Alcor A-3660

Case Report

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1. Summary

Information was derived from multiple sources and was all converted to Mountain Standard Time (MST). For de-identification, dates are not shown. T-0 represents the date of cardiac arrest, T-X represents occurrences before T-0, and T+X represents occurrences following T-0.

A-3660 was a 71-year-old member with whole-body cryopreservation arrangements. The member was admitted to hospital for pneumonia. The cause of death shown on the death certificate was acute hypoxemic respiratory failure subsequent to pneumonia. Cardiac arrest was estimated to be at 03:45 hrs on T-0 days and the member was pronounced legally deceased in Florida at 03:49 hrs on T-0 days in December of 2023.

After stabilization and field cryoprotection without cephalic isolation (this was a neuro-on-whole-body field cryoprotection procedure), the patient was air transported to Alcor for cryogenic cooldown. The patient arrived at Alcor on T+4 days at 21:54 hrs. The cryogenic cooldown was initiated on T+4 days at 22:43 hrs and terminated on T+8 days at 16:39 hrs. The patient was transferred to long-term care at liquid nitrogen temperature on T+11 days at 14:26 hrs.

2. Patient Assessment

T-7 days

This member had not been on the Alcor Watch List. The member's family contacted Alcor at 14:12 hrs that the member was in the hospital with difficulty breathing.

With little history on the member, Alcor's Chief Medical Advisor (CMA) contacted the member's physician to request additional information. The member was undergoing a procedure, and the CMA was told there would be daily updates.

T-6 days

The member had respiratory issues that were thought to be due to extra fluid in the lungs, causing difficulty with breathing. The member was placed on oxygen. The member was given Lasix to remove fluid from the lungs and this did result in making it easier to breathe. The member had been scheduled for a bone marrow biopsy, but this was cancelled because of the overall health condition.

The member was eating an enhanced fluid diet. The member had several pressure ulcers, which is an indication of the member's poor condition. The member's status was "Do Not Resuscitate" (DNR), but otherwise, the family wanted the member to receive as much supportive care as possible.

T-5 days

X-rays were taken, showing consolidation in the lungs, indicating pneumonia. An infectious disease doctor was consulted to see if the member's antibiotics needed to be adjusted. The antibiotics were changed (but not recorded). Overall, the member still had moderate respiratory issues, but was stable.

T-4 days and T-3 days

There were no changes and nothing to report on these two days.

3. Deployment

T-2 days

The patient was put into hospice care/comfort care in the hospital. The Alcor Deployment Committee called a Level-1 deployment. Later that day the hospital physician stated that the member was progressively deteriorating. The member was given fluid periodically to keep the blood pressure up. The hospital would support the member until the Alcor and SA teams could arrive and be in place. No aggressive treatment for the respiratory failure was being given, meaning the member could decline rapidly.

Both the Alcor DART team and the contractor, Suspended Animation (SA) in California, were deployed. At 12:08 hrs SA deployed their contract perfusionist and surgeon, who were expected to arrive on location at 22:00 hrs. Two DART team members booked flights to also arrive on location at 22:00 hrs. SA's perfusion equipment was shipped from their Florida offices to arrive on location at 22:20 hours.

T-1 days

A third DART team member arrived at 05:09 hrs. The luggage with the portable ice bath (PIB) was delayed until 10:00 hrs. A cooperative funeral home was located and contracted. Dry ice was sourced and secured.

4. Standby

At 08:31 hours the member was placed on morphine for pain control with a prognosis of respiratory failure and not being responsive to the antibiotics, and possibly going into cardiac arrest within the hour.

At 12:41 hrs it was learned from the funeral director that the county in which the member was located was the only county in the state to require a medical examiner (ME) to authorize the transit permit, and the ME's office would be closed the next day for the Christmas holiday. No exceptions would be granted. A private charter flight was arranged as backup to commercial air cargo but was not needed in the end.

After discussing the situation, Alcor's Director of Development (DOD) and one of Alcor's Co-CEOs agreed that the prolonged delay required that in order to do the best possible cryoprotectant perfusion for this member, the procedure in the field would need to be a neuro-on-whole-body field cryoprotection without cephalic isolation. Patient transport would be on dry ice via commercial air cargo or ground transportation depending on weight restrictions at air cargo) when the transit permit was signed.

At 16:07 hrs, all remaining equipment had arrived and was stored in the hospital room.

T-0 days

At 02:06 hrs the DART team was notified by the hospital nurse that the member was in the active stage of dying. The member was pronounced legally deceased at 03:49 hrs. Cardiac arrest was estimated to be at 03:45 hrs.

At 04:00 hrs the team learned that the hospital would only allow people to enter the hospital through the emergency room (ER) with a security escort, which caused a delay (see the Discussion section).

