

# Alcor A-2813

## Case Report

# ALCOR



LIFE EXTENSION FOUNDATION  
*The World's Leader in Cryonics*

[www.alcor.org](http://www.alcor.org)

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## September 2015

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## 1. Overview

Alcor member A-2813 was a 97-year-old man who was a new Alcor member. His health history included advanced heart disease, pulmonary fibrosis, pneumonia, acute respiratory distress syndrome, respiratory failure and kidney failure. He had undergone a coronary artery bypass graft and aortic porcine valve replacement in 2008 and had suffered a heart attack in 2013.

The patient experienced cardiac arrest and was subsequently pronounced deceased on 25-May-2015 at 0732 hrs EDT (0432 hrs MST) in a hospital in Fort Lauderdale, Florida. After experiencing some technical and logistical challenges, patient A-2813 received standby, stabilization and transport by SA and then underwent a whole body cryopreservation by and is currently in the care of Alcor.

## 2. Personnel

### **Suspended Animation Inc. (SA) Stabilization Team:**

Robert Wesley, MD, Ph.D.; Cardiothoracic Surgeon

Patrick Davis, CCP, RRT; Perfusionist

Ken Schroeder, EMT- trained

### **Alcor Life Extension Foundation (Alcor) Cryoprotective Surgery Team:**

Tom Wolvos, MD; Surgeon

Sandra Russell; Surgical Assistant

Hugh Hixon, MS; Cryoprotection Perfusionist

Joan O'Farrell; Scribe

Max More, Ph.D.; Overseer

### **Deployment Committee:**

Steven Harris, MD; Chief Medical Advisor

Aaron Drake, NREMT-P, NAEMSE; Alcor Medical Response Director

Catherine Baldwin, COO of Suspended Animation Inc.

*\*Note: The written narrative will be kept in it's local time zone to preserve the chronology of events, but the timelines will be converted to Alcor's time zone, which is Mountain Standard Time (MST).*

## 3. Pre-Deployment

Friday, 06-Mar-2015, at 0404 hrs EST, Suspended Animation (SA) received an emergency text from Aaron Drake, Alcor Medical Response Director, indicating that Alcor member A-2813 was

admitted to the Cardiovascular Intensive Care Unit (CVICU) at a hospital in Fort Lauderdale, Florida. After a telephonic discussion with Deployment Committee members, the SA team was put on partial standby based on the patient's medical history, age, ventilator status, and low blood pressure.

On Saturday, 07-Mar-2015, Catherine Baldwin, COO at SA and Tabitha Carvalho, Director of Client Services and Donor Recovery at SA, met with the hospital Medical Director, the floor staff in the Cardiovascular Intensive Care Unit (CVICU) and the patient's daughter. The standby procedure and stabilization process were discussed with the Medical Director and daughter as well as the floor staff.

The Medical Director indicated that the hospital had an active transplant program and was accustomed to scheduling and supporting teams with a Do Not Resuscitate Order (DNR) as well as the removal of the ventilator when there was no longer anything that could be done for the patient or brain death had occurred. The SA team agreed that a DNR status was preferred, but the decision to remove the patient from the ventilator rested with the family. The patient's daughter emphasized that she did not want to remove her father from the ventilator and that she wished for any and all extraordinary measures be taken to extend her father's life. This meant that the patient would remain on "full code status" and that if he went into cardiac arrest, all resuscitation measures would be used to attempt to revive him. The Medical Director indicated that he would provide full cooperation with the SA team. However, he stated that there was no space in the patient's room or on the CVICU floor to pre-position team members and equipment. They would have to be brought in when the patient experienced cardiac arrest.

The patient status at this point was stable, alert, oriented and able to follow commands although he remained on the ventilator. The patient's medical team felt that he was in no immediate danger. Based on the patient's vitals and full code status, it was decided that he was stable enough to have two standby team members wait at their Boynton Beach facility near the hospital while other team members remained nearby on alert to deploy on short notice.

On 09-Mar-2015, as the end of the contracted 72-hour standby period had passed, the Deployment Committee conferenced to review the patient's case for continuing or discontinuing the standby. Based on the patient's stable vital trends and medical information, the committee determined that the patient was stable enough to abort the standby. It was agreed SA would continue close but remote monitoring of the patient.

From 10-Mar-2015 to 16-Apr-2015, daily patient reports were gathered from the patient's medical providers and relayed to the Deployment Committee via e-mail. Few changes were noted, and the patient remained stable on the ventilator.

