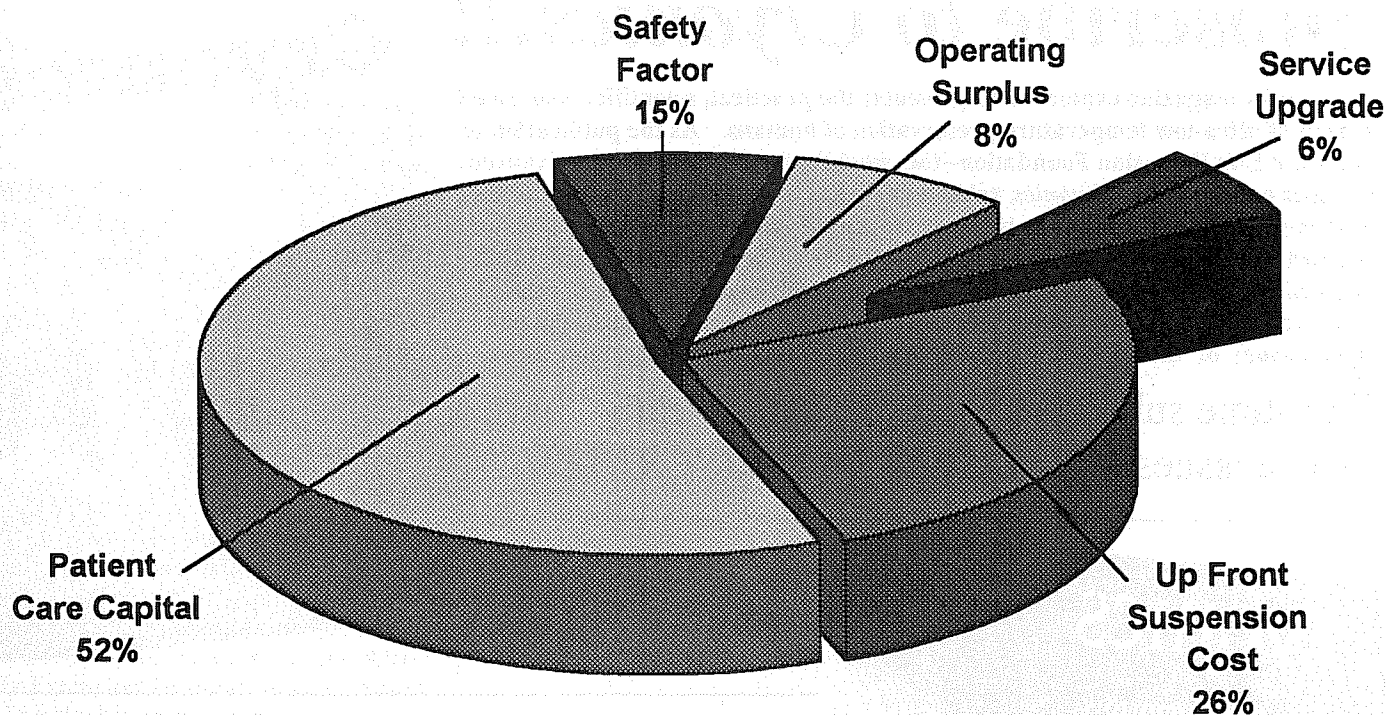


Cryonics

Volume 14(10) • October, 1993

ISSN 1054-4305 • \$3.50



Suspension Pricing and the Cost of Patient Care

by Ralph Whelan

—Also—

Current Status of Legal Discussions in Arizona

By Stephen Bridge, President

Cryonics is...

Cryonic suspension is the application of low-temperature preservation technology to today's terminal patients. The goal of cryonic suspension and the technology of cryonics is the transport of today's terminal patients to a time in the future when cell/tissue repair technology is available, and restoration to full function and health is possible--a time when freezing damage is a fully reversible injury and cures exist for virtually all of today's diseases, including aging. As human knowledge and medical technology continue to expand in scope, people who would incorrectly be considered dead by today's medicine will commonly be restored to life and health. This coming control over living systems should allow us to fabricate new organisms and sub-cell-sized devices for repair and resuscitation of patients waiting in cryonic suspension.

Alcor is...

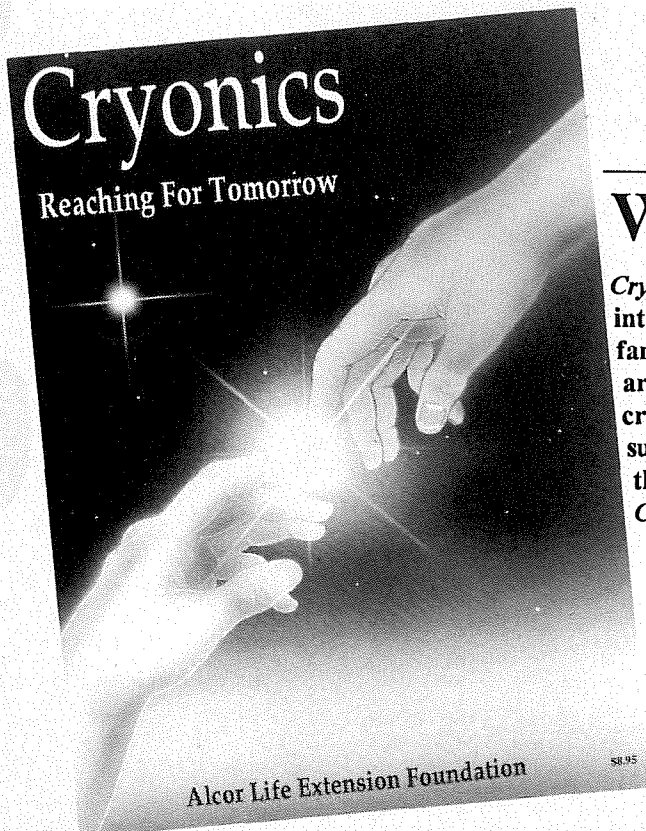
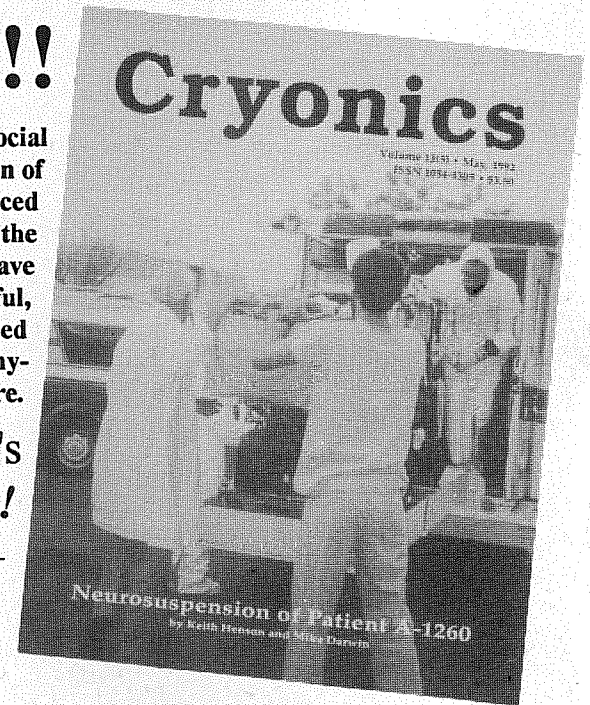
The Alcor Life Extension Foundation is a non-profit tax-exempt scientific and educational organization. Alcor currently has 27 members in cryonic suspension, hundreds of Suspension Members--people who have arrangements to be suspended--and hundreds more in the process of becoming Suspension Members. Our Emergency Response capability includes equipment and trained technicians in New York, Canada, Indiana, North California, and England, and a cool-down and perfusion facility in Florida.

The Alcor facility, located in Southern California, includes a full-time staff with employees present 24 hours a day. The facility also has a fully equipped and operational research laboratory, an ambulance for local response, an operating room, and a patient storage facility consisting of several stainless steel, state-of-the-art storage vessels.

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Cryonics magazine explores and promotes the practical, scientific, and social aspects of ultra-low temperature preservation of humans. As the publication of the Alcor Life Extension Foundation--the world's largest and most advanced cryonics organization--*Cryonics* takes a realistic, real-world approach to the challenge of maintaining in a biologically unchanging state patients who have reached the limitations of modern medicine. *Cryonics* contains thoughtful, provocative discussions of cryonic suspensions performed by Alcor, related research, nanotechnology and molecular engineering, book reviews, the physical format of memory and personality, the nature of identity, and more.

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Cryonics

Volume 14(10)
October, 1993

Issue 158, ISSN 1054-4305



Cryonics is the magazine of the Alcor Life Extension Foundation, Inc.

Editor: Ralph Whelan
Production Editors: Eric Geislinger
and Jane Talisman

Published monthly. Individual subscriptions: \$35 per year in the U.S.; \$40 per year in Canada and Mexico; \$45 per year all others. Back issues are \$3.50 each in the U.S., Canada, and Mexico; \$4.50 each all others.

Please address all editorial correspondence to ALCOR, 12327 Doherty Street, Riverside, CA 92503 or phone (800) 367-2228 or (909) 736-1703. FAX #: (909) 736-6917. E-mail: alcor@cup.portal.com



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Issue to press: September 15, 1993.

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Cover: Ralph Whelan completes an extensive study of suspension pricing in this month's cover story.

Director Election Results

The first order of business at the September 12 meeting of the Alcor Board of Directors — attended by 60+ people — was the election of a new Board of Directors. The result, as evidenced by the list of Directors on the contents page, is a nine-person Board of Directors consisting of Steve Bridge, Fred Chamberlain III, Keith Henson, Hugh Hixon, Carlos Mondragón, David Pizer, Michael Riskin, Mark Voelker, and Ralph Whelan.

We wish to thank Allen Lopp and Brenda Peters for their time and effort as Directors of this organization, and we welcome Fred Chamberlain and Michael Riskin to their new posts.

Pricing Cryonic Suspension

Several months ago we began preparing a new edition of *Cryonics: Reaching For Tomorrow* (CRFT), Alcor's introductory handbook. Chief amongst the targets for revision was Appendix C, "The Cost of Cryonics," which Steve Bridge and Michael Riskin had found to contain errors. After many hours of work, and the glimmerings of a sense that they had a tiger by the tail, Steve and Michael allowed Ralph Whelan to sink his enthusiasm into the project.

A few hundred hours of consolidated effort later, Ralph submitted "Suspension Pricing and the Cost of Patient Care" for consideration. Although preliminary and theoretical in many respects — let's call it Version 1.2 (it's already seen substantial revision) — there was general agreement that immediate publication was necessary, if the next CRFT was to contain a reasonably peer-reviewed version. So curl up someplace warm, quiet, and well-padded, and try to enjoy what a hard time we have figuring out how much you'll cost us. (And please, no sharp objects, except the one between your ears.)

On a related note, Alcor has recently hired trust attorney Kathryn A. Ballsun to take on the project of proposing a Trust Fund arrangement for the Patient Care Fund. A very preliminary proposal was received from Ms. Ballsun just prior to press time. We will report on this in more detail next month.

Also in the patient-related news: The

August, 1993 meeting of the Alcor Board saw the formation of the Patient Care Fund Investment Advisory Committee (PCFI-AC). This committee was given the tasks of analyzing and assessing all current Patient Care Fund investments, making recommendations for changes to these investments, and making recommendations for possible changes to the Patient Care Fund Policy. The committee, consisting of Alcor Suspension Members Linda Chamberlain, Michael Riskin, and Courtney Smith, has already submitted its analysis of the current investments, and will report on the latter two objectives at the October meeting of the Board of Directors.

Acoma Building Update

Literally moments before closing time for this issue, Cryonics Property Limited Liability Company began close of escrow proceedings on the "Acoma Building" of the Scottsdale Airpark in Scottsdale, Arizona. If all goes well, this will be complete by the time you read these words, and the Alcor staff will be tackling, head-on, the complex challenge of moving Alcor to Arizona. See Steve Bridge's column in this issue for an update on the

various legal matters associated with this move, all of which seem to be developing in promising directions.

Space Shortage!

Things are happening so fast right now, it's hard to find the time or the room to report on it all in the pages of *Cryonics*. This month *would* have marked the 35th consecutive appearance of Mike Perry's **For the Record** column, but because Dr. Perry's topics are, by definition, historical, reporting on current events has to take precedence.

Look forward to seeing Mike's latest column, *Glimpses of a Lost Immortalist*, in the November issue of *Cryonics*.

Upcoming PBS Special Features Alcor

Airing October 4 and October 5 at 8:00 pm on PBS is "*Death: The Trip of a Lifetime*." This two-hour special (one hour each night) will feature cryonics and Alcor, and that's about all we know about it. Tune in with some friends, if you're feeling adventurous.

Increase in Neurosuspension Prices

As of January 1, 1994, the price of neurosuspension with Alcor will be \$50,000. As with previous price increases, anyone entering the sign-up process (by paying the \$100 Application Fee) prior to midnight on December 31, 1993, will be "grandfathered" at the current rate of \$41,000. (Some restrictions apply.)

We wish to point out, though, that all members in the \$41,000 neurosuspension category — and those in the \$35,000 suspension category as well — should strive to have *at least* \$50,000 in life insurance or some similar funding mechanism, to guard against the possibility that a price increase for *all* members may have to take place at some point in the future.

For a comprehensive explanation of the short- and long-term costs of cryonic suspension and patient care, refer to "Suspension Pricing and the Cost of Patient Care" in this issue. Given that the assumptions and working figures in that paper are correct, it's clear that the expenses of neurosuspension *already* exceed \$41,000, even with all safety margins eliminated.

Letters to the Editor

Folks:

Over the two years that I have been a suspension member I have tried to learn and experience as much as I can about Alcor and the people who support it. I have endeavored to meet and talk to as many Alcor members as possible, which for me is no easy task. There is not another Alcor member within a thousand-mile circle of my home. But I have traveled twice to California and attended an Alcor meeting at a member's home, visited the Alcor facility, lunched with several members of the staff, and spent several hours on the phone talking to a couple of other members. All for the sake of getting a better idea of the people and the organization with whom I have contracted to preserve my mortal remains.

I am a cryonicist in the most liberal sense of the word. I'm a rookie. I have never been on a suspension and my knowledge is limited to articles from *Cryonics* and other information supplied by Alcor. I know only what I have read of the biochemistry and medical procedures of suspension and I doubt that I will ever have the opportunity or stomach to perform a "shutdown" or retrieve a member's brain.

However, I have been active in life and business for many years and over that time I have been able to develop a sense for people. I am impressed with the people of Alcor and of the organization in general. I see dedicated, responsible people who have committed to an organization which is arguably on the edge of general acceptability. They eke out a living at poverty level wages for the sake of cryonics and the thrill of being pioneers. I have great respect for these people, and I must say that as part of the silent majority, I am getting a little tired of some of the written attacks directed at those who seek to take us into the future.

I first became aware of some political dissention when an unsolicited, poorly organized tome arrived in my mail box. Its couple-of-hundred pages of photocopied letters, articles, and dot matrix output seemed to point to problems regarding the Alcor leadership. The content was biased, selective, and most of all, ignored.

Recently, a couple of letters have appeared in *Cryonics* which I have found to be regrettable. They have been written by individuals who are on the outside by

choice and who wish to use the openness of Alcor and the letters to *Cryonics* as their venue to attack. I appreciate criticism and I encourage debate. However, I am loathe to accept some of the personal attacks I have seen leveled at some of the Alcor directors and staff. I also refuse to respect the attacks of skilled individuals who instead of working within the system choose to pack up their ball and bat of skill and experience and go home.

I support Alcor. I have committed centuries of my being to it and I tire of those who cannot find the ability to work within debate and consensus. Can you imagine what could be created through cooperation?

I have found Alcor to be an extremely open organization by letter or phone. Blunt questions are answered frankly. Alternative arguments are solicited. Mistakes are acknowledged and corrective action is sought. In fact I find it refreshing and encouraging that *Cryonics* has published articles that show the best (J. Bedford in suspension for 25 years) and the worst (Chatsworth disaster) of cryonics. As well, I have read all points of view in the Letters to the Editor and I appreciate that this forum is open to all — members and non-members.

This letter is a confirmation of support. I doubt if I will always agree, but at all times as a member, I will strive to be constructive and for the greater good. For those who only wish to spend time to attack and complain, the message to you is that few are listening.

Sincerely,
Guy Desrosiers

Dear Editor,

In the September 1993 issue of *Cryonics* magazine, Maureen Genteman, Mike Darwin, and I complained that editor Ralph Whelan had violated Alcor policy by printing replies to our letters in the same issue of the magazine.

Ralph responded by denying there ever was such a policy because of what Jerry Leaf told him. As he put it: "Jerry was extremely explicit about this with me, stating that in reality this was a *Mike Darwin Policy*. And he was quite content to let that policy accompany Mike in his departure from the editorship of *Cryonics*."

