Community Resuscitation Strategy

Northern Ireland

July 2014

Contents

Note

Unavoidably the strategy document contains a number of technical terms. In addition a number of abbreviations are used. These are explained in the glossary at Appendix 1.

Minister's Foreword

In the last year in Northern Ireland there have been over 1,400 cardiac arrests that occurred in the community outside a hospital environment. Fewer than 10% of people who suffer an out-of-hospital cardiac arrest survive to be discharged from hospital.

Community resuscitation saves lives.

Cardiopulmonary resuscitation (CPR) and early defibrillation are the two critical interventions that are required for a person to survive an out-of-hospital cardiac arrest. CPR is the act of providing the rescue breaths and/or chest compressions that can keep the person alive until professional help arrives.

The *Chain of Survival* illustrates the vital importance of speed: early recognition that a cardiac arrest is happening; early CPR to buy time; early defibrillation to restart the heart, and post-resuscitation intensive care to restore quality of life.

In parts of the world where a high proportion of the population is trained to perform CPR the survival rate for those who suffer an out-of-hospital cardiac arrest is higher than in areas where the proportion of the population trained in CPR is low.

Typically it takes just two hours for someone to train to perform CPR.

In Northern Ireland significant effort and resources are invested in CPR training, in schools and in other settings. A Northern Ireland community resuscitation strategy will help to focus a drive to increase the number of people, of all ages, trained in CPR skills, and will help us to make the best use of available resources to achieve this.

Some people who have not been trained to do CPR are wary of intervening when someone appears to be suffering a cardiac arrest, even though they can be coached on the spot by the 999 emergency operator. As well as increasing the number of people who can perform CPR, this Strategy aims to overcome the anxieties that make some people wary of getting involved.

By definition, a community resuscitation strategy has to be a collaborative effort involving the active participation of many people in all walks of life. I am grateful for the contribution made so far to the development of the strategy by our partners in the voluntary and community sector, in other government departments and in the Health and Social Care family. The whole can be greater than the sum of the parts, and continued partnership working will be an important factor in the long-term success of the strategy. I am confident that across Northern Ireland there is a shared commitment to work together and the potential to save many lives.

Northern Ireland has been a world leader in this field. The late Professor Frank Pantridge and his colleagues at Queen's University and the Royal Victoria Hospital not only invented the portable defibrillator but made an important contribution to the development of CPR. The late Professor John Anderson from the University of Ulster was an outstanding figure in biomedical research. Part of their legacy is their vision and leadership. The purpose of this strategy is to save lives. We should be ambitious.

1. The case for a community resuscitation strategy

Despite technological improvements in medicine there has been little improvement in survival from cardiac arrest in many developed countries, including Northern Ireland, in the past 50 years. It is still the case that over 90% of people who collapse with a cardiac arrest outside hospital will die. There are parts of the world where survival rates have been improved significantly, through system-wide improvements in the response to out-of-hospital cardiac arrest (OHCA). The most important factors in the response to an OHCA are early recognition, early cardiopulmonary resuscitation (CPR) and – in particular – early defibrillation, followed by appropriate hospital care.

Because no-one knows where or when an OHCA will occur, and the patient is unlikely to survive unaided until an ambulance arrives, immediate action by those who happen to be present is crucial. Across a whole community, a resuscitation strategy requires the participation of large numbers of people.

Everyone can play their part.

Even a modest improvement from our current levels of response could result in a significant number of additional lives saved in Northern Ireland each year. This strategy aims to improve survival from OHCA in Northern Ireland, to levels that are being achieved in those parts of the world that have well developed community resuscitation systems.

Sudden death from heart disease in Northern Ireland

Northern Ireland has one of the highest death rates from ischaemic heart disease (IHD). IHD is caused by a reduced blood supply to the heart muscle, usually due to coronary heart disease, and in adults is the predominant cause of cardiac arrest. In 2011 in Northern Ireland 1,966 people died from IHD, of whom 1,216 died outside of hospital. This

resulted in a loss of almost 8,000 potential years of life lost in those under 75, i.e. almost 6,300 years for men and 1,700 for women.

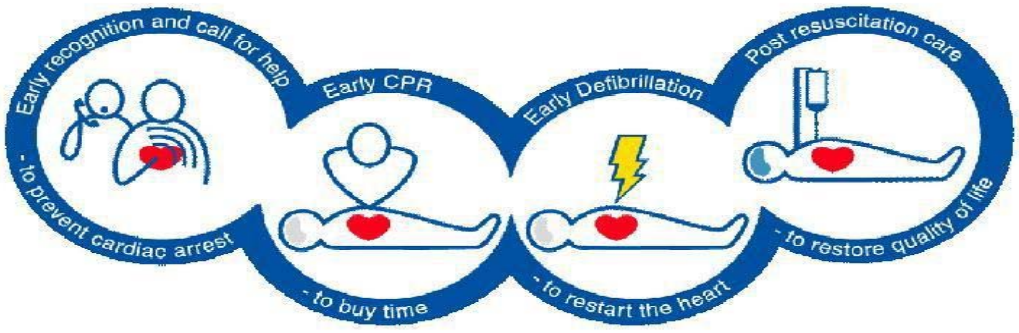
Cardiac arrest occurs when the heart stops beating. In Northern Ireland each year over 1,400 people suffer an out-of-hospital cardiac (OHCA) arrest. Fewer than 10% of them survive to be discharged from hospital. Early cardiopulmonary resuscitation and a defibrillator shock are vital to a person's chances of surviving a cardiac arrest. The majority of people who survive a cardiac arrest are resuscitated from ventricular fibrillation (VF) by the administration of a defibrillator shock, however CPR should be started as soon as possible while awaiting an appropriately equipped paramedic vehicle from the Northern Ireland Ambulance Service (NIAS) or the delivery of an automated external defibrillator (AED) machine from nearby.

