

LUCAS[®] CHEST COMPRESSION SYSTEM

CASE STUDY

The Miracle Man Liverpool Hospital, Sydney, Australia

It started as an ordinary day at work for 51-year-old husband and father, Graeme Webb, who had no history of heart disease. As the day progressed, Graeme began experiencing a strange tingling in his mouth and made the decision to leave work. Upon arriving home, the discomfort began to worsen and he called for an ambulance. The last thing he remembers is the ambulance arriving at the Emergency Department.



Left to right: Kathryn Spears, Graeme Webb and Dr. Trudi Davis reunite three months after Graeme's cardiac arrest.

Arriving at Liverpool Hospital

Graeme arrived in the Emergency Department of Liverpool Hospital at 2.00 p.m. and went into cardiac arrest ten minutes later. Dr. Trudi Davis immediately moved him to the resuscitation bay and commenced cardiopulmonary resuscitation (CPR). He was in ventricular fibrillation (VF) and defibrillation was attempted but was unsuccessful.

Faced with a protracted resuscitation, Dr. Davis made the decision to use the Physio-Control LUCAS chest compression system in order to provide consistent, high quality CPR and enable the medical and nursing staff to perform critical resuscitation management functions. "Graeme didn't respond to the first defibrillation so we then took the decision to apply LUCAS because that would provide good quality CPR and allow us to defibrillate without interruption while we considered reversible causes."

Once the LUCAS device commenced CPR it immediately provided Dr. Davis with, as she puts it, "enormous cognitive space to think about all the other things I needed to think about to get Graeme the appropriate treatment, rather than being preoccupied with rotating staff through cycles of manual CPR."

"It is very rare to see a single piece of equipment make a fundamental difference to a patient's outcome. I am ecstatic about the result we got for this patient."

- Dr. Christian Mussap, Interventional Cardiologist

Dr. Davis contacted the Interventional Cardiologist, Dr. Christian Mussap, in the Cardiac Catheterisation Lab (cath lab) to request that Webb be assessed for percutaneous coronary intervention (PCI). Clinical Nurse Consultant Kathryn Spears made arrangements for him to be transferred from the emergency department to the cath lab with the LUCAS device providing CPR throughout. She said that the LUCAS allowed staff to focus on intubating the patient and administering medications without having to worry about the quality of CPR the patient was receiving.

"It's about trying to find a balance to make sure everyone's getting the best care possible and LUCAS 2 certainly supports that in terms of ensuring the quality of CPR is consistent and is able to be delivered irrespective of whether the staff are tired and irrespective of how long the resuscitation has been going," she said.

"It was a busy area. We had a lot of people wanting to help, but it was quite controlled in the actual bay itself because we didn't need any additional staff there to provide manual CPR," said Spears.

The Procedure

Previously at Liverpool Hospital, it has been highly unusual for a patient to be transported to the cath lab unless they have 'Return of Spontaneous Circulation' (ROSC) before transport. The journey takes up to ten minutes and requires staff members to be performing CPR while the patient is being moved, presenting significant injury risks to patient and staff.

Acting Director of the Emergency Department, Dr. Shamus Shepherd, said that in his experience, if the patient didn't get ROSC following a reasonable period of CPR and advanced life support, then they were invariably pronounced deceased.

"To be able to put LUCAS 2 on a patient and not worry about rotating my staff through the job of CPR buys me enormous cognitive space to think about all the other things I need to think about during a resuscitation in order to provide the optimum and most appropriate treatment for the patient."

- Dr. Trudi Davis

"This is a game-changer and as a result we have changed our policy regarding transporting patients in cardiac arrest to the Cath Lab."

- Dr. Christian Mussap

In Graeme's case he suffered a witnessed cardiac arrest in the Emergency Department, CPR commenced immediately and a switch was made from manual to mechanical CPR for consistency and effectiveness of CPR. The goal was to keep Graeme well perfused throughout his attempted resuscitation and the subsequent transport to the cath lab.

"I think what was unique about Graeme's case was that it was a prolonged period of CPR," Dr. Shepherd said. Graeme had been down for 37 minutes by the time he reached the cath lab. There he was met by Interventional Cardiologist Dr. Christian Mussap and Interventional Cardiology Fellow Tamer Youssef. "The LUCAS 2 generated a systolic blood pressure of 90 mm Hg which enabled us to engage the arteries," said Dr. Mussap, "It would have been almost impossible to get arterial access without the LUCAS 2."

Having successfully completed the PCI, opened the coronary vessel and restarted Graeme's heart, Dr. Mussap said that at this point he was not sure that Graeme would have a good neurological outcome as his previous experience had been that these patients suffer a significant 'neurological insult'. Dr. Mussap commented after the procedure that "The device saved his life. He would not have survived."

The Recovery

Dr. Trudi Davis says that the most surprising part of Graeme's story was that he woke up neurologically intact soon after the procedure, despite many patients in similar circumstances needing long periods of time on life support in the Intensive Care Unit (ICU).

Dr. Mussap said that when he went to visit Graeme in ICU the next morning he discovered he had already been transferred to Coronary Care and was sitting up in bed talking to his teenage son and daughter. Dr. Davis also remembers talking to Graeme and his family in ICU the next morning where they were all in tears, such was the huge emotional relief.

Interviewed later, Dr. Mussap was adamant that Graeme was truly lucky to have survived his cardiac arrest, but he felt it was the survival neurologically intact that was absolutely remarkable. "I was skeptical, as patients in this situation usually do badly" Dr. Mussap said. "However, this is a game-changer and as a result we have changed our policy regarding transporting patients in cardiac arrest to the cath lab."

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Life-saving team: Graeme ("Miracle Man") surrounded by Dr. Trudi Davis, CNC Kathryn Spears, Dr. Shamus Shepherd, General Manager Robynne Cooke and the Liverpool Hospital Auxiliary volunteers.

The Outcome

Graeme Webb has been fondly dubbed, 'The Miracle Man' by the Liverpool Hospital staff. He was discharged from hospital eight days later and returned to work within three months of his cardiac arrest. He has since made the decision to spend more time with his family.

A Survivor Returns

Three months after being discharged from hospital, Graeme was invited back by Liverpool Hospital staff to meet with the team involved in his resuscitation and the Hospital Auxiliary volunteers who had raised funding to purchase the LUCAS 2 used throughout Graeme's resuscitation and PCI.

"LUCAS 2 is a piece of equipment that will change practices and change lives, and it has certainly changed Graeme's life."

- Kathryn Spears, Clinical Nurse Consultant

More Information

For information about Liverpool Hospital Cardiac Catheterization Lab tests and the LUCAS chest compression system under fluoroscopy, please ask your sales representative for Physio-Control product comparison document 3319603 (LUCAS vs. AutoPulse under Fluoroscopy).

Physio-Control Headquarters
11811 Willows Road NE
Redmond, WA 98052 USA
Tel 425 867 4000
www.physio-control.com

**Physio-Control Operations
Netherlands B.V.**
Galjoenweg 68
6222 NV Maastricht
The Netherlands
Tel +31 (0)43 3620008
Fax +31 (0)43 3632001

**Physio-Control
UK Sales Ltd**
11 Old Jewry, 7th Floor
London EC2R 8DU
United Kingdom

**Physio-Control
Australia Pty Ltd**
Suite 4.01
15 Orion Road
Lane Cove
NSW 2066
Australia
Toll Free Tel 1800 987 982
Toll Free Fax 1800 890 892