Ralph is wrong about that. While it's true that the discussion that led to the policy was motivated by Mike Darwin's practice of responding unfairly to letters in the same issue of *Cryonics*, there was no doubt in anyone's mind at that time that the policy was meant to prevent *any* editor of *Cryonics* Magazine (not just Mike Darwin) from abusing his or her power.

I want to point out further that the issue was discussed extensively at the time, not just by Jerry Leaf, but by others including Hugh Hixon (who was co-editor of *Cryonics*) and the entire Alcor Board. I know this because I was one of the people who participated in these discussions.

Ralph's remark that the interest in the editorial response policy has become "suddenly and 'mysteriously' popular" is itself an unfair response to the three writers who believe they have been treated unfairly. There's nothing mysterious about believing one has been treated unfairly, only about an editor who is apparently mystified by such feelings.

When Mike Darwin was accused of being unfair as editor of *Cryonics*, he at first protested that it was not true. However, it was pointed out to Mike that it was too much to expect of any magazine editor to be fair when he, his magazine, and the organization for which he works were being criticized; that it was inappropriate for him to judge his own actions, and that the fact that a number of Alcor members thought he was being unfair was enough evidence to suggest that he was, in fact, being unfair.

Ralph now says that since "...Mike Darwin is no longer editor, we feel that we have the self-control to fairly respond to matters of importance and substance in the same issue in which they are brought up."

Is Ralph suggesting that only Mike Darwin is capable of acting unfairly as editor of *Cryonics*? Is he saying that all three writers were treated fairly, even if they think otherwise? Does he really believe that he can be an objective judge of his own actions? That's what Raskolnikov believed in Doestoyevsky's novel *Crime and Punishment*. Raskolnikov was wrong... profoundly wrong. And so is Ralph.

Ralph's recollection of what Jerry Leaf told him is no defense for treating letter writers unfairly, nor is it chapter and verse on Alcor policy. I *know* that a specific editorial response policy was

adopted by Alcor, whether it ever appeared in *Cryonics* magazine or not, regardless of what Jerry may (or may not) have said to Ralph in a private conversation.

Ralph says that the policy of responding to "salient questions and commentary in the 'Letters...' section" is an "eminently sensible practice, which he 'intends to continue.'" Yet, in the same issue, he *fails* to print a response to the *two* letters of virulent criticism of Mike Darwin by Fred and Linda Chamberlain. Does Ralph really believe that printing a response to criticism of the Alcor Board or of Tanya Jones, while not printing a response to criticism of Mike Darwin, is evidence of his fairness and objectivity? If so, than his ethical standards suggest the philosophy of "doublethink" described in George Orwell's novel, *1984*.

The best evidence I've seen about the need for an *ethical* Editorial Response Policy in *Cryonics* Magazine is Ralph Whelan's editorial judgment in the September issue of *Cryonics*.

Saul Kent

Readers interested in further consideration of this area of Editorial Policy should see Steve Bridge's brief article about same elsewhere in this issue. — Ed.

Fellow Alcor Members:

Our Letter to the Editor in the last issue has resulted in some expressions of gratitude and some criticism for not being more specific about details. These issues cover nearly a decade, numerous suspensions, and the personal interests of many different families of suspended members. For these reasons, it is neither possible nor appropriate for us to make such details public.

As Linda said in her previous letter, we do not expect or encourage Alcor members to take our word, alone, on these matters. Each member must investigate these issues and come to their own conclusions about where their personal safety lies. Whatever any Alcor member chooses to do, now or in the future, at least they will have the opportunity to make an informed decision. We believe that we have helped Alcor with its moral and fiduciary responsibility to its membership. We respect Alcor's suspension members and their ability to seek their own information sources and make up their own minds.

Should some Alcor members feel that

their interests will be better served by forming a different organization, they are free to do so. Only those who talk about leaving seem to feel this would in any way be negative for Alcor. Most Alcorians we have spoken with, feel that competition is always healthy and competently competing cryonics organizations can only strengthen the cryonics movement.

Alcor has a highly skilled and competent suspension team dedicated to unending improvement. But no amount of technologically advanced equipment or expertise can offset the importance of an organization dedicated to the long term safety of suspended patients. Even if a vast difference in technology were to exist between one organization and another, no family member who had to see their loved one thawed due to lack of organizational stability or dedication to long term safety would find solace in suspension technology levels alone.

In addition to its suspension technology, a cryonics organization must also be judged on its dedication toward and its track record for safety in long term storage, what patient care services it offers and the manner in which it invests patient care funds in order to assure these services, and the manner in which it addresses the subject of reanimation and reentry into the future society we all hope awaits us. Members will be hearing more in the future about the advances Alcor is making on all of these fronts.

Keeping Alcor strong cannot be done by just a few, however. It takes a team effort. The Alcor staff and directors are a team we are proud to support and proud to be part of. We're rolling up our sleeves on Alcor's behalf and we're asking each and every Alcor member to join the team dedicated to keeping Alcor strong and safe for us all.

Linda and Fred Chamberlain
Founders of Alcor

To *Cryonics* Magazine:

I would like to explain why I have given up my suspension membership in Alcor.

My primary reason for quitting is the continued presence of Carlos Mondragón and Keith Henson on Alcor's board of directors. I respect the time and effort that these men have invested in cryonics. I particularly admire the exceptional hard work that Keith has done on the suspen-

sion team. However, I believe that being a director of a cryonics organization requires different qualifications from being an employee or a volunteer. A director must be not only loyal and active, but highly ethical. A cryonics organization depends entirely on trust; if its directors cannot be trusted to follow written policy, then in the long term, I believe the organization will not endure.

At various times, in my opinion, these two directors (Mondragón more than Henson) have demonstrated that they feel entitled to bend or break the rules and violate commonsense ethical guidelines. I believe there have been violations of patient confidentiality; a substantial unpaid personal debt; irregularities in the use of a telephone credit card; and many other actions taken with disregard for Alcor's policy, especially in the case of the Patient Care Fund, where Mondragón seemed to pay no attention to restrictions which were supposed to govern his actions.

I have mentioned these issues in less public areas, but the people concerned seem to feel immune to criticism, perhaps because the system is so self-protective. Under Alcor's by-laws, each of the nine directors has nine votes which he or she can cast at an election once a year, either to appoint new directors or to reappoint old ones. This means that the board can re-elect itself, or (more likely) a cadre of four or five people can cast votes for each other and virtually guarantee their continued stay in office, as happened in 1992. At the time I am writing this letter, the 1993 elections have not taken place, so I don't know how things will work out. However, even if Mondragón and Henson should be voted out of office, the system will still remain the same, inviting further abuses in future. A system of impeachment, as is available for some U.S. government officials, might be a good idea, so that Alcor members can at least have some restraining power over the ruling body.

Mondragón, in the past, has suggested that anyone who feels disenchanted with Alcor can simply quit. Of course, he is well aware that quitting literally means risking one's life. Thus, it's not likely to happen often, and this, too, encourages Alcor directors to feel secure.

In my case, the frustration and depression I felt at the continued complacency of people whose behavior I deeply distrust finally outweighed the security that I used to derive from being an Alcor member. Consequently, with a great deal of unhappiness, I terminated my suspension arran-

gements, resigned as president of Alcor's New York chapter, and refused to do further work as Alcor's publicist.

At the same time, I want it to be clearly understood that I am still very loyal to Alcor as an institution, and to the employees who work there. This is why I have not "gone public," itemizing transgressions specifically or publishing some kind of an expose. If I did that, it would be harmful to Alcor in particular and cryonics in general.

I have served Alcor well as a volunteer. I've certainly succeeded in spreading the word about cryonics effectively. I think I could do a lot more in this respect. Indeed, I've barely scratched the surface. But I cannot wholeheartedly promote an organization where there are directors who seem to recognize no authority but their own.

In due course, if the composition of the board of directors changes, I may hope to apply once again for membership in Alcor and would be happy to work on its behalf, because I admire almost all the people associated with Alcor, and no other endeavor in my life seems more important to me than cryonics.

— Charles Platt

Dear Ralph:

The June issue, while up to your present standard of production, still bothered me in several respects. First, the short story: David Krieger had a good idea with the paper thin and paper-cheap computers, but the story itself was far too nicey-nicey. I did not take up cryonics because I thought that everything was easy and would be easy on my revival; I did so because I wanted to live. The story "Revival" had a very disquieting resemblance to a soap commercial: just use *Tide*, and in a blink of the eye all your clothes will come out looking brand-new!

Nor was I present at the suspension, but somehow I feel sure that more went wrong than the article presented. This is not intended, and should not be read, as a criticism of anyone on the cryonics team. It's just that such reports become useful to the degree to which they uncover problems which need fixing. After all, I knew beforehand that Alcor suspended people, and believed (and still believe) that Alcor personnel do suspensions better than anyone else currently offering that service. I did *not* want to read an advertisement, I

wanted to read a serious discussion of faults and how to remedy them. (I also don't mean that it should be *only* faults: Tanya deserves a lot of credit for the good things. But perfection will never be attained; we can at best try to reach for it).

And finally we have Keith Henson's column. I thought for a while that he would discuss more practical matters from now on, but I guess not. At one time you asked me to start writing a column, and his recent column makes me think hard about whether I want to do that. His ideas seem so completely off the wall that it's not clear to me at least that many readers would conclude from them that cryonics is attractive at all. At the same time, he and I have argued so often that another one would be too repetitious. He's welcome to believe what he believes, and we'll let the true future, the real one that comes closer every day, tell us just how accurate he is.

You may remember that about two weeks ago, when I was last at Alcor, I said that cryonics very much needed a magazine *independent* of all of the societies. And I raised the possibility that *Cryonics* might gradually separate itself from Alcor. You felt that would be impossible. The June issue of *Cryonics* makes me worry about that independence.

Best, and long long life,
Thomas Donaldson

Dear Editor,

At least twenty-five Alcor members who were in attendance at the election/board meeting of September 12 have requested that I publish this, my Farewell Speech upon retiring from the board of Alcor.

"I am very proud to have been such an integral part, for the last ten years, of what Jerry Leaf liked to call 'the greatest adventure of the 20th century.' I have loved working with local chapters, sharing achievements with all the hard-working activist members around the country, working with the staff, and with some members of the board. I now count as friends some of the most extraordinary people anyone could ever hope to know or to have known. I am truly fortunate to have established friendships that will last a lifetime and hopefully much longer. These are values of mine that could never change. But today marks the end of my involvement in cryonics and Alcor for the foreseeable future.

I am weary of being abused, bullied, lied to, and lied about by certain members of this Board. I feel like I've been encouraged not to think. I feel unwanted and unappreciated. I have experienced a distinct lack of common decency and common sense among the members of this board. It seems the only way to get Alcor to live up to its own policies these days has been to threaten it with lawsuits. I feel discouraged and I feel profound disappointment.

I cannot alter the results of this election, unless I am no longer a candidate myself, and I wish to alter the results because of my deep concern for the patients in the care of this board. Also for the members who hope to receive care someday from Alcor.

Even if I participated and were elected, the board composition would most certainly be one that I do not feel I can work with. If I can no longer be effective, then there is no legitimate purpose in my participating or holding a position.

For the last two years, I feel like I've been trying to work with a bunch of "bad boys." For an organization (and especially a board) that is comprised of 90% males, there is a serious shortage of men.

I've been accused of not being a team player. You guys are no fun to play with. You keep changing the rules or ignoring them altogether.

I've as much "esprit de corps" as anyone but it's tough to muster much esprit when the corps is rotten.

Therefore I can no longer give you my time, my energy, my money, my creativity, or my love.

You have driven me away, Carlos Mondragón and Dave Pizer.

But I do not feel defeated.

Having communicated this to you, I now feel free.

P.S. By not running, I was attempting to improve Dr. Steve Harris' chances of being elected. I failed and it is a sad statement as to the priorities of this board.

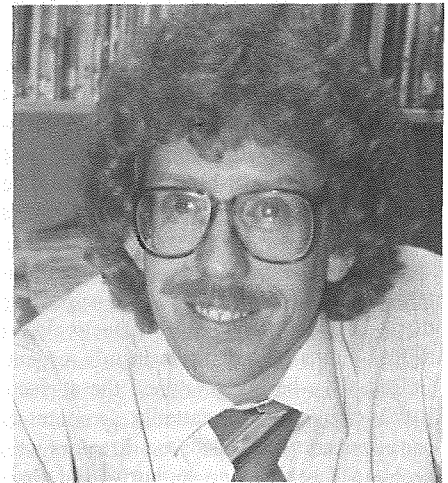
Alcor faces four critical challenges: 1) lack of physical safety for the patients 2) lack of fiscal safety for the patients and members 3) lack of technological progress and skill 4) chronic hemorrhaging of the endowment fund due to consistent operating losses.

I do not feel that the choices being made by this board will meet these challenges.

Sincerely,
Brenda Peters

Current status of legal discussions in Arizona

Steve Bridge



Over the past two months, Alcor — in the persons of Dave Pizer, Mark Voelker, and myself — has been engaged in a series of discussions with officials in Phoenix and Scottsdale, Arizona. Since Alcor placed a deposit (on behalf of *Cryonics Property, LLC*, the limited liability company that is trying to purchase the property) on the Acoma Drive building in the Scottsdale Airpark, it was important to find out if there were any barriers to Alcor moving and working in Arizona or Maricopa County.

City Of Scottsdale. In the spring of 1992, it seemed possible that Alcor might directly (or through a partnership) acquire a different building in Scottsdale. In preparation for that, Alcor Directors Carlos Mondragón (then Alcor President) and David Pizer, with the assistance of Sterling Johnson (a Scottsdale Airpark property manager), held discussions with Lisa Collins, a Project Coordination Manager in the Scottsdale Department of Planning and Community Development. They explained cryonics to her, gave her Alcor literature, and requested a specific ruling on whether such use would be permitted in I-1 zoning, which includes the types of buildings suitable for cryonics use. Ms. Collins discussed this with other officials in her department, and on April 28, 1992, sent a letter to Sterling Johnson which stated, in part:

I have reviewed your request to locate a business providing cryogenic tissue preservation as a use in the I-1 (Industrial Park) district. I understand this business will be primarily laboratories and

corporate offices. This use will be classified as a "research and development laboratory and office" and is listed as a permitted use in the I-1 district.

The effect of such a letter is that no Conditional Use Permit would be required to do cryonics in I-1. It falls under the category of "permitted use."

In early August of this year, I spoke with Ms. Collins to assure myself and other members that there was no misunderstanding. She informed me that the department certainly *did* know this was cryonics, and that several department officials had read Alcor's literature. There was no question in her mind that this was a permitted use.

In late July, David Pizer and I had applied for a business license for Alcor. We discovered that non-profit corporations didn't *need* a business license in Scottsdale; but they gave us one anyway, at our insistence. Under "nature of business" on the application, I wrote "Cryonics (research and development laboratory)." We told them to check with Planning and Community Development if they needed further details. A supervisor in the License Office later told us that she *had* checked with Planning and Development and was told that we were approved to operate. We now have our business license.

Maricopa County Medical Examiner. In 1992, Carlos Mondragón had received a letter from the County Medical Examiner for Phoenix and Scottsdale (the same office as Coroner in Riverside County, but an appointed pathologist instead of an

elected official) indicating that he would be cooperative. By June, 1993, however, Maricopa County had appointed Dr. Philip Keen as a new M.E., so we decided to start over.

I spoke with the M.E.'s office twice, sent literature, and then spoke with Dr. Keen on the telephone for a few minutes. He found cryonics to be mildly interesting intellectually, but didn't understand why we were concerned with his office. He assumed that the rapid treatment required meant that anyone who came to the M.E.'s office for autopsy would be excluded from treatment automatically. I explained why this was not so, and what kinds of cooperation we might need from his office for patients who deanimated in his jurisdiction (moving our patients to the head of the list, keeping the remains as cool as possible, performing autopsies as quickly as possible with a minimum of invasive procedures, and avoiding sectioning of the brain). He seemed to consider these requests to be unreasonable and indicated that everyone who required autopsy in his county would receive the most complete autopsy he could perform. In fact, in the past the Maricopa County M.E.'s office had been criticized for not doing enough autopsies and he was going to solve that problem. Also, any person who came into his office after 8:00 a.m. would not be autopsied until the following day.

This was not the most friendly start to this relationship, but Dave Pizer's and my conversations with other local officials gave us some clues to Dr. Keen's resistance. The previous M.E. had been publicly criticized for having a poorly run office,

and Dr. Keen was under a lot of pressure to straighten things out. Also, it turned out that when I spoke to him he had just returned from vacation to find that *both* of his assistant pathologists had resigned without notice.