The Chain of Survival

The Chain of Survival is a concept which is well recognised internationally and which shows a series of actions that improve a person's chances of surviving a cardiac arrest. Like any chain, the chain of survival is only as strong as the weakest link.

The four links in the chain, in relation to community resuscitation, are:

- **early recognition**, to prevent cardiac arrest;
- **early CPR**, to buy time;
- **early defibrillation**, to restart the heart, and
- **post-resuscitation care**, to restore quality of life.



The first link of this chain indicates the importance of recognising the warning signs that may lead to a cardiac arrest, including signs associated with heart attack such as chest pain, and calling for help in the hope that early treatment can prevent arrest. The central links depict the integration of CPR and defibrillation as the fundamental components of early resuscitation in an attempt to restore life.

Speed of recognition and intervention correlates strongly with survival and recovery:

- immediate CPR can double or triple the person's chances of survival from VF in an out of hospital cardiac arrest (OHCA);
- performing chest-compression-only CPR is better than giving no CPR at all;
- following a VF OHCA, CPR plus defibrillation within three to five minutes of collapse can produce survival rates as high as 49%–75%;
- every minute of delay before defibrillation reduces the probability of survival to discharge by 10%–12%;
- however, when bystander CPR is provided, the decline in survival is more gradual, averaging 3–4% per minute.

The fourth link in the chain – post-resuscitation care – is a complex and evolving area. Developments include systems to ensure delivery of the patient to a hospital best able to deliver an appropriate level of care; therapeutic cooling to reduce the possibility of brain damage; and early coronary angiography and percutaneous coronary intervention ('stenting'). These also contribute to improvements in survival, and require further development in Northern Ireland, however they are outwith the remit of this strategy as the focus of the strategy is on community interventions.

This strategy is concerned primarily with the first three links in the chain, and in particular with increasing the likelihood of bystander CPR.

2. Development of the strategy

Working together

The Minister requested the development of a community resuscitation strategy for Northern Ireland with the aim of improving survival rates for those who suffer an OHCA. The development of the strategy has been overseen by a Steering Group chaired by the Chief Medical Officer. A list of the members is attached at Appendix 2. A Working Group was also established, chaired by the Medical Director of NIAS. As the central element of the strategy is to increase the number of people in the community with skills in CPR it was recognised that input was required from a range of organisations. Membership of the Working Group was drawn from a number of government departments, voluntary organisations and the Health and Social Care service. A list of the Working Group members is attached at Appendix 3.

The Terms of Reference of the Working Group are attached at Appendix 4. Following a joint meeting of the Steering Group and Working Group in February 2013 the Working Group met monthly to progress the strategy. The Steering Group has met on two occasions – in June and September – to consider drafts of the strategy and related issues.

Literature review

The evidence base for CPR is large and comprehensive. It was reviewed to inform the development of this strategy and ensure that it is based on the best available evidence. The review examined methods to maximise training of individuals; examples of successful community-based resuscitation programmes; the economic impact; out of hospital cardiac arrest registries; and first responder schemes. Local information is limited and the review is based on evidence published elsewhere in the UK and beyond. A summary of the findings is presented below. The full literature review and reference list is available at: http://www.dhsspsni.gov.uk/index/consultations/current_consultations.htm

Training the community in resuscitation

Content of training

Good quality evidence has demonstrated the acquisition of resuscitation skills in training periods as short as 2 hours. Moderate quality evidence suggests the content of courses should be reduced and simplified. Full resuscitation skills should be taught; however compression-only resuscitation can be taught in the context of limited time (e.g. television adverts). The content of courses must be in line with national resuscitation council guidance; digression from the curriculum has been demonstrated to decrease understanding. Good evidence supports the use of self-directed training methods such as video training, but hands-on synchronous practice is required alongside these methods for effectiveness. The evidence for solely electronic learning is currently limited but developing. The evidence for peer training, although supportive, is of lower quality. Local projects have demonstrated that a cascade training model is a viable way of increasing the pool of people trained in resuscitation skills.

Refresher training

Resuscitation skills decay over a period of 3-12 months after training. The evidence on the benefit and timing of refresher training is currently incomplete and conflicting. Most studies have focused on healthcare professionals who have a duty of care, and the findings may not be translatable to the general population.

Bystander CPR, even if training was completed a long time ago, results in better survival for victims compared to victims who receive no CPR. There is no evidence to suggest that regular retraining is essential for bystander CPR to be effective, or that regular retraining leads to an increase in survival rate. From a layperson perspective, prior training in resuscitation is likely to save lives regardless of the length of time since training.

Targeting specific groups for training

The evidence is poor for mass training events (e.g. at conferences or concerts). Programmes that target very specific groups (e.g. students or young parents) have not, in general, increased bystander CPR rates. There is, however, evidence to

support teaching resuscitation skills to family members of individuals with cardiovascular disease. This carries benefits beyond increasing survival and has been shown to reduce anxiety, increase emotional adjustment, and increase the sense of empowerment in family members.

Multimedia Campaigns

Television campaigns to increase bystander resuscitation rates have been used in several countries. An increase in bystander resuscitation has been associated with this form of campaign in urban areas (Seattle, USA) and in rural areas (Denmark). Most television campaigns have been part of a multi-component programme, and published evaluations have not evaluated how much of the improvements are attributable to the television campaign. The evidence for television campaigns is currently limited to non-controlled trials and descriptive studies. Further development of the evidence base is required to clearly determine their role.

The evidence for using electronic learning, social media, viral videos and other novel media to increase bystander CPR rates is currently limited but is developing.

