

# Impact of LUCAS® Chest Compression System on the Isle of Man

## CASE STUDY

### The Situation

Located in the Irish Sea between Great Britain and Ireland, the Isle of Man is a self-governing British Crown Dependency spread over 221 square miles with a population of 86,000.

The Isle of Man Ambulance & Paramedic Service (IOMAPS) is an integral element of community health services and operates within the remit of the newly formed Department of Health and Social Care.

IOMAPS' headquarters and training facility is based at Nobles Hospital in the capital city, Douglas, and employs over 40 full-time equivalent staff, including registered paramedics and Institute of Health & Care Development (IHCD) qualified ambulance technicians at a ratio that allows the service to deploy a paramedic on each of its four emergency ambulances.

The fleet of emergency vehicles also includes ambulance officers available to assist and often staff in response cars, paramedic motorcycles and patient transport vehicles stationed at three locations across the island to provide maximum coverage and optimal levels of operational coverage. The service has a total resource of nine ambulances, four passenger transport service vehicles, eight response cars, an incident support unit and a shared (fire, police and ambulance) decontamination vehicle. It operates a system of dynamic cover whereby ambulance resources are moved to strategic, location-dependent activities, such as during the annual motorcycle road racing season.

Emergency 999 calls and requests from general practitioners for assistance are managed by the island's Emergency Services Joint Control Room (ESJCR) and direct calls from various other agencies and from the two main hospitals on the island. The ESJCR is a tri-control handling ambulance, fire and police calls. However, unlike UK Ambulance Trusts, the Isle of Man does not have a clinical decision-maker in the control centre, which means all 999 calls are treated as emergencies.

From April 2013 to March 2014, IOMAPS responded to 7,500 emergency 999 calls. Calls are handled slightly differently to the nearby United Kingdom, although the service has adopted UK response standards as performance benchmarks.

If a call is prioritized as life-threatening by the ESJCR, the following response standards apply:

- Reach 75% of life-threatening calls within eight minutes – this response needs an individual equipped with a defibrillator and appropriate training
- Attend 95% of patients categorised as life-threatening, with an ambulance, within 19 minutes – this needs to be a fully-equipped emergency vehicle, capable of transporting patients

Of those 7,500 emergency calls, 107 were for assistance with a suspected cardiac arrest. This figure represents all calls including those where patients were deemed beyond resuscitation efforts.

Over the past few years IOMAPS has undertaken a number of measures to provide the best possible prehospital care with available resources;

- All staff trained to current UK Resuscitation Council, Cardiac Arrest Guidelines, with an emphasis placed on returning to the basics of resuscitation efforts and ensuring adequate provision before moving onto advanced life support attempts
- Equipped all emergency ambulances across IOMAPS, the emergency department at Nobles Hospital and the Minor Injury Unit at the Ramsey & District Cottage Hospital with the LUCAS mechanical chest compression devices from Physio-Control
- Ongoing work with an island-wide network of 40 Community First Responders who are now dispatched by ESJCR sooner into the call for cardiac arrests than previous, getting help to the scene earlier
- Closer collaboration with the Isle of Man Fire and Rescue Service and provision of training to station staff in the use of AEDs and in 'assisting the paramedic' skills
- A review of AEDs was undertaken and an island-wide database of known locations was compiled
- Retrospective data collection from patient report forms.

The current (April 2014) ROSC rate on arrival at the ED is 30%. The prehospital discharge rate from Nobles Hospital for those patients that received resuscitation (for all attempted resuscitation, not only witnessed VF/VT heart rhythms) in the 2013–14 period has raised to 15%, up from 10.9% in 2012.

While long-term survival at this stage is not expected to increase vastly, with more patients having a ROSC during resuscitation efforts, there is a greater chance for interventions to have a greater effect, increasing the chances of successful outcomes.



IOM Ambulance and Air Ambulance

### Impact of the LUCAS device on the Isle of Man: Interview with Steve Crowe, clinical manager at IOMAPS

Our own research revealed that ambulance crews were spending 33 minutes providing manual chest compressions at the scene and during the transportation phase, which is difficult for even the strongest team members to sustain. The LUCAS device never tires and provides consistent, quality chest compressions, significantly reducing the time off the chest during transport.

Since the introduction of 13 LUCAS mechanical chest compression systems in mid-2012, both IOMAPS and the Resuscitation department continue to review its performance and audit using data from patient forms to record and report ROSC and discharge rates.

The LUCAS device continues to make a positive and significant impact. Prior to its introduction the ROSC rate was 16% in a prehospital situation. It is currently at 30%. One of the latest treatments following ROSC is therapeutic cooling of the patient and this is now being considered at Nobles hospital as a feasible option, due to the fact that more patients are being admitted into the intensive therapy unit post-cardiac arrest.

Since the introduction of the LUCAS device the approach to cardiac arrest is calmer and more considered, with the devices freeing up a pair of hands to provide the advanced life support required, that was often taking second place. So far we have trained over 100 people to use the device and the feedback from the team is extremely positive. They often report it to be the best piece of equipment that has been introduced into the ambulance service for years.

