely to be used infrequently and is more likely to be used on an adult than a pupil. However, school-age children have been shown to be capable of using AEDs in simulated cardiac arrest scenarios so an undoubted advantage of having AEDs placed in prominent positions in schools is that the pupils will become familiar with them and can learn about their purpose. This can be incorporated into first aid and CPR training for pupils (see 'CPR education in schools' below for more information). The Resuscitation Council (UK) recommends AED familiarisation, as part of its CPR training in schools, not only for teachers and other responsible adults, but also for all school pupils.

The RC (UK) would be supportive of AEDs being placed in schools where there is a recognised need to do so. To be used as a PAD, a school defibrillator should ideally be placed on an exterior wall where it can be accessed by the public when the school is closed.

CPR education in schools:

Although locating defibrillators where a cardiac arrest may be likely to occur is crucial, this is not sufficient to increase survival rates after OHCA alone. This is because public awareness and confidence to know what to do in an emergency is also key. CPR education in schools is a core way that this can be achieved, by empowering the next generation of lifesavers to act in an emergency.

There is strong evidence to show that teaching young people essential life-saving skills leads to more lives saved in all settings and over many years. In Denmark, where CPR training in schools has been mandatory since 2005, the chances of recovery from an out-of-hospital cardiac arrest are triple those in the UK. In Norway, where CPR is also a mandatory part of the curriculum, survival rates from bystander CPR are an astounding 70%, compared to less than 10% in the UK.¹⁷

The RC (UK) welcomes the Westminster government's plan to introduce compulsory first-aid and CPR training (including defibrillator awareness) to the curriculum in all secondary schools in England from 2020. The new mandatory subject of health education in England will include basic first aid at primary school level, and how to do CPR and the purpose of a defibrillator at secondary school level. The RC (UK) is liaising with the Department for Education in England on the plans for the implementation of CPR education on the curriculum.

The reason for including CPR training on the curriculum at secondary, rather than primary school level, is that CPR is usually best taught after 12 years old. This is because children's ability 'to achieve an adequate depth of chest compression depend[s] on their age and weight'¹⁸:

"No year 5 pupil (age 9-10) was able to compress the manikin's chest to the depth recommended in the guidelines...19% of pupils in year 7 (age 11-12) and 45% in year 9 age 13-14) achieved adequate compression depth. Only the 13-14 year olds performed chest compression as well as adults'.¹⁹

Although it is important to raise awareness of first aid and CPR amongst primary school pupils, as they are able to learn 'the theory of the technique just as well as older

¹⁷ Böttiger BW, Semeraro F, Altemeyer K-H et al. Kids save lives: School children education in resuscitation for Europe and the world. *Eur J of Anaesthesiol* 2017; 34: 792-96.

¹⁸ Jones I, Whitfield R, Colquhoun M, Chamberlain D, Vetter N, Newcombe R. At what age can schoolchildren provide effective chest compressions? An observational study from the Heartstart UK schools training programme. *BMJ*, doi: 10.1136/bmj.39167.459028.DE (published 27 April 2007). P. 1.

¹⁹ *Ibid.* P. 1.

children',²⁰ the greater strength of secondary school pupils means that they are better able to physically perform the skill of CPR.

We would also like to take this opportunity to commend the fantastic work being done in by many Scottish councils to put CPR training on the curriculum in their local schools. We would be happy to offer our expertise to support the Scottish government to promote CPR education or PAD in Scottish schools at a national level.

Regarding the best way forward to expand work done at a local level as part of Jayden's Rainbow campaign in Inverclyde more widely in Scotland, the RC (UK) would be happy to advise further.

Closing comments:

The RC (UK) would like to thank Kathleen Orr for her vital work bringing this important issue to public attention through Jayden's Rainbow campaign, and via this petition, and commend those responsible for tabling it. The RC (UK) would also be happy to advise the committee further, by attending any forthcoming round table evidence session.

Further information:

The committee may find the following information useful for its further consideration:

- <https://www.resus.org.uk/defibrillators/do-i-need-an-aed/>
- <https://www.resus.org.uk/defibrillators/cabinets-for-public-access-defibrillators/>
- <https://www.resus.org.uk/publications/a-guide-to-aeds/> (please note, this document will be updated with a revised publication shortly. We are happy to supply an advance copy of the 2019 revised copy in draft form for the committee's information).
- <https://www.resus.org.uk/cpr/cpr-aeds-and-the-law/>
- <https://www.resus.org.uk/publications/resuscitation-to-recovery/>

²⁰ Ibid. P. 3.