The patient was moved from the CVICU to a Special Care Unit on 24-Mar-2015, for long-term ventilator care. After the patient had been moved, SA provided daily reports from 25-Mar-2015 to 16-Apr-2015 and weekly e-mail updates to the Deployment Committee from 17-Apr-2015 to 06-May-2015. The patient's vitals trend remained stable during this time.

On 07-May-2015, the patient experienced increased respiratory distress and was transferred from Special Care Unit to the Critical Care Unit (CCU) with a diagnosis of Acute Respiratory Distress Syndrome (ARDS).

On 12-May-2015, the patient's fraction of inspired oxygen (FiO<sub>2</sub>) on the ventilator increased to 100%, one sign of possible imminent decline. The Deployment Committee recommended SA deploy a full team to the patient's location, and the team began assembling at the hospital at approximately 2000 hrs EDT.

At 0700 hrs EDT on 13-May-2015, the SA Team Leader met with the CCU Assistant Nurse Manager and the CCU Case Manager and discussed the expected procedures for patient care if the patient declined and experienced cardiac arrest. The Team Leader then met with the patient's daughter, floor staff nurses, and the Charge Nurse. Hospital security was contacted to plan out the best route for exiting the hospital with the patient.

The patient status on this day was stable even with an FiO<sub>2</sub> of 100%, blood pressure of 125/58. Heart rate 70 bpm and paced, and an SpO<sub>2</sub> of 93%. During this time, the hospice nurse attempted to visit the patient and his daughter but was refused. The patient remained in the CCU on "full code status."

From 14-May-2015 to 16-May-2015, the patient's vitals and status were poor but remained stable.

On 16-May-2015, the Deployment Committee decided to abort the full standby based on the patient's vitals and previous history. The SA Team Leader notified the nursing staff and family members of the decision to discontinue the standby. From 17-May-2015 to 23-May-2015, SA remotely monitored the patient each day by contacting the patient's bedside nurse in the morning and evening after the hospital staff's shift change. The patient's status after each review was provided to the Deployment Committee via email.

A third deployment occurred on 24-May-2015 after SA received a call from the patient's bedside nurse at 0220 hrs EDT. The nurse indicated that the patient seemed to be in real decline as his oxygen saturation dropped to 82%, he had tachycardia, and he was bleeding from his tracheal tube. The SA team received approval to deploy at 0233 hrs EDT.

Three team members from Florida responded first, including the surgeon and perfusionist. The first team members were onsite about 0515 hrs EDT. Two additional team members from California were scheduled to join them and were booked on the first available flight to Florida. The SA team leader alerted the appointed funeral director of the patient's status and the likely need for him to sign the patient out of the hospital and prepare transport arrangements and documentation.

At 0647 hrs EDT on 25-May-2015, the SA team leader received a call from hospital staff that the patient had experienced cardiac arrest, and Code Blue resuscitation efforts had begun. SA Team members waiting outside the hospital gathered medications and equipment from the vehicle and moved to the CCU floor.

After two full Code Blue protocols, the patient was pronounced legally deceased at 0732 hrs EDT and stabilization procedures began.

#### **4. Stabilization and Transport**

After pronouncement, the SA team administered 100 mg of Propofol, 100,000 IU of Heparin, and 250,000 IU of Streptokinase using the existing Peripherally Inserted Central Catheter (PICC) at the bedside. The patient was moved to the waiting ice bath, and an AutoPulse cardiopulmonary support device provided chest compressions.

The patient's tracheal tube was filled with blood, so the SA ventilator was not used. While the Funeral Director filled out the paperwork to release the patient, the team moved the patient to the waiting SA vehicle outside the emergency room entrance.

Within the first eleven minutes after pronouncement, the patient was covered with ice and ice water re-circulated over him using the SA cooling mask and tubing circuit. Team members continue to administer 400 mg of S-Methylthiourea, 15 mg of Ketorolac, 300 mg of Aspirin with THAM, 500 mg of Niacinamide, 200 IU of Vasopressin and the first dose of 1 mg of Epinephrine (administered every three minutes thereafter) was given via PICC.

In the next 30 minutes, the SA team members continued to administer 20 g of Sodium Citrate, 80 mg of Gentamicin, 1.5 g of L-Kynurenine Sulfate and five more doses of 1 mg of Epinephrine via the PICC line while driving to the nearby funeral home approximately ten minutes away. Nasopharyngeal temperature, read manually at this time, was 35.8 °C.