5. Patient Recovery and Stabilization

As there were multiple team members, many stabilization procedures could be accomplished at the same time. The patient was placed into the portable ice bath (PIB) to start external cooling at 04:30 hrs and 250 lbs. of water ice were added around the patient. The patient's peripheral I.V. catheter placed earlier by the hospital was used to access the patient's vasculature for the administration of the stabilization medications. The first stabilization medication was administered at 04:30 hrs (see the below Table of Medications Administered for the names of the medications, the dosages, and the times of administration).

The surface conduction cooling device (SCCD) with face mask was placed on the patient and circulation of the ice water over the patient was started to improve external cooling at 04:30 hrs. Manual chest compressions were started at 04:33 hrs to circulate the medications. Using the ROS-Q mechanical chest compression device, mechanical cardiopulmonary support was started at 04:33 hrs. Manual ventilation was started at 04:37 hrs. The battery for the transport ventilator would not charge, so the patient was ventilated with a bag-valve mask. This was continued until the stabilization medications had been administered at 04:53 hrs.

A King airway was placed in the trachea at 04:34 hrs and antacid was administered to protect the stomach at 04:40 hrs. Thermistors were placed in the patient's nares at 04:39 hrs to measure the nasopharyngeal temperatures. Swimmer wax was placed around the thermistors to prevent ice water from entering the nares and corrupting the temperature data. The right nasopharyngeal temperature (NPT) was 33°C and the left nasopharyngeal NPT was 34°C.

After stabilization was complete, the transport of the patient to the funeral home (for surgery and cryoprotectant perfusion) was initiated at 04:49 hrs.

6. Field Surgery

The patient arrived at the funeral home at 05:20 hrs. Mechanical chest compressions were terminated at 07:50 hrs in order to start surgery, which commenced at 07:51 hrs (see the Discussion section).

The left carotid artery was cannulated at 08:15 hrs with an 18 Fr, right angle cannula. The right carotid artery was cannulated at 08:27 hrs with an 18 French (Fr), right-angle cannula. The right jugular vein was perforated and isolated with surgical ribbon to obtain refractive index (RI) readings from the effluent. The left jugular vein was left intact. As the cephalon was not isolated, the vertebral arteries could not be cannulated, nor could the completeness of the Circle of Willis be determined.

7. Field Cryoprotectant Perfusion (FCP)

The open circuit, gravity-induced cryoprotectant perfusion was initiated at 08:28 hrs using Bladder #1, containing nM22 cryoprotectant with a concentration of 0.05 CNV and a molarity of 0.47. See the below Table of Concentrations (Brix) of nM22 Solution, for the times the bladders were started, the precalculated concentrations of each bladder, and the refractive index of effluent samples taken.

Sidebar:
The gravity feed system for FCP uses a tripod that can be adjusted for height to control the arterial pressure. The pre-mixed cryoprotectant was in a series of bladders with graduated concentrations [measured by the refractive index (RI) in Brix units].

By hanging two bladders with different cryoprotectant concentrations on a teeter-totter atop an elevated tripod, a smoother transition of increasing concentrations of cryoprotectant can be achieved. The first bladder was hung and opened to flow, and the second bladder was opened when the first bladder was about half empty. The third bladder was hung when the first bladder was empty and opened when the second was about half empty, and so on.

The height of the bladders on the teeter totter was 39 inches which is (39 x 2.054 mmHg per inch of height =) 80 mmHg, the maximum arterial pressure at the infusion site. The goal is to have the pressure between 70 and 80 mmHg and the bladders can be raised or lowered as needed to optimize flow and protect the vasculature.

Using a Codman perforator, the burr hole was drilled at 08:33 hrs. A thermocouple was placed into the burr hole to measure brain temperature.

Ethylene glycol antifreeze at 50/50 concentration was added to the water in the heat exchanger at 09:10 hrs to produce temperatures below 0°C, and the 30-minute pause for equilibration was initiated.

Sidebar:
Per the cryoprotection protocol, the ramp is to be paused at 30 Brix (approximately 50% of the desired terminal concentration of 52.5 Brix) to allow the patient to come to osmotic equilibrium. <u>When the bladder system is used, bladders 5 & 6 represent the pause.</u> At the end of the 30-minute pause, the ramp is resumed at the maximum addition rate (maximum without

losing total volume in the circuit) to go to 105% of the desired end concentration (49.9 Brix x 105% = 52.5 Brix) and held between 102% and 105% concentration until the terminal concentration is obtained.

The field cryoprotectant perfusion was terminated at 11:50 hrs. The terminal refractive index reading was 37.7 Brix, and a molarity of 9.91. (see the Discussion section).

The patient was moved into the dry ice shipper at approximately 11:54 hrs, and covered with approximately 500 lbs. of dry ice.

8. Patient Transport

T+1, T+2, and T+3 days

The patient was kept on dry ice at the funeral home awaiting the transit permit. The DART team checked dry ice levels every 12 hours and topped off as needed. A total of 900 lbs. of dry ice was utilized.