Telephone instructions

High quality studies demonstrate that ambulance-dispatch-assisted CPR instructions can increase bystander CPR rate as much as two-fold. This benefit is seen in both urban and rural settings, and remains even in areas where emergency response is rapid. There is tentative evidence that dispatch-assisted CPR increases survival for cardiac arrest victims.

Dispatchers are estimated to miss cardiac arrest in 10%-32% of cases. Work in America identified that cardiac arrest was incorrectly identified 14% of the time, with CPR administered inappropriately in 4.3% of cases. No adverse outcomes were reported as a direct result of these interventions.

Barriers to resuscitation

Two key barriers to bystander resuscitation are identified in the literature: a reluctance to learn resuscitation skills, and a reluctance to perform resuscitation when required.

A range of factors have been identified in studies as barriers to learning resuscitation skills: lack of time; lack of interest; inconvenience of leaving house; cost; inability to find a course; bad health/physical limitations; fear of contracting HIV; fear of being sued. It has been suggested that a lack of motivation to learn resuscitation skills has a greater negative impact on community resuscitation than a lack of motivation to perform resuscitation.

Multiple factors decrease the willingness of bystanders to perform resuscitation. These include characteristics of the bystander (panic; fear of disease; fear of harming the victim; fear of performing CPR incorrectly) and characteristics of the victim (stranger; unkempt appearance; evidence of drug use; presence of blood or vomit).

Acquisition of infectious disease is a specific factor frequently identified as reason to avoid performing resuscitation. The risk of disease transmission during training and actual CPR performance is regarded as very low.

Psychological barriers also exist to performing resuscitation. People experience difficulty making a decision to help, rather than actively choosing not to help (the concept of ambiguity). Overall helping behaviour decreases with an increasing number of bystanders (the concept of diffusion of responsibility).

Giving individuals information on what to expect in an arrest situation, and explaining the concept of ambiguity, and the concept of diffusion of responsibility during resuscitation training may address some of these factors.

Successful community resuscitation programmes

A number of countries have developed community resuscitation programmes that have increased the rate of bystander CPR.

Sweden

Since the mid-1980s a national programme in CPR has existed in Sweden. This programme functions according to a cascade principle where instructor-trainers

train instructors who then train rescuers in CPR. Since 1983, 5,000 instructor-trainers have trained more than 50,000 instructors who have in turn trained almost two million of Sweden's nine million inhabitants to perform adult CPR.

The programme has seen bystander CPR attempts for OHCA in Sweden increase from 31% in 1992 to 55% in 2007. Survival to one month increased from 4.8% in 1992 to 10.7% in 2007. Initiation of bystander CPR was higher in remote areas compared to urban areas.

USA

The Arizona SHARE (Save Hearts in Arizona Registry & Education) Program promotes a comprehensive, standardized system of OHCA care throughout Arizona encompassing all 'links' in the Chain of Survival – bystander response, emergency medical dispatcher CPR instruction, Emergency Medical Services provider resuscitation, and standardized care at hospitals. A variety of methods were used to improve awareness of cardiac arrest and encourage bystander CPR training. The programme reached over 500,000 individuals in the state through training classes, video viewing, and other marketing methods. Bystander CPR increased from 28% of cardiac arrests in 2005 to 40% in 2009.

Canada

The Government in the Canadian Province of Manitoba, under The Defibrillator Public Access Act, requires AEDs to be installed in high-traffic public places such as gyms, arenas, community centres, golf courses, schools and airports by January 31, 2014.

The public places designated under the Act were selected based on expert advice and public feedback. A stakeholder expert advisory group identified several types of high traffic public places where cardiac arrest is more likely to occur. The Act has a requirement for ease of access to the public; registration of location with a central coordinating body which shares this with 911 emergency dispatchers; and regular maintenance and inspection of AEDs.

Concerns about liability

One barrier to intervention that has been identified is a fear of being sued.

There are no reported instances of a CPR provider being successfully sued. Some commentators have suggested that a failure to provide support is more likely to have legal consequences.

The UK Resuscitation Council states: “It is....extremely difficult to give any definitive advice on this subject partly due to the absence of any legal precedent and partly due to the difficulty of predicting what sort of harm might actually be suffered as a consequence of any attempted resuscitation”. They note: “Although there have been a few cases in the United Kingdom where a claim has been brought against a ‘rescuer’, there have been no reported cases where a victim has successfully sued someone who came to his aid in an emergency”.

In Canada many provinces have instituted ‘Good Samaritan’ laws that legally limit the types and scope of negligence lawsuits permissible in a court of law against lay people who have provided emergency medical care. All 50 US States have instituted ‘Good Samaritan’ laws giving at least some immunity to lay people who engage in life-saving situations.

It is generally accepted that as the casualty would almost certainly die without intervention, the risk of being found to be liable for causing injury following a resuscitation attempt is very small.

Economic studies

There has been limited economic modelling of CPR training. A small amount of work has been carried out modelling the costs and cost-effectiveness of public access defibrillation, with a focus on cost per quality adjusted life year (QALY – see glossary). The evidence in this area is currently evolving and remains incomplete at present. The majority of work has been undertaken in America and Canada and the results may not be directly transferable.

Modelling studies have suggested that the cost-effectiveness of a public access defibrillation (PAD) scheme varies with a number of factors. Location of the defibrillator influences cost-effectiveness with international airports giving relatively lower cost per QALY ($13,000-$55,200) while community centres and retail stores give relatively high costs per QALY ($10.3 million and $12 million respectively). Several studies identified PAD as more cost-effective if delivered by police and/or fire fighters rather than lay public. One study suggested training laypersons selected by occupation, low training costs, or having high-risk household companions is substantially more cost-effective than most public health initiatives (although training unselected individuals was more costly than other public health initiatives). Some work has suggested that the use of PAD is cost-effective in settings where the annual probability of their use is 12% or greater.

