

Alcor News Bulletin

Number 14: August 1st, 2003

Alcor Upgrades its Regional Capabilities

July was a pleasantly quiet month at Alcor. None of our members required help, and we're happy to report that no one contacted us with news of any potentially serious medical condition.

Mathew Sullivan, Director of Suspension Readiness, used the welcome break in our case load as an opportunity to complete his assembly of ten new meds kits, plus additional support kits which are now required because our meds kits have grown in content and complexity. Two meds kits and two support kits have already been sent to our team in Southern California. Meds/support packages are also destined for northern California, Florida, Boston, Canada, and the UK.

The purpose of deploying these kits is to enable "first aid" for cryopatients in an emergency, ideally with the help of local volunteers who have received basic training at Alcor.

When paramedic Larry Johnson joined Alcor as Director of Clinical Services earlier this year, one of his first decisions was to change the way we package our medications. Formerly each set of meds was contained in numbered Zip-Loc bags inside a rigid plastic Pelican-brand suitcase of the type that is often used to transport photographic equipment. Larry recommended that we switch to "Thomas packs," which are padded backpacks specifically designed to hold pharmaceutical supplies in color-coded compartments. These packs are widely used by paramedics, and we adopted them earlier this year as our new standard.

The medications in our kits include anticoagulants and specially compounded drugs that help to minimize ischemic injury to the brain. Critical Care Research, a California laboratory specializing in resuscitation medicine, revamped our medications based on their unique and unmatched success in reviving dogs after substantial periods of warm ischemia (lack of blood flow at normal body temperature). At this time, Alcor is the only cryonics organization that has obtained a license to use compounds developed and tested by CCR.

We are not claiming to prevent ischemic injury, but we believe that our current medications enable us to delay it more successfully than has been possible in the past.

To continue our regional upgrades, we hope to distribute more Air Transportable Perfusion kits (ATPs) which enable blood washout and intravenous cooling in remote locations. Surgical trays containing instruments for vascular access must be assembled to accompany each ATP, and our new lab assistant Todd Huffman will be working on this with Hugh Hixon in the near future.

Upgrading our regional capability has been a long-term goal

at Alcor. It took longer than we hoped, but is now becoming a reality.

We can't afford to distribute meds kits and ATPs to every part of the country, but if you live in an area where there is a concentration of Alcor members, your first step should be to attend our training course to learn how we treat cryopatients immediately after legal death is pronounced.

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Training Update

As reported in the previous Alcor News, Alcor's next training sessions will be at Creekside Lodge, near Mayer, Arizona, commencing Friday, October 24th and continuing until Monday, October 27th. A free shuttle-bus service will transport attendees to Creekside from Phoenix Sky Harbor airport. The shuttle takes approximately 90 minutes to make the journey.

Students who arrive at Creekside during the afternoon of Friday 24th will find a free buffet waiting for them. Registration will be at 6 PM, followed by an evening class providing an overview of standby/transport tasks, problems, and priorities.

Hands-on work will start the next day at 8 AM and will continue till 6 PM, with a break for lunch in the Creekside Lodge dining room. Classes on Sunday will run from 8 AM through 7 PM.

Some of our students at the March training session commented that the instruction could have been a little more intensive, and we've taken their advice. If you spend the weekend with us at Creekside in October, you should expect us to keep you fully occupied.

Topics will include intubation, medications, cardiopulmonary support, blood washout and intravenous cooling with the ATP, and legal issues associated with cryonics. Students will be able to practice with our equipment in the evenings.

We are planning to limit attendance to 20 students, who will be divided into two groups of 10 for the hands-on work during the weekend. Some students have already registered, so we encourage you to make your reservation as soon as possible.

Learning the basics of cryonics field work is a challenging but fulfilling experience, and can help you to establish a nucleus of volunteers in your area. The more Alcor members who become actively involved, the better the chances are for all of us to receive a successful cryopreservation.

For additional information, please send email to:

Paula Lemler

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Progress Toward Intermediate Temperature Storage

In the previous Alcor News we reported that Alcor has

acquired the prototype of an Intermediate Temperature Storage (ITS) device developed by Brian Wowk of 21st Century Medicine. (For an explanation of why ITS is desirable, please go to our archives at www.alcornews.org and check the explanatory section in Alcor News #13 dated July 1st, 2003.)

Our new lab assistant, Todd Huffman, has been studying Brian Wowk's design and has visited 21st Century Medicine to discuss reliability issues and possible modifications. Since the ITS pod will be cooled by positioning it above a pool of liquid nitrogen inside a Dewar, we have been debating which type of Dewar to use. An off-the-shelf industrial design is available, large enough to contain seven ITS pods (one in the center and six around it, in a hexagonal pattern). However, our proprietary "bigfoot" Dewar design is much taller, only slightly more expensive, and we have had extensive experience operating them over the past decade. A "bigfoot" seems our best option at this point.

In theory, it would be tall enough to contain a stack of three layers of ITS pods, with seven pods in each layer. The problem is that a tall Dewar will allow a more severe temperature gradient. In other words, the pods at the top will tend to be warmer than the pods at the bottom, and ITS requires that the temperature should be controlled with some precision.

One way around the problem is to use an internal framework of metal such as aluminum, which is a good conductor of heat and could minimize the temperature gradient. Another possibility is to fill the lower part of the Dewar with conventional neuropatients fully immersed in liquid nitrogen, with a single layer of ITS pods above them at the top. The disadvantage of this configuration is that we would have to modify our standard neuropatient containment shell. Also the ITS pods would get in the way during insertion or removal of neuropatients.