T+4 days

The DART team departed from funeral home at 08:30 hrs. The shipper was left at the airline cargo department at 10:30 hrs. The right NPT was -60°C and the left NPT was -65°C, but the datalogger had been damaged (see the Discussion section), so this temperature may not be correct. The burr hole temperature probe was not able to obtain a reading.

9. Cooling to Liquid Nitrogen Temperature

The patient arrived at Alcor at 21:20 hrs. The NPT was -80°C.

Computer-controlled cryogenic cooldown was initiated at 22:43 hrs on T+4 days, plunging to -80°C and descending thereafter at -1°C/hour to liquid nitrogen temperature. On T+8 day at 16:39 hrs, an uneventful cooldown was terminated. On T+11 days at 14:26 hrs, the patient was transferred to long-term care at liquid nitrogen temperature.

10. Timeline and Time Summaries

Timeline

T-0	03:45	Time of cardiac arrest
T-0	03:49	Pronouncement of legal death
T-0	04:30	Hospital central line left in place
T-0	04:30	Start of ice bath cooling
T-0	04:30	Start of manual chest compressions
T-0	04:33	Start of mechanical chest compressions
T-0	04:34	Placement of King airway
T-0	04:30	Administration of first medication (propofol)
T-0	04:43	Administration of final medication (Deca-glycerol/THAM)
T-0	04:49	Start transport of patient to mortuary
T-0	05:20	Arrive at funeral home
T-0	07:50	End cardiopulmonary support (20°C)
T-0	07:51	Start of field surgery
T-0	08:33	Drill burr hole and place thermistor (end of surgery)
T-0	08:28	Start field cryoprotection (FCP)
T-0	09:10	Start 30-minute pause for equilibration (bags #6 & #7)
T-0	11:50	End of field cryoprotection (FCP) (final RI 37.7 Brix)
T-0	11:54	Start of dry ice cooling
T+1	10:20	Dry ice temperature achieved (24 hours estimate)
T+1	10:30	Arrival of patient at cargo dept/airport
T+4	21:54	Arrival of patient at Alcor (NPT -80°C)
T+4	22:43	Start of patient cryogenic cooldown
T+8	16:39	End of cooldown
T+11	14:26	Transfer of patient to long-term care at LN2 temperature

Time Summaries

Event Duration hr:min		days	time	
00:04	From: Till:	T-0 T-0	03:45 03:49	Time of cardiac arrest Pronouncement of legal death
00:45	From: Till:	T-0 T-0	03:45 04:30	Time of cardiac arrest Start of manual chest compressions
00:45	From: Till:	T-0 T-0	03:45 04:30	Time of cardiac arrest Administration of first medication (propofol)
00:13	From: Till:	T-0 T-0	04:30 04:43	Administration of first medication (propofol) Admin of final medication (Deca-glycerol/THAM)
04:06	From: Till:	T-0 T-0	03:45 07:51	Time of cardiac arrest Start of field surgery
00:42	From: Till:	T-0 T-0	07:51 08:33	Start of field surgery Drill burr hole and place thermistor (end of surgery)
04:43	From: Till:	T-0 T-0	03:45 08:28	Time of cardiac arrest Start field cryoprotection (FCP)
03:22	From: Till:	T-0 T-0	08:28 11:50	Start field cryoprotection (FCP) End of field cryoprotection (FCP) (final RI 37.7 Brix)
08:05	From: Till:	T-0 T-0	03:45 11:50	Time of cardiac arrest End of field cryoprotection (FCP) (final RI 37.7 Brix)
00:42	From: Till:	T-0 T-0	07:51 08:33	Start of field surgery Drill burr hole and place thermistor (end of surgery)
00:37	From: Till:	T-0 T-0	07:51 08:28	Start of field surgery Start field cryoprotection (FCP)
03:59	From: Till:	T-0 T-0	07:51 11:50	Start of field surgery End of field cryoprotection (FCP) (final RI 37.7 Brix)
03:26	From: Till:	T-0 T-0	08:28 11:54	Start field cryoprotection (FCP) Start of dry ice cooling
08:09	From: Till:	T-0 T-0	03:45 11:54	Time of cardiac arrest Start of dry ice cooling
114:09	From: Till:	T-0 T+4	03:45 21:54	Time of cardiac arrest Arrival of patient at Alcor (NPT -80°C)
00:49	From: Till:	T+4 T+4	21:54 22:43	Arrival of patient at Alcor (NPT -80°C) Start of patient cryogenic cooldown