We found that the M.E.'s office was under the authority of the County Board of Supervisors, so David Pizer arranged a meeting between the top assistant of one of the Supervisors, the Manager of the M.E.'s office, and ourselves. We were told Dr. Keen was too busy with autopsies to meet with us that day; but he arrived about ten minutes into the meeting. Face-to-face, we were able to have detailed and frank discussions, with the final result being that, since the M.E.'s office did give special consideration in organ donor situations, he would agree to ease his restrictions somewhat and would certainly try to communicate with us in any problem situation. He also acknowledged that the "after 8:00 a.m., wait until tomorrow" rule was just an administrative rule and would be ignored if necessary. We made some definite progress here, and I think we have made a start on working with Dr. Keen in the future.

Arizona Department Of Health Services. Considering all of the problems Alcor has had with the *California* Department of Health Services, we knew this contact was going to be critical. In 1992, Greg Jacquin, an Associate Director of the Arizona DHS, gave Alcor a letter which said in part, "Based on the description of your organization and its activities which you provided, we find no Department rules or statutes which would prohibit Alcor's business plans in Arizona."

This sounded pretty solid; but I realized that many specific answers were needed to questions that only cryonicists ask:

There is no box on the Disposition Permit or Death Certificate for us to check "cryonics." What do we check?

Are there procedures for becoming a licensed or authorized storage facility for anatomical donations?

The California DHS considers our whole body patients to be "human remains" and therefore require disposition permits to show we continue to store those patients. However, they consider our neuropatients to be merely "tissue samples" or "stored organs," so we merely show "cremation" as the disposition (since that is what happens to the majority of the

body). How does Arizona wish to treat neuropatients?

Indeed, these were questions that the ADHS had not previously considered — and they needed careful answers.

Dave Pizer and I had a meeting with Rosalie Lopez, Greg Jacquin's assistant, then a meeting with Ms. Lopez and Renee Gaudino, the Head of the State Office of Vital Records. Many questions were answered in these two meetings. Arizona's Death Certificates and Disposition Permits conveniently had a box for "other" and Ms. Gaudino thought they could come up with a phrase such as "Anatomical Donation — cryonics" that would be the standard. There *are* no procedures in Arizona for becoming a storage facility (nor are there in California). But in Arizona the DHS officials conceded that meant we didn't have to get a permit to do it. Actually, everything went well until we got to "what do we call the neuropatients?"

Ms. Gaudino could not come up with what rule might cover frozen heads. Although she thought it might be just organs, like California, she didn't want to take responsibility for that decision. She felt like we needed to get an Attorney General's opinion. Dave and I sighed and thought, "Oh, no. *Another* layer of government to go through."

After a bit of work, we managed to set up another meeting, this time with Ms. Lopez, Ms. Gaudino, and Assistant Attorney General Terri Skladany. Mrs. Skladany was the AG's regular liaison with the DHS. Alcor Director Mark Voelker also attended this meeting.

In addition to the neuropatient problem, another regulation had arisen. Human remains being transported into Arizona must be placed in a "hermetically-sealed" (air-tight) container. We pointed out that this was quite impossible, since liquid nitrogen cannot be kept in air-tight containers. LN₂ is constantly changing from a liquid into a gas, and the pressure increase would blow the lids right off. This looked like it might create a major problem, until we began discussing the Anatomical Donation connection. Someone suggested that treating Alcor's current patients as anatomical donations (which is how we treat them legally anyway) might allow us to get around the hermetic-seal regulation. Certainly the purpose of the regulation, which is to prevent spread of disease from a corpse, would be met by the fact that the patients and any disease organisms they carried

were already at -196 degrees C and therefore not a risk to the public health.

As we worked out this train of thought, it became apparent that treating the neuropatients as simple anatomical donations was also the best solution to that problem. The meeting was friendly and it seemed to me that both the DHS and the AG's office were taking great pains to make sure they were not in a position either of interfering with us or giving us blanket permission. (Remember, the first law of bureaucracy is "Protect your job." This is often expressed more crudely as "Cover your ass.")

After that, Mark Voelker and I spent a couple of hours researching the Arizona version of the Uniform Anatomical Gift Act and other regulations dealing with human remains. We have found nothing that would seem to interfere with cryonics, and the case law indexes indicated no Arizona precedents involving the UAGA.

Not long after my return to Riverside, I received a long letter from Greg Jacquin, which included the following, "You will note that the Director of the Arizona Department of Health Services is neither authorized nor responsible to enforce the [Uniform Anatomical Gift] Act. Neither the Department or the Attorney General's Office has the background or technical knowledge necessary to interpret the provisions of the Act as they would apply to your business operation. Even with additional information, it would be inappropriate for us to provide that kind of interpretation, therefore, we leave it to you to determine how the statute applies to Alcor." Mr. Jacquin also asked for some further technical information which he would forward to the Office of Disease Prevention.

Well, that's not exactly a definitive answer. But they certainly are not saying "No." I think it is promising that they will leave the interpretation up to us. Obviously, that means "up to the courts" if someone wants to argue about our interpretation; but it is hard to see how we could have gotten a more specific answer under the circumstances.

Still, I thought more was required. So on August 18 I sent another letter back to Mr. Jacquin, Ms. Gaudino, and Mrs. Skladany, in which I explained how Alcor plans to use the UAGA for its authority to act. I also discussed in detail the legal mechanisms we will use to move the patients, how we will fill out their forms, and how we will handle all future cryonic

suspension "donors" (not "patients" in this discussion). I have asked for confirmation on each of these items. As of September 8, no further correspondence had been received.

Other Agencies. Dave Pizer and I also had a brief discussion with someone in the non-profit office in the Arizona Department of Revenue. The amount of forms we have to fill out in Arizona seems to be about one quarter of what is required by California. This gentleman seemed surprised we were even asking all of these questions, until he found out we were from California.

We checked in with the County Hazardous Waste Office and found that they had been arguing over the regulations for medical waste for three years and still didn't have final guidelines. What they did have seemed to be similar to what we were already doing in California.

Legal Protection For Members. It has been pointed out many times that one legal advantage California has is Health and Safety Code 7100, which states "Direc-

tions of Decedent. A decedent, prior to his death, may direct the preparation for type or place of interment of his remains, either by oral or written instructions, ... The person or persons otherwise entitled to control the disposition of remains under the provisions of this section shall faithfully carry out the directions of the decedent subject only to the provisions of this chapter with respect to the duties of the coroner."

On at least three occasions, trial courts have acknowledged that this law includes the right of individuals to direct cryonic suspension of their remains.

While looking through the Arizona laws, I found Title 36, Chapter 7, "DISPOSITION OF HUMAN BODIES." 36-831.01-A states, "If the person on whom the duty of burial is imposed pursuant to section 36-831 is aware of the decedent's wishes regarding the disposition of his remains, that person shall comply with those wishes if they are reasonable and do not impose an economic or emotional hardship."

While this is not as strongly worded as the California law, it still could provide substantial protection to Arizona residents

who make sure to impose "the duty of burial" on Alcor." We promise it will be no emotional hardship if you promise not to make it an economic hardship. (Incidentally, it is made clear in other sections that the word "burial" is meant to include "other funeral or disposition arrangements.") And California residents should realize that they are still protected by the California law, even if Alcor's patient storage moves to Arizona.

In general, so far I have found the Arizona officials to be reasonably friendly and pleased that we decided to talk to them before moving to Arizona. I believe that we were seen as responsible individuals and as a responsible organization. Certainly this is no guarantee that a move to Arizona will be free from legal strife, but I think it sets some useful precedents.

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Suspension Pricing and the Cost of Patient Care

Ralph Whelan

Introduction

Several months ago, Steve Bridge and Michael Riskin endeavored to clean up a few math errors and update some costs in Alcor's suspension pricing procedure. Mike Darwin's "The Cost of Cryonics," (which first appeared as an article in the August, 1990 issue of *Cryonics*, then as an Appendix in *Cryonics: Reaching For Tomorrow*) yields a bottom line that *does* seem to approximate our ultimate costs. But the harder they looked at any one category in that analysis, the more the theories on the various individual expenses seemed out of line with the checkbook ledger. Before long, they were convinced that a comprehensive re-examination of both suspension costs and patient care costs was necessary, and they began this task.

When Steve's mounting presidential obligations began taking the wind out of this particular sail, making "a few hours' work" (or so I thought) stretch out over several weeks, I offered to take over the project. Steve and Mike did *not* protest too much.

What *are* the true costs of suspension and long-term patient care? My approach to answering this was to compose the following list of relevant considerations:

- The "Up Front" cost of suspending the patient
- The annual cost of storing the patient
- The capital requirement necessary to meet annual costs through interest alone
- The anticipated investment Return Factor on investment of PCF capital
- The appropriate Safety Factor for the chosen Return Factor on PCF investments
- The utility (and affordability) of a Percent Rule, such as our present 10-Percent Rule
- The Operating Surplus desired for each

suspension

- The anticipated change in Up Front Cost and Annual Cost due to economies of scale
- The anticipated change in Up Front Cost and Annual Cost due to inflation

That was the last easy part of this project.

By way of *process* in examining these topics, this paper will:

I. Pick a number of patients/members at which point Alcor should no longer be a "start-up" company, and call this the "post-start-up" point. That is, decide at what point adding a single patient no longer contributes significantly to economies of scale. (This is because we wish to see what people should pay for cryonics if start-up costs are not being passed on to them.)

II. Update all *Up Front Suspension Costs* (inventory, labor, and other costs associated with Emergency Response and perfusion/cooldown and charged to Operating and Research) on a per-patient basis for both present-day and post-start-up suspension patients.

III. Calculate all *Annual Storage Costs* (liquid nitrogen, floor space, custodial labor, dewar amortization, administration, and utilities/overhead, all charged to Patient Care) on a per-patient basis for both present-day and post-start-up patients.

IV. Determine the difference between present-day and post-start-up *Up Front* and *Annual* costs (as determined in sections II and III); compare both to actual recorded costs of suspension and storage for feedback.

V. Examine the assumptions that un-

derlie our existing Return/Safety Factor (Patient Care Fund capital requirement per patient) of 100X, then propose a new Return Factor and evolving Safety Factor to replace the 100X Return/Safety Factor.

VI. Examine the assumptions that underlie our existing 10% Rule and Operating Surplus, and consider the effects of altering either or both of these.

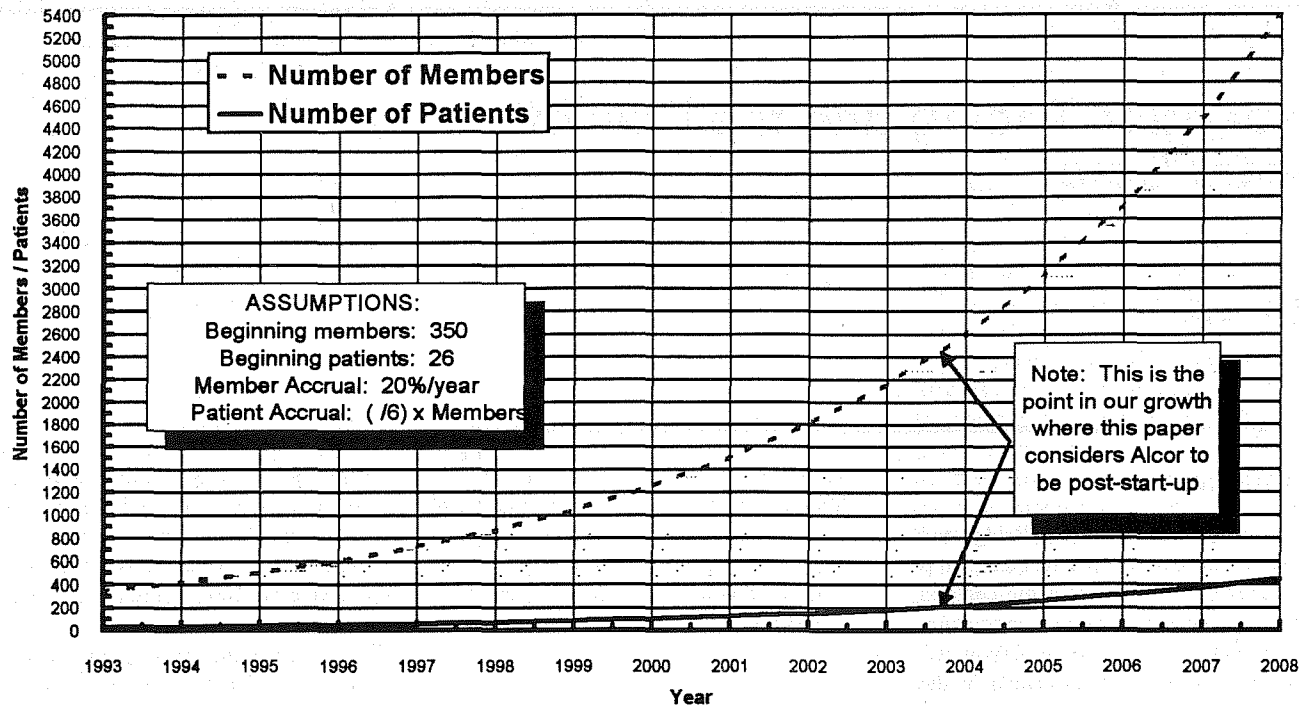
VII. Propose a comprehensive and evolving Suspension Expense Breakdown for present-day suspensions and post-start-up suspensions, along with a method for assessing our various expenses reasonably even as they evolve. Ideally, we should end up with a Patient Care Allotment and an Operating Fund Allotment for static-priced (in 1993 dollars), inflation-ready \$120,000 whole body suspensions and \$50,000 neurosuspensions, based on the results of I through VI above.

If nothing else, this analysis should serve as a starting point from which we can debate the various issues *quantitatively* and *concretely*. I welcome comments and questions.

Persons uninterested in detail work can probably skim or skip sections II, III, and IV without *too* much confusion. Persons interested only in bottom lines can skip sections I through VI.

Part I: When Are We No Longer A Start-Up?

My method for answering this is, by my own admission, *ad hoc*, but uses the statistically reasonable approach of setting upper and lower bounds for expected growth and using them as parameters in making an educated guess. (A Squeezing Theorem of sorts, for you math buffs.) Specifically, Alcor Engineer Hugh Hixon



and I agree that if we use the "Acoma building" in Scottsdale as a working model for our next facility, Alcor should be able to comfortably store at least 400 patients before we have to consider moving again. Assuming that we freeze about one person per year per 60 Suspension Members (i.e., 5 freezes per year at 300 Suspension Members), and assuming an annual growth rate in Suspension Membership of 20% per year (conservative considering the 29.3% we've averaged over the past decade), we come up with the following: Sometime in the year 2007, Alcor will top 4000 Suspension Members and 400 patients.

It's important that we consider total patients AND total membership in our estimation of when we'll cease to be a start-up, since continuing economies of scale in both of these areas is likely — and necessary, if we are to leave the start-up phase. If we can agree that both of the following are reasonable:

- We will no longer be a start-up when we have 4000+ Suspension Members (yielding at least \$1,000,000/year in revenue from dues), 400+ patients (necessitating — at our current neuro to whole body ratio — 40 Bigfoot dewars), and 70+ freezings per year (one every five days), and
- We can handle 4000+ Suspension Members, 400+ patients, and 70+ freezings per year in a facility on the scale of the one we're now considering

in Scottsdale,

then we can use our projected costs at "new-facility-saturation" — as described above, as an upper bound for when we will no longer be a start-up, and then decide which point between the present and that upper bound is appropriate for use in costing out post-start-up suspension costs. Ideally, we can hope to begin charging that post-start-up suspension cost to our members immediately.

So what should be the actual turnover point for start-up to post-start-up? If we find it reasonable to assume that it's somewhere between 27 and 400 patients, we can arbitrarily choose 200 patients as a working figure. (Anyone with a better method in mind is invited to propose it.) Based on this assumption, we will take post-start-up to mean an Alcor that is in the Acoma building (or something similar) with 200 patients and 2400 members, both of which (at 20%/year average growth) would occur sometime in the year 2003. If our current neuro-to-w.b. ratio continues, we will have 74 whole body patients and 126 neuropatients at that time, requiring a minimum of 20 Bigfoot dewars (assuming use of the Bigfoot center columns for neuros). 18 of those "Bigfeet" would contain 4 whole bodies and 5 neuros, one would contain 2 whole bodies and 5 neuros, and one would contain 31 neuros, for a total of 74 whole bodies in Bigfeet, 95 neuros in Bigfoot-Center-Well Storage, and 31 neuros in Neuro-Dedicated-Bigfoot

Storage. If we continue to do roughly one suspension per year per 60 members (our present rate), we will be performing roughly 40 suspensions per year at that time.

