The Woman Who Froze to Death – yet lived (Norway, 1999) Anna Bagenholm

While taking a break from her long medical training to become a surgeon, Anna Bagenholm fell into danger when skiing on one of her favourite mountains in the beautiful countryside near Narvik in northern Norway.

It was a warm spring evening in the Kjolen Mountains and the twenty-nine-year-old was enjoying herself with two friends, who were also doctors. Suddenly, as she tried to steer a path around a waterfall, she fell head first into a fast-moving stream. The water wasn’t deep but she was trapped between thick ice and rocks, struggling to breathe. Her friends tried to pull her free but were unable to move her. One of them battled to keep a grip on Bagenholm’s wet skis, desperate to prevent her being pulled further under, and the second called for help on her mobile, aware that her stricken friend was being pummelled by an unstoppable torrent of ice-cold water tumbling down the mountainside.

Fortunately, in what would otherwise have been a death-trap, Bagenholm found a pocket of air beneath the ice. This allowed her to keep breathing, although it couldn’t protect her from the cold. As the minutes wore on and no help came, she gradually lost consciousness. After forty minutes her friends were left clinging to what appeared to be a lifeless body.

It took a while longer for the first of two rescue teams to reach the narrow gully. A rope was attached to Bagenholm’s legs to hold her fast, then the rescuers began using a snow shovel and a small saw to break through the eight-inch-thick ice. It was slow work but eventually, when a second team arrived with a larger, more pointed shovel, they were able to pull her free.

By now Bagenholm had been trapped underwater for around eighty minutes. She wasn’t breathing and no one could feel a pulse, which meant her heart has stopped beating and her blood was no longer flowing. Shining a bright light into her eyes produced no response, a worrying sign suggesting that she had died from a combination of the freezing temperatures and the lack of oxygen.

The nearest hospital was an hour away by air, but the huddled group on the mountainside refused to give up. Waiting for a helicopter to arrive, they made repeated attempts to revive their patient, but she remained white-faced and completely motionless. Standard practice for such an incident includes the kiss of life, chest compression and other first-aid techniques known collectively as cardiopulmonary resuscitation, or CPR – but none seemd to be having any effect.

Still showing no signs of life, Bagenholm was lifted into the helicopter and flown to Tromso University hospital, more than two hours after her fall. The symptoms she displayed were immediately familiar to hospital staff. It looked like hypothermia: when the body temperature drops below 30c most people lose consciousness, and at 25c a heart attack is likely. Without medical treatment death can follow very quickly.

Bagenholm’s temperature had dropped to an astonishing 13.7c. She was an exceptionally severe case, although the condition is far from rare in this part of Scandinavia. The city of Tromso is well withing the Arctic Circle, and snowfalls of nearly eight feet have been recorded there. Local hospitals frequently treat people with hypothermia, but when the emergency staff were still unable to detect a pulse, they knew that this was no ordinary situation.

The good news was that their air pocket had prevented Bagenholm from drowning, but now the hospital had to launch a long and complex procedure to see fi there was any chance of bringing the patient fully back to life. The assembled doctors and nurses knew that in all the previous cases of hypothermia they had treated no one had ever recovered from such a dramatic drop in temperature.

In a specially designed operating theatre Bagenholm was hooked up to a sophisticated bypass (heart-lung) machine and a video probe was inserted into her chest to monitor her heart. While resuscitation attempts continued, the blood carefully drained from the veins, fed through the machine and then gently pumped back into her arteries. The hope was that by gently warming the blood, they would gradually return the patient to a normal temperature and regained consciousness.

By now there had been no signs of life for more that four hours, but then a faint heartbeat was detected and shortly afterwards confirmed. Over a period of nine hours Bagenholm’s pulse slowly strengthened as nearly a hundred medical personnel worked to complete the process of bringing her brain and body back to full consciousness.

It was clear, however, even when her heartbeat normalised and she opened her eyes several days later, that she was far from well. There were no obvious signs of injury, no broken arms or legs, but she was unable to move any of her limbs. Her kidneys and digestive system were also not functioning properly, and for at least 2 months she remained in the hospital’s intensive care unit. Hooked up to a variety of medical equipment, she needed round-the-clock specialist treatment.

Crucially, she had suffered no brain damage, an amazing outcome for someone who had exhibited no signs of life. It is not possible to explain this medical miracle with any certainty, mostly because no one else has ever recovered from a body temperature as low as 13.7c. For this reason Bagenholm’s case continues to be closely studied by doctors around the world. Many valuable lessons have been learned about how to save the lives of people suffering strokes, liver failure and epilepsy, as well as severe hypothermia.

However, Bagenholm’s medical team think they might know the reason for her extraordinarily good fortune. In one very important regard they believe the exceptionally cold temperature under the ice might have worked to their patient’s advantage. For some time doctors have known that a cool brain needs less oxygen than a warm one, and Bagenholm might, in effect, have been able to hibernate during the hours following her fall into the icy stream.

Ordinarily such a thing would never happen, but perhaps the unusual nature of her accident allowed Bagenholm’s body to cool down completely before her heart stopped functioning. If her brain was sufficiently cold its individual cells would require very little oxygen. In this way her brain was able to survive for several hours, and in circumstance which otherwise might have killed even the fittest person.

Bagenholm was certainly fit but her recovery and return to good health nevertheless took more than a year. Even then, it was never quite complete. Some of the damage to the nerves in her hands and feet turned out to be irreversible, and sadly this meant she had to abandon her dream of becoming a surgeon. Fortunately, she was able to retrain as a radiologist, a doctor who specialises in medical investigations and treatment using techniques such as X-rays and ultrasound scans.

Once qualified in radiology, Anna Bagenholm began working with the very doctors and nurses who saved her life, and alongside one of her friends from that fateful day, who is now a member of the Tromso University helicopter emergency team. Happily both have returned to the slopes many times and continue to enjoy skilling in some of northern Europe’s most breath taking and unspoiled landscape.