11. Table of Medications Administered

T-0 days

TIME	MEDICATION	DOSE	PURPOSE
04:30 hrs	Propofol	200 mg	Anesthetic; reduces cerebral metabolic demand; reduces the theoretic possibility of increased awareness during aggressive CPS.
04:33 hrs	Sodium citrate	20 g Note 1	Anticoagulant; prevents blood clot formation.
04:34hrs	Heparin	50,000 IU	Anticoagulant; prevents blood clot formation.
04:34 hrs	Vasopressin (1st dose)	40 IU Note 2	Vasopressor; increases blood pressure during CPS.
04:35 hrs	Minocycline	200 mg	Antibiotic and neuroprotectant
04:35 hrs	SMT (S-methyl-isothiourea)	400 mg Note 3	Neuroprotectant (iNOS inhibitor); protects the brain from ischemic injury; raises blood pressure.
04:38 hrs	Decaglycerol/THAM	200 ml Note 4	Decaglycerol inhibits cerebral edema.
04:40 hrs	Antacid	250 ml Note 5	A buffer used to neutralize stomach acid.
04:40 hrs	Vasopressin (2nd dose)	40 IU Note 2	Vasopressor; increases blood pressure during CPS.
04:40 hrs	Vital Oxy (w/ saline)	70 mL Note 6	Antioxidants: melatonin, vitamin E (D-alpha tocopherol), PBN (alpha Phenyl t-Butyl Nitrone) and anti-inflammatory carprofen.
04:43 hrs	Decaglycerol/THAM	200 ml Note 4	Decaglycerol inhibits cerebral edema.
08:28 hrs	Streptokinase	250,000 IU Note 7	A thrombolytic used to break up existing blood clots.

Notes:

1. The standard formulation for sodium citrate is 20% w/v, in sterile packaging provided by the manufacturer. 10 grams of sodium citrate are given to patients who weigh less than 40 kg, and 20 grams are given to patients who weigh over 40 kg. This patient weighed 136 kg and therefore received 20 grams of sodium citrate.

2. Vasopressin is a fixed dosage of 40 IU, per dose for two doses. The second 40 IU dose is to be administered concurrently with Vital-Oxy, I.V. Vasopressin is to be administered only if the patient's temperature is above 20°C as it is ineffective at cold temperatures.

3. SMT (S-methyl isothiourea) is a powder, (1 vial = 400 mg) dissolved in 10 mL of saline and injected through a 0.2 µ filter. SMT is unstable in solution with a use life of approximately six hours.

4. Decaglycerol/THAM is administered as a custom formulation of 20% w/v decaglycerol and 4.5% w/v THAM (tromethamine) in water (pH = 10.4 and pKa = 8.3). It is a fixed dose of 200 ml.
5. An antacid can be given in several doses, totaling 250 mL, and inserted through the nasogastric tube in an airway.

6. The medications protocol dilutes 70 mL or less, based on body weight, of Vital-Oxy into 150 mL of saline for a total of 220 cc of diluted Vital-Oxy saline. Each mL of Vital-Oxy contains 194 mg Sigma Cremophor EL (or Sigma Kolliphor EL), 155 mg ethanol, 19.4 mg PBN, 3.24 mg carprofen, 1.55 mg melatonin, and 198 IU vitamin E (see the Discussion section).

7. The standard administration of streptokinase is 250,000 IU fixed dose, dissolved in 5 mL of 9% sodium chloride, to be added to the blood washout solution prior to remote blood washout, or to the first cryoprotection flush in the OR. The dosage is reduced to 25,000 IU in field neuro (FCP) cases and added to the first bladder). This medication previously needed to be infused through a 0.2 µ filter. The medication now in use is already sterile-filtered and can be reconstituted in the vial.

12. Table of Concentrations (Brix) of nM22 Solution

A-3660 step-ramp, nM22									
Preferred endpoint is over 49.9 Brix from both jugulars for 1/2hr									
2L Bag label number	**[nM22], CNV**	**Molarity of penetrating CPAs***	**Brix (calc)**	**Bag start hh:mm, MST**	**hrs post pronounc-ement**	**Bag avg. flow rate, mL/min**		**Sample time hh:mm, MST**	**Effluent Conc., Brix**
1	0.05	0.47	11.81	8:28	4.65	285.7		8:44	10.6
2	0.08	0.78	13.14	8:35	4.77	222.2		8:50	11.1
3	0.14	1.29	15.35	8:44	4.92	333.3		8:58	12.6
4	0.23	2.15	19.03	8:50	5.02	333.3		9:20	26.8
5	0.50	4.67	29.85	8:56	5.12	166.7		9:35	33.9
6	0.50	4.67	29.85	9:08	5.32	166.7		9:52	29
7	1.06	9.91	52.306	9:20	5.52	133.3		10:18	34.3
8	1.06	9.91	52.306	9:35	5.77	117.6		11:03	34.5
9	1.06	9.91	52.306	9:52	6.05	76.9		11:20	35.1
10	1.06	9.91	52.306	10:18	6.48	62.5		11:32	33.9
11	1.06	9.91	52.306	10:50	7.02	153.8		11:47	36
12	1.06	9.91	52.306	11:03	7.23	117.6			
13	1.06	9.91	52.306	11:20	7.52	166.7			
14	1.06	9.91	52.306	11:32	7.72	111.1			
15	1.06	9.91	52.306	11:50	8.02	80.0			
END				12:15	8.43				
* does not account for concentration of non-penetrating CPAs									

13. Discussion

Standby and Stabilization

Because the ventilator battery failed, a bag-valve mask was used. There is nothing to be corrected here as the bag-valve mask is the solution for a failed ventilator. This is why they are brought on every case.