Experimental studies in Canada have identified initial cost of $51,579 per year to save an additional life, with a much lower cost in subsequent years ($2,632 per year) to save an additional life (as training, equipment purchase etc. are not required to the same degree). Work in Scotland based on the Heartstart register found the cost per life year gained was £29,625 pounds sterling ($49,625) and the cost per QALY gained was £41,146 pounds sterling ($68,924).

Out-of-hospital cardiac arrest registries

The benefits of OHCA registries are well established and include:

- collection of epidemiological data on OHCAs (e.g. incidence, location);
- measurement of outcomes of OHCAs;
- assessment of the performance of each stage in the emergency response to OCHAs;
- identification of high risk locations/settings/populations and developing interventions to improve care, and
- evaluation of the impact of new interventions to improve outcomes.

Cardiac arrest registries have been established in London, North East England and Scotland. A national register in Ireland has been established in recent years and is expanding to cover the regions. Data collected from registries has been used to

describe the epidemiology of OHCA, identify factors that increase the likelihood of survival, and demonstrate the impact of service developments on outcomes.

First Responder schemes

A small number of moderate quality studies report that community first responders equipped with AEDs achieve improved survival when they arrive at the patient sooner than traditional Emergency Medical Services (EMS) responders.

The ideal characteristics of a community first responder scheme have not yet been identified. Pending definitive evidence the consensus view is that a range of factors are considered when developing a programme – location, development of a team responsible for monitoring and maintaining AED devices, training and retraining programmes, coordination with local EMS, and identification of a group of individuals who are committed to using the AED for victims of arrest.

The Northern Ireland Public Access Defibrillation (NIPAD) study evaluated a local mobile Public Access Defibrillation scheme operated by lay First Responders. A number of benefits to such a scheme were identified: increased community participation in CPR and First Aid training, increased confidence for First Responders and the potential for them to arrive before traditional EMS.

A number of disadvantages were also identified: a considerable amount of time that is required to coordinate the scheme effectively; high attrition rates among First Responders; non-adherence to training by First Responders (including incorrect/non-use of AEDs); a not inconsiderable cost; clinical governance risks e.g. vetting First Responders.

The study identified that, in the Northern Ireland context, First Responder schemes can reduce the mean call response time in rural areas (Ballymena, Magherafelt, Antrim) but not in urban areas (Belfast). Modelling suggested that over a five-year period in a rural area the scheme would save an additional 4 lives at a cost of £51,275/QALY. It was noted that this figure should be interpreted with caution as it

is highly sensitive to changes in the level of cardiac arrests witnessed, volunteer availability and the sensitivity of the dispatch mechanism.

Public access defibrillation

Evidence suggests that automated external defibrillator programmes should be actively considered for implementation in public places where cardiac arrests are usually witnessed and trained rescuers are quickly on scene. A number of venues have been identified in the literature as worthy of consideration: airports, sport facilities, offices, casinos and aircraft. Lay rescuer AED programmes with very rapid response times, and uncontrolled studies using police officers as first responders, have achieved reported survival rates as 49–74%. The success of such programmes depends on sufficient numbers of trained individuals and the availability of AEDs.

Public access defibrillation (PAD) and first responder AED programmes may increase the number of victims who receive bystander CPR and early defibrillation, thus improving survival from OHCA. Data from Japan and USA shows that when an AED is available victims are defibrillated much sooner and have a better chance of survival. Japanese data also demonstrated an inverse relationship between the number of AEDs available per square km and time to first shock; and a positive relationship with survival.

The full potential of AEDs has not yet been achieved, because they are used mostly in public settings, yet 60–80% of cardiac arrests occur at home. Programmes that make AEDs publicly available in residential areas have not yet been evaluated.

The acquisition of an AED for individual use at home, even for those considered at high risk of sudden cardiac arrest, has proved not to be effective.

Conclusions from the evidence

The evidence supports the concept of the Chain of Survival and each element within it. Survival from an OHCA is dependent on the immediate commencement of treatment by those present. This in turn relies on early recognition of a cardiac arrest, and the willingness of bystanders to administer CPR, and if possible defibrillation, until professional assistance arrives.

The literature review shows improvements in survival rates in those places that have strong community-based CPR training programmes; public access defibrillation initiatives, and effective arrangements and systems to capture data on OHCAs.

The focus of the Objectives in section 3 of this document is to strengthen the Chain of Survival within the community.

Current CPR training provision in Northern Ireland

Training in CPR skills is provided by a range of organisations from the Health and Social Care service and the voluntary and private sectors. Those who receive it include school children, first aid staff, community groups and people associated with some of the sporting organisations. Although a baseline of current provision would be valuable it was recognised that obtaining this quickly would be difficult given the variety of providers and of groups receiving training.

HSC Trusts

All Health and Social Care Trusts in Northern Ireland train their clinical staff in compliance with the Resuscitation Council UK (RCUK) guidelines. All Trusts train to three levels of resuscitation skills, these being basic, intermediate and advanced. The level of training that

the individual staff member will attend is dependent on the roles, responsibilities and expectations of their clinical role. All HSC Trusts have a Resuscitation Policy in line with RCUK's Standards for Clinical Practice and Training. Not all Trusts use the cascade approach to resuscitation training, i.e. where individuals are trained so that they can train others. Some Trusts also provide limited training for non-clinical staff based on individual risk assessment. Some of the Trusts provide training to certain patients groups and their families.

