

**Alcor A-2694**

**Case Report**



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## 1. Overview

On Friday, November 1, 2013 a newly signed up international member became Alcor's 118th patient. A-2694, a confidential whole-body member, was declared clinically dead on October 27th in the Czech Republic.

A-2694 completed sign-up paperwork just four days before being pronounced and we confirmed receipt of payment for his cryopreservation on the day of pronouncement. The patient was admitted to a hospital in the Czech Republic on Wednesday, October 23. Initially, a relative told us that doctors had claimed that conducting cryopreservation procedures in that country would be illegal. That turned out to be incorrect, although there is a requirement to conduct a postmortem autopsy. Fortunately, either because of the patient's dual citizenship or because a close relative was physically present to dismiss that requirement, no postmortem was required. Although payment for cryopreservation had not yet been received, the patient's brother had the wisdom to wire sufficient funds to allow us to begin preparations (with the invaluable assistance of international funeral directors Rowland Brothers in London) and to send Medical Response Director Aaron Drake to the Czech Republic.

We had hoped to perform a field cryoprotection for the first time. This would have allowed us to cryoprotect the patient first and then ship him on dry ice. Just recently, we had positioned supplies in England for this purpose. Unfortunately, this turned out to be impossible. In part, this was due to the extremely close time frame for the patient's sign-up. More critically, however, we ran into incredibly bad luck in that on the day our supplies were to be moved from England to the patient's location, England was hit by the massive St. Jude storm. Winds of up to 80 mph led to cancelled flights and other major travel disruptions. Even if the patient had been well enough to move him to Germany (as we had suggested), field cryoprotection would not have been feasible.

The patient's location in the Czech Republic added further difficulties. It turned out that the hospital lacked any ice facilities – a situation that would never happen in a US hospital. When the patient's condition (based on very limited medical information) seemed to be critical, Aaron Drake got on a flight to the Czech Republic on Sunday, October 27. The patient was pronounced while Aaron was still in transit, then placed in the hospital morgue at around 2 degrees Celsius. All the dry ice in the area was purchased and used to cool and pack the patient for air transport to Alcor. A-2694 arrived at Phoenix Sky Harbor International Airport early in the evening of Friday, November 1<sup>st</sup> and was taken to Alcor, arriving at 9:31 pm. The transfer into cool down took a little over an hour.

## 2. Personnel

Czech Republic: Aaron Drake, Medical Response Director, field cooling, documentation and transport. He was supported by Max More, CEO and Diane Cremeens, Membership Department Coordinator.

Scottsdale, AZ: Max More; Aaron Drake; Hugh Hixon; Steve Graber; Mike Perry; and Richard Cremeens participated in the arrival and cooldown procedures.

## 3. Pre-Deployment

On September 18<sup>th</sup>, 2013, Alcor received an application from an individual who had been previously diagnosed with colorectal cancer. Despite numerous treatments at a variety of international clinics, all attempts to arrest or reverse the disease had failed. The normally slow progressing cancer had spread and metastasizes had developed on the liver which caused a more serious complication of hepatic insufficiency. Medical providers had predicted that the individual might survive until the Christmas holidays, but certainly no longer.

In one final attempt to extend the person's life, a partial hepatectomy was scheduled for October 8<sup>th</sup> to remove the vast majority of the liver with the hope that the remaining small percentage would regenerate. Liver regeneration is a phenomenon by which the liver can re-grow its own tissues to repair itself from surgical removal. When as much as two-thirds of a patient's liver is removed, regeneration can cause the organ to return to its normal size within a week and the basic functions of detoxification of the blood and tissues, regulation of metabolism and regulation of fluid levels throughout the body will return to normal.

Diagnostic imaging is performed initially to see if the cancer can be removed completely through this procedure. Still, sometimes during surgery the cancer is found to be too large or spread too far to be removed, and the surgery has to be cancelled. Unfortunately, this is what occurred for this individual as the procedure was canceled after the surgeon examined the liver. Given the new findings, medical providers suggested that the individual may now only have between two and eight weeks to live.

During this time, the brother and personal representative of this prospective member were completing the contracts and returning them to Alcor. Funding the contract was a bit problematic for the family as they had intended to dissolve assets upon the death of the individual and pay Alcor with the proceeds, expecting to complete the process within 7 to 10 days after pronouncement. They did not understand that Alcor maintains a policy of securing funding

through life insurance or prepayment as significant expenditures of resources and money occur within the deployment and preparation for cryopreservation and that Alcor could not proceed without a guarantee of payment.