Part II: Up Front Suspension Costs, Present-Day and Post-Start-Up

The *Up Front Suspension Costs* listed in "The Cost of Cryonics" (\$18,908 and \$27,469 for neuro and whole body respectively) do *not* reflect reality. In fact I had Tanya Jones (Alcor's Suspension Services Manager) do a fast-as-possible (about 2 hours) assessment of obvious inaccuracies in our expense accounting in this regard. Her adjusted (but still *very* preliminary) *Up Front Suspension Costs* for neuro and whole body are \$25,172 and \$31,718 respectively. There is certainly a need for more reliable numbers in this category, and these will be available once the bar-code inventory system is complete. (Tanya and Scott Herman are working on this.) For now, let's work with Tanya's preliminary figures, breaking them down into two categories: *Up Front Inventory Cost* (\$15,082 and \$20,888 for neuro and whole body respectively), and *Up Front Labor Cost* (\$10,090 and \$10,830 respectively).

For the reason stated above, we will assume for now that the current numbers for *Up Front Inventory Cost* are reasonably realistic and likely to remain stable (in

1993 dollars) as we move from present-day to post-start-up. While economies of scale should bring our purchase price down, it is a certainty that if we wish to approach the medical mainstream we will eventually have to adopt the expensive regulatory procedures used by hospitals in maintaining *their* inventory, and we will not enjoy the savings that presently pertain to our "non-medical" (in the eyes of regulatory agencies) procedure. It's therefore difficult to predict whether this number will go up or down in years to come, so I will assume it remains stable.

While the *Up Front Inventory Cost* may be reasonable, at 200 patients and 2400 members we will be doing roughly 40 suspensions per year, so we will need — and be able to support — a Full Time Transport Team and a Full Time Suspension Team. Therefore, the proposed *Up Front Labor Costs* that figure into those *Up Front Suspension Costs* will shift in the direction of *more economy* as we approach post-start-up. I will assume the data shown in Table 1 for labor costs.

The "per-patient" total is figured, of course, at 40 patients per year. The two per-patient totals sum to \$8,000 per patient. Thus, to determine the total post-start-up *Up Front Suspension Cost*, I will

take the present-day *Up Front Inventory Cost* for whole bodies of \$20,888 (which we've decided not to alter for post-start-up calculations) and add the post-start-up *Up Front Labor Cost* of \$8,000, for a total of \$28,888. Similarly, I will take the present-day *Up Front Inventory Cost* for neuros of \$15,082 and add the post-start-up *Up Front Labor Cost* of \$8,000, for a total of \$23,082. With these figures, we can construct a comprehensive table for post-start-up and present-day *Up Front Suspension Costs* (Table 2).

Readers expecting a more significant expression of economies in the post-start-up *Up Front Labor Costs* should keep in mind that this paper *does not* assume a proportionate amount of volunteer activity during suspensions when they are occurring almost weekly.

Part III: Annual Storage Costs, Present-Day and Post-Start-Up

Anyone attempting a mathematical analysis of the ongoing costs of storing cryonics patients will soon conclude that *most of the costs that a given patient incurs are a function of the amount of space*

s/he takes up. With this in mind (details to follow shortly), consider that if an entire Bigfoot is dedicated to neuro patients, there will be ten in each of the four pods and five in the center column, for a total of 45. From a nitrogen usage perspective, it's then irrelevant which five are in the center column; what matters is that those five patients constitute one ninth (i.e., five forty-fifths) of the patient group, and should bear one-ninth of the cost. Thus, for dewars that contain four whole bodies in pods and 5 neuros in the center column, the five neuros in the center column will be seen to consume one-ninth of the liquid nitrogen for that dewar as well, so that *each neuro will be seen to consume one forty-fifth of the liquid nitrogen, for that dewar, and each whole body in its pod will be seen to consume ten forty-fifths (two-ninths) of the liquid nitrogen for that dewar.* Priced in this sensible manner, the cost of storage for individual neuropatients is identical when they are stored with other neuropatients or with whole body patients, and the cost of whole bodies is constant whether there are neuros in the center well or (for instance) pets.

After reading an earlier draft of this paper, Alcor Patient Caretaker Mike Perry (who clearly understood the ap-

Table 1. Up front labor costs, post-start-up

TRANSPORT TEAM

	Salary (\$/yr.)
Team Leader	25,000
Team Leader	25,000
Surgeon	25,000
Surgeon	25,000
Technician	25,000
Technician	25,000
ANNUAL TOTAL:	150,000
PER-PATIENT:	3,750

SUSPENSION TEAM

	Salary (\$/yr.)
Team Leader	35,000
Team Leader	25,000
Surgeon	35,000
Perfusionist	35,000
Technician	20,000
Technician	20,000
ANNUAL TOTAL:	170,000
PER PATIENT:	4,250

Table 2. Up front suspension costs, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole (\$/yr.)	Present-Day Whole (\$/yr.)
Inventory Cost	15,082	15,082	20,888	20,888
Labor Cost	8,000	10,090	8,000	10,830
TOTALS:	23,082	25,172	28,888	31,718

proach I was using better than I did) summarized this as follows:

"By a reasonable argument, I think, Ralph has arrived at a 10-to-1 ratio between the space occupied by a whole body and that occupied by a neuro. If C is the total cost, and c is to be the cost assessed for each whole body, with the mix of patients Ralph assumes (74 whole bodies, 126 neuros) we obtain $74c + 126(c/10) = 86.6c = C$, or $c = C/86.6$. . ."

I'll add to this by saying that when I do 10-to-1 "cost-sharing" for our *current* patient mix of 10 whole bodies and 17 neuros (versus the post-start-up patient mix Mike is addressing above), a simple variant of the above equation applies: $10c + 1.7c = 11.7c = C$, or $c = C/11.7$. (See *Utilities/Overhead*, for instance.)

• **Liquid Nitrogen:** Currently, it appears that we spend roughly \$.50/liter for liquid nitrogen, including delivery fees and transfer losses. (Note: this is currently under investigation, but likely to be correct to +/- 15%.) After some discussion, Hugh and I have agreed that at 200 patients we would likely be spending between twenty and twenty-five cents/liter for liquid nitrogen (that also includes any delivery fees and transfer loss), so I will assume \$.25/liter as our post-start-up liquid nitrogen cost.

Using 13.3 liters/day as boiloff for Bigfeet (the average of the three now in use, which boiloff 12.1, 13.8, and 14.1 liters/day), we find that at post-start-up each neuro will use $(1/45) \times 13.3 = .30$ liters of liquid nitrogen a day, which is 108.2 liters per year, which at \$.25 per

liter is \$27.04 per year. Post-start-up whole bodies will use $(10/45) \times 13.3 = 3.0$ liters of liquid nitrogen a day, which is 1082 liters per year, which is \$270.37 per year.

For present-day patients, we will use \$.50 per liter for liquid nitrogen. There's another difference between post-start-up and present-day figures, though: Our presumed ratio of 10-to-1 between whole bodies and neuros does not yet apply, since present-day whole body patients are not yet requiring ten times the liquid nitrogen that present-day neuros require (even assuming that the neuros are in Bigfeet), since we don't even have enough dewars for that yet. That is, even though all of the whole body patients fit in 3 dewars and all of the neuropatients *would* fit in .3 dewars, the liquid nitrogen consumed by a Bigfoot dewar at .3 capacity (neuros only) would be the same as one at full capacity, since I assure you that it would be *kept* full of liquid for the additional safety. So, the *total* present-day whole body nitrogen consumption is approximately *three* times the *total* present-day neuro nitrogen consumption (i.e., a 3/4 to 1/4 ratio). Three quarters of the total nitrogen consumption divided by 10 whole bodies is $.75 / 10 = .075$ per whole body, and one quarter of the total nitrogen consumption divided by the 17 neuros is $.17 = .015$ per neuropatient. The ratio between these consumption fractions is $.075 / .015 = 5$, so the present-day ratio of nitrogen consumption between whole bodies and neuros is effectively 5-to-1 (i.e., 5/6 to 1/6). So again using 13.3 liters/day as boiloff for Bigfeet, we find that each present-day neuro will use $13.3 \times 1/6 / 5$ patients (per dewar) = .44 liters of liquid

nitrogen a day, which is 161.8 liters per year, which at \$.50/liter is \$80.91 per year. Present-day whole bodies will use $13.3 \times 5/6 / 4$ patients (per dewar) = 2.77 liters of liquid nitrogen a day, which is 1011.4 liters per year, which at \$.50/liter is \$505.68 per year. (See Table 3.)

• **Floor Space:** If a Bigfoot "footprint" is roughly 5 feet x 5 feet = 25 square feet, then many of them in a long line would need no more than a six-foot wide passage-way in front of them, i.e. a 5 feet x 6 feet = 30 square feet "walking slot" per dewar. This would yield a *maximum* "practical footprint" of 55 square feet. However, since it is equally likely that two rows of Bigfeet can be arranged to allow a single six-foot wide passageway between the rows, wherein each dewar would be billed for *half* the six-foot wide walking slot, we'll assign the *minimum* "practical footprint" a value of 25 square feet + (3 feet x 5 feet) = 40 square feet. Then we'll pick the midpoint between *maximum* and *minimum* as our working figure, for 48 square feet per dewar.

The 19,600 sq.ft. Acoma building has an asking price of \$770,000, or \$39.29 per square foot. However, it is not Alcor but rather the *Cryonics Property Limited Liability Company* that will own the building. A reasonable *market rate* floor space rental assumption would be \$.45/sq.ft., but *Cryonics Property* plans to charge Alcor \$.25/sq.ft./month, or \$3.00/sq.ft./year. Any given Bigfoot, then would owe 48sq.ft. x \$3.00/sq.ft./year = \$144/year in a Patient Care Bay maximally occupied (whatever its size). Thus, each post-start-up whole body patient will be billed \$144/year x 10/45 = \$32/year, and each post-start-up

Table 3. Liquid nitrogen, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
Liquid Nitrogen	27.04	80.91	270.37	505.68

Table 4. Floor space, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
Floor Space	3.20	26.47	32.00	135.00

neuro patient will be billed \$144/year x 1/45 = \$3.20/year.

However, a *present-day* Patient Care Bay in a new building is *not* going to be maximally occupied. Instead, it will likely be approximately 20ft. x 30ft. = 600sq.ft., and occupied by only 4 patient-bearing Bigfeet. These patients will bear the cost of the room, or 600sq.ft. x \$3.00/sq.ft. = \$1,800/year. There's another difference between post-start-up and present-day figures, though: Present-day whole body patients are not yet requiring ten times the floorspace that present-day neuros require, since we don't even have enough dewars for that yet. That is, even though all of the whole body patients fit in 3 dewars and all of the neuropatients would fit in .3 dewars, a Bigfoot dewar only three tenths full takes up as much floor space as a full one. To account for this the whole body patients will be seen for now as demanding *three* times the floorspace of neuropatients, instead of ten. So, the 10 whole bodies will bear 3/4 of the total cost, or \$1,350/10 patients = \$135.00 per whole body, and the 17 neuros will bear 1/4 of this cost, or \$450/17 patients = \$26.47 per neuropatient. (See Table 4.)

• **Custodial Labor:** As with the floor space argument above, if all of our patients — whole body *and* neuro — were stored in Bigfoot dewars, which likely will be the case soon after we move from the earthquake risk, then the Patient Caretaker's

labor would divide between them at roughly 3-to-1 whole body-to-neuro. Though by the time we are post-start-up it most likely *will* be 10-to-1, for now we'll view it as 3-to-1 (i.e., 3/4 to 1/4), so Mike Perry's salary of \$9,000/year divides to \$6,750 for the whole bodies and \$2,250 for the neuros, or \$6,750 / 10 = \$675 per present-day whole body patient and \$2,250 / 17 = \$132.35 per present-day neuropatient.

With 20 Bigfeet, Mike Perry would be spending 3 hours per month per Bigfoot on custodial tasks, or 60 hours per month total. Quite manageable. And with that many patients, the labor ratio between whole bodies and neuros would approach the "ideal" 10-to-1 ratio. At \$15/hour, this would break down into 10/45 x \$45 x 12 months = \$120 per year for whole bodies, and 1/45 x \$45 x 12 months = \$12 per year for neuros. This would work out to \$10,800 a year, and this is all that I will bill for the post-start-up Patient Caretaker's salary, even though I expect he will be paid more. *If* he is paid more, the "more" should come from operating, unless his custodial labor turns out to require more than 60 hours per month. (See Table 5.)

• **Equipment Amortization:** A 20-year amortization of each \$18,000 Bigfoot yields \$900 per year, or 10/45 x \$900 = \$200/yr. for each whole body, and 1/45 x \$900 = \$20/yr. for each neuro. Additionally, all patients must split the amortization

cost of a back-up dewar for use in emergencies. (Back-up dewars can also be used to receive bulk delivery of Liquid Nitrogen, should we begin doing this.) This will simply be the yearly amortization cost (\$900) distributed between the total number of whole bodies and the total number of neuros on a 10-to-1 basis for post-start-up and a 3-to-1 (see *Floor Space*) basis for neuros. I'll assume arbitrarily that with 200 patients we would want three back-up dewars rather than just one. Thus, for post-start-up whole bodies we have 3 x \$900 x 10/11 / 74 = \$33.17/year, and for post-start-up neuros we have 3 x \$900 x 1/11 / 126 = \$1.95/year. For present day, figure \$900 x 3/4 / 10 = \$67.50/year for whole bodies, and \$900 x 1/4 / 17 = \$13.24/year for neuros.

Also, all present-day whole body patients must split the \$9,600 cost of the A-9000 whole body cooldown dewar. This expense will not carry over to post-start-up patients, though, because once we have more than one back-up Bigfoot dewars we can use one of them for this purpose.

Also required for long-term patient care are a crane (\$1,500), a scale (\$1,000), and assorted hardware (\$400) totaling roughly \$2,900 in value. Plus, whole body patient pods (\$700 apiece), and for neuropatients the 5-patient "center columns" (\$150 apiece, \$30 per neuropatient). Since we expect continual upgrades in our storage techniques, all of these items will be amortized over a ten-year basis. (Except

Table 5. Custodial labor, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
Custodial Labor	12.00	132.35	120.00	675.00

Table 6. Equipment amortization, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
Storage Dewar	20.00	20.00	200.00	200.00
Back-Up Dewar	1.95	13.24	33.17	67.50
Cooldown Dewar	—	—	—	48.00
Crane / Scale / Misc.	1.45	10.75	1.45	10.75
Pods / Center Columns	3.00	3.00	70.00	70.00
TOTAL:	26.40	46.99	304.62	396.25

the dewars themselves, which are on a twenty-year amortization schedule, as described above.)(See Table 6.)

• **Administration:** This category will include all labor — for instance, pod construction — that is not direct custodial labor. With 200 patients and 2000 members, I will assume that most Alcor personnel will have *no* direct role in patient care, and will have none of their salaries billed to it. I will assume that 1 Patient Caretaker continues to be adequate, his salary covered under *Custodial Labor*, one quarter of the time of 1 Facility Engineer will be adequate, and one half of the time of a Records Administrator will be required (the duties of this position our currently split between several Alcor employees). I will also assume that this staff will be paid a market wage, i.e., roughly twice what each of the staff is currently receiving. Let's say \$8,000/yr. for one quarter of the time of an Engineer, who will divide his

time at about 3 to 1 between whole bodies and neuros (Hugh's estimate). Let's say \$12,000/yr. for one half of the time of a Records Administrator, whose time will divide equally between all patients.

Finally, we'll add \$4,582.86 to cover employee-related expenses (payroll taxes and Worker's Comp). I arrived at this figure by taking our present ratio of patient-related salaries to the sum of payroll taxes and Worker's Comp, and extrapolating this ratio to the post-start-up patient-related salary figures. For post-start-up, 36% of \$4,582.86 = \$1,649.83 will bill to neuros, and 64% of \$4,582.86 = \$2,933.03 will bill to whole bodies. For present-day, 36% of \$2,731.86 = \$983.47 will bill to neuros, and 64% of \$2,731.86 = \$1,748.39 will bill to whole bodies. See the below boxes for breakdowns of the relevant categories. NOTE: Employee Expenses includes the payroll tax and Worker's Comp for the Patient Caretaker, though his *salary* is accounted for under

Custodial Labor.)

So our post-start-up Administration total will be \$12,000 + \$8,000 + \$4,582.86 = \$24,582.86/yr. Our present-day Administration total will be \$3,937 + \$2,250 + \$1,440 + \$660 + 2,731.86 = \$11,018.86/yr. The following table breaks these down appropriately, and you will see that for the post-start-up figures if you multiply the neuro total by 126 and the whole body total by 74 (these two numbers represent the assumed neuro/whole body spread at 200 patients), the resulting amounts indeed sum to \$4,582/yr. The present-day figures (multiplying the neuro total by 17 and the whole body total by 10) also checks. (See Table 7.)