Transport data was rendered unreliable for three reasons. First, was the use of an unknown thermocouple type with a T-type logger. The Alcor standard is T-type owing to its high accuracy and repeatability at cryogenic temperatures. Second, temperatures reported by the field team cannot be considered as accurate either due to this issue. The thermocouple probes used in this case were sourced from a hardware store near the funeral home, and the team was not aware of the incompatibility. Third, exposure to environmental temperatures caused the data logger to freeze, resulting in no graphs of field data being possible. This problem was addressed by increasing the scrutiny of the field kit review procedure to ensure all equipment is included.

DART confirmed that they spoke with hospital administration, security, and the medical team to request rapid entrance to the hospital at any time of day or night. Though extensive efforts were made to ensure access to the patient would be rapid at or prior to time of cardiac arrest, as well as change in shifts for staff, the team was delayed in entering the hospital due to closed entrances for the holidays and the hours of operations during the early morning time of cardiac arrest. The hospital front entrance was closed when the DART team arrived. DART had to find the number to the security team to gain access. Once the security guard arrived, they were transported via golf cart to a rear entrance of the hospital to gain access to the patient. They needed security escort the entire way to the ICU.

Cryoprotectant Surgery and Perfusion

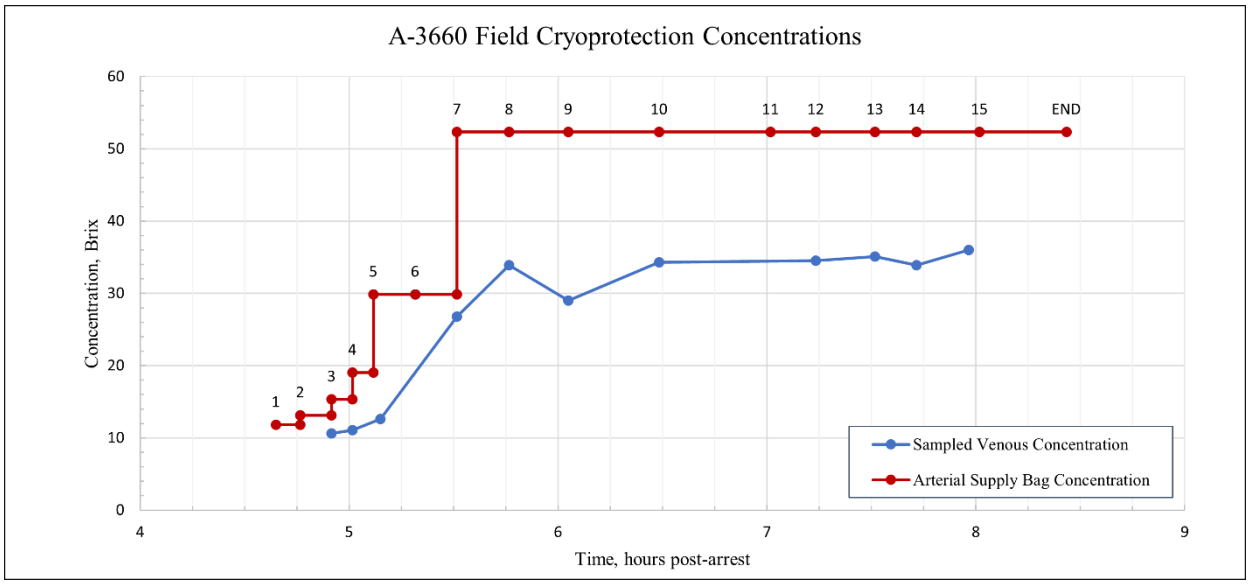
The cryoprotectant perfusion was ended with a terminal refractive index (RI), as measured in the effluent, of only 37.7 Brix. Cryoprotectant perfusion was terminated before the 3-hour (from the pause for equilibration) limit to perfusion time to limit cryoprotectant toxicity.