Given this information and the surprising development from the liver surgery, the brother decided to wire Alcor a minimum non-refundable deposit on October 9<sup>th</sup>. Since international members are not eligible for comprehensive member standby, an additional amount of money must be paid to cover the expenses of planning and making commitments to other businesses and organizations. As this was an international funds wire transfer it would take longer to be processed in comparison to domestic wire transfers. This transfer took four days to be received by Alcor's bank.

Discussions began with Rowland Brothers mortuary in Croydon, UK, just south of London. Alcor had previously worked with this company and they have proven to be an invaluable resource when it comes to international shipping of human remains. As Alcor has to comply with funeral industry regulations when it comes to both domestic and international shipping, we rely on those individuals who are credentialed to ensure we remain in compliance.

Alcor had previously positioned a response kit at the Rowland Brothers facility along with the cryoprotective perfusate to eliminate the possible delay that customs might bring during transport. The Schengen Agreement among 26 European countries allows for freedom of travel across borders without the need for Visas and lengthy border controls, thus allowing for the kit to be quite mobile across Europe. Alcor made arrangements for a skilled embalming representative from Rowland Brothers to retrieve the kit and perfusate and meet Aaron in the Czech Republic so they could both perform the surgical procedure and perfusion together.

The next development with the patient occurred two weeks later, on October 23<sup>rd</sup>, when the individual was admitted to a local hospital in the Czech Republic. When the family discussed the cryopreservation directives with hospital personnel, the question was raised if this process was even legal in that country, having never heard of it before. Between Alcor and Rowland Brothers, we were able to satisfy the concerns of the hospital by explaining the similarities of the process to that of embalming and how this decision was the individual's personal directive.

On the 24<sup>th</sup>, the brother wired the remaining funds to Alcor to complete the contract, expecting that it may take an additional three days to be received. The family also shared that the health of their loved one was deteriorating. We asked for clinical indicators such as vital signs, blood work, medications, etc, to better evaluate how long the individual had before we should consider sending a team over to the hospital. A few results were provided that suggested the individual was stable, drinking water and receiving sustenance through an IV, but the information was far from complete. The family promised to provide more information as it became available.

To help avoid the potential problems associated with the hospital's protocols, Alcor suggested moving the patient to another country for care. The areas of concern included: the hospital required the body to stay in his bed for two hours following pronouncement before allowing a release to a mortuary; the hospital had no ice and therefore could not cool the body except later in the hospital morgue; and, an autopsy from the medical examiner was standard and could only be waived if the family made a personal appeal to forgo the procedure. Despite our request, the family maintained the patient was not healthy enough to travel but said they would make the appeal to the medical examiner to prevent the autopsy.

Numerous emails and phone calls to the family over the next two days requesting additional medical data on the patient were made; however no information was supplied.

#### **4. Deployment**

On Sunday morning, October 27<sup>th</sup> at 5:15 AM, Aaron received a call from the brother that the patient was near death and that we should send a team straight away. Aaron called Max to report the news and to see if the funds had arrived by wire transfer, confirming the completion of the membership contract. Max said he would have Bonnie Magee, Alcor's Finance Director, get online and check the account. In the meantime, he authorized Aaron to call Rowland Brothers funeral directors to activate and send the representative and supplies to the Czech Republic as previously planned. He also authorized Aaron to book the next available flight to Prague to intercept with the local mortuary.

Aaron called Rowland Brothers to request they send their skilled representative and Alcor's response equipment with cryoprotective perfusate to meet him in Prague. They coordinated their schedules so they would arrive approximately two hours before Aaron arrived the following day. They would also direct the local mortuary in the Czech Republic to maintain communication with the family and be available when needed, as Aaron would be unavailable during the flight.

Aaron left home for Alcor to gather his surgical kit to couple with the perfusate supplies that were pre-positioned. Max called to say that Bonnie had confirmed the receipt of the remaining funds through the online banking portal that morning and the standby was a full go.

Aaron's flight departed at 12:45 pm out of Phoenix. Unfortunately, the individual was declared legally dead while Aaron was en route, at 2:15 pm Arizona time.

## 5. Field Cooling & Transportation

Just after pronouncement, the mortuary in the Czech Republic received a call from the family saying the individual has passed away and they immediately sent a vehicle with a cold container to retrieve the body. The hospital provided the release as soon as they arrived, bypassing the normal waiting period and the standard autopsy. When they arrived back at the mortuary, the patient was placed in a cooling room set at 2 °C.