At 0815 hrs EDT, the team arrived at the funeral home. While the surgeon scrubbed in, another team member placed an EZ-IO intraosseous access line in the left tibia. Three more doses of Epinephrine were given, and high volume medication was started (150 ml of Vital-Oxy in saline, 100 ml of THAM) using this line.

#### **5. Field Surgery & Perfusion**

At 0831 hrs EDT, the first incision was made in the right groin area. Due to extensive venous varices in the right groin area, this groin was abandoned after about 10 minutes and the left groin was explored.

The nasopharyngeal temperature at this time was 30.1 °C.

The left femoral vessels were exposed, and a short longitudinal arteriotomy was made on the right femoral artery just proximal to the profunda takeoff. A 19 Fr. arterial catheter was inserted and advanced into the upper aorta. A 23 Fr. venous catheter was inserted through left femoral vein. The surgeon encountered an obstruction in the pelvis and adjustment was made to correct the situation.

Exsanguination and perfusion with cold MHP2 organ preservation solution started at 0918 hrs EDT. Good flow and clear venous effluent were observed. The patient circuit was closed, and recirculation started at 0932 hrs EDT. Additional ice and alcohol were added to the perfusion cooling bath at this time to facilitate further cooling. Peak flow rate observed was 2.6 L/min and the lowest flow rate was 2.4 L/min.

The perfusion pump was shut off at 0949 hrs EDT. Significant volume was lost during recirculation. All 30 liters of MHP2 organ preservation solution were used. The nasopharyngeal temperature at this time was noted manually as 11.0 °C.

The surgeon disconnected the circuit from the patient, removed the cannula, and the vessels were ligated. The groin was closed with 3-0 Vicryl sutures and skin staples.

While the patient was undergoing surgery and perfusion, the funeral director made air shipment arrangements to ship the patient to Alcor. SA identified and suggested the next available non-stop flight and asked the director to use the fastest route available with the least risk of delay. The director noted that, due to the Memorial Day holiday, many airlines cargo desks were either closing early or had limited availability in cargo space or personnel to handle a last minute human remains shipment. Also, routing considerations had to be made given the heavy weather around Texas and Oklahoma. Options for non-stop flights out of Miami as well as Fort Lauderdale were considered.

Meanwhile, the patient was placed in a body bag inside a second body bag inside a Ziegler case. The Ziegler case was insulated with custom cut foam board and double-bagged water ice was packed around the patient in the outer body bag before the Ziegler was closed and loaded into the air shipment tray.

A booking was made to fly patient out of Fort Lauderdale at 1455 hrs EDT via Charlotte, North Carolina to arrive in Phoenix, Arizona at 2334 hrs MST accompanied by a team member from SA.

## **6. Cryoprotective Surgery and Perfusion**

It wasn't possible to initialize the computer controlled perfusion and data collection system at Alcor for this case. The problem was later traced to a hardware connection problem that required diagnosis and repair by system designer Steve Graber, who due to rare circumstances was out of town and out of communication during the attempts to start the system.

The difficulties initializing the whole body perfusion system proved to be moot after another problem occurred. The intent was to do a sternotomy and cannulate the aortic arch and right ventricle, but the patient previously had bypass surgery (which was determined from an X-ray of the patient's chest that the team received), so the sternal wires needed to be cut. The surgeon was able to get most of them, but a few remained inaccessible. Those were cut by a team member as well as the sternum, with sheet metal snips. Unfortunately, as often happens with cardiac

surgery, the previous median sternotomy and bypass surgery that this patient received resulted in adhesions between the heart and the sternum. As a consequence, the heart was damaged by the process of opening the thoracic cavity, beyond the surgeon's ability to establish cardiopulmonary bypass.

The situation was discussed by telephone with Alcor's Chief Medical Advisor, Dr. Steve Harris. It was decided to use Alcor's Field Cryoprotective Perfusion (FCP) system to do a carotid perfusion of the patient's head in order to cryoprotect the brain.

Carotid cutdowns were performed, and a field neuro tubing set was rigged on an IV pole and serviced with a ladder. The liquid column height was about 46 inches, giving a static perfusion pressure of 90-100 mmHg, depending on the density of the cryoprotectant in the step. Perfusion was done in half-steps, drawing either from a single bag or two bags simultaneously, giving about 15 concentration steps. Cryoprotection was initiated at 2137 hrs post-pronouncement.

Effluent samples were taken from the cut jugular veins and measured with an automatic refractometer. Perfusion was terminated with the ninth bag, the effluent from both jugular veins being over 50.4 Brix for over 30 minutes, the normal criterion.

The temperature record was completed manually with DuaLogR data recorders.