When the Northern Ireland Ambulance Service receives a 999 call for an OHCA, the call-taker in the emergency control centre provides telephone instructions on how to perform CPR while an ambulance is being dispatched. If an AED is available instructions can also be provided on its use.

HSC Clinical Education Centre

The HSC Clinical Education Centre provides a wide range of clinical and professional training and education for Nurses, Midwives and Allied Health Professionals on a regional basis. All Nursing and Midwifery Education Consultants are experienced clinicians and teachers. The skill mix embraces all parts of the professional register and many of the clinical specialities. The Centre delivers approximately 170 Adult Basic Life Support (BLS) and 75 Paediatric BLS study days each year and adheres to current RCUK Guidelines. The Centre has a Service Level Agreement (SLA) with the five HSC Trusts and the Northern Ireland and Southern Area Hospices. All programmes are free at the point of delivery to these core clients.

The CEC also provides training to the private and independent sectors on a consultancy basis.

First Responder schemes

First Responder schemes are made up of volunteers who live or work in a community or village. Many of these volunteers have been trained by Trust Resuscitation Officers and Community Resuscitation Development Officers (CRDOs), to attend certain emergency 999 calls to complement the ambulance

service. Their purpose is to provide first aid including CPR and cardiac defibrillation if required, until an ambulance arrives. This is a mobile form of public access defibrillation (PAD).

First Responders are currently dispatched by NIAS using technology linked to the NIAS command and control system. Once dispatched they go to the location of the emergency call and undertake their First Responder role until the arrival of an ambulance which will have been dispatched simultaneously.

First Responder schemes are in place in a number of locations across Northern Ireland, including Islandmagee; the Glens of Antrim; Slaughtneil (north of Maghera); Broughderg (north-west of Cookstown); Londonderry; Loughgiel, County Antrim; Rathlin Island, and the Irvinestown/Enniskillen area.

Community Resuscitation Development Officers

At present there are 4 CRDOs in place across the Northern, Western and South Eastern Trusts. The CRDOs all work alongside the Trusts' Resuscitation Officers in delivering training. These staff were initially funded by the BHF and employed by the HSC Trusts to provide training in schools, businesses and the community. All the posts except one in the South Eastern Trust are funded non-recurrently by the HSCB until April 2014.

The CRDOs provide training that is in line with the RCUK guidelines, and use training materials that are suitable for each setting or group of people being trained, including – where appropriate – Heartstart materials developed by the British Heart Foundation (BHF).

Schools and voluntary/community bodies

As part of the development of this strategy, to establish the current level of CPR training in Northern Ireland separate surveys were sent to schools and to voluntary/community groups. While the response rate was low, from the information received it is estimated that

- between 74% and 90% of schools provide or facilitate CPR training for teachers/teaching assistants and/or pupils, and
- between 44% and 64% of voluntary and community organisations provide training for both staff and their volunteers or for staff/volunteers only.

British Heart Foundation Northern Ireland

In the 1990s the British Heart Foundation (BHF) developed the Heartstart initiative, with input from RCUK to educate schoolchildren in emergency life support (ELS) skills including CPR. This is based on a model used in Norway. Through this initiative schoolchildren and members of the public are taught what to do in a life-threatening emergency. There are a number of trained instructors, for example, teachers, employees and community volunteers, who deliver ELS skills training, which includes CPR training, free of charge to community organisations, businesses and schools. Through the Heartstart schemes over 31,000 school-aged children in over 615 Heartstart schools and almost 4,500 members of the public in Northern Ireland were trained during 2012.

ABC for Life

Another voluntary provider is ABC for Life which targets children in primary school. It uses medical students from Queen's University Belfast who are trained to instruct teachers in basic life support, and the teachers in turn instruct their pupils at a suitable time during their P7 year. All of the 911 primary schools in Northern Ireland were invited to participate in the programme. 450 schools enrolled; 321 schools so far have received training and equipment, and 83 schools have received refresher training.

Voluntary ambulance services

The voluntary ambulance services – British Red Cross, St John Ambulance and the Order of Malta – are significant providers of a range of training courses, in CPR, AED use and first aid. These courses, which meet nationally agreed standards, are delivered to their volunteers, members of the public, employers, community organisations and First Responder schemes.

They also provide personnel trained in CPR and AED use for sporting and other public events.

Workplace first aid training

The Health and Safety (First-Aid) Regulations (Northern Ireland) 1982 apply to all workplaces in Northern Ireland, including those with less than five employees, and to the self-employed. An employer should make an assessment of first-aid needs appropriate to the circumstances of each workplace.

In 2012 seventeen thousand people attended First Aid at Work (FAW) training courses.

Workplace first aid training is currently provided by organisations that are registered with HSENI to do so.

Automated external defibrillator (AED) machines

There are thought to be over 1,000 AED machines available outside of hospitals in Northern Ireland. However there is no comprehensive record of who has an AED machine, where the machines are located, who has access to them, who is trained to use them or whether they are regularly maintained. AED machines have been provided to many sports clubs across Northern Ireland. The Irish Football Association is currently promoting a scheme which encourages football clubs to participate in fully funded first aid and defibrillator training which aims to provide first aid kits and defibrillators to clubs taking part in the training. Some community groups and schools are also known to have purchased AED machines.

Conclusion:

How strong is the Chain of Survival in Northern Ireland?

The validity and the importance of the Chain of Survival have been demonstrated. This section has sought to establish the strength of the Chain of Survival in practice within the community in Northern Ireland.

Early recognition, early CPR and early defibrillation are all key elements to improving survival from OHCAs. Direct evidence on any of these is not readily available in Northern Ireland at present. However, our current knowledge of CPR training provision in Northern Ireland is a useful indicator.