Cryogenic Cooldown

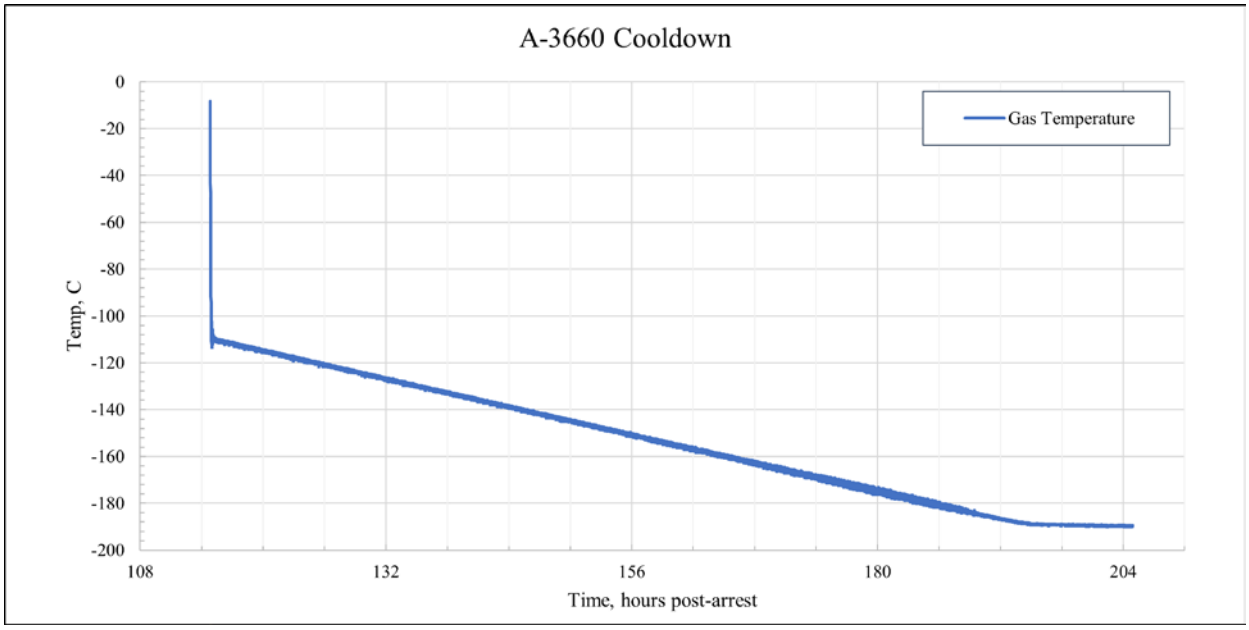
Upon arrival of the patient, the cooldown team discovered that the temperature probes were not T-type. They were incompatible with the on-site data loggers and the cooldown system, so the team was not able to acquire arrival temperatures or connect the patient probes to the cooldown system. The cooldown was otherwise uneventful.

14. Cryoprotection and Temperature Graphs

Due to a failure in the data logger related to environmental temperature causing the data logger to freeze, the field temperature data for this case was unfortunately unrecoverable, resulting in no graphs of field data being possible (see the Discussion section).



Despite running the entire step ramp bag set with good flow indication, the measured effluent concentration never exceeded 36 Brix. It is not known whether this represents the actual effluent concentration or if it is due to equipment failure or sampling of non-effluent liquid. An ex-situ CT scan of the patient, currently not scheduled, will provide insight into this question.