At the end of bag three, the surgeon said that the brain appeared shrunken in the burr holes, indicating that in spite of the long transit time, the blood brain barrier was still intact. He measured the retraction with a forceps at around 3 cm on both sides. However, at the end of the perfusion, the burr holes were re-examined. The brain had not, as observed previously, extruded into the burr holes, but it also did not appear retracted, and the surface had an uneven appearance with bumps 3 to 5 mm across.

The patient was transferred to a tray and prepared for cooldown. The patient's arms were strapped in, and his hands placed for placement in a WB pod. His body width was 22", which meant that the patient might not fit into the standard pod, and provisions should be made for an alternative solution.

The patient was placed in the cooldown box and the program "WB Cryoprotected to -100 °C" used, which assumed that cryoprotection had been at least partially successful and that the brain would still be plastic at that temperature.

The plot of the plunge showed cooling curves for the base of the brain (pharyngeal) and the surface of the brain (burr hole). The burr hole reading dwelled at higher temperatures for a longer than usual, suggesting that some freezing of the brain was occurring due to incomplete

cryoprotection. This was in agreement with the burr hole and refractometry observations. It was also consistent with the long-standing observation that after about 18 hours, cryoprotection of the brain becomes difficult, and then, impossible.

## 7. Timelines

*(All times converted to Arizona time/ MST)*

### **Stabilization:**

DATE: 25-May-2015

0347 hrs	Received call; Code Blue had been called
0350 hrs	Funeral Director notified to mobilize to hospital
0422 hrs	Team at bedside; Patient in second round of Code Blue
0432 hrs	Patient pronounced legally deceased
0434 hrs	100 mg of Propofol & 100,000 IU of Heparin administered
0434 hrs	Streptokinase 250,000 IU administered
0436 hrs	Patient moved to ice bath
0437 hrs	Autopulse started
0440 hrs	Patient in SA vehicle; 400 mg of SMT administered
0441 hrs	1 mg of Epinephrine, 300 mg Aspirin & 15 mg of Ketorolac administered
0442 hrs	500 mg of Niacinamide administered
0443 hrs	200 IU of Vasopressin administered
0443 hrs	Patient covered by additional ice and water
0445 hrs	100 mL of Sodium Citrate administered
0449 hrs	1 mg of Epinephrine administered
0449 hrs	Nasopharyngeal probe placed; temperature 35.82 °C
0450 hrs	1.5 g of L-Kynurenine administered

0451 hrs 70 mL of Vital Oxy started

0458 hrs 1 mg of Epinephrine administered

0500 hrs AutoPulse battery changed

0501 hrs Drove to funeral home

0509 hrs 1 mg of Epinephrine administered

0515 hrs 1 mg of Epinephrine administered; patient arrived at funeral home

0524 hrs IO placed in left tibia; Vital Oxy moved from PICC to IO site

0524 hrs 1 mg of Epinephrine administered; nasopharyngeal temperature 31.59 °C

0527 hrs 1 mg of Epinephrine administered

0529 hrs 60 mL of THAM administered

0530 hrs 1 mg of Epinephrine administered

0531 hrs First incision started to right groin area

0539 hrs AutoPulse stopped

0547 hrs Nasopharyngeal temperature 30.12 °C

0548 hrs Nasopharyngeal temperature 29.71 °C

0604 hrs Venous and arterial cannulae inserted; nasopharyngeal temperature 28.98 °C

0618 hrs Washout started; nasopharyngeal temperature 26.67 °C

0622 hrs Nasopharyngeal temperature 24.12 °C

0628 hrs Venous effluent clear; nasopharyngeal temperature 22.7 °C

0632 hrs Vital Oxy added to circuit; MHP2 recirculation started; nasopharyngeal temperature 21.1 °C

0633 hrs Nasopharyngeal temperature 20.16 °C

0637 hrs Nasopharyngeal temperature 19.06 °C

0641 hrs Nasopharyngeal temperature 17.67 °C  
0647 hrs Nasopharyngeal temperature 16.07 °C  
0649 hrs Recirculation ended

**Cryoprotection:**

*\*Mountain Standard Time (MST)*

1500 hrs A call was placed by Alcor's CEO that additional team members would be required as Alcor needed additional help for a patient who would be arriving at their facility on 26-May-2015 at approximately 0100 hrs.  
1830 hrs The additional team members arrived at Phoenix Airport and traveled by taxi to Alcor arriving at 1955 hrs.  
2000 hrs The operating rooms were set up, and the new members reviewed equipment to use with the team. Two ice chests of plastic bags of crushed ice were filled. Use of the video camera, patient hoist, arrival gurney, cool down box, and hoist were reviewed.