It is evident that across Northern Ireland a substantial volume of CPR training is being delivered by statutory, voluntary and private sector providers.

It is apparent also that there is little coordination between CPR training providers, either within or between the statutory and voluntary sectors.

The information that is available on the scale of current provision, such as the number of people who have been trained, is patchy.

Information about AEDs in Northern Ireland – numbers, location, accessibility, state of maintenance – is not known.

3. Vision and Objectives

Vision

The Vision for the Community Resuscitation Strategy is:

> to increase survival for those who suffer an out-of-hospital cardiac arrest, to the highest level that can be achieved across Northern Ireland.

Objectives

The Strategy partners will seek to realise the Vision by pursuing the following Objectives:

1. raise public awareness of the importance of early recognition of an out-of-hospital cardiac arrest, and the importance of early intervention;

2. encourage members of the public to intervene in the event of an out-of-hospital cardiac arrest;

3. increase the availability of, and access to, appropriate and effective CPR training provision across Northern Ireland;

4. achieve high uptake of CPR training;

5. make the most efficient use of the resources available to support community resuscitation training

6. improve the availability of, and access to, the automated external defibrillators that are in place across Northern Ireland, and

7. enhance the capacity of information systems to capture and provide key data on out-of-hospital cardiac arrest and patient outcomes.

4. Proposed actions supporting the Objectives

A range of possible actions have been identified which will support the Objectives. The proposed actions are listed in this section. The Objectives are not discrete: they are closely interrelated, and one course of action can support several Objectives. Also, within the Objectives there are two coherent groups: objectives 1 & 2, and objectives 3-5. Each of the proposed actions in this section is listed against the Objectives that it would support most directly.

Each Objective and the actions associated with it will strengthen one or more of the links in the Chain of Survival in the community. The Strategy comprises a large number of interdependent elements. It will be necessary to phase the implementation over a number of years. Initially the focus will be on CPR training, while work on availability of AEDs will also commence improvements in community access to AEDs will take longer to achieve.

NIAS will establish and lead the regional implementation group which will comprise a range of stakeholders.

Objective 1: Raise public awareness of the importance of early recognition of an out-of-hospital cardiac arrest, and the importance of early intervention.

Objective 2: Encourage members of the public to intervene in the event of an out-of-hospital cardiac arrest.

- **The Public Health Agency (PHA), supported by a communication advisory group (CAG), will develop a resuscitation communication plan and will lead the implementation of the plan. This plan will be informed by:**
  - **a review of the evidence base regarding communication approaches adopted elsewhere, to confirm learning around validity and appropriateness of potential communications initiatives;**
  - **engagement with key stakeholders;**
  - **baseline research to assess awareness levels, attitudes and behaviour of the Northern Ireland public in relation to recognising and reacting to an OHCA;**

- **the establishment of baseline data on the level of understanding of, and obstacles to, AED use in NI, and**
- **identification and consideration of barriers to intervention, including fear of harming the patient, fear of infection, fear of litigation or of prosecution.**

- **The CAG will evaluate the communication plan and will revise it accordingly.**

Objective 3: Increase the availability of, and access to, appropriate and effective CPR training provision across Northern Ireland.

Objective 4: Achieve high uptake of CPR training.

Objective 5: Make the most efficient use of the resources available to support community resuscitation training

In view of the existing considerable volume and diversity of training provision, and given the presence of numerous AEDs as previously indicated, there is potential for improving outcomes for those who suffer an OHCA, through closer collaboration between the general public and organisations in the statutory, voluntary and private sectors.

The Health and Social Care service in Northern Ireland directly employs approximately 60,000 people. This is a considerable pool of people who could be trained as necessary to intervene in the event of an OHCA, not just in their workplaces but in their communities.

All schools should be encouraged to provide CPR training to pupils twice during their school career: once while in primary school and once in post-primary education**.**

- **The Health and Social Care Board will commission a model of community resuscitation (CR) which through partnership working will:**
  - **provide a range of CR training programmes, including training in emergency life support (ELS), suitable for different settings e.g. workplaces, schools and community settings;**

- **deliver quality-assured training programmes that are consistent with the minimum training standards set out by the Resuscitation Council UK (www.resus.org.uk);**
- **involve a team of Community Resuscitation Development Officers to support the delivery of the Strategy;**
- **use a "cascade training" approach for the provision of CPR training;**
- **facilitate and promote collaboration, coordination, communication, learning, sharing of information, the development of initiatives etc. through the establishment of an inclusive regional group;**
- **support other organisations in their plans for offering CPR training;**
- **encourage suppliers to facilitate purchasers of AEDs to undertake CPR training and instruction in the use and maintenance of AEDs;**
- **provide targeted training for "at risk" groups e.g. post-myocardial-infarct patients and their relatives, and**
- **provide regular updates that detail:**
  - **the effectiveness of CR training;**
  - **the management of OHCA across Northern Ireland, and**
  - **OHCA patient outcomes.**

- **The implementation group will consider models or ways to encourage and facilitate Health and Social Care employees to be trained in CPR and in the use of an AED.**

- **The implementation group will encourage community and voluntary organisations, public bodies and private sector employers to include CPR training in their training plans, particularly for those employees based in public buildings with significant public access or high footfall.**

- **The Department of Education will facilitate the availability of CPR training resources through the C2k managed service.**

- **The Department of Education will issue a circular to all schools to advise them of the availability of CPR training resources in C2k.**

- **The Northern Ireland Ambulance Service will:**

    - **engage with CPR training providers including voluntary ambulance services, commercial providers and others, to consider ways of coordinating provision and ensuring consistency of approach and**

    - **engage with voluntary and community organisations to**

        - **further develop community and first responder schemes.**

Objective 6: Improve the availability of, and access to, the automated external defibrillators that are in place across Northern Ireland.