Meanwhile, a depression had formed off the east coast of the United States and headed east, assisted by the jet stream. The storm was named "Christian" but was referred to as the St Jude storm after the feast of Saint Jude the Apostle, which takes place on 28 October, the day when the storm was expected to be at its height. When the storm made landfall in the UK, winds were gusting at 99 miles per hour. Both Heathrow and Gatwick had cancelled the majority of their flights and many phone lines were down due to toppled trees.

This storm prevented the Rowland Brothers representative from departing on his scheduled flight. He was able to secure a flight the following day, but as most passengers were rescheduled as well, the flight was not until the evening, much later than expected.

When Aaron arrived in Prague, Czech Republic, he learned of the developments with respect to both the patient and the airlines. He became concerned that the delay in the arrival of the equipment and perfusate from England might be too long to perform the field cryopreservation. He consulted with both Max and Hugh Hixon, Jr., Alcor's Research Fellow, to determine what time frame was acceptable since the blood brain barrier begins to breakdown at some point after clinical death and it becomes difficult, if not impossible, to perfuse and protect the brain. Their calculations suggested that too much time would pass until the perfusate would arrive and that the surgical procedure should be cancelled and instead proceed immediately to cooling with dry ice.

Upon arrival, the mortuary picked up Aaron at the airport in Prague and drove him to the town where the patient was cooling, about 70 kilometers away. Aaron then called Rowland Brothers to have them cancel their flight to Prague as the surgical procedure was being cancelled in favor of dry ice cooling. The director of Rowland Brothers insisted that no thermocouple or temperature recording devices be used as this would cause serious issues with international customs when the casket was x-rayed. The shipping container would be required to be opened, examined and have to be repackaged for shipping. This could also result in the mortuary's preferred shipping status being revoked. Aaron agreed and said Alcor would comply with the terms.

The following morning, Tuesday, 150 kilos of dry ice and 100 kilos of blue gel ice were purchased in Prague and taken back to the mortuary. The patient's body was taken out of the cooler, cleaned and draped in a body wrap. Following this, the body was placed in a zinc foil pouch and hermetically sealed. No standard Ziegler shipping containers were available so a metal casket was determined to be preferable to the standard cardboard containers. Four inch Styrofoam sheets were purchased and cut to fit all of the interior sides including the lid and base of the casket. Once completed, the zinc foil pouch was placed in the casket and approximately 2/3 of the dry ice was placed around the patient to begin the cooldown to dry ice temperature of -78.5 °C. This would take close to two days to accomplish.

Wednesday became an administration and paperwork day. The certificate of death had to be retrieved from the hospital and signed in the city where pronouncement occurred. An official seal had to be affixed to the certificate from the health ministry. The receiving mortuary in Arizona had to provide a letter of acceptance to be submitted to the Czech government. And the most direct flight had to be identified, booked and scheduled with airline cargo.

On Thursday morning, the remaining dry ice and gel ice were placed inside the casket. In the Czech Republic, customs officials are driven to the mortuary by the funeral director for inspection of the casket before it is sealed. Once approved, the casket is sealed, wrapped in a protective material and an official seal is placed on the casket along with a special color coded twine wrap. This ensures that no additional tampering can occur after the inspection. The customs officials are then returned to their offices.

Following approval, the casket was loaded into the back of the mortuary vehicle and driven to the cargo agent located at the Prague airport. The casket was weighed and the documents were submitted for review. After an hour, the documents were approved and the casket was reloaded in to the mortuary vehicle to be moved to British Airways cargo. Special arrangements had been previously made so the casket would be held in cold storage while it waited for the flight, scheduled some six hours later.

The British Airways flight departed Prague for London Heathrow airport Thursday evening and awaiting in customs cargo throughout the night until the following morning when it was scheduled for a direct flight to Phoenix Sky Harbor airport. When the cargo arrived in Phoenix, the local mortuary was on site to sign and retrieve the casket and transport it to Alcor, where the cooldown team waited.



## 6. Cooldown

The mortuary arrived at Alcor at 9:31 PM with the shipment from the airline cargo. The casket was rolled out of the back of the van onto a church truck so that it could easily be moved into the patient care bay. The customs twine and protective cover were removed from the container and a casket key was used to unlock and open the lid.

Once opened, the Styrofoam insulation and gel ice packs were removed. The ice packs that were closest to the body were still frozen solid while the packs nearer the top of the casket were more pliable. There was no evidence of any remaining dry ice but the body still felt very solid. The protective garment that draped the patient's body was opened and an attempt was made to place a thermocouple in the nasopharynx to determine how cold the body had remained during transportation. The thermocouple could only be advanced an inch or two and the reading of -4 °C seemed to be very unreliable and not indicative of the true core body temperature.