DATE: 26-May-2015

0014 hrs One of the SA team members arrived, advising that the plane with the patient had arrived 30 minutes earlier. He did not have any patient information or notes with him; however, he assured Alcor's CEO that SA's COO had audio and visual information about the procedure in Florida and after her review this would be forwarded to Alcor. He advised the team of his team's fatigue due to the rigors of the field procedure. He stated that the perfusion went well but did not elaborate further.  
0037 hrs The patient arrived at Alcor by vehicle and was brought to the patient bay outside the O.R., where the container was supervised and unpacked. The Alcor team was present while SA's transport box was opened and the patient travel bag was unzipped. The original ice bags were partially melted and were discarded. The patient was then lifted from the transport box, brought into the O.R. and placed on the operating table which was lined with fresh ice bags from Alcor. Additional gallon bags of crushed ice were placed around the patient.  
0042 hrs The patient was on the table in the O.R. It was observed that the standard rectal plug and rectal temperature probe were not placed by SA. One nasopharyngeal probe had been placed by SA in the left nasopharynx (start time unknown). The temperature that was visible on the monitor screen at this time was 43° F.

- 0045 hrs The patient's head was shaved in preparation for the burr holes. The patient was covered with more ice.
- 0047 hrs The surgeon arrived. A printed picture of the patient's chest x-ray was posted on the wall and reviewed. It clearly indicated a pacemaker and median sternotomy wires which correlated with an old, 8-10 inch scar on the patient's sternum. It was apparent that fem-fem bypass had been used for the washout in Florida because there were two freshly stapled incisions (approximately five inches in length) in both the left and right inguinal area.
- The video camera at the foot of the O.R. table was turned on (settings had previously been set for the highest resolution and memory was available for 5 to 6 hours of continuous recording).
- The SA temperature monitor was taken by an SA team member when he left. Alcor was unable to download the data before he left. He stated that when video and audiotapes were reviewed by SA, procedure documentation would be provided. No notes available at that time.
- 0050 hrs Per H. Hixon, stopping and restarting.
- 0054 hrs A second temperature monitor from Alcor was started (Digi-sense dual logger) and two nasopharyngeal (NP) probes were inserted approximately six inches into the left and right nostrils. Logging was started and temperatures were set to record every 15 seconds.

### **First temperature reading at Alcor: 7.1 °C**

- 0055 hrs A second nasopharyngeal probe was placed.
- 0056 hrs Temp. 5.4 °C; 5.2 °C.
- 0102 hrs The right sided burr hole was started by the surgeon.
- 0104 hrs The left sided burr hole was started by the surgeon. Both burr holes were started with a pneumatic drill but were not completed with the rongeur until hours later. (Note: specially designed rongeurs are used as a follow-up to the air drill when removing the final bone mantle to expose the surface of the brain). A small opening of about 1/8" of an inch allowed a temperature probe to be placed in the left burr hole.

[Sandra's remarks: "I was within several inches of the burr holes throughout the entire procedure, and I never saw the surface of the brain through either burr hole. At no time was the brain seen to be extruding from the burr holes. Even several hours later when Dr. Wolvos expanded the view into the brain by clipping away

at the brain mantel with the rongeurs, I was not able to visualize the brain despite shining three different flashlights directly into the burr holes.]

- 0109 hrs Chest prepped with betadine by team member; tray opened.
- 0117 hrs Removal of sternal wires began.
- 0120 hrs Error message on computer: 201003@DAQmx  
Create channel (A1-temperature-thermocouple.vi:1  
(Picture of screen taken by Max)
- 0124 hrs Note: Need wire cutters.
- 0124 hrs Retrieved sternal saw; cutting performed by the surgeon.
- 0128 hrs Difficulty cutting wire sutures. Cut with wire snips.
- 0132 hrs Chest spread open. More ice bags placed on the patient.
- 0136 hrs The surgeon stated, “heart was stuck to the undersurface of sternotomy because of adhesions from previous surgery, and wire cutters cut through the heart.”
- 0138 hrs Now suctioning blood into container beneath O.R. table  
A call placed to Dr. S. Harris. After discussion, the decision was to access carotids.
- 0142 hrs Alcor’s CEO advised abandoning the computer system as the software was repeatedly sticking. The team was unable to return to the previous system without key member present. The team decided to change to a gravity based step ramp system due to the technical challenges.
- 0145 hrs The left jugular vein and left carotid artery were isolated.
- 0156 hrs The right jugular vein and right carotid artery were isolated.
- 0159 hrs Isolation was completed.
- 0200 hrs More ice bags were placed on the patient.
- 0203 hrs The probes were changed. And a probe was added to the burr holes.
- 0206 hrs (Burr holes 276 points) every 15 seconds (CCR Log-R) SR
- 0219 hrs Cannulated left carotid artery.
- 0222 hrs “Running”, per H. Hixon.