It is not known how many AEDs are in place in Northern Ireland. The limited evidence available suggests that this may be in the region of 1,000. The location, availability and servicing/maintenance of these AEDs is largely unknown.

- **NIAS will:**

    - **produce public information / guidance about AEDs, covering purchase, maintenance, location, access and signage;**
    - **produce guidance on the provision and accessibility of AEDs in**
        - **buildings and public spaces with significant public access or high footfall and**
        - **places of employment with significant numbers of employees;**
    - **assess the feasibility and potential value of establishing and maintaining a register of AEDs for Northern Ireland;**

    - **consider models and ways of improving public access defibrillation;**

    - **consider how best to encourage owners, purchasers and suppliers of AEDs to ensure that each AED is registered with NIAS;**

- **consider how best to identify the location, condition and availability of existing AEDs;**
- **consider how best to support and incentivise the ongoing servicing and maintenance of AEDs in the community;**
- **explore and identify the most effective ways of promoting public access defibrillation;**
- **work with others to support the establishment of new First Responder schemes and to support existing schemes in order to increase the population served by such schemes, and**
- **engage with other emergency response services to consider, where appropriate, how to increase the availability of CPR and AEDs through a system of co-response.**

Objective 7: Enhance the capacity of information systems to capture and provide key data on out-of-hospital cardiac arrest and patient outcomes.

The outcome of an OHCA is dependent on critical interventions, in particular effective chest compressions, early defibrillation, and appropriate post-resuscitation care, as represented in the Chain of Survival. However, despite considerable efforts to improve the treatment of cardiac arrest, most reported survival outcome figures are poor and the true effectiveness of specific aspects of resuscitation remains difficult to quantify.

A number of countries and regions use OHCA registry data to identify factors that increase the likelihood of survival, and to indicate the impact of service developments on outcomes. In 2011 the Department of Health in England introduced survival from cardiac arrest as part of the Ambulance Service National Quality Indicator Set.

In Northern Ireland data on the number of patients who are resuscitated in the community is not routinely collected on hospital information systems. Using the standardised Utstein template, all HSC Trust Resuscitation Officers currently collect data on in-hospital cardiac arrests, which includes patient outcomes. NIAS collects

data on OHCAs, also using the Utstein template, however the existing datasets regarding OHCA resuscitation and patient outcomes are not linked.

A whole-system approach is needed to improve outcomes from OHCA. A core part of this is the availability of high-quality, comparable data that enables the analysis of the quality of care and of how effectively the care is delivered.

Data needs to be captured that will enable the impact of training in bystander CPR in terms of patient outcomes, across the whole community and over time to be ascertained.

Given the limitations of existing information systems, it is necessary to develop suitable data sources and information systems in order to provide the data necessary for ongoing monitoring and analysis.

- **The HSCB will scope available datasets to identify opportunities to link them in order to provide data on OHCAs and patient outcomes that can be benchmarked with other regions.**
- **HSC bodies, led by HSCB, will identify suitable data sources and information systems linked across the HSC in order to inform ongoing monitoring and analysis.**
- **HSC Trusts will be required to submit data on all patients who suffer an OHCA.**
- **HSCB, PHA and NIAS will use the data to inform the targeted deployment of emergency resources, AEDs, Community First Responders etc. to improve the timeliness of response to OHCAs.**
- **DHSSPS will seek to develop baseline data on OHCAs that could inform appropriate indicators to monitor the effectiveness of the Strategy.**

5. Monitoring and evaluation of the strategy

The need for CPR training across the community will continue indefinitely, and this is a long-term strategy. In order to assess in the medium term how well the Objectives of the Strategy are being met, arrangements will be set up and maintained for the continuous monitoring of key information (such as the number of people trained in CPR; bystander-administered CPR; public access to and use of defibrillators, and outcomes for those who suffer an OHCA), and for periodic reviews of the strategy as a whole and of specific elements of the strategy. Information provided for the purposes of Commissioning Plan performance indicators will also be used.

These arrangements will also enable the strategy to evolve, for example through the consideration and adoption of new initiatives.

HSCB, working with PHA, NIAS and the other HSC Trusts will, through the established accountability processes, report progress made in the implementation of the Strategy.

The Strategy will be formally reviewed in 2019.

Appendix 1: Glossary

AED
Automated External Defibrillator

BLS
Basic Life Support: This is the level of medical care which is used for victims of life-threatening illnesses or injuries until they can be provided with more advanced medical care by EMTs, doctors, nurses or paramedics.

Cascade training
A model of training, by which a number of people (the cascade trainers*)* are trained to train others. With regard to training in CPR and the use of AEDs, there is a consensus that the chain should be limited so that the quality of the training is not diluted, i.e. those trained by the cascade do not train others

CEC
Health and Social Care Clinical Education Centre

CRDO
Community Resuscitation Development Officer. CRDOs' role is described in Appendix 4.

CPR
Cardiopulmonary Resuscitation: chest compressions and breaths delivered to a person who has suffered a cardiac arrest. 'Bystander CPR' refers to CPR delivered by someone who happens to be at the scene of an out-of-hospital cardiac arrest as distinct from CPR delivered by emergency medical personnel.

CR
Community Resuscitation: delivery of CPR, with or without the use of an AED, by a bystander.

CVD
Cardiovascular disease (also called heart disease): a class of diseases that involve the heart and the blood vessels, or both.

EMS
Emergency Medical Services

First Responder
A person who has completed a course and received certification in providing pre-hospital care for medical emergencies. They have more skill than someone who is trained in basic first aid but they are not a substitute for advanced medical care rendered by emergency medical technicians (EMTs), doctors, nurses, or paramedics.

