

ALCOR



LIFE EXTENSION FOUNDATION
The World's Leader in Cryonics

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ALCOR NEWS

A newsletter about Alcor and cryonics activities and developments

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December 2018/January 2019

CEO UPDATE

by Max More



The first major acquisition paid for by the remarkable and much appreciated \$5,000,000 research donation is a CT scanner. The Vimago High Definition CT arrived at Alcor on December 19. The resolution of the Vimago High Definition CT (HD CT) system is as high as 0.09mm x 0.09mm x 0.09mm (isotropic voxels, vastly higher spatial resolution than conventional CT).

As Steve Graber, Alcor's Chief Technical Coordinator wrote: "A big step forward for the Alcor CT Scan analysis program last year was the development of a CT color lookup table that allows us to now determine the overall perfusion level for each Alcor patient. This is the first time that we've been able to 'look inside' each patient's brain and assess perfusion success.

The list of uses for CT at Alcor range from interventional use, such as during a surgical procedure to ensure that cannulas are properly placed, performing before/after comparisons, visualizing perfusion of the brain and surrounding tissue in real-time, as well as for performing quantitative analyses of all of the past cryopreservations performed at Alcor over the years and into the future. This type of research can lead to a better understanding of the roles that time, distance, specific cause of death, surgical time and method, etc. have on the perfusability of the patient. With that knowledge we should be able to better understand how

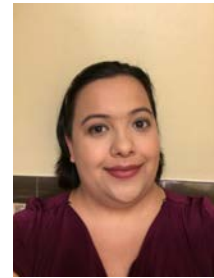
to improve our medical response to our members in a real and significant way." Along with all of Steve's work on this, Brian Wowk deserves mention for ensuring that this unit was the correct fit for us.

Referring to the photo, Steve Graber says: "Sharp eyed observers may notice a second (portrait) computer monitor in that shot. That is my new touch-screen interface to our recently updated LabView-based Perfusion Process Control system, and it's mated to a tiny, fanless, core i7 NUC style PC and a 70" 4K wall-mounted graphing and info monitor. We just got this up and running on our existing O.R. based 'neuro' system. On the same day the scanner was delivered actually."

NEWEST TEAM MEMBER

Administrative Assistant

Ashley Bettini joined Alcor in January 2019 as an Administrative Assistant. Her duties include assisting the Executive Administrator in filing paperwork, handling mail and emails, welcoming visitors to Alcor, and other administration work. Ashley graduated from Arizona State University with a Bachelor's degree in Nonprofit Organizational Leadership and Management in May 2018. She is originally from California and much of her experience is working in the nonprofit sector in various fields. She has volunteered in the medical field, animal sanctuaries, children's museum, and organized and ran a one day conference with fellow students while attending ASU.



ASK AN OFFICIAL

Your questions answered by an Alcor official

QUESTION: Why does it take so long for a case report to be published?



ANSWER: We really, really do *not* like to provide more than a short case summary until the final case report has gone through all the stages of reviewing and editing and all potential errors have been eliminated before the case report is published. The first step of writing an initial draft

can be strenuous and time-consuming. There is usually a tremendous amount of data to be gathered from multiple sources, such as field notes from the stabilization and transport and the OR scribe notes. That includes waiting for the report from our contractor for standby, stabilization, and transport. It also requires the lengthy process of reducing all those notes to the same format and converting times made in different time zones, during different parts of the case, into Mountain Standard Time (MST) so that the flow of events is consistent.

Next, the videos made during the case need to be viewed (this often requires many hours from multiple cameras) and making notes and comparing against the written timelines. At this point issues that need clarification will require that the sources are emailed and there is often a waiting time for the responses. Only after this information gathering is complete and integrated, which can take weeks, is a draft written.

Even when a draft is completed it is checked for technical details, typos and stylistic consistency; the in-house review at Alcor includes a minimum of four individuals. Finally, it is submitted to the Cases Group for final checks, comments, and suggested edits. It may be cleared by Cases in days but can stay there for weeks as several people may pose questions, ask for more detail, or have other input. Once *that* is done, it is published. All of this usually takes several months, partly because the reviewers all have their own jobs demanding their attention.

Having said that, we are now making real progress in catching up past case reports. Two reports have recently been published (with over a dozen still in the pipeline): A-3079, and Herbert Drazen, A-2887, both cases without cryoprotective perfusion.