• **Utilities/Overhead:** Electricity demands will be assumed to roughly triple, so we take the 1992 figure of \$198.48 for 23 patients and first scale it to 27 patients (\$198.48 x 27/23 = \$233.00) and then triple that (\$233.00 x 3 = \$699.00) to ac-

Salaries now billed to patient care: \$17,287

- 25% of Facility Engineer's time (Hugh) = \$3,937/year = \$984.25 neuros (25%) and \$2,952.75 whole bodies (75%)
Divide by 10 = \$295.28/year. for whole body
Divide by 17 = \$57.90/year for each neuro
- 100% of Patient Caretaker's time (Mike) = \$9,000/year = \$3,000 neuros (33.3%) and \$6,000 whole bodies (66%)
Divide by 10 = \$600/year. for each whole body
Divide by 17 = \$176.47/year. for each neuro
- 10% of President's time (Steve) = \$2,250/year
Divided equally by 27 = \$83.33 for each patient
- 10% of Suspension Services Manager's time (Tanya) = \$1,440/year,
Divided equally by 27 = \$53.33 per patient
- 5% of Accountant's time (Joe) = \$660/year,
divided equally by 27 = \$24.44 for each patient

Employee Expenses ("Administration"):

Payroll taxes (\$1,812.36) + Worker's Comp (\$919.50) = \$2,731.86, apportioned as follows:

- Mike represents 52% of patient-related payroll and thus \$1,420.57 (52%) of the \$2,731.86 Miscellaneous Expense figure, i.e \$473.52 neuro (1/3) and \$947.05 whole body (2/3)
- Hugh represents 23% of patient-related payroll, and thus \$628.33 (23%) of the \$2,731.86 Miscellaneous Expense figure, \$157.08 neuro (1/4) and \$471.25 whole (3/4)
- Tanya, Steve, and Joe represent 25% of the patient-related payroll, and thus \$682.97 (25%) of the Miscellaneous Expense figure, i.e. \$341.48 neuro (1/2) and \$341.48 (1/2) whole body

Thus the total of \$2,731.86 will be apportioned as:

\$473.52 + 157.08 + \$341.48 = \$ 972.08 neuro
\$947.05 + \$471.25 + \$341.48 = \$1,759.78 whole

Table 7. Administration, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
Facility Engineer	15.87	57.90	81.08	295.28
Records Administrator	60.00	161.32	60.00	161.32
Employee Expenses	22.91	57.18	22.91	175.98
TOTAL:	98.78	276.40	163.99	632.58

count for the expansion to 200 patients. This will be distributed at a 10-to-1 whole-body-to-neuro ratio because it scales as a function of space taken up by the patients. Phone expenses will be moved somewhat arbitrarily from the present assumption of \$360 annually to \$500 annually, and will divide equally between all patients, whole body or neuro (i.e., it is *not* a space-sensitive expense). Office expenses, like electricity, we will first scale to 27 patients and then triple ($\$108.25 \times 27/23 = \$127.08 \times 3 = \$381.24$). This also will be divided equally. We will do the same for postage expenses ($\$402.50 \times 27/23 = \$472.50 \times 3 = \$1,417.50$) and shipping expenses ($\$136.05 \times 27/23 = \$159.71 \times 3 = \$479.13$). Premises liability insurance will be moved somewhat arbitrarily from \$1,997 to \$3,000, and will be divided equally. The post-start-up figures total to \$6035.84, and again if you multiply the neuro and whole body totals by 126 and 74 respectively, and then sum them, \$6035.84 is what you will get. (See Table 8.)

To sum up, let's look now at Table 9 that compares all of the post-start-up *Annual Storage Costs* with our present-day *Annual Storage Costs*. But remember, even the *Present-Day Costs* as we've defined them are *theoretical* at this point, in that we've yet to compare them with what we are actually paying (or will be when the neuros are in Bigfeet).

We now have figures for the annual costs of storing patients with which to approach an analysis of anticipated *Capital Requirements, Return Factors, Safety Factors, Percent Rules, and Operating Surplus*. However, before we approach such considerations, we could probably benefit from comparing our anticipated *Annual Storage Costs* with our *actual* costs during 1992.

Part IV: Reality Check

Let's step back a moment and compare our now-complete (but theoretical) present-day *Annual Storage Costs* with our recorded Patient Care Expenses for 1992. The following table juxtaposes our *Theo-*

retical Present-Day Annual Storage Costs (as arrived at in Part 3 of this paper) and our *Actual Present-Day Annual Storage Costs*. Because the actual expenses are culled from our 1992 Patient Care Expenses accounting, they are not broken down on a per-patient basis, but instead reflect only the total Patient Care Fund Expenses for the entire year. (Figuring realistic *per-patient* storage costs is, after all, the point of this paper.)

In figuring the number of patients by which to divide the total expenses for 1992, I began by considering that we started 1992 with 20 patients, 12 of them neuro and 8 whole body, then added 3 neuro patients and 2 whole body patients over the course of the year. The number of months in 1992 that each of the 3 neuro patients were present sum to 22, which is roughly equivalent to our having had 2 neuropatients (instead of 3) for the entire year. The number of months in 1992 that each of the 2 whole body patients were present sum to 13, which is roughly equivalent to our having had 1 whole body patient (instead of 2) for the entire year.

Table 8. Utilities/overhead, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
Electricity	.83	1.99	8.28	19.91
Phone	2.50	13.33	2.50	13.33
Office Expenses	1.91	4.71	1.91	4.71
Postage	7.09	17.50	7.09	17.50
Shipping	2.40	5.92	2.40	5.92
Liability Insurance	15.00	73.96	15.00	73.96
TOTAL:	29.73	117.46	37.18	135.84

Table 9. Annual storage costs, post-start-up vs. present-day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
Liquid Nitrogen	27.04	80.91	270.37	505.68
Floor Space	3.20	35.29	32.00	120.00
Custodial Labor	12.00	132.35	120.00	675.00
Equipment Amortization	26.40	46.99	304.62	396.25
Administration	98.78	276.40	163.99	632.58
Utilities/Overhead	29.73	117.46	37.18	135.84
TOTALS:	197.15	689.40	928.16	2,465.35

This is fortuitous in that it allows us to do our figuring as if we had a static 9 whole body patients and 14 neuropatients throughout the year, for a total of 23 patients. (See Table 10.)

A comparison of bottom lines makes it immediately obvious that either our theoretical costs of storing patients are dramatically wrong in several categories, or since 1992 the cost of storing patients has dropped dramatically in several categories. We shall now see that it is largely the latter, and why.

Before we examine the categories individually, it's important that we recall that some of the per patient figures used in Part 3 of this paper (the ones that reflect expenses that scale 10-to-1 whole body to neuro) were arrived at simply by taking the actual 1992 patient expenses, extrapolating to 27 patients, and then dividing by 11.7 for whole bodies and 117 for neuros. Thus, we should not be surprised when our comparison of this 27-patient reasoning with the 23-patient reality of 1992 does not exactly jibe. The theoretical figures reflect a whole body to neuro ratio that is different from that in 1992.

Liquid Nitrogen. This category shows the biggest discrepancy (\$9,418) between theoretical and actual costs. We can cut that discrepancy considerably just by recalling that the theoretical numbers assume that the neuropatients are in Bigfoot storage, which as of yet they are *not*. The vault units in which they are actually stored boil off 5.25 liters/day on average, and hold only 9 neuropatients apiece. (For ease of calculation, let's say that in 1992 each unit held 7 of the 14 neuropatients.) Thus, liquid nitrogen consumption for all neuropatients in 1992 actually cost 5.25 liters/day x 2 x 365 days x .50 \$/liter = \$1,916.25, rather than the \$1,133 that they would cost if they were in Bigfoot storage. That accounts for \$783.25 of the discrepancy.

Next, we should realize that whole body and neuro cooldowns (after suspensions) were billed to patient care. Each whole body cooldown consumes roughly 1600 liters of liquid nitrogen, and each neuro cooldown consumes roughly 160 liters of liquid nitrogen. This would have resulted in the consumption of 3680 liters

of liquid nitrogen used for patient cooldown in 1992, at an expense of \$1,840. Ideally, this non-recurring expense should be considered an *Up Front Suspension Cost*, so we will not build it into our theoretical annual costing. That accounts for \$1,840 of the discrepancy.

That leaves \$6,795 to account for in liquid nitrogen expense. It's apparent that various expenses like dewar test fills, biological sample maintenance, and companion animal suspensions account for this discrepancy to a large extent, but as of this writing the details of such are not available. For now we will assume that there *is* revenue flowing into patient care to account for such expenses (for instance, the companion animal suspension charges), and endeavor to address this in the future as more detailed accounting becomes available. (Furthermore, consider that the first four months of 1993 show a liquid nitrogen expense of only \$3,657, a consumption rate which would lead to a 1993 total of roughly \$11,000, which is considerably less than the 1992 number. Perhaps the 1992 liquid nitrogen expense, for reasons not yet understood, is in fact

Table 10. Theoretical vs. actual annual storage costs
(1992, 14 Neuropatients and 9 whole body patients)

	Theoretical Cost of 14 Neuros (\$/yr.)	Theoretical Cost of 9 Whole Bodies (\$/yr.)	1992 Expenses for 14 Neuros and 9 Whole Bodies (\$/yr.)
Liquid Nitrogen	1,133	4,551	15,102
Floor Space	371	1,215	—
Custodial Labor	1853	6,075	9,000
Equipment Amortization	658	3,566	10,490
Facility Engineer	811	2,658	3,937
Records Administrator	2,258	1,452	5,636
Employee Expenses	801	1,584	6,504
Electricity	28	179	198
Phone	187	120	—
Office Expns. / Supplies	66	42	208
Postage	245	158	403
Shipping	83	53	136
Liability Insurance	1,035	666	—
Archival Storage	—	—	164
Asset loss / Securities Gain	—	—	1,275
SUBTOTALS:	9,529	22,319	53,053
TOTALS:	31,848		53,053

higher than we can expect 1993 expense to be.)

Floor Space. The Patient Care Fund did not incur floor space charges in 1992 because the Fund is a part owner in Sym-bex, the Property Group that owns Alcor's current facility. This is unlikely to be the situation indefinitely, so the anticipated cost is shown.

Custodial Labor. Our theoretical figures in this category total to \$7,928, which is lower than the actual amount of \$9,000 charged to Patient Care in 1992 simply because the Patient Caretaker's salary has not changed since 1992, but the number of patients has increased. So this difference of \$1,072 is reflecting an economy of scale.

Equipment Amortization. Here we have another significant discrepancy between theoretical and actual amortization expenses for 23 patients. This \$6,266 discrepancy may well disappear entirely after the comprehensive inventory project that is now underway is complete. Since we do not presently have a detailed accounting of exactly what equipment is being amortized to generate this figure, we will assume that the equipment we've identified as mission critical to ongoing patient care is all that is necessary, and we'll adjust this figure upward if the inventory project indicates that more equipment is necessary. Thus, we will assume that the theoretical figure reflects what actual future amortization expenses are likely to approximate.

Facility Engineer. As with the Patient Caretaker, this difference of \$468 is an economy of scale.

Records Administrator. Our theoretical figures in this category total to \$3,710, which is lower than the actual amount of \$5,636 partially because (as with the above category) the figures shown reflect *current* costs, and the costs per patient of adding our 28th patient are *less* than they were when we were preparing to add our 24th. Thus, of the \$1,926 difference between the theoretical and actual categories, \$646 is a simple function of economies of scale. The remaining discrepancy of \$1,280 is present because the fraction of the employees' salaries being billed to Patient Care was cut this year.

Employee Expenses. The \$4,455 discrepancy here is mostly a result of exorbitant Workman's Compensation fees in

1992, which have since dropped by \$3,772 in terms of patient expense. The remaining \$683 will disappear as well, since it is a function of the patient-related salaries discrepancy described in "Records Administrator" above.

Electricity. The difference of \$15 here is a direct function of economies of scale.

Phone. No phone expenses were billed to Patient Care in 1992.

Office Expns. / Supplies. The small discrepancy here results from a one-time expense.

Postage. No discrepancy.

Shipping. No discrepancy.

Liability Insurance. Alcor did not have Liability Insurance in 1992, but does now. The Patient Care Fund bears a fraction of the cost of that insurance proportional to the amount of total Alcor assets that the PCF represents. (This expense may go up, if the Patient Care Fund becomes protected in other ways.)

Archival Storage. Since this is a one-time charge for patients entering suspension, it is no longer billed to Patient Care.

Asset loss / Securities Gain. This figure represents the difference between a \$3,100 loss on sale of assets expense and a \$1,825.38 increase in the value of securities. It is not an actual "cash cost" of caring for patients, so it does not appear in the Annual Costs analysis (Part 3 of this paper). I'm no accountant, but my understanding of this (based on conversations with those who are) indicates that these categories reflect how reality *differs* from your prediction of it, and that in general you assume no asset loss (for instance) beyond your standard depreciation (amortization). In other words, this category could as easily have a net positive effect as a net negative effect. It's proper to assume zero here.

Based on this analysis, \$12,098 of the \$21,205 discrepancy we can confidently ascribe to economies of scale and more economical methods. The remaining \$9,107 seems likely to disappear as well, but we have insufficient information to conclude that it *will* disappear. Still, until proven wrong by analysis or example we will make the optimistic assumption that this paper has accurately identified the ap-

propriate *current* and *future* costs in each category, and that the apparent improvements in economy are genuine.

Now, with a reasonable level of confidence in our breakdown of per-patient *Annual Storage Costs*, for present-day if not post-start-up, we can begin to address Return Factors, Safety Factors, and Percent Rules.

Part V: Capital Requirements, Return Factors and Safety Factors

Let's turn our attention to the amount of money — the *Capital Requirement* — required to generate sufficient interest to meet our proposed *Annual Storage Costs* costs perpetually.

Our existing *Capital Requirement* is 100X (i.e., 100 "times" or "multiplied by") our existing *Annual Storage Costs* figure. This figure was arrived at, many years ago, by:

- The assumption of 2% "real return" (that is, actual return after accounting for the effect of inflation) on Patient Care Fund investments — which was reasonable considering that at the time such investments were limited to T-Bills. No stocks. Thus, a *Capital Requirement* of 50X the *Annual Storage Costs* was required to generate a *Return Factor* of 2%.
- The decision to *double* the above-stated *Capital Requirement* for an additional margin of safety and preparedness. In other words, a multiplicative (2X) *Safety Factor* was enacted, which changed the *Capital Requirement* from 50X to 100X.

Now, recall our bottom line annual storage expenses (Table 11).

From these figures we can see that with our present *Capital Requirement* of 100x, our present-day price for *storing* (not freezing) a patient should be at least \$68,940 for neuros (and that's if they were in the more economical Bigfeet!) and \$246,535 for whole bodies. We can also see that once we are post-start-up, these will drop to \$19,715 for neuros and \$92,816 for whole bodies, which is actually very close to what we *had* been considering our *present-day* costs of storing (again, not freezing) to be!

Add to this the nontrivial *Up Front Suspension Costs*, and the prices for sus-

pensions using the 100x Return/Safety Factor and these updated costs look like Table 12.

So what's going on? Are we radically underpricing suspensions, in light of these up-to-date annual storage costs? Is the Patient Care Fund losing money?

In fact, the Patient Care Fund is growing *despite* not receiving suspension revenue even close to 100X our actual *Annual Storage Costs*. What we're seeing here is two mis-estimations effectively canceling each other out. The previous iteration of anticipated annual patient care expenses (in "The Cost of Cryonics") dramatically understated the actual cost of patient care both for today *and* for when it was written. However, the requirement that 100 times the annual patient care expenses be added to the Patient Care Fund for each suspension was based on the notion that Patient Care Fund money would never be invested in anything riskier than T-Bills. As more and more financially sophisticated persons entered the Alcor membership, though, there developed an overwhelming consensus that such an investment philosophy (T-Bills only) was not "conservative," but was in fact *bad money management*. Much higher returns could be achieved with very conservative investments, sufficiently diversified to assure stability of the Fund in anything short of total collapse of the economy.

(It's not entirely coincidental that these two mis-assessments survived for so long, and balanced each other nearly exactly to boot. It's because revenues matched expenses so closely that the un-

derlying assumptions escaped close scrutiny. In fact, when it was obvious that expenses were creeping up to match revenues, and no cost-cutting in the patient care area seemed feasible, the logical thing was done: prices were raised, from \$35,000 and \$100,000 to \$41,000 and \$120,000 for neurosuspension and whole body suspension respectively. What the actual per-patient expenses were — and why — was not as important as *meeting them*.)

So not only is our assumed Return Factor (2%) very much out of line with with our present investment policy, but also we've employed an exceedingly arbitrary approach to deciding on an appropriate Safety Factor. Not only does it neglect to consider the actual dollar amount of the buffer it will generate, but also because it is *multiplicative* it has the effect of forcing the whole body patients — whose annual costs are by necessity much higher than those of neuropatients — to contribute much, much more to the safety of *all* patients (neuro and whole body alike). Has it ever been established that because the costs of caring for whole body patients is higher, they should contribute more to safety from legal attack, or any other potential future liability? Not at all. In reality, the principal effect of this multiplicative approach to defining a Safety Factor is to dramatically magnify the already-significant difference between annual capital requirements for whole body patients and neuropatients.