0224 hrs Changed thermocouple (temp. of fluid from bag to neck)

0227 hrs Bag #1 was out. Bag #2 on.

0232 hrs Bag #3 was on – running a mix of bags #2 and # 3.

0234 hrs Samples of effluent from jugulars:  
Refractometer Left: 12.6. Right: 12.0.

0240 hrs Ran bags #3 and #4.

0242 hrs Could not visualize if the brain was retracting.

0243 hrs Bag #3 was finished.

0245 hrs The brain appeared significantly retracted on the left side.

0247 hrs The brain appeared the same on the right side.  
As per the surgeon, “the brain was previously retracted upon completion of the burr holes”.

0248 hrs Refractometer readings: Right: 15.9. Left 17.0.

0254 hrs Bags #5 and #6 were running.

0257 hrs Bag #5 was out.

0258 hrs Running on Bag #6 only.

0300 hrs Refractometry readings: Right = 18.5 and Left = 14.1.

0303 hrs Now running bags 6 & 7.

0306 hrs Bag #6 off; started Bag #7.

0307 hrs Refractometer readings re-done. Corrected: Right side = 37.6 and left side = 36.7.

0309 hrs Refractometry readings: Right = 28.2 and left = 38.6.

0313 hrs Refractometry readings: Right = 34.6 and left = 33.7.  
Now on bags #7 and #8.

0316 hrs Bag #7 finished; Bag #8 was started.

0318 hrs Drew sample refractometry readings: Right = 32.9 and left = 36.9.

0323 hrs Replaced BH and NP DuaLogR to new DuaLogR #2.  
(the battery in the DuaLogR #1 was running down; was labeled).

0324 hrs DuaLogR #2 was running.

0329 hrs Refractometry readings: Right = 45.3 and left = 44.6.

0344 hrs Started Bag #9. Refractometer readings: Right = 54.1 and left = 53.7.

0352 hrs Bag #8 was finished; Bag #9 running.

0355 hrs Refractometer readings: Right = 54.4 and left = 54.8.

0357 hrs Removed ice bags.

0416 hrs Bag #9 finished, samples taken. Refractometer readings: Right = 56.0 and left = 54.3.

0429 hrs Prepared patient for transfer.

0456 hrs Hoisted patient and then lowered him into the cool-down box.

## 8. Issues & Actions

### LOGISTICS

**Issue:** Delay in starting stabilization due to Code Blue and full resuscitation status.

**Corrective action:** None. The family desired extraordinary measures and for resuscitation to be applied.

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**Issue:** The protocol calls for a minimum of two IV or IO access points. Initially, only the PICC line was used. Earlier placement of IO port would facilitate faster medication administration.

**Corrective action:** Re-education and training.

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### STABILIZATION

**Issue:** Unfamiliarity with a new temperature logger resulted in the perfusion data loggers being shut off.

**Corrective action:** Video and hands-on re-training on how to use the new temperature loggers.

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**Issue:** Maalox not given because there was no airway and the esophageal tube was not placed.

**Corrective action:** Maalox could have been delivered through PEG tube. Remind team members to use PEG access if available, include in training update materials.

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**Issue:** Only 100 mg of Propofol was given instead of a full dose of 200 mg.

**Corrective action:** In-service all team members on administering a full dose of “fixed dose” medications.

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**Issue:** Significant perfusate loss on high flows limited cooling time on recirculation.

**Corrective action:** Request perfusion contractor provides immediate in-service to perfusionists and surgeons on perfusion/perfusate management for cooling.