The safety of ambulance crews has also been greatly increasing during the transport phase, as they no longer need to stand for long periods unsecured in a moving vehicle providing chest compressions.

The introduction of the LUCAS chest compression system has been so successful that we're witnessing interest from other medical charities on the island and have held familiarisation LUCAS device training with them. The LUCAS device is also carried in the DHSC air ambulance during race periods. There is also a desire to purchase more units for the east and west wings of Nobles Hospital.

### Island life: Interview with Russell Thornhill, Chief Ambulance Officer, IOMAPS

Living in an island community often poses challenges with regards to providing end to end, specialist healthcare availability. We are a rural community and our 86,000 islanders are spread throughout the island, but the demands of our patients are still the same as those in larger, urban areas.

We are also faced with operating in an environment of increasing service demand and financial constraints, which has also affected the island. Our status as a self-governing Crown Dependency means parliament is unable to pass legislation to fund additional infrastructure projects, such as the LUCAS device roll-out. The roll-out and charity donations are just one example where our community pulls together for the good of the island.

I like to think we're very resourceful in the way we operate and in many ways this is driven by our overarching value, 'putting people at the heart of our service'—meaning those we serve and also investing in our team of professionals, who deliver high-quality care in sometimes very demanding circumstances.

Our most intense, tough, but exciting time of the year for IOMAPS is during the TT motorcycle race festival held each year in May and June, and the lesser-known Manx GP held every summer.

During the TT—one of the most prestigious motorcycle events—the island's population swells with an additional 40,000 spectators. The race organiser has its own medical team, helicopters and paramedic service, which caters purely for fallen racers and officials, while IOMAPS looks after the needs of the resident island population and visitors. During that time all personal and sick leave is cancelled.

Almost 38 miles of public roads are closed to create a racecourse for the riders. This provides a logistical challenge in terms of getting to patients and then transporting them to hospital. To ensure we can have adequate coverage across the island, we position our emergency ambulances at various points on the island and can also call upon the air ambulance, if needed.



Steve Crowe and Russell Thornhill



TT motorcycle race

As is the nature of this race, road traffic collisions do inevitably occur—with some 55 in the 2013 race. We have many years of close collaboration with the race organiser and established protocols and processes in place. An IOMAPS team member is present at control tower in Douglas as a liaison point. However, we continue to learn from the unexpected. Last year when a racer fell and his bike crashed into a group of spectators resulting in a dozen casualties, both medical teams worked seamlessly to ensure patients were treated quickly.

We invest heavily in training and although there is always pressure to be more efficient and leaner, we continue to invest in training for our team and also ensure our front-line emergency ambulances are equipped with the highest level of equipment and monitoring devices.

In addition to the LUCAS device, all of our emergency ambulances are equipped with LIFEPAK® 15 and 1000 monitor/defibrillators. We are also beginning to explore how we can get even more from the technology and are using CODE-STAT™ data review software solution from Physio-Control to debrief with our crews post-event, using the retrospective analysis tool and easy access to resuscitation data and reports.

We have a long-standing relationship with Physio-Control that goes back ten years. Over the years, Physio-Control has really worked in lock step with us and has often gone the extra mile to overcome our specific challenges and nuances. We have also found the educational support offered by Physio to be a welcome addition to the usual service offered and ongoing support they offer.

#### Charity Funding

*While the Department of Health and Social Care agreed in principle that the benefits of mechanical CPR were greater than the manual method, due to budgetary constraints they were not in a position to fund the business and clinical case for the island-wide introduction of mechanical chest compression put forward by IOMAPS.*

*Undeterred and convinced of the potential of mechanical CPR and the LUCAS device, the IOMAPS team contacted local charities to gauge interest in the project. Charities were invited to a presentation detailing the project and given a demonstration of the device – meaning the focus of the presentation was on the device and how it would positively impact resuscitation across the island. The charities were impressed by the device and given time to consider their opinions, with a deadline set by which they could make contact to lend their support. If sufficient funds were not secured, then ‘Plan B’ was to reduce the rollout of the LUCAS device in each of the areas, while still maintaining island-wide cover as best as possible.*

*Factored into the proposal was on-going revenue for each unit for six years, to include batteries and the disposable suction cups purchased up front from Physio-Control, to be drawn up as required. The whole funding package was created to be self-sufficient from start to finish and in the future will be replaced with the Department of Health and Social Care’s asset fund.*

*The response was overwhelming and six local charities co-opted to donate funds; Henry Bloom Noble Healthcare Trust, Isle of Man branch of the British Heart Foundation, League of Friends of Noble’s Hospital, League of Friends of Ramsey & District Cottage Hospital, Ramsey Cottage Hospital Welfare Trustees and Microgaming Health and Care Trust.*



IOM Ambulances and Air Ambulances

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