What, then, should our Return Factor and Safety Factor be? To decide this, we should refer first to the historical

return over inflation of the types of investments we now view as acceptable for Patient Care Fund money. Consider the graph on the following page, which examines the performance of the S&P 500 Total Return Gains over the last 40 years, as well as the CPI (Consumer Price Index, i.e., inflation) over the same period. I have intentionally "smoothed out" year-to-year fluctuations, since it is long-term performance that we are interested in. The possibility of short term (one- or two-year) losses — or gains, for that matter — should not significantly affect our thinking.

As the graph indicates, the average gain of stocks over inflation for the past 40 years is 7.1%. A similar examination of just the past ten years (graph omitted) would show an average gain in stocks of 16% over the past decade, compared to inflation of 3.8%, for an actual gain of 16% - 3.8% = 12.2%. Since average inflation during the past 40 years has been just over 4%, and average inflation during just the past ten years has been just *under* 4%, I will propose that we use 4% as our anticipated inflation figure henceforth. Since the average gain of stocks for the past 40 years has been 11.4%, and for the past decade 16%, I will propose that we assume an average gain of stocks of 11%. Therefore, I propose that we assume that the average gain of stocks over inflation in the future will be 11% - 4% = 7%, a figure it has consistently outperformed on both time scales.

But the Patient Care Fund will invest more conservatively than the

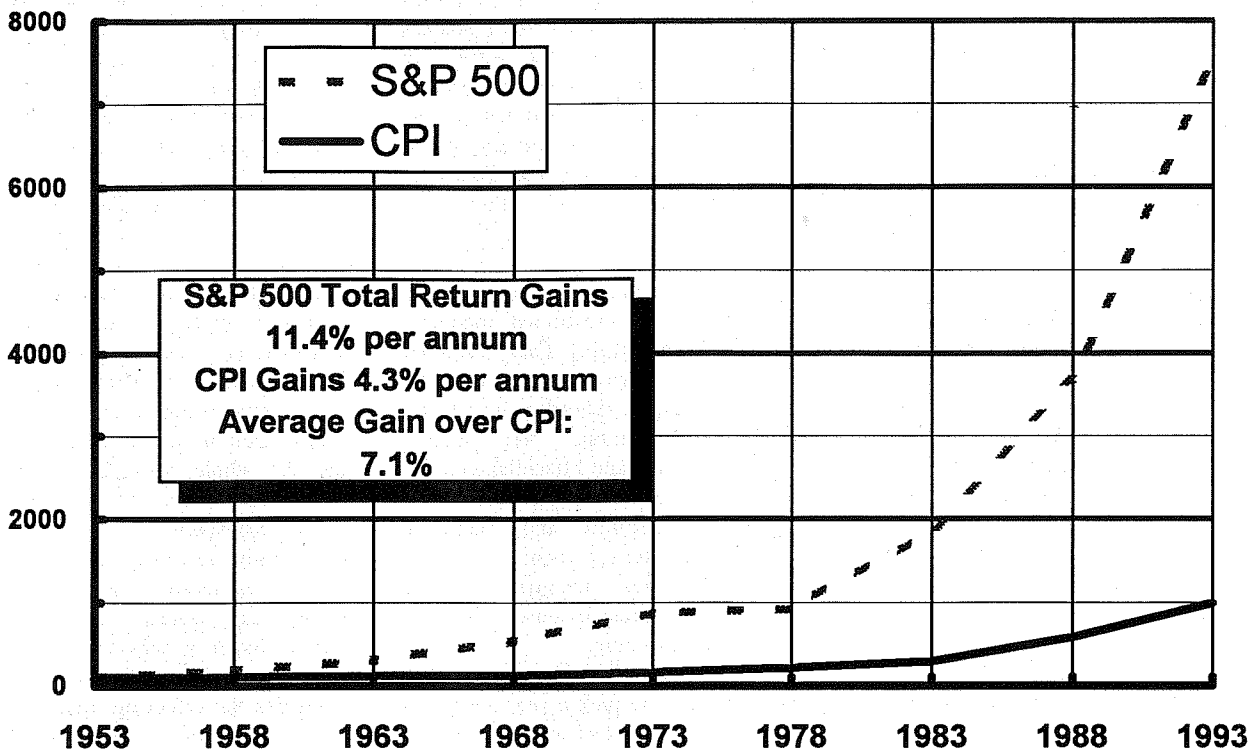
Table 11. Annual storage costs, post-start-up vs. present day

	Post-Start-Up Neuro (\$/yr.)	Present-Day Neuro (\$/yr.)	Post-Start-Up Whole Body (\$/yr.)	Present-Day Whole Body (\$/yr.)
TOTALS:	197.15	689.40	928.16	2,465.35

Table 12. Minimum suspension prices with 100x capital requirement

	Post-Start-Up Neuro in Bigfoot (\$/yr.)	Present-Day Neuro in Bigfoot (\$/yr.)	Post-Start-Up Whole in Bigfoot (\$/yr.)	Present-Day Whole in Bigfoot (\$/yr.)
Up Front Suspension Costs	23,082	25,172	28,888	31,718
100X Capital Requirement	19,715	68,940	92,816	246,535
TOTALS:	42,797	94,112	121,704	278,253

40-Year Comparison of Stocks and Inflation



average investor, and thus will enjoy less than the average gain. I submit that, by investing very conservatively, the Patient Care Fund can easily achieve an average gain over inflation of 4%, just barely over *half* the average gain of stocks over inflation in general. Ignoring whatever Safety Factor we desire, then, an assumed Return Factor of 4% generates a Capital Requirement of 25X the *Annual Storage Costs*. Again, leaving aside for a moment any desired buffer against unanticipated expenses, it seems that we can conservatively assume an 8% return (4% *real* return) on Patient Care Fund investments. (And in fact 8% is roughly our average return on Patient Care Fund investments right now.)

Let's now recalculate our "Minimum Suspension Prices" table with a Capital Requirement of 25X (i.e., a Return Factor of 4% and — for the moment — no Safety Factor). (See Table 13.)

It's encouraging to see that our present minimums of \$120,000 for whole body suspension *easily* covers the present-day *Up Front Suspension Costs* and *Annual Storage Costs*, given our assumed Return Factor of 4%. Our present neurosuspension price of \$41,000, on the other hand, does *not* meet expenses with these assumptions. (Remember, my proposed *Annual Storage Cost* assumption for neuros is roughly 8 *times* our current assumption, and my proposed *Annual*

Storage Cost assumption for whole bodies is 6 *times* our current assumption. This is why I can propose lowering the Capital Requirement to 25X when currently 100X is necessary to match these expenses.) But what about a Safety Factor? Shouldn't we arrange for *more* than our bottom line expenses to be paid into the Patient Care Fund with each suspension, to prepare for potential legal challenges, unforeseeable catastrophes, and even reanimation?

As I described above, our present system assumes a 2% real return on Patient Care Fund investments, which translates to a Capital Requirement of 50X anticipated *Annual Storage Costs*, then as a Safety Factor *doubles* the 50X Capital Require-

Table 13. Minimum suspension prices with 25x capital requirement

	Post-Start-Up Neuro in Bigfoot (\$/yr.)	Present-Day Neuro in Bigfoot (\$/yr.)	Post-Start-Up Whole Body in Bigfoot (\$/yr.)	Present-Day Whole Body in Bigfoot (\$/yr.)
Up Front Suspension Costs	23,082	25,172	28,888	31,718
25X Capital Requirement	4,929	17,235	23,204	61,634
TOTALS:	28,011	42,407	52,092	93,352

ment, for a Capital Requirement of 100X. Since we do not wish to continue this practice of demanding from whole body patients a *much* higher contribution to patient safety than that which is contributed by neuropatients, we should replace this *multiplicative* Safety Factor with an *additive* Safety Factor. I propose a Safety Factor of \$10,000 per suspension, both neuro and whole body. Though the current multiplicative Safety Factor might *seem* to contribute more to the Patient Care Fund, in reality the vastly understated *Annual Storage Costs* were absorbing the supposed safety margin almost entirely. If the *Annual Storage Costs* presented in this paper are realistic, and if we can meet those costs *plus* \$10,000 for each suspension, this additive Safety Factor will contribute more to patient safety than the present multiplicative approach. (See Table 14.)

The good news is, given the Alcor Board of Directors decision (early this year) to raise neurosuspension prices to \$50,000 at the end of this year, the expenses are not yet out of control. (Assuming, once again, that the neuropatients find their way into Bigfoot storage soon, i.e., pending a move out of an area of high seismic risk.)

The bad news is, we're not done yet.

Part VI: Percent Rules and Operating Surplus

The following synopsis of Alcor's "10% Rule" opens Steve Bridge's clarification of the Rule, as reaffirmed by the Board of Directors on May 2, 1993:

Since at least 1986, it has been Alcor's policy to apply 10% of all unrestricted Operating Fund (General Fund) income to the Patient Care Trust Fund.

This policy was originally instituted because the Board of Directors and management felt that funds for long-term patient care were a weak point in Alcor's structure. Some early patients were underfunded, and the Directors were not confident they knew how to predict long-term costs. As a commitment to the patients and to the future health of the Patient Care Trust Fund, the Board of Directors agreed to provide this extra security in the Fund.

Steve's clarification goes on to name the following as "unrestricted income": Emergency Responsibility Fees (Member Dues), Interest charges on late payments, Application Fees (Membership Initiation), Unrestricted Donations, Net Excess Suspension Income, and Miscellaneous Income. The categories specifically *disin*cluded were Literature and Magazine Sales, Archival Storage Income, Endowment Fund Interest Income, Directed Donations, Jones Trust Income, and Companion Animal Revenue.

What has been the effect of the 10% Rule? In 1992 — to pick a year we've already focused on somewhat — \$10,907 of Unrestricted Income was paid from the Operating Fund to the Patient Care Fund. This year, the Operating Fund will likely pay roughly \$12,000 to the Patient Care Fund as a result of the 10% Rule. Notably, at least in 1992 (and perhaps in other years) the Patient Care Fund's expenses would have been larger than its revenues had there been no 10% Rule (when the non-cash expense of depreciation is included).

Now put that concept on the back burner for a moment, and consider what's known as "Operating Surplus." This refers to the amount of suspension income left over after the *Up Front Suspension Costs* have been paid, and the Patient Care Fund

has received its capital requirement for a given suspension. (Note: not to include suspension income *over and above* the minimum charge, commonly referred to as "Overfunding.") Operating Surplus has been known to range from roughly \$12,000 to various large negative figures, but is generally expected to land somewhere in the \$7,000 (neuros) to \$11,000 (whole bodies) range.

Now an Operating Surplus, if desired, cannot simply be hoped for. It must be *built into* the suspension costing structure, just as the current Operating Surplus figures are built into our *existing* suspension costing structures. So let's assume that we desire a \$10,000 Operating Surplus per suspension performed, neuro or whole body. (Keep in mind that there's no reason that the whole body Operating Surplus should exceed that for neuros. The *Up Front Suspension Costs* for neuro and whole body are nearly identical, and there is no relationship between Operating Surplus and *Annual Storage Costs*. The current disparity between the two figures is entirely arbitrary.) Table 15 (next page) quantifies the effect on minimum suspension prices of a \$10,000 Operating Surplus.

In the whole body suspension department, things look okay, considering that our current price is \$120,000. (What about members "grandfathered" at the \$100,000 rate? I will address these in the next section.) In the neurosuspension department, however, we've run into a problem, even considering our maximum price to be \$50,000 (as we will do henceforth), rather than today's \$41,000. Clearly, it will be necessary to relax requirements somewhere, i.e., *cut expenses*. In the current context, *cut expenses* means look at the four categories at left on the above table and decide what is least mission critical, and to what degree.

Table 14. Minimum suspension prices with 25x capital requirement and \$10,000 safety factor

	Post-Start-Up Neuro in Bigfoot (\$/yr.)	Present-Day Neuro in Bigfoot (\$/yr.)	Post-Start-Up Whole Body in Bigfoot (\$/yr.)	Present-Day Whole Body in Bigfoot (\$/yr.)
Up Front Suspension Costs	23,082	25,172	28,888	31,718
25X Capital Requirement	4,929	17,235	23,204	61,634
Safety Factor	10,000	10,000	10,000	10,000
TOTALS:	38,011	52,407	62,092	103,352

Let's suppose that we take a hard line with ourselves and simply decide that the present-day neurosuspension expenses don't allow for an Operating Surplus. Now let's look at 1993 — the present — imagining that all year we've been applying the suspension costing theories espoused in this paper, and see what this means. So far this year we've had two neurosuspensions and no whole body suspensions. If no whole body suspensions occur during the last quarter of the year, and if we've applied the "No Neurosuspension Operating Surplus" approach to expense reduction in neurosuspensions, then at the end of this year the 10% Rule will dictate that the Operating Fund pump roughly \$12,000 into the Patient Care Fund, while it will have received zero dollars in Operating Surplus from suspensions performed during the year. Now consider that at least 80% of that \$12,000 will have come directly out of the living Alcor members' Emergency Response Fees. In effect, then, we will have created a situation in which we are suspending people and placing their appropriate and conservative funding *plus* a \$10,000 Safety Factor into the Patient Care Fund, then taking several thousand

dollars of *Emergency Response* revenue from members' dues and placing *that* into the Patient Care Fund as well. Meanwhile the non-patient operations portion of Alcor (i.e., including *Emergency Response*) is losing money, and *that's what the living members depend on.*

Of course, I understand that there can be many reasons why the Operating Fund could run at a deficit, now or in the future, and we *don't* wish to simply drop the 10% Rule if that merely weakens the Patient Care Fund to "bail out" Operating. But consider what's really happening here: by adopting the Patient Care Fund capital requirements I propose in this paper, on an average year with our average suspension load and spread (e.g., 4 neurosuspensions, 2 whole body suspensions), then leaving aside Operating Surpluses and 10% Rules we will be placing \$15,776 *more* into the Patient Care Fund than if we stick with the current capital requirements. (See table below.) In fact, even if the 10% Rule was dropped entirely for that year, the capital requirements proposed in this paper would generate more revenue for the Patient Care Fund than the current capital requirements *with* the 10% Rule. But if we in fact *keep*

the 10% Rule, and *drop* the Operating Surplus from neurosuspension to boot, we're just arbitrarily deciding that living members are going to subsidize frozen ones, and this despite that we're enacting a system wherein the frozen members' costs can be met squarely, and with a healthy Safety Factor. (See Table 16.)

But really this example only illustrates that slashing the neurosuspension Operating Surplus and maintaining the 10% Rule is not necessarily the most sensible way to bring \$60,000 costs in line with \$50,000 prices. The question is, *what is the most sensible way, and why?*

Part VII: Apportioning the Expenses of Suspensions and Patient Care

We now find ourselves in the position of having to ask, first, "Does it make sense for cryonic suspension revenue to subsidize Operations expenses (via an Operating Surplus) *beyond* those directly related to the suspension?" And second, "Does it make sense for Operating income to subsidize Patient Care (via a 10% Rule)?"

Table 15. Minimum suspension prices with 25x capital requirement, \$10k safety factor, and \$10k operating surplus

	Post-Start-Up Neuro in Bigfoot (\$/yr.)	Present-Day Neuro in Bigfoot (\$/yr.)	Post-Start-Up Whole Body in Bigfoot (\$/yr.)	Present-Day Whole Body in Bigfoot (\$/yr.)
Up Front Suspension Costs	23,082	25,172	28,888	31,718
25X Capital Requirement	4,929	17,235	23,204	61,634
Safety Factor	10,000	10,000	10,000	10,000
Operating Surplus	10,000	10,000	10,000	10,000
TOTALS:	48,011	62,407	72,092	113,352

Table 16. Patient care fund suspension revenue, proposed versus current
(One year, 4 neuro and 2 whole body suspensions)

	Proposed Neuro (\$)	Proposed Whole (\$)	Current Neuro (\$)	Current Whole (\$)
Capital Requirement, 1 Patient	17,235	61,634	7,538	42,719
Safety Factor, 1 Patient	10,000	10,000	7,538	42,719
TOTAL PER-SUSPENSION:	27,235	71,634	15,076	85,438
TOTAL FOR ENTIRE YEAR:	108,940	143,268	60,304	170,876
	252,208		231,180	

Leaving aside the comparative financial robustness of these two areas (Operating and Patient Care) at any given moment and focusing instead on an "all things being equal" approach, neither of these questions has an *obvious* answer to me. That is, I don't see that it *just makes sense* that either one or both of these has an affirmative answer. While I certainly share most everyone's desire to see the Patient Care Fund's interest-earning power stay well ahead of its expenses, I don't at all see that the key to accomplishing this lies in garnishing unrelated income (rather than, say, increasing the Safety Factor). And while I certainly share most everyone's desire to see the Operating Fund's revenue stay well ahead of its expenses — which will surely lead to innovation in the cryonic suspension process and improved Emergency Response capability — I don't at all see that the key to accomplishing this lies in inflating the suspension cost by some Operating Surplus amount that will not serve to improve the cryonic suspension or Emergency Response of the member who supplies it (rather than, say, raising dues).

