

## CASE STUDY

# Using AutoPulse in One of the World's Most Dangerous Terrains—the Swiss Alps



In addition to the AutoPulse, the rescue team uses the X Series® monitor/defibrillator.

five decades to treat patients in one of the world's most dangerous terrains.

In 2013, Air Zermatt equipped all the helicopters it uses for air rescue with the AutoPulse® Non-invasive Cardiac Support Pump. The AutoPulse helps to resuscitate patients with consistent, high-quality chest compressions, and

Switzerland has 44 mountain peaks over 4,000 meters. Twenty-nine of those peaks are covered by Air Zermatt. Pioneers in mountain rescue, the Air Zermatt pilots and crew use equipment and techniques they have developed and refined over the last

allows Air Zermatt to maintain that same level of CPR efficiency throughout the entire rescue and transportation process.

### Decision to buy the AutoPulse

Prior to installing the AutoPulse, Air Zermatt evaluated other mechanical CPR devices but selected the AutoPulse for a number of reasons, including how easy it is to deploy and use. It also offers rescuers the ease of carrying the patient in a soft carry sheet, since he or she is already lying on a backboard. And the AutoPulse uses a LifeBand® load-distributing band to provide compressions. The LifeBand squeezes the entire chest safely, not only providing good perfusion, but also offering a much better option than a piston-driven device for mountain rescue and helicopter transportation.

"During transport there are so many disruptive factors," explains Axel Mann, Chief Medical Director of Air Zermatt. "You have to change positions, then regain your balance. If you can use the AutoPulse, it's ideal, because it always works—no matter what position the helicopter or ambulance is in."



With the AutoPulse, rescuers can provide optimal compressions while transporting patients or performing other life-saving activities.

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*Chief Medical Director of Air Zermatt, Axel Mann*

"What also impressed us about the AutoPulse was the endurance of the batteries, which can continue to operate for 45 to 60 minutes even in cold conditions," added Dr. Mann.

#### When a code occurs

As soon as an emergency call comes in to Air Zermatt's Central Rescue Coordination Center, a pilot, a paramedic, and an emergency doctor are dispatched. Details about the patient's condition, the landing site, visibility, and whether a winch operation is necessary are transmitted to the pilot and crew in-flight.



A two-person medical crew can run a full resuscitation and maintain perfusion while transporting the patient with the AutoPulse.

While a winch can be used to lower the AutoPulse, the crew typically carries it to the patient. As with every cardiac arrest, Air Zermatt helicopters only have

10 minutes to reach the patient. Their average arrival time is between 6 and 8 minutes. Once the medical team arrives, they quickly check the patient's level of consciousness. If the patient has no circulation and is not breathing, the medical team immediately starts resuscitation procedures.

"To keep the hands-off interval as short as possible, we start manual compressions and place electrodes on the chest to see if there's ventricular fibrillation," explains Dr. Mann. "If that's the case, one shock is given. Then, when the shock has been administered, manual resuscitation starts again. After one cycle of 30:2, we quickly sit the patient up so we can lay him on the AutoPulse."

"This is an enormous relief," says Dr. Mann, "as it frees up an additional person who can perform medical procedures on the patient. The machine conducts a very sufficient and professional resuscitation, which we, as humans, couldn't achieve."

#### AutoPulse during flight

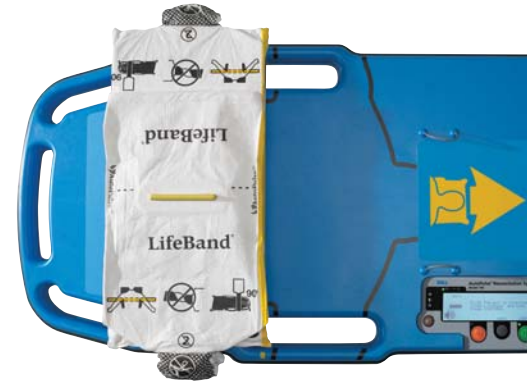
Space is confined in helicopters. Due to its low-profile design, AutoPulse compressions can be continued while loading the patient in the helicopter and during flight. "When we take responsibility for heart attack patients, we attend to them and take them as quickly as possible to an intracardiac catheter [PCI] clinic in a university hospital," Dr. Mann explains. "We also

put the AutoPulse on them as a preventive measure, without resuscitating them or switching the machine on. But should dysrhythmia affect them during transport within these first two hours and resuscitation become necessary, we have an extremely efficient way of taking action immediately, and neither member of the two-person medical team has to perform manual resuscitation," he added.

Hypothermia patients are also a speciality of Air Zermatt because of crevasse accidents. In these cases, the patient must be continuously resuscitated as soon as they are rescued until they arrive at the hospital, where they can be warmed with extra-corporeal cardiopulmonary resuscitation (ECPR). High-quality CPR must be maintained during the 45- to 60-minute trip to the hospital. Providing high-quality manual CPR for that period of time isn't feasible, but with the AutoPulse it is.

The AutoPulse plays a vital role in air rescue. Most European helicopter emergency medical services (HEMS) use the AutoPulse as a standard of care when treating cardiac arrest victims. A study comparing

Because the AutoPulse uses a load-distributing band that squeezes the entire chest, patients receive consistent, high-quality compressions that drive good blood flow.



outcomes of cardiac arrest patients transported in a helicopter who were treated with manual CPR or the AutoPulse found that the AutoPulse patients fared better.<sup>1</sup> The AutoPulse patients were significantly more likely to achieve ROSC (return of spontaneous circulation), 30% versus just 7% in the manual CPR group. In comparative clinical trials, the AutoPulse improved ROSC by 62% compared to typical CPR.<sup>2</sup> The randomized CIRC trial demonstrated that AutoPulse delivers the highest quality CPR, based on survival to hospital discharge and neurological status.<sup>3</sup>

Saving lives in extreme environments requires skill, dedication, and great equipment. The AutoPulse is capable of meeting extreme demands.



Transporting the patient from the scene is simplified thanks to the carry sheet and the AutoPulse's low profile, which is an advantage in the helicopter.



For more information on the ZOLL AutoPulse, please call +1-978-421-9655 or go to [www.zoll.com/autopulse](http://www.zoll.com/autopulse).

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<sup>1</sup>Omori, K, et al. The analysis of efficacy for AutoPulse system in flying helicopter. *Resuscitation*. 2013;84:1045-1050.

<sup>2</sup>Westfall, M, et al. Mechanical versus manual chest compressions in out-of-hospital-cardiac arrest. *Critical Care Medicine*. 2013;41:1-7.

<sup>3</sup>Wik, L, et al. Manual vs. integrated automatic load-distributing band CPR with equal survival after out of hospital cardiac arrest. The randomized CIRC trial. *Resuscitation*. 2014;85:741-748.

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Want to learn more about how Air Zermatt utilizes the AutoPulse? Watch the video here: [www.zoll.com/AirZermatt](http://www.zoll.com/AirZermatt)

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