MEMBERS IN THE NEWS

Two well-known Alcor members were in the news recently:



Longtime SF writer, astrophysicist, and Alcor friend Gregory Benford won the 2019 Robert A. Heinlein award. [Gregory Benford](#)

The award is bestowed for outstanding published works in science fiction and technical writings that inspire the human exploration of space. This award is in recognition of Benford's body of work, including his 32 novels, over 218 short stories, and many non-fiction articles. You can find a profile of Dr. Benford here: [Benford Profile](#)

Aubrey de Grey is known for his unrelenting and persuasive work to extend the human life span. It therefore surprised many when he made the first breakthrough in more than 60 years towards solving a well-known math problem by announcing a new solution to the so-called Hadwiger-Nelson

problem. What is that? Ask Google for an explanation.

IMPORTANT INFORMATION

HIPAA and POA forms

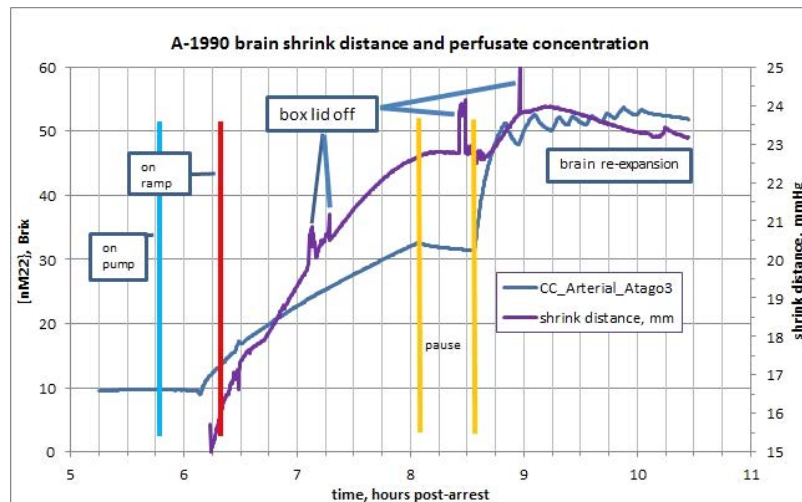


Many of our members have asked what they can do to facilitate communication with the medical community and the Alcor team when responding to a medical emergency. The Health Insurance Portability and Accountability Act or (HIPAA) forms and Power of Attorney or POA forms are a vital part of the process. It is important for members to reach out to their local hospitals to obtain HIPAA forms, fill them out but do not date them, and send the form to Alcor to be kept with their files. These forms will allow the Alcor team to communicate with the member's doctor or hospital if the need arises.

There is a DPOA form on the Alcor website <https://alcor.org/Library/html/medical-power-of-attorney-for-cryonics.html>

TECHNICAL UPDATE

By Steve Graber, Technical Coordinator



Graph credit - Hugh Hixon

Brain Retraction Measurement Device - Case Validation and Calibrated to mm

My Brain Retraction Detection Device (BRRD) which measures the contraction and expansion of the brain surface during cryoprotection directly below a burr hole, has been returning some interesting data. The output from the device is now calibrated so that we can derive a standardized reading in millimeters. In the attached graph (purple trace) you can see that the brain shrinks away from the device until the 30 Brix pause where it gains back some volume, then it shrinks again as we apply full ramp, until we stop adding cryoprotectant. At that point the brain begins to re-expand.

Process Chiller Upgrade to LN₂ Quad Valve

We had some LN₂ chiller solenoid valve failures recently, which led to a discussion about the use of a multi-redundant system. In my last board report I talked about how this quad valve system was designed in CAD. All of the components were ordered based on the CAD part numbers. With parts in hand, I completed the assembly and attached it to our existing process chiller. It worked right out of the box.



Neurocan CT Identification Ring

There have been times when I am analyzing CT scan data and find that it would be convenient to have the patient A-number visible within the DICOM series data. Using our new and nifty laser cutter I have started making ID rings out of acrylic showing the A-number. These fit into the bore of our neurocans.



Ice Bath Gurney Autoloader - Completion and First-Use Case Validation

I've added an autoloading ice bath gurney to our new response vehicle.

Prior to the outset of this project I had envisioned that the operator would push the gurney into the vehicle by hand, and at specific points they would need to manually pull levers that caused the gurney legs to collapse as it went onto the travel tray. This did not go as planned. During testing loaded with 600 lbs of ice the gurney was very difficult to push up the ramp into the vehicle. It was also discovered that pulling on a leg release lever at the wrong time with that much loaded weight could be disastrous, as the gurney would collapse right onto the ground. It was not usable in that condition.