In fact, I'll even say that I see more sense in a costing structure in which the money paid for a cryonic suspension goes no further than the expenses of *that suspension* and the anticipated annual storage expenses (including the Safety Factor of your choice) of *that patient* (even if the latter is in the form of a pooled fund, like the current Patient Care Fund). Similarly, the membership dues (again, *ideally*) I would prefer to see applied to the operations of the organization that per-

tain to the living, dues-paying members. For a post-start-up (i.e., "ideal") Alcor, then, I would hope to see *no* Operating Surplus and *no* 10% Rule. *Those who advocate unbundling of suspension and storage should note that this is virtually required if that is ever to occur.*

(And those who are "smelling a rat" right now and suspecting that this is nothing but a sneak attack on the 10% Rule should note that unless the Operations portion of Alcor somehow becomes hugely profitable, *any* comparison of Operating Surplus and 10% Rule cashflows as we proceed into the future will show Operating Surplus figures quickly *dwarfing* 10% Rule figures. I.e., if both the Operating Surplus and the 10% Rule were dropped right now, the Patient Care Fund would *profit*. And not just 5 or 10 years from now or "eventually." Assuming two or more suspensions per year it would profit from this *immediately*.)

However, Alcor is *not* a post-start-up organization yet. In fact, Alcor is suffering from a dramatic *lack* of economies of scale in both Operations and Patient Care. But despite the lack of economies in the area of Patient Care, I know without even asking that all of the Alcor Directors emphatically agree that the *Annual Storage Costs* whatever they may be *will be met*, in their entirety, period. This determination has prompted — among other things — the writing of this paper, which advocates a suspension costing structure that (if enacted) will (via improved expense accounting alone) increase revenue to the Patient Care Fund by *more* than the amount of the

entire 10% Rule. That is, *improved expense accounting can now accomplish what previously required a 10% Rule* (i.e., keeping revenues ahead of expenses in Patient Care), and the admirable desire for growth well ahead of expenses in the Patient Care Fund can — and should — be accomplished via the *Safety Factor*. If we've assessed our expenses well, the Safety Factor that this paper proposes will cause the Patient Care Fund to enjoy revenue of roughly \$50,000/year *above and beyond its capital requirement for meeting expenses*. (Assumes five suspensions per year, our present-day expectation. As the number of suspensions goes up, so does the Safety Factor revenue.) If it isn't working out that way *despite* our confident predictions, the erroneous expense assessment *will* be apparent (even if confusing) and should be *fixed*, not counterbalanced by revenue from the living members.

From this perspective I propose the following present-day through post-start-up plan for integrating *Up Front Suspension Costs* and *Annual Storage Costs* with the optimal *Return Factor*, *Safety Factor*, and *Operating Surplus* in a manner that allows for Suspension Pricing of \$50,000 and \$120,000 perpetually, i.e. *not* in 1993 dollars but rather in the dollars of the day. Table 17 below shows the proposed breakdown for present-day suspension expenses for all members, by category of "suspension minimum." (This is where the "grandfathered" members are accounted for.) Table 18 shows the proposed breakdown for post-start-up suspension expenses for

Table 17. Proposed present-day suspension expense breakdown

(All expense variables for all suspension minimums)

	\$35K Neuro Member (\$)	\$41K Neuro Member (\$)	\$50K Neuro Member (\$)	\$100K Whole Body Member (\$)	\$120K Whole Body Member (\$)
Up Front Suspension Costs	25,172	25,172	25,172	31,718	31,718
Annual Storage Expenses	689	689	689	2,465	2,465
Return Factor	x 25	x 25	x 25	x 25	x 25
Capital Requirement	17,235	17,235	17,235	61,634	61,634
Safety Factor	—	—	7,593	6,648	10,000
Operating Surplus	—	—	—	—	10,000
Service Upgrade	—	—	—	—	6,648
Loss on Suspension	-7,407	-1,407	—	—	—
TOTAL:	35,000	41,000	50,000	100,000	120,000

all members. The heavily grayed rows are strictly information; they do not contribute to the column totals.

Starting from the far right column of Table 17 and working our way to the left, we first see that \$120,000 whole body suspension members can meet all suspension expenses — including both the \$10,000 Safety Factor and the \$10,000 Operating Surplus — with revenue to spare (\$6,648). The \$100,000 whole body suspension members can meet the *Up Front Suspension Costs* and *Capital Requirement*, but the Safety Factor is reduced to \$6,648, and the Operating Surplus is absent. The \$50,000 neurosuspension members come out very similar to this, with the Safety Factor being reduced to \$7,593 and the Operating Surplus again absent. The \$41,000 neurosuspension members and the \$35,000 neurosuspension members, though, *cannot* meet the *Up Front Suspension Costs* and the *Capital Requirement*, even with nothing at all put toward either the Safety Factor or the Operating Surplus. These members will have to be suspended at a *loss*, and that loss will have to be split in some fashion between the Operating Fund and the Patient Care Fund. Various methods of

dealing with this have been discussed informally, but it is not the purpose of this paper to solve that particular problem, but rather to identify it and *quantify* it.

Below (Table 18) appears a similar but somewhat more complicated chart that analyzes our post-start-up expenses for the same member categories. You'll note that in this table, I have re-stated the post-start-up economies of scale in the dollars of the day (2003), specifically to demonstrate that *given this paper's growth assumptions and expense calculations, savings due to economies of scale will rival depreciation of currency sufficiently that we needn't raise the suspension minimums during the next ten years.*

Thus, our costs should drop sufficiently that \$50,000 and \$120,000 in the dollars of 2003 should easily meet the *Up Front* and *Annual Storage* costs. And though the neurosuspensions at that price will yield no Operating Surplus, and a sub-optimal Safety Factor (\$5,773), the whole body suspensions will yield \$10,000 in both of these categories *as well as* \$13,304 *additional surplus* (\$8,989 in 1993 dollars). I've listed this as a "Service Upgrade" to suggest the possibility that all of this *additional surplus* might fund im-

provements in the suspension or storage technology, though it may as easily be used to balance out the suboptimal neurosuspension Safety Factor (or the absent Operating Surplus, for that matter). And in general, one should note that there is no crime in achieving little or no Operating Surplus, since we're really viewing it as bolstering Operating Fund revenue while we're still a start-up, which by definition should not be necessary once we are post-start-up. The Safety Factor, on the other hand, we would rather see at \$10,000 in all cases. But the bottom line is, we're *undercharging for neurosuspension* given the expenses we've settled on (or at least, settled on *desiring*), and if we wish to keep our neurosuspension price at \$50,000 for the foreseeable future, we must settle for what works. (Don't forget that the Operating Surplus for neuros we've slashed to *zero*.)

Let's now put into words what these two tables propose. We'll study in detail only the \$50,000 neuros and the \$120,000 whole bodies, since that (ideally) is where our prices will be for at least the next decade.

This paper proposes that starting immediately (i.e., "present-day"), the *Up*

Table 18. Anticipated post-start-up suspension expense breakdown

(All expense variables for all suspension minimums)

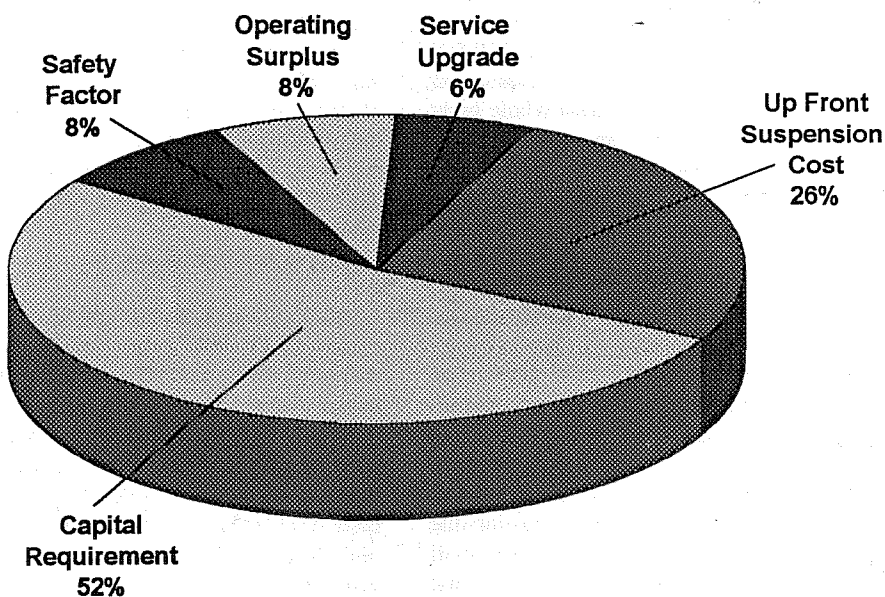
	\$35K Neuro Member (\$)	\$41K Neuro Member (\$)	\$50K Neuro Member (\$)	\$100K Whole Body Member (\$)	\$120K Whole Body Member (\$)
Up Front Costs, (1993 \$)	23,082	23,082	23,082	28,888	28,888
Annual Expenses, (1993 \$)	197	197	197	928	928
Return Factor	x 25	x 25	x 25	x 25	x 25
Capital Req., (1993 \$)	4,929	4,929	4,929	23,204	23,204
Safety Factor, (1993 \$)	—	—	5,773	10,000	10,000
Operating Surplus, (1993 \$)	—	—	—	5,476	10,000
SUBTOTAL, 1993 DOLLARS:	28,011	28,011	33,784	67,568	72,092
INFLATION: (SUBT) x (1.04) ¹⁰ - (SUBT)	x1.48 -28,011	x1.48 -28,011	x1.48 -33,784	x1.48 - (67,568)	x1.48 - (72,092)
Cost of Money, 10 yrs., 4%	13,445	13,445	16,216	32,432	34,604
SUBTOTAL, 2003 DOLLARS:	41,456	41,456	50,000	100,000	106,696
Service Upgrade, (2003 \$)	—	—	—	—	13,304
Service Upgrade, (1993 \$)	—	—	—	—	8,989
Loss on Suspension (2003 \$)	-6,456	-456	—	—	—
Loss on Suspension (1993 \$)	-4,362	-308	—	—	—
TOTAL (in 2003 Dollars):	35,000	41,000	50,000	100,000	120,000

Front Suspension Costs expense allotments be \$25,172 and \$31,718 for neuros and whole bodies respectively. The long-term patient Annual Storage Costs expense allotments should be \$689/year for neuros and \$2,465 for whole bodies. Based on the average annual gain of stocks over the past 40 years of 11.4%, and average inflation (Consumer Price Index) of 4%, we'll assume an average annual gain of stocks of between 7% and 8% for the future, and then assume that the conservatively invested Patient Care Fund will consistently achieve at least half that, or 4%. A 4% return-on-investments assumption translates to a Return Factor of 25X, so the Capital Requirements necessary to address long-term patient Annual Storage Costs should be set at 25X the Annual Storage Costs, or \$17,235 and \$61,634 for neuros and whole bodies respectively.

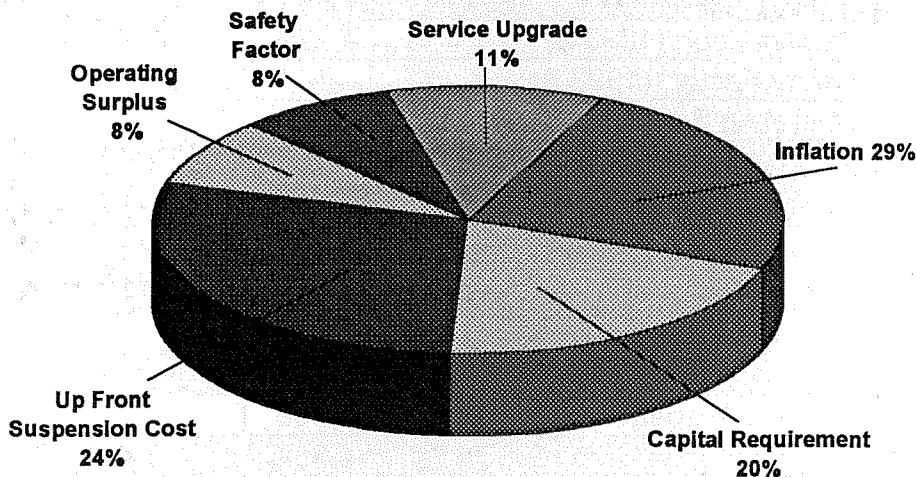
The sum of these Up Front Suspension Costs and Annual Storage Costs for neuros is \$42,407, and for whole bodies is \$93,352. This means that given our desired price ceilings of \$50,000 and \$120,000, there remains \$7,593 in neurosuspension revenue, and \$26,648 in whole body suspension revenue. Since the Patient Care Fund's Safety Factor we believe to be more important than the Operating Surplus, and since we've set targets of \$10,000 per suspension in both of these categories, the neuro members will have the entire \$7,593 of remaining suspension revenue applied to the Patient Care Fund's Safety Factor, whereas the whole body members will meet the \$10,000 target in both of these categories with \$6,648 remaining. This \$6,648 surplus we'll call a Service Upgrade for now, though it falls to the Board of Directors to decide where this should be applied.

The net effect of redefining expenses in this way (and eliminating the 10% Rule and for neuropatients the Operating Surplus) will be an overall increase in Patient Care Fund revenue, and Operating Fund revenue that is higher day-to-day but slightly lower overall, and more consistent and predictable overall. As the "Anticipated Post-Start-Up Suspension Expense Breakdown" table shows, by eliminating the Operating Surplus from neurosuspensions, and gradually diminishing the Safety Factor in neurosuspensions from \$10,000 to \$5,773 over the next ten years (and sitting back and enjoying some economies of scale), we can continue to meet our Up Front Suspension Costs and Annual Storage Costs without raising our price at all. Whole body suspensions in

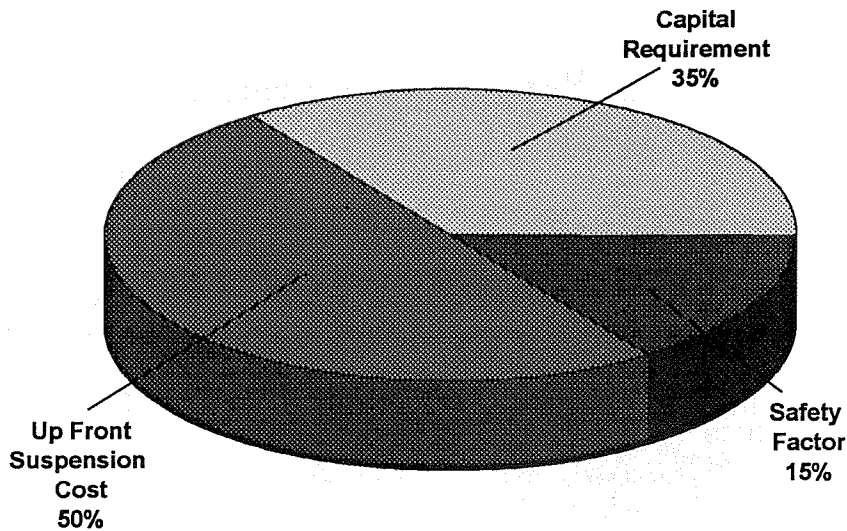
PROPOSED PRESENT-DAY WHOLE BODY BREAKDOWN, \$120,000 MINIMUM



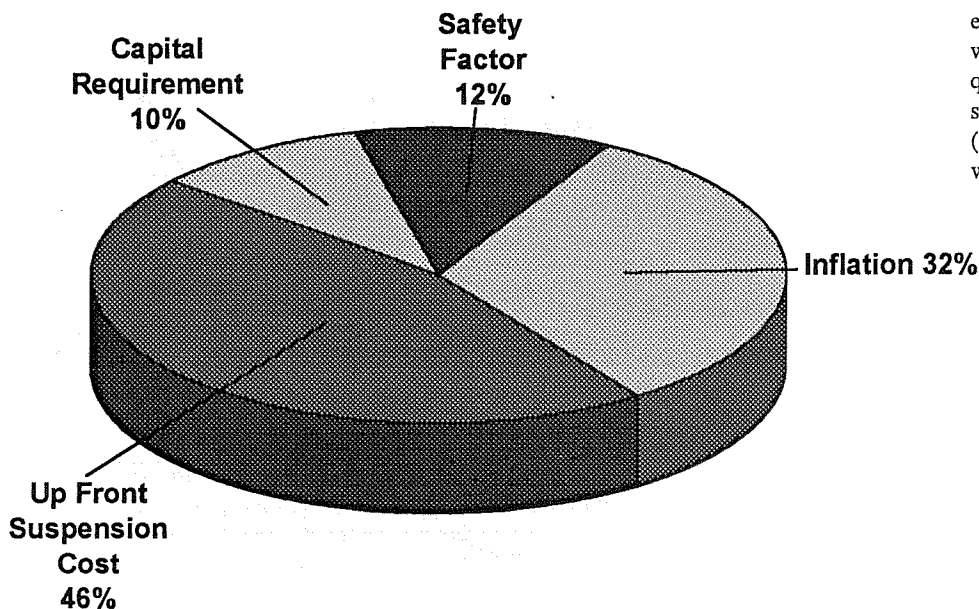
PROPOSED POST-START-UP WHOLE BODY BREAKDOWN, \$120,000 MINIMUM



PROPOSED PRESENT-DAY NEURO BREAKDOWN, \$50,000 MINIMUM



PROPOSED POST-START-UP NEURO BREAKDOWN, \$50,000 MINIMUM



fact will become *better* funded as the decade passes, not worse (and may make up for the suboptimal neurosuspension Safety Factor). Our *Capital Requirement* must change to reflect our current investment policies and revised *Annual Storage Costs*. The *10% Rule* is unnecessary, since the more accurate *Capital Requirement* assumptions will generate *more* Patient Care Revenue than the existing assumptions and the *10% Rule* together are generating now. Whatever safety buffer we desire above these basic expenses should come from the *Safety Factor*, not a Percent Rule. (This paper targeted a \$10,000 per suspension safety margin.)