Another issue which Todd is investigating is the optimal refill system to maintain the reservoir of liquid nitrogen. A gravity feed would provide the security of constant refill without pumps, but would be grossly inefficient since the pipe connecting it with the Dewar cannot be optimally insulated and will promote nitrogen boiloff.

Using a pump for automatic refill sounds intuitively risky, but low-temperature pump design has been perfected in industrial applications, and a Dewar refill pump probably would run only for a few minutes per week. Two pumps could be installed in parallel for redundancy.

Todd has been tabulating every conceivable failure mode, including liquid-nitrogen level sensor malfunction (Dewar will boil dry), failure of temperature sensor inside ITS pod (patient may become too cold or too warm), wire-break failure, pod heater failure, control system failure, and many others.

Probably we will need four months to explore all these failure modes and develop satisfactory solutions, after which the construction and testing of actual patient storage units may take another two months. This is longer than we would

like, but obviously the system must be absolutely reliable before we can offer it as an option to our members.

We can't predict how much ITS will cost relative to conventional Dewar storage until we have established all the components in the system and have measured the liquid nitrogen boiloff rate.

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July Board Meeting

Here are some quick items from the board meeting which was held at the Alcor facility in Scottsdale on July 13th:

Our membership administrator, Jennifer Chapman, reported that Alcor membership is growing at an annualized rate of 10 percent.

A bulk storage liquid nitrogen tank has been located for our new patient care bay, but construction of the patient care bay is still being delayed by our difficulty in finding an engineer who will come to the facility to evaluate the strength of the roof, where we plan to install a crane for Dewar-to-Dewar patient transfers.

Alcor's web site is being moved to a new hosting service, where we will have direct control over the content. (Previously, a web design company implemented every alteration, which was a slow and costly procedure.) We hope the new site will be up within another couple of weeks, but the transfer must be carefully handled, since all of Alcor's email addresses and email distribution lists will move to the new hosting service along with the web pages.

Alcor is renewing its licensing agreement with 21st Century Medicine for the vitrification solution which we use for cryoprotection of our patients.

A plan to change our rules for remote standby will be presented for a board vote at the September meeting. Also, our board members will be up for election at that meeting.

Alcor director Ralph Merkle made a motion to transfer a cryopatient from the CryoStar freezer into conventional liquid nitrogen storage. Five directors voted in favor, one abstained, and one voted against. The transfer has since taken place. This helped to resolve an issue which has been a source of debate during several board meetings. For further details, see "The CryoStar Controversy," below.

Paramedic Larry Johnson, who serves as Alcor's Director of Clinical Services, has completed all the necessary signup paperwork and is now an Alcor member. Jerry Lemler stated that Larry will be taking on responsibilities of Chief Operating Officer, since Charles Platt resigned from that position (as reported in the previous Alcor News). However, any appointee to the position of C.O.O. must be confirmed by the Alcor board.

All Alcor board meetings are open to the public. The dates of future meetings have been established for the rest of the

year:

Sunday, August 10th.
 Sunday, September 7th.
 Sunday, October 5th.
 Sunday, November 2nd.
 Sunday, December 14th.

Meetings usually begin at 10 AM during the summer months and 11 AM in the winter. They are held at the Alcor facility in Scottsdale. Please contact Alcor for additional details.

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The CryoStar Controversy

Rick Potvin, an Alcor member who lives in the Phoenix area, has been publishing some personal commentary about Alcor on a web site which some of our members may have visited after Rick publicized it on CryoNet. We welcome opinions and suggestions from anyone who takes an active interest in cryonics, but we found some of Rick's statements a bit surprising. For instance, he wrote on July 14th:

"In trying to figure out what I can say and not say--which I suppose is going to be par for the course if I continue to write about cryonics--I concluded that it's okay to talk about what a piece of junk the Cryostar is."

Alcor owns a CryoStar freezer of a type that is a standard item of equipment in hundreds of laboratories, and our directors, advisors, and staff have been discussing the relative merits of maintaining patients around -125 degrees Celsius in the CryoStar instead of immersing them at -196 degrees in liquid nitrogen. While we are waiting for the Wowk design of Intermediate Temperature Storage pod to be refined and tested, the CryoStar can provide ITS on an interim basis right now, and has proved that it will reduce the incidence of fractures which tend to occur after vitrification. Alcor clearly should do whatever it can to minimize all forms of damage to its patients.

The disadvantages of the CryoStar are obvious: It requires a supply of electricity and contains a compressor and a thermostat, just like a domestic refrigerator. It is fitted with an alarm and a highly dependable liquid-nitrogen backup system, and a patient can be "evacuated" from it quickly if necessary; but overall it may be less reliable than a Dewar.

That said, we feel that characterizing the CryoStar as "a piece of junk" may be a bit misleading.

A recent concern about the performance of our CryoStar was resolved when a technician visited Alcor and noted that the ambient temperature in the operating environment should not exceed 80 degrees Fahrenheit. Exceptionally hot Phoenix summer weather had driven the temperature above 80 degrees in our patient care bay, even with Alcor's industrial-strength air conditioning running constantly.

We considered options such as adding extra insulation to the CryoStar, adding a standalone air-conditioning unit in the

patient care bay, adding a blower to increase the efficiency of the CryoStar's heat exchanger, or devising a liquid-nitrogen vapor system that would cool the heat exchanger more aggressively. So far, the first of these options has been implemented with some success.

We welcome debate on current issues at Alcor, and we welcome visitors to our board meetings. However, debate is pointless if it is based on misconceptions or oversimplifications, and the CryoStar issue has been complicated enough to sustain in-house discussions and disagreements for almost a year. Anyone who is interested in airing this kind of issue publicly should feel free to do so, but we invite them to contact us for some basic fact-checking first.

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