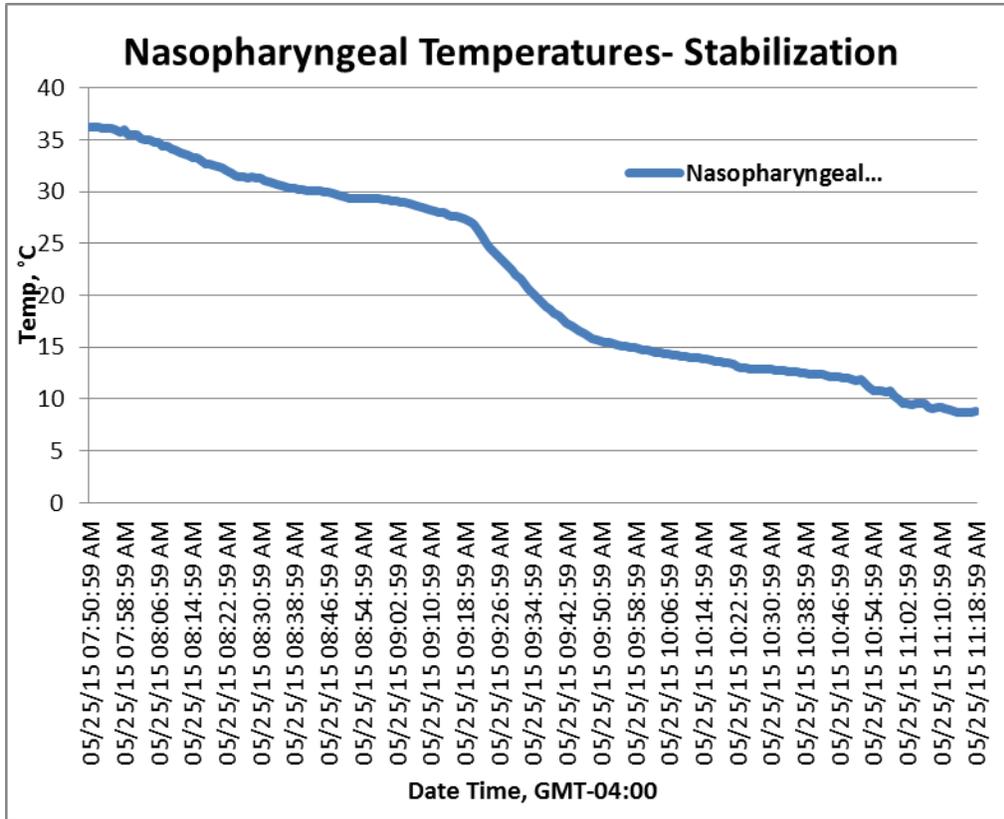
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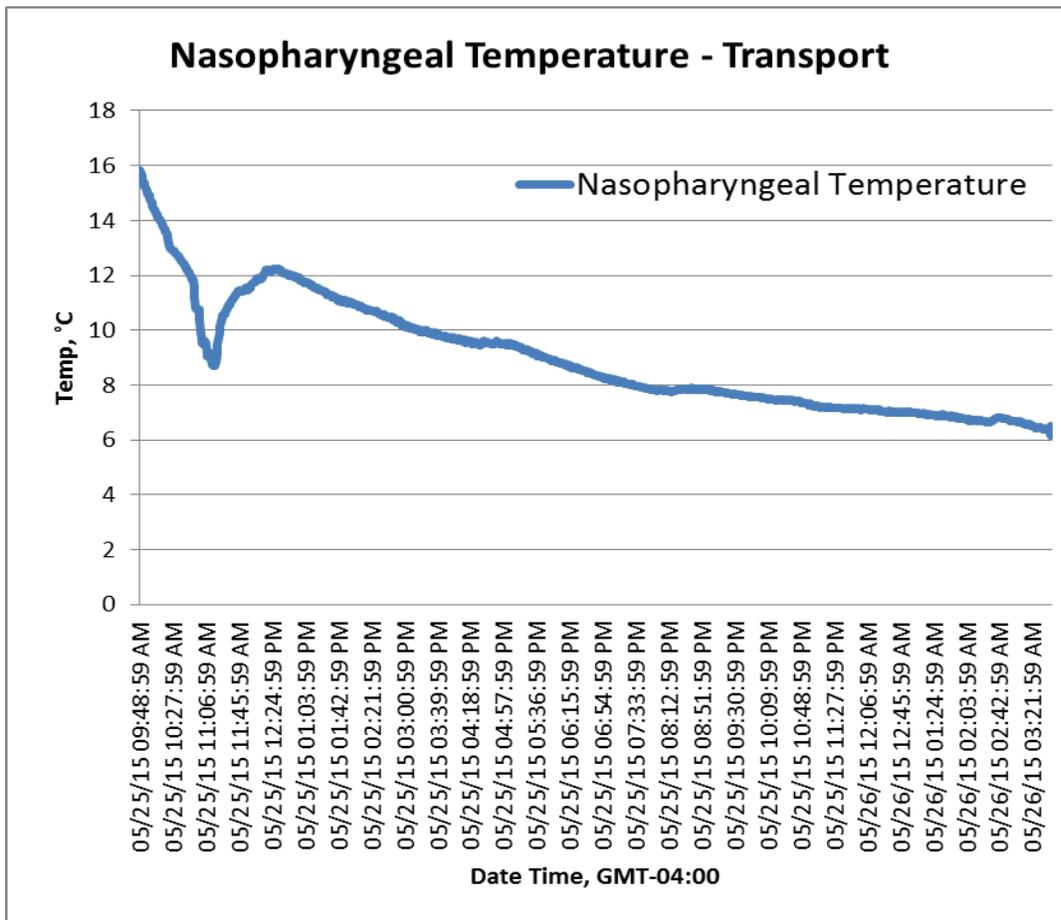
### **TRANSPORTATION**