Heartstart
A training initiative set up by the British Heart Foundation which covers a range of Emergency Life Support (ELS) Skills including cardiac arrest.

HSC
Health and Social Care

HSCB
The Health and Social Care Board for Northern Ireland

IHD
Ischaemic heart disease, also known as Coronary Artery Disease (CAD): atherosclerotic heart disease or coronary heart disease, is the most common type of heart disease and the most common cause of heart attacks and cardiac arrest.

NIAS
The Northern Ireland Ambulance Service

NIRO
Northern Ireland Resuscitation Organisation

OHCA
Out-of-hospital cardiac arrest

PAD
Public Access Defibrillation: when an AED is used by a member of the public to deliver a shock to a person who has suffered an out-of-hospital cardiac arrest.

PHA
Public Health Agency

QALY
Quality-Adjusted Life Year. This is a concept used in assessing the value for money of medical intervention. The QALY is based on the number of years of life that would be added by the intervention and the quality of life lived.

RCUK
Resuscitation Council UK

VF
Ventricular Fibrillation: A condition in which there is uncoordinated contraction of the heart muscle, which can potentially be corrected by early defibrillation.

Appendix 2: Membership of the Steering Group

- Dr Michael McBride (Chairman), Chief Medical Officer
- Dr Margaret Boyle, Senior Medical Officer, DHSSPS
- Andrew Dougal OBE, Chief Executive, Chest Heart Stroke Association
- Dr Brid Farrell, Consultant in Public Health Medicine, Public Health Agency
- Liam McIvor, Chief Executive, NIAS
- Peter McLaughlin, Health and Social Care Board
- Angela McLernon, Assistant Chief Nursing Officer, DHSSPS
- Dr David McManus, Medical Director, NIAS

Appendix 3: Membership of the Working Group

- Dr David McManus (Chairman), Medical Director, NIAS
- Cyril Anderson, Workplace Health, Health and Safety Executive Northern Ireland
- Dr Margaret Boyle, Senior Medical Officer, DHSSPS
- Seamus Camplisson, Health Protection Branch, DHSSPS
- Martin Coleman, Health Protection Branch, DHSSPS
- Padraig Dougan, NIRO (NI Regional Resuscitation Group)
- Dr Brid Farrell, Consultant in Public Health Medicine, Public Health Agency
- Dr Andrew Hamilton, Consultant Cardiologist, South West Acute Hospital
- Florence Hand, Community Resuscitation Programme Coordinator, Northern Health and Social Care Trust
- Niall Heaney, Sustainable Rural Communities Branch, DARD
- Martin Ireland, Voluntary and Community Unit, DSD
- Sharon Lawlor, Curriculum Support Branch, DE
- Stephanie Leckey, Area Development Manager, Prevention & Care, British Heart Foundation (BHF) Northern Ireland
- Seamus McAleavey, Chief Executive, Northern Ireland Council for Voluntary Action
- Peter McLaughlin, Assistant Director of Commissioning, Health and Social Care Board
- Phil McLaverty, Nurse Education Consultant, HSC Clinical Education Centre
- Dr Charlie Martyn, Medical Director, South Eastern Health and Social Care Trust
- Paula Murray, Curriculum Support Branch, DE
- Kieran O'Hara, Senior Instructor, SportNI
- Bill Stewart, Information and Analysis Directorate, DHSSPS
- Patricia Stewart, Policy Officer, Northern Ireland Council for Voluntary Action
- Tracey Teague, Voluntary and Community Unit, DSD
- Dr Philip Veal, Specialist Registrar, Public Health
- Colin Watson, Sport and Recreation, DCAL
- Stephen Wilson, Assistant Director; Communications and Knowledge Management, Public Health Agency
- John Wright, Area Manager, NIAS

Appendix 4: Terms of Reference of the Working Group

Aim – To improve survival rates for those who suffer an out of hospital cardiac arrest through the development of a community resuscitation strategy.

Objectives

- Review the existing evidence regarding community resuscitation;
- Identify the key components of a strategy and prioritise actions to improve the survival of those who suffer an out of hospital cardiac arrest
- Review the current community resuscitation and training provision across Northern Ireland and identify appropriate ways to maintain and increase the number of individuals trained in resuscitation within available resources;
- Identify any additional resources that might be required to implement a community resuscitation strategy;
- Identify ways to raise public awareness of the importance of early resuscitation in out of hospital cardiac arrest and how to maximise intervention by members of the public;
- Consider the feasibility of an Automated External Defibrillator (AED) register for Northern Ireland and how it contributes to effective community resuscitation and
- Consider ways to evaluate the effectiveness of the strategy over time, including the further development of information systems to cover out-of-hospital cardiac arrest and patient outcomes.

Appendix 5: Useful web links

Literature Review: http://www.dhsspsni.gov.uk/gdm_crs_microsoft_word_-_community_resuscitation_strategy_-_full__literature_review.pdf

ABC for Life: www.qub.ac.uk/sites/ABCForLife

American Heart Association: www.heart.org

Association of First Aid Training Providers: www.aofa.org

British Heart Foundation: www.bhf.org.uk
www.bhf.org.uk/heartstart

British Red Cross: www.redcross.org.uk

ERC European Resuscitation Council: www.erc.edu

HSC Clinical Education Centre: www.cec.hscni.net

ilcor – International Liaison Committee on Resuscitation: www.ilcor.org

National Ambulance Service Responder Managers Forum: www.responderforum.nhs.uk

NI Chest Heart & Stroke: www.nichs.com

Order of Malta: www.orderofmalta.org.uk

Resuscitation Council UK: www.resus.org.uk

St John Ambulance: www.sja.org.uk