Lastly, I think it's worthwhile to point out that if all present-day expenses were apportioned fairly, and if we were to reach the \$10,000 targets in both *Safety Factor* and *Operating Surplus*, the cost of neurosuspension with Alcor would right now be \$62,407, and the cost of whole body suspension would be \$113,352. By the time we are post-start-up, these "fair and ideal" expenses *minus the Operating Surplus* (because it is there only to account for high start-up costs) would sum to \$56,256 and \$91,896 respectively (in 1993 dollars). That is, even at \$50,000 neurosuspensions are underpriced by *twenty-five percent*, though with post-start-up economies that may eventually drop to about thirteen percent. At \$120,000 whole body suspensions are *overpriced* by about six percent, and a decade from now that overpricing will have increased to about *thirty percent*.

While as a neurosuspension member I personally benefit from this disparity, and while the inequities may roughly balance each other, the bottom line is that even if we adopt this paper's proposal, we are not quite charging our costs *per suspension*. I suspect that in the long run market forces (specifically, *whole body market forces*) will demand that we address this.

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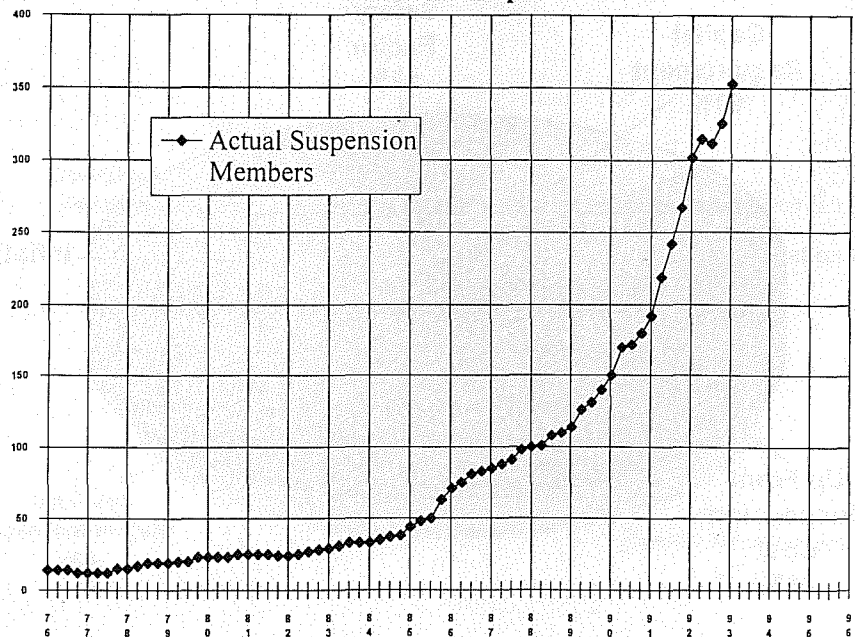
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How Many Are We?

Alcor has 362 Suspension Members, 498 Associate Members (includes 104 people in the process of becoming Suspension Members), and 27 members in suspension. These numbers are broken down by country below.

Country	Members	Applicants	Subscribers
Andorra	0	0	1
Argentina	0	1	1
Australia	13	1	4
Austria	1	0	1
Brazil	0	0	1
Canada	11	5	43
Costa Rica	0	0	1
Denmark	0	0	1
Estonia	0	0	1
Finland	0	0	2
France	0	0	2
Germany	2	0	2
Holland	0	0	2
Ireland	0	1	0
Italy	0	2	1
Japan	2	0	1
Lichtenstein	0	0	1
Lithuania	0	0	2
New Zealand	0	0	1
Russia	0	0	3
Spain	6	2	0
Sri Lanka	0	0	1
Sweden	0	0	1
Switzerland	0	0	1
U.K.	13	3	8
U.S.A.	314	89	311
Ukraine	0	0	1

Total Alcor Suspension Members
Linear Graph



Editorial Policy

Steve Bridge

Over the last two issues there have been some complaints about our editorial policy concerning how letters are handled. Several years ago the policy was established that, except for direct factual answers to questions posed by the letters, there would be no editorial replies in the same issue of the magazine. These would all be held until the following issue. The purpose of this was to prevent the editor from choosing some letter-writers to berate without the writer having an opportunity to rebut.

As a goal, that policy had a lot of validity. However, it is becoming harder to maintain over time and here's why (and, no, it's not because all editors are opinionated control freaks).

When Alcor had a hundred members and no electronic mail (*e-mail*), the pace of ideas was slower. Most questions were hashed out over the phone or through regular mail. A number of people were on a regular "insiders" mailing list and were able to provide input on many policies and problems before they got to the magazine in the first place.

Today, however, the pace has accelerated tremendously. We have over 360 members and cannot spend as much time with each one. A large percentage of our communications proceed through e-mail and much of that is *public* via CryoNet, an e-mail network of about 150 cryonicists. In the case of Mike Darwin's and Saul Kent's letters in the July/August issue of *Cryonics*, both letters were first published on CryoNet several weeks before that issue of *Cryonics* went to press, although they were labeled as "letters to the editor of *Cryonics*." My response to Saul had been posted on CryoNet within two days of Saul's initial letter, and many responses were posted to the responses, etc. over a period of two weeks. To have held my answer back from the readers of *Cryonics* for another month when the issue on CryoNet had already been beaten to pieces would have been absurd.

Tanya's response to Mike was longer

in the making and was posted to CryoNet only a little before the magazine went to press; but Mike's letter and Tanya's reply generated megabytes of commentary by other writers. We can never hope to publish all of this material except in a book-sized periodical each month. Tanya's answer to Mike *had* to be published immediately because Mike's letter was a direct attack on Alcor's competence. We could not allow our readers to wait for a month to see what our response would be. I feel sure that if Mike himself had still been the editor and someone else had made such important criticisms about a suspension, Mike would not have waited another month to respond, policy or no policy.

It is important for both our readers and our CryoNet subscribers to understand that *Cryonics* is not CryoNet and can never be so. CryoNet provides rapid discussion of topical issues the moment they occur. The level of adrenalinized writing (as well as the level of argument, emotion, and just plain rudeness) is much higher than any magazine reader will appreciate. Occasionally you will see some of these postings in *Cryonics*, but usually only when they are simultaneously sent as those types of letters.

Letter-writers who plan to post to both CryoNet and to *Cryonics* should remember that we cannot just publish all of CryoNet. We may publish your initial letter and our initial reply; but subsequent replies will have to be especially geared for the magazine. Those dozens of posts one may make on CryoNet have to be condensed for the very different audience that reads *Cryonics*.

I personally think it is absurd to wait until the next month to comment on a letter when the editor or the president has something useful to say. I see nothing abusive in this practice as such, although I admit an editor has to be very careful. Still, most magazines I have looked at do not appear to have such limitations on their editors. I believe it is not wrong for

the editor to comment in the same issue of the magazine if done in the right way; it moves the communication along twice as fast. As President it is my duty to watch and make sure that the Editor, Ralph Whelan, is not using these replies to abuse the writers, and Ralph has to keep an eye on my own replies.

One line from Mike's protest in the September issue bears examining. "I see that yet another policy of Alcor's is not being respected: namely not using letters to the editor as stalking horses for Alcor political diatribe." I think careful readers of the past several issues will realize that my answer to Saul and Tanya's answer to Mike were *much* less political than Mike's and Saul's own letters. The responses were not "diatribe" in any way I understand the meaning of that word. They were "answers."

An error we *did* make was in not *informing* Saul, Mike, and Maureen Genteman that we were replying to their letters in the same issue and not sending them our replies directly (although Saul had, of course, seen mine long before and Mike saw Tanya's response posted on CryoNet just before we went to press). I think we also erred by not showing Mike Darwin copies of the Chamberlains' letters in the September issue so he could reply if he wanted to, either in that same issue or to have plenty of time to prepare for the following issue.

So here is what we will attempt as a policy:

The editor of *Cryonics* or the president of Alcor or some other designated individual may respond to a letter writer in the same issue that the letter is published, as long as the letter-writer is informed of that response before the magazine goes to press. The editorial responder will exercise great care to respond factually rather than argumentatively. The editorial responder must show the response to the original writer. The writer can choose to withdraw his or her letter; but we cannot guarantee there will be time to revise it. If the writer

wishes to revise the original letter, the editor will hold the letter and possible reply until the next issue.

If a letter is received several weeks before publication, there may be time for the original writer to respond to the editor in the same issue; but this will rarely be practical. (Our editor has many other tasks,

and none of us tend to work on the magazine until close to deadline.)

Also, if a letter critical of some Alcor member is to be published, we will let the object of the letter know as soon as possible in case a reply can be made. We do not guarantee the same privileges to non-members or other individuals who

may be the objects of criticism, but we will try to be as fair as we can.

We do not guarantee we will be perfect at enforcing these policies. They may prove to be impractical. If so, we'll publish your letters telling us where we have goofed.

The Fate Of The Bleach

Hugh Hixon

As noted in Tanya Jones' description (in the June '93 *Cryonics*) of the suspension conducted in April, one of the problems of the transport was the intrusion of cooling water containing hypochlorite bleach as a disinfectant into the extracorporeal perfusion circuit, through a leak in the heat exchanger. Hypochlorite demonstrably corrodes the stainless steel of the heat exchanger (producing black nonmagnetic granules).

With regard to the leakage through the heat exchanger, I believe the most probable scenario is this: Solid bleach granules were added midway up the ice bath, and were washed down to the intake of the ice bath circulating pump. When I completed hooking up the heat exchanger, I probably tested it before going on to other tasks, and then turned the pump off until bypass was begun. During this brief period, undissolved granules of bleach were circulated, and lodged in the narrow passages of the heat exchanger. When the heat exchanger pump was shut off after the test, they remained there and etched one or two pinholes through the stainless steel of the heat exchanger.

With regard to the fate of the hypochlorite in the circuit, it should be almost immediately obvious to anyone knowledgeable in biochemistry that a strong oxidizing agent such as hypochlorite or chlorine will immediately attack almost any reducing agent and be destroyed in consequence. Obviously this is the reaction which resulted in the hemoglobin color change. But hemoglobin is a very strong colorant, and there is not much of it in the perfusate at the end of the washout, and so it will run out rather quickly. In the Viaspan flush perfusate, however, there is

a fairly large amount of the biological reducing agent *glutathione*. (Glutathione is also a component of Alcor's SHP-1 perfusate.) The alert biochemist suspects that the hypochlorite didn't get very far; but how to confirm this?

Adapting a simple test for pool chlorine indicates that the chlorine (which is what the hypochlorite dissociates to at the pH of the Viaspan) is entirely neutralized by the Viaspan perfusate in a matter of seconds, after *first* oxidizing the remaining hemoglobin in the circulating perfusate (and the Viaspan *does not* affect the test). The speed of the Viaspan neutralization and the flow rate of the perfusate are such that the chlorine is completely neutralized before it has passed through the oxygenator. As long as the glutathione lasts.

So how much hypochlorite got into the extracorporeal circulation? Initially, I believed I had a marker. The hypochlorite salt was that of lithium, an ion found only in the blood of people who are using it as a medication for depression. I had a test carried out for lithium on samples taken at the time I noticed the hemoglobin color change. The result of the test was that the amount of lithium was below the limit of detection. Repeating the test with a more sensitive method got a similar answer: less than the detection limit. And this limit was clearly in that *Twilight Zone* of analytical chemistry where the reaction of the sample with the walls of the container begins to be a significant source of interference. Other calculations indicated, however, that the hypochlorite in less than a drop of bath water would be sufficient to give the observed color change of the hemoglobin.

A static leakage test on the heat ex-

changer indicated a leakage rate of less than a milliliter per hour. If I very pessimistically assume a leakage rate of one milliliter per hour, the maximum amount of hypochlorite that could have gotten into the system is about 1/20th the total amount of glutathione present. And the maximum ratio at any one time is 1/3000th. (In my much more demanding neutralization test, the ratio was 1/10th.)

The other problems with the bath-water leakage are particulates and bacteria. The fate of the particulates is this: anything larger than 40 microns was stopped by the blood filter before reaching the patient; any other particles in the range from 4 to 40 microns got hung up in the patient's capillary bed, where it *could* obstruct the flow (along with small clots); anything below 4 microns probably just circulated. Bacteria in the bath water had to survive hypochlorite concentrations at least 180 times the maximum concentration recommended by the manufacturer (of 0.15mM ClO⁻). Once in the perfusion circuit, they were maintained at about 5 degrees Celsius (refrigerator temperature) for approximately 12 hours; they then had 70% of their water sucked out of them by the glycerol perfusate; they then were frozen. Their opportunity to reproduce and get an infection going was nil.

This is *not* to minimize the seriousness of the leakage: we didn't like it, and wish to avoid it in the future. That it was neutralized before it got to the patient is purely fortuitous. But the systems affected are *robust*, and the effects for cryonics purposes appear small next to other insults such as ischemic time and clotting side-effects.

Business Meeting Report *By Ralph Whelan*

The August 8 meeting of the Alcor Board of Directors began at 1:21 pm at the home of Russ Cheney in Torrance, California. The September Board of Directors meeting will take place on September 12 at the Alcor facility in Riverside, California. The annual election of directors will take place at this meeting.

Steve Bridge reported that new employee Scott Herman was hired for three months beginning July 19th. As "the new guy," he has done a great deal of work already in repairs and clean-up in the facility and has made great progress on the inventory program. Due to the generosity of Dave Pizer, Scott is living at Wrightwood. He will be paid from contributions to Alcor for the move to Scottsdale, AZ.

Hugh Hixon, Ralph Whelan, Mike Perry, and Scott Herman had a long meeting with an estimator from a major van lines company to begin developing plans for moving Alcor and the patients. We hope to meet with at least two other companies.

Steve reported that the financial status of our Operating Fund is still shaky. We still await the refund of our personal property taxes and we have not received the insurance payment from the suspension in April. We anticipate these matters being cleared up by the end of August. In the meantime, the Board of Directors approved in a special meeting borrowing of an additional \$20,000 from the Endowment Fund to cover overdue bills (which were causing some severe problems), payments to our architect, and other important bills. As of August 7, 1992, the Operating Fund owes the Endowment Fund about \$102,000 and the Research Fund owes the Endowment Fund approximately \$18,000 (for the payment of the remainder of a Promissory Note to Paul Wakfer/Cryovita for suspension equipment purchased from Cryovita last year). This will be paid back to the Endowment Fund at a rate of \$3,000 per suspension, plus interest.

Tanya Jones, Suspension Services Manager, reported that implementation of an inventory system is well underway. All of the equipment necessary to install this system has been purchased, and its configuration is nearly complete, thanks to the enthusiastic support of Scott Herman. Once this initial configuration is done, a physical inventory of the disposable supplies will begin. This system will also allow for invoicing of suspension patients on an individual basis when fully implemented.

Due to the unfailing generosity of a New York member, a Citizen's Band radio will soon be available to replace the one

which was stolen from the ambulance two months ago. This was the only item which hadn't yet been replaced since the unfortunate burglary earlier this year.

Derek Ryan, Membership Administrator, reported that three members completed the sign-up process in July to become full suspension members, while one member canceled his suspension arrangements for financial reasons. Five people entered the sign-up process in July.

Ralph, Steve, and Hugh made a special point of thanking Alcor member Scott Herman for his ongoing arduous volunteer efforts at the Alcor facility, and Regina Pancake for her way-above-and-beyond-the-call-of-volunteerism efforts to secure a Death Certificate for Alcor patient