**Issue:** Delay in transportation due to holiday schedule and funeral director’s lack of HR shipping account with Southwest Airlines.

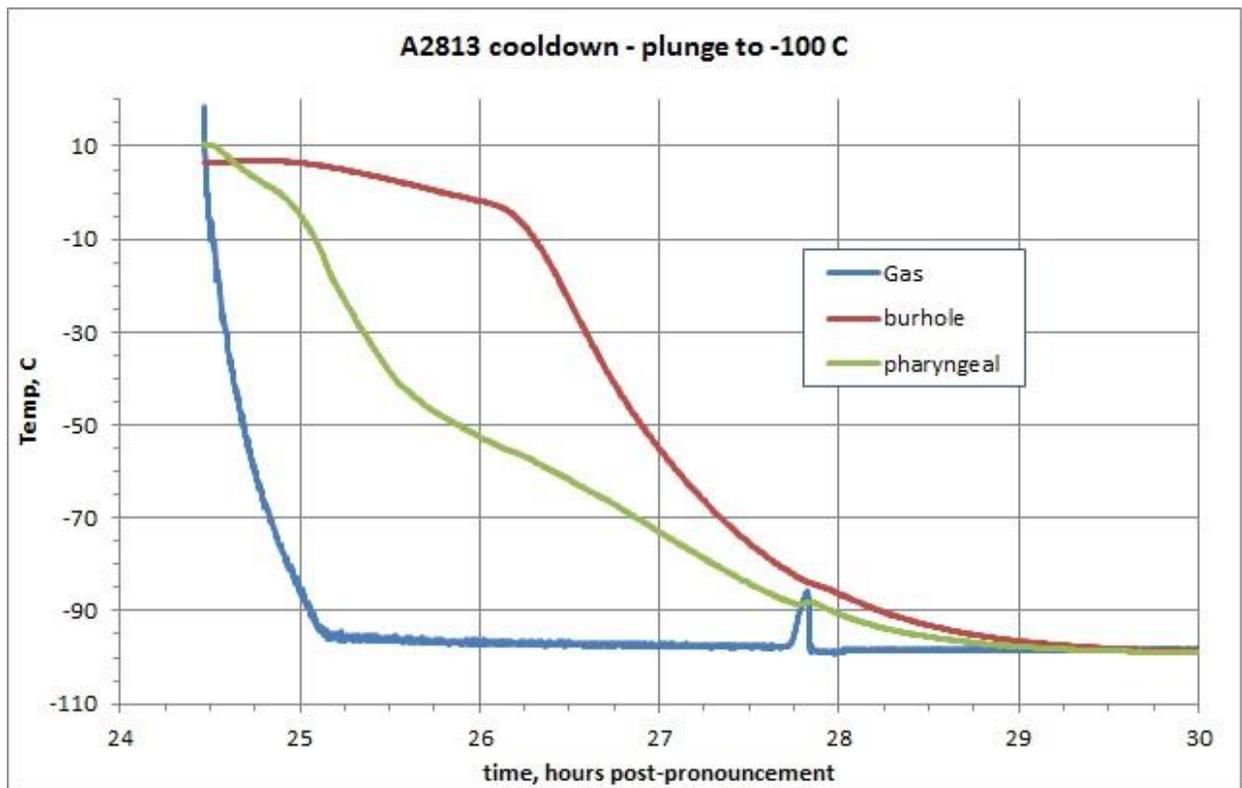
**Corrective action:** Clarify with funeral directors to see if they have accounts with all major airlines for shipping. Fort Lauderdale funeral director will acquire Southwest Airlines account.

### 9. Graphs





Cooling to -100° C



--End of report--