Resuscitation training in Ireland - past to present

Irish people from all walks of life have been fighting sudden cardiac death for many years. Numerous initiatives and groups have been established throughout the country, with the common goal of reducing cardiac arrest related deaths. But until the 1990s, cardio pulmonary resuscitation(CPR) training was not recognised as being as important as it is now, and consequently was less structured and accessible. I will look at some of the work that took place over the last thirty years.

The art of restarting the heart dates back centuries. In earlier ages, rescuers whipped cardiac arrest victims with stinging nettles in an attempt to stimulate a response. In 1530, bellows were used to pump air into the lungs – variations of this practise were used in Europe for the next 300 years. The Sylvester method was invented in the 19th century: lifting the victim's arms over the shoulders and then pushing them across the chest.

The CPR method we use today (compressions and breaths) is the preferred technique since the 1960s. This method can double or triple a person's chance of surviving – training improves the quality of the CPR delivered. In 1947, the first successful defibrillation of a human heart occurred when cardiac surgeon Claud Back successfully resuscitated a 14-year-old boy named Richard Hayward, shocking the open heart with paddles during congenital heart surgery repair. Sinus rhythm was restored and the boy made a complete recovery. The story made world-wide news.

Significant development in the field of defibrillators quickly followed. Paul Zoll performed the first closed chest defibrillation in 1966 and went on to form the Zoll medical company in 1980. Zoll defibrillators are used all over the world and in many of our Irish hospitals today. In 1965, a Belfast cardiologist, Frank Pantridge, invented the first portable defibrillator. The next advancement came thirteen years later, when the first automatic defibrillator (AED) was invented, which meant that persons other than medical personnel could now perform the procedure. This was a game-changer.

By the early 1990s advances in technology and medical research promoted the importance of Resus training. The Irish Heart Foundation (IHF), established in 1966 as a national charity focusing on heart health, commenced its first national CPR programme, led by Tom Giffney from 1994-2001. A free programme, *Learn to Save a Life*, was developed in order to meet the

needs of communities and healthcare professionals, but because it was free, people sometimes didn't show up, so a fee was introduced in order to increase the value of the training. Basic Life Support (BLS) training of varying content and delivery modes was delivered locally to meet individual hospital needs.

In 1992, the HSE began employing its first cohort of Resuscitation Training Officers (RTO), and by 1996 most of the Dublin hospitals had these positions filled. Anne Scahill took up the first post on June 27th in 1992 in St James hospital, and the other Dublin hospitals followed.

By 2000, following recommendations from the cardiovascular health strategy from the Department of Health and Children 1999, most acute hospitals in Ireland had RTOs in post.

Throughout this time, pre-hospital staff and communities were also interested in learning these vital skills, including the use of manual defibrillators. Staff had to attend a week-long course to fine tune their expertise. Many paramedics and ambulance training school attendees supported this training. Some of the key leaders who implemented training at this time were John Burton (Mid-Western Health Board), Fergus McCarron (Regional training officer, Co. Donegal), Martin O'Reilly (Dublin Fire brigade), Brian Power and Declan Lonergan (Paramedic training officers, Eastern Health Board). The training of pre-hospital staff under the guidance of Sean Duffy (chief ambulance officer of NW region) started in Donegal in 1992 and was then rolled out nationally.

At the turn of the millennium, the Pre-Hospital Emergency Council (PHECC) was founded, with responsibility for standards and training in the prehospital arena. Fergus McCarron, who was an early advocate of resuscitation training, was himself to benefit from his own advocacy: on September 11 2001, while in the process of preparing a Cardiac First Response Programme presentation for the then Minister for Health Michael Martin, he called into his own Emergency Response workplace to run a repair on a defibrillator. On arriving home he collapsed and suffered a cardiac arrest. Those he had trained were his first responders, successfully defibrillating him with the very defibrillator that he had repaired. He continued to teach CPR for the next twenty years. Cardiac arrest is time critical. Starting CPR and using an AED quickly can markedly improve outcomes.

Today AEDs are widely available in public areas. Early work on public access defibrillation (PAD) was advocated for by Cardiologist Joe Galvin (Cardiologist), including many others. In 2001, five AEDs were introduced to Blanchardstown shopping centre. Dublin airports CPR and AED programme has saved 32 lives since it was first introduced in 2003, with over fifty

AEDs available on site. One such save, in 2020, was Dr. Farqad Alamgir, a UK based cardiologist for over thirty years. It took four shocks and seventeen minutes of CPR to restore his normal heartbeat.

During the 1990s there was an increased awareness and interest in Advanced Cardiac Life Support (ACLS) training among hospital staff from the acute services. Doctors returning from the United States who had trained as BLS and ACLS providers believed it was time to introduce structured resuscitation training to Ireland. Consultant Anaesthetists Noel Flynn (University Hospital Galway), Jeanne Moriarty (St James Hospital), Pat Benson (St Vincent's University Hospital) and Derek Barton, then Consultant in Emergency Medicine in Connolly Hospital, Blanchardstown, pioneered and promoted resuscitation training in their hospitals.

CPR Committees were established in larger hospitals, and the role of Resuscitation Training Officer was developing. Derek Barton had returned from Oxfordshire, where he had trained as an ACLS instructor, in 1991 to become a consultant in emergency medicine in James Connolly Memorial Hospital. He became the first chairperson of the ACLS council, set up in the early 90s, with the support of the IHF, to promote advanced resuscitation training nationally and ensure maintenance of standards.