The body was placed in an open dewar pod and secured down with body straps that had been riveted to the inside. A neuro container which had been chemically etched with A-2694 for identification was placed around the head and Dacron wool was used to ensure a snug fit. The pod was then screwed closed before it was lowered into an empty dewar that is designed to inject liquid nitrogen vapor at specifically timed intervals to control the rate of cooling. This continues over many days until the body reaches LN2 temperature when a final transfer to another dewar for liquid nitrogen emersion can be completed.

## 7. Issues and Actions

**Issue:** There was very limited availability of dry ice and initially it was reported by the mortuary that none could be obtained.

**Action:** Cross reference the countries where our members are located and identify whether dry ice is readily available. If not, we may need to develop a secondary protocol for those countries. Create clear guidelines for the quantity of dry ice needed, based on the weight of the patient, how much initial cooling is needed, expected transport time, and expected performance of transport container used.

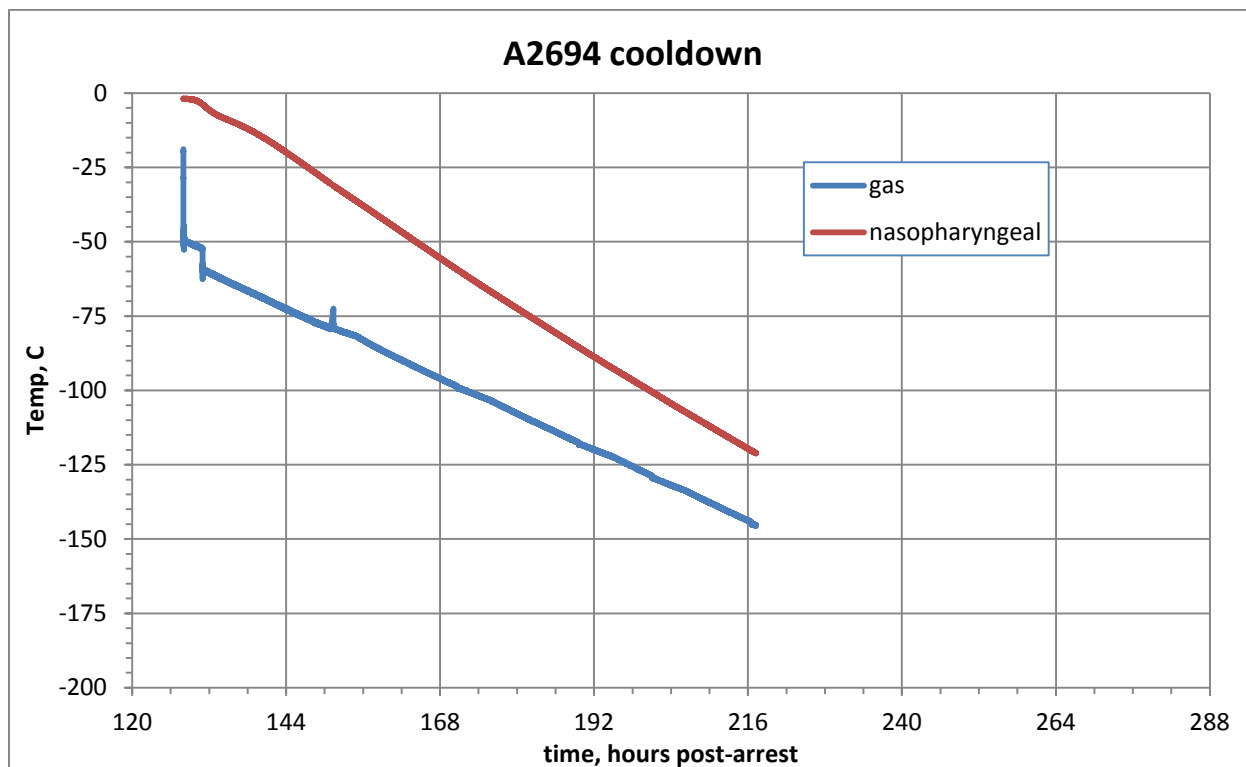
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**Issue:** No international charger adaptors were packed into the kit to accommodate recharging phones and electronic devices and these had to be purchased.

**Action:** Develop a personal items check list specifically for international cases to include these and other non-stabilization related supplies.

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## 8. Graph



--End of report--