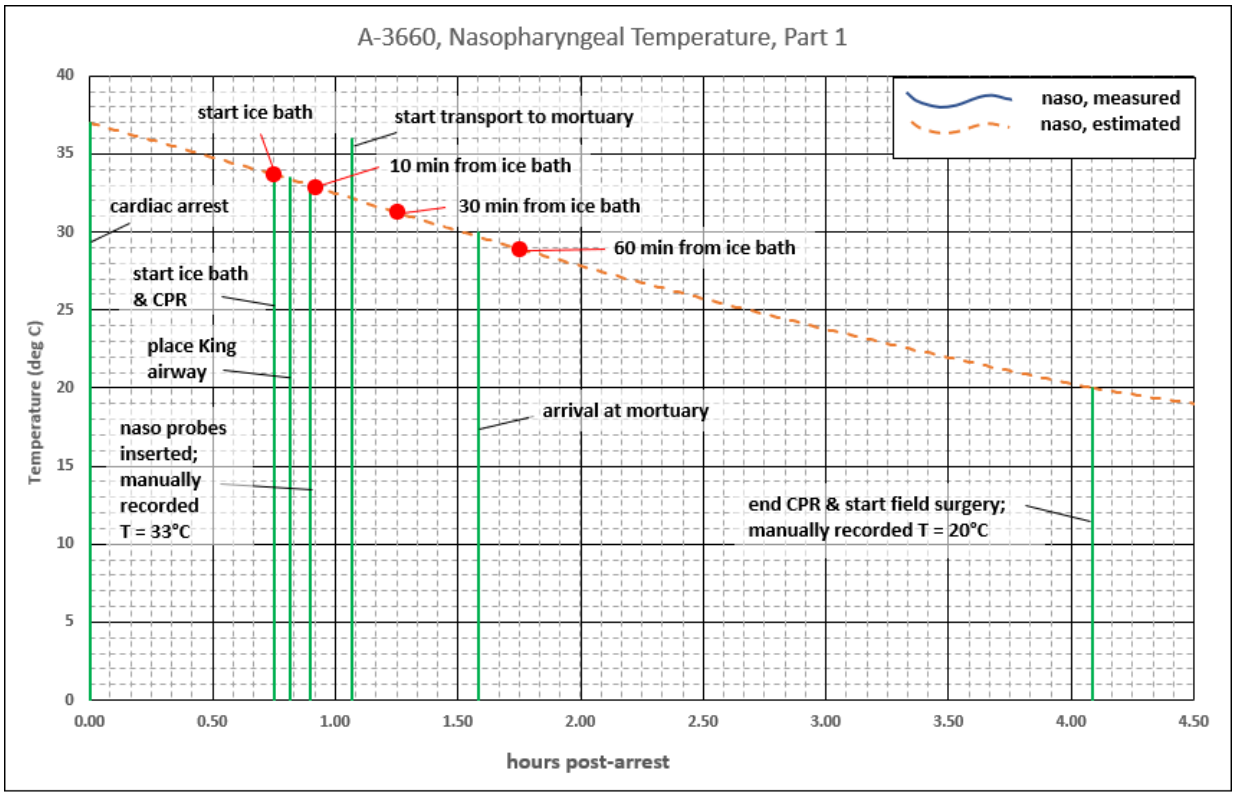


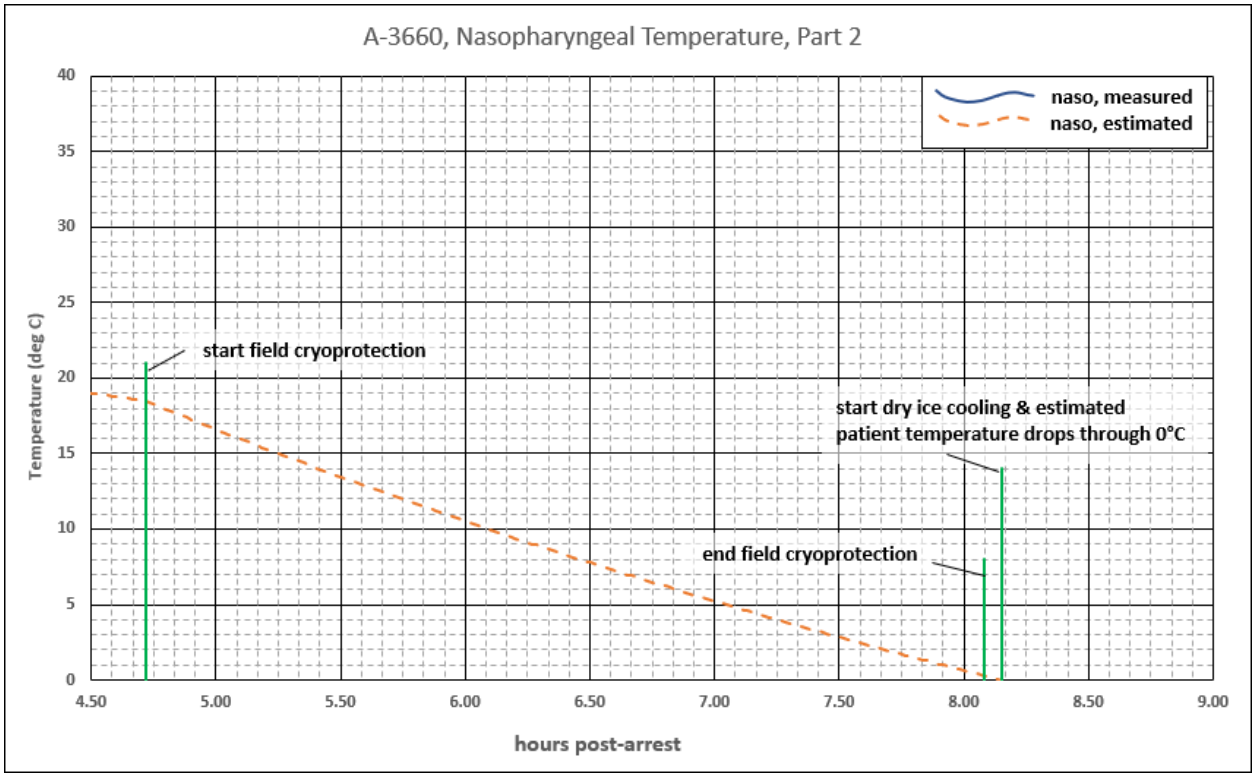
15. S-MIX

The Standardized Measure of Ischemic Exposure (S-MIX) expresses the total ischemic exposure prior to the start of cryogenic cooling as the equivalent duration of normothermic ischemia. An S-MIX of 00:00 (hh:mm) is the ideal case of no ischemic damage. The higher the S-MIX time, the more damage. Factors that improve the S-MIX, and that are quantitatively accounted for in the below table are: shorter times at higher temperatures, ventilation during cardiopulmonary support (CPS), and oxygenation during blood washout. The duration from cardiac arrest to 0°C is 08:09. As shown below, and due to lowering of the body temperature, S-MIX duration is shorter, at 02:13.

event	segment #	days (T+X)	time (MST) duration	post-arrest	Tnaso (deg C)	CPS w/ ventil.	washout oxygen.	S-MIX (hh:mm)
Cardiac arrest		T-0	03:45	00:00	37.0			
	seg 1		00:45	00:45	-3.3	no	no	00:40
Start ice bath cooling & chest compressions		T-0	04:30	00:45	33.7			
	seg 2		00:04	00:04	-0.3	no	no	00:03
Placement of King airway		T-0	04:34	00:49	33.4			
	seg 3		00:05	00:05	-0.4	yes	no	00:02
Naso probes inserted		T-0	04:39	00:54	33.0			
	seg 4		00:10	00:10	-0.8	yes	no	00:04
Start transport of patient to mortuary		T-0	04:49	01:04	32.2			
	seg 5		00:31	00:31	-2.5	yes	no	00:10
Arrive at funeral home		T-0	05:20	01:35	29.7			
	seg 6		02:30	02:30	-9.7	yes	no	00:32
End CPR & start of field surgery		T-0	07:50	04:05	20.0			
	seg 7		00:38	00:38	-1.5	no	no	00:11
Start field cryoprotection		T-0	08:28	04:43	18.5			
	seg 8		03:22	03:22	-18.2	no	no	00:30
End field cryoprotection		T-0	11:50	08:05	0.3			
	seg 9		00:04	00:04	-0.3	no	no	00:00
Start dry ice cooling		T-0	11:54	08:09	0.0			
totals:			08:09	08:09	-37.0			02:13

The below plots show events related to the S-MIX calculation. Datalogger temperature data was not available for this case and so two key, manually recorded temperatures (noted on the plot) were used to construct the estimated time vs temperature decline. The red dots can be used to construct a metric for how fast the patient is initially cooled (see the Patient Cooling Rate table below). This is a critical period since body temperature is highest and ischemic damage most rapid.

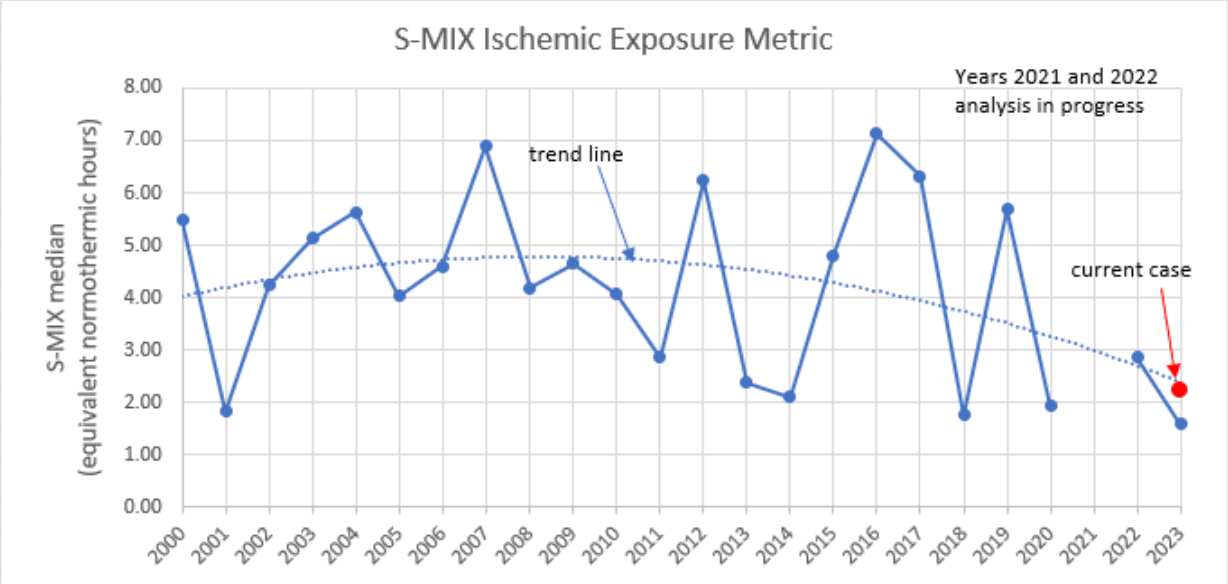




The below table provides cooling data for 10, 30, and 60 minutes after the team first applies water ice.

Patient Cooling Rate			(patient weight 136 kg; 300 lb)	
Note: time = 0 at start of ice bath	0 min elapsed	10 min elapsed	30 min elapsed	60 min elapsed
Naso temperature (°C)	33.7	32.9	31.3	28.9
Temperature drop (°C) from t = 0	0.0	-0.8	-2.4	-4.8
Cooling rate (°C/min) from t = 0	N/A	-0.08	-0.08	-0.08

The following plot shows the trend of S-MIX achieved since 2000.



16. CT Scans

Cryoprotectant Distribution (Post-cryopreservation CT scan)

Because this was a whole-body cryopreservation, no post-cryopreservation CT scans were obtained. When the in-house scanner is functional and whole-body patients are being scanned, additional information will be added to this report.