Some advanced resuscitation training took place in these initial years using borrowed materials from the American Heart Association (AHA) programme, certified by the IHF. In June 1993, Arnyce Pock and five other AHA instructors travelled to James Connolly Memorial Hospital to run Ireland's first ever ACLS course. Realising that the national certification for BLS and ACLS would not be recognised when medical staff went abroad, the IHF engaged with the AHA to look at delivering an internationally recognised standardised programme in Ireland, establishing BLS, ACLS, and PALS programmes with dual certification and worldwide recognition. An agreement was signed in 1995 and Ireland became the first internationally affiliated training centre for AHA certified training outside of the USA. AHA now have training centres all over the world, delivered in over 90 countries, in 17 different languages.

The ACLS council were busy in the early days supporting the Irish providers to adapt some of the AHA guidelines to suit Irish hospitals. Some of the recommended drugs were not available in the Irish settings. Cardiologist Marie Harte, with the support of other council members, published supporting Irish guidelines up to 2005. The current chair of ACLS council Ireland, Mr Ashraf Butt, consultant in emergency medicine Cavan, continues to be passionate about all aspects of emergency care and resuscitation standards since his appointment in 2015.

The International Liaison Committee on Resuscitation meets every five years to discuss the latest studies and research, and to release global guidelines and protocols on how CPR should be performed. Some changes are made with each new set of guidelines, the most notable being the importance of chest compressions. In 2005, the number of compressions to breaths increased from 15:2 to 30:2. The rate of compressions has gone from 60 a minute to 100 to 120 per minute. Also, the long-standing ABC (airway, breathing, circulation) method was discontinued in 2010, to favour starting compressions first: CAB.

The role of the RTO in acute hospitals has required constant adaptation to implement new policies and keep pace with frequent updating of guidelines. In 1996, Billie Lawler chaired the first Irish Association of Resuscitation Officers (IARO) meeting, which today has 50 members. In 2012/2013, the first National Early Warning Score System (EWS), a track and trigger system to help recognise and treat deteriorating patients, was introduced in Ireland. Medical Emergency Teams were introduced for early intervention to treat patients and help prevent the need for cardiac arrest teams. This programme was a work stream of the acute medical programme: its successful implementation required a robust educational strategy, and many RTOs were involved in its launch, and have remained involved in its sustained performance. A reduction in cardiac arrests followed its roll-out, and though many variables determine survival rates, it was believed to have played a major role. RTOs have been campaigning for a national in-hospital cardiac arrest register since the launch of the out-of-hospital register, in place since 2007.

Nigel Salter, consultant in Emergency Medicine and Vice Chairperson of ACLS council, with the support of the patient deteriorating committee, is beginning a pilot study on hospital cardiac arrest data in the Ireland East Hospital group in August of 2023. This is a very welcome initiative.

Research shows that it takes an entire system to save a life. The chain of survival metaphor, used for over 30 years, outlines this this system: six links depending on each other.

Following the appointment of Brigid Sinnott in 2006 as national BLS coordinator for the IHF work immediately began on developing strong relationships between all the emerging parties interested in Resus training, such as PHECC, RTO'S, GP groups, medical professionals and community groups, working together to increase cardiac arrest survival rates and strengthen the Irish chain of survival.

So how does our chain of survival look today?

Link 1: **Early recognition and call for help**. Bystander rates of CPR have increased from 60% in 2012 to 85% in 2022, one of the highest in Europe. We have had dispatch-assisted CPR nationally since 2015, which means all 999 call-takers give instructions on recognising a cardiac arrest and starting CPR.

Link 2: **High Quality CPR.** Over 70% of cardiac arrests take place in the home. Increasing community training in CPR strengthens this link. *CPR 4 Schools* trains almost 200,000 students in CPR annually. Approximately 70,000 professionals train annually through IHF CPR programmes, and other organisations train through PHECC. Through training, the individual is ten times more likely to respond to a cardiac arrest, and the quality of CPR is better.

Link 3: **Defibrillation.** This link needs work. The time to defibrillation is the single most important determinant of survival after cardiac arrest. There are approximately 10,000 AEDS available, but we haven't a correct system to dispatch them. Only 7% of out-of-hospital cardiac arrests have an AED attached to their chest prior to arrival of emergency services. An AED register is in the planning phase. Cardiac first responder groups (local volunteers trained in CPR and use of an AED) also strengthen this link, with over 200 groups active nationally, following the example of the Dunlavin community, Wicklow in 2006.

Link 4: **Advanced resuscitation.** The ACLS Programme is the national standard for advanced resuscitation training. In 2018 Celine Mc Phillips was appointed National ACLS coordinator. Her role is to support the ACLS programme in conjunction with the ACLS Council to oversee the delivery of high quality, consistent and fair training standards. We now have 33 ACLS training sites, 330 ACLS instructors and in 2022 trained over 4,500 ACLS providers.

Link 5: **Post cardiac arrest care.** Evidence now shows that a person remains critical in the immediate time after a cardiac arrest, and stabilising the patient prior to transfer to a higher level of care is emphasised in the ACLS programmes.

Link 6: **Recovery.** Patients and families need support following a cardiac arrest. Survival is complex and requires physical and emotional support. The IHF and NAS (National Ambulance Service) are currently developing a cardiac arrest survival support group/network.

Learned CPR techniques have greatly improved our skills during resuscitative attempts, and providers' confidence has improved. Cardiac arrests are no longer disorganised occurrences, but are characterised by good leadership, communication and knowledge. Survival rates have improved, with more gains to be made. As we move into the future, the resuscitation champions

will move more from the classroom to simulation and self-directed learning. The science shows that improved education increases positive outcomes and survival. Research indicates skill decay after 3-6 months in the current 2-year model. With this in mind, simulation training with low-dose, high-frequency models are currently being promoted by the IHF, and will possibly become the future style of training.

Thanks to all previous and current instructors who have devoted their time to teaching resuscitation programmes, preparing healthcare professionals and communities how to respond to a cardiac emergency.

Your work has helped preserve and protect life.

References

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