To surmount these issues, I decided to add a powered winch to pull the gurney up the ramp into the vehicle coupled with switches mounted on the gurney legs that detect the position of the gurney on the ramp. The switches trigger solenoid actuators at the precise moment so that the holding pins are released and the legs fold up. In this way the gurney rolls onto the tray and this all happens with minimal user intervention. The user simply has to plug the coiled orange 12V DC power cord from the RV into the gurney and press the load button on the pendant controller. Unloading is very simple as the legs unfold and lock automatically on the way out. This system is much faster to load and unload than in our other response vehicle, and with the new gurney design the patient is now much more securely placed within the vehicle for travelling. The system was validated during our response to A-3152 after we met our team members with the patient (flown on wet ice) at the Scottsdale Airport, transferred the patient on ice from the airplane onto the gurney, then used the autoloader to place the patient into the response vehicle. It worked well.

MEDICAL RESPONSE DIRECTOR

The ROSC-U Miniature Chest Compressor, by Christopher Divver

During the debrief of recent cases, a gap in our stabilization, stand-by, and transport (SST) service delivery was identified by the Alcor staff. This gap occurred when the Lucas2, manual cardiopulmonary support (CPS) device ceased operation after roughly 45-minutes of use. Fortunately, in each of these cases, the patient was at the Alcor facility when the device ceased operation and had reached optimal presurgical temperature. Despite having purchased two new batteries, on the very next case the device automatically shut-down after 45-minutes of use without an audible or visual warning; contrary to the Lucas2 literature. Having identified this gap, the decision was made to explore alternative products that would better meet our SST requirements.



Steve Graber, Alcor's Technical Coordinator, and Chris Divver, Alcor's Medical Response Director, attended the Air Medical Transportation Conference in Phoenix in October 2018 to speak with the manual cardiopulmonary resuscitation (CPR) device representatives. During this conference we were introduced to the ROSC-U™ Miniature Chest Compressor manufactured by Resuscitation International.

The ROSC-U device has several enhancements over the Lucas2 device with one significant difference: the battery will last over 3 hours! According to their website: the *lithium iron phosphate batteries can exceed fifteen hundred charge/recharge cycles where other battery types are limited to 200 - 300 hundred cycles, retain eighty percent of its charge after one year of non-use, and provides approximately three hours of CPR device use per charge.*

From the Physio-Control website: *The LUCAS2 battery is a rechargeable Lithium-Polymer (LiPo) battery which typically lasts for 45 minutes of operation. You can charge the battery quickly, less than 2 hours in the device if connected to the external power supply or car power cable, and less than 4 hours in the desktop charger.*

Other benefits of the ROSC-U device for our patients are:

- Delivers Circumferential Chest Compressions vs. Single Point Compression
- More Effective Chest Compression
- Improved Perfusion
- Compressions Adjust to the Anatomy of the Individual Patient:
- Reducing Occurrences of Patient Injuries
- Increasing Use Time (per Charge) by Decreasing Energy Required
- Frees Up Personnel Allowing to focus on other CPS functions

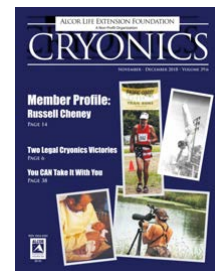
Other benefits of the ROSC-U device are its compact size, its decreased weight over the Lucas2, its ease of use, and its cost, which is significantly less than the Lucas2. Resuscitation International is also located less than 5 miles from Alcor, as opposed to Physio-Control which is in Washington state.

A proposal was sent to the research committee and voted upon to allow Alcor to purchase a ROSC-U™ Miniature Chest Compressor for testing and field use. Delivery of the unit is anticipated in early December; stand-by for updates in an upcoming newsletter!

CRYONICS MAGAZINE

Printed version of *Cryonics* magazine

Cryonics magazine is moving to a quarterly publication starting in January 2019. We are excited about the changes. Please send us an email with your feedback and if you have not indicated your preference for digital or mailed version of *Cryonics* you can still do so by sending an email to marji@alcor.org.



MEMBERSHIP STATISTICS

Growth Rate

Alcor's full, cryopreservation membership grew in one year by 93 members to 1,236 (that's the net number, after subtracting members who were cryopreserved or stopped being Alcor members). The growth rate was 8.14%. That's the fastest rate since 2005. It is also the largest numbers of new members ever! We also ended the year with 164 patients. As of November 15, 2018, members were 77.5% male and 22.5% female.



2018	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Members	1,149	1,159	1,171	1,176	1,179	1,194	1,198	1,208	1,214	1,220	1,224	1,236
Patients	155	156	156	156	157	158	159	161	162	164	164	164
Associate	292	274	271	271	278	275	288	290	293	290	290	285
Total	1,596	1,589	1,598	1,603	1,614	1,627	1,645	1,659	1,669	1,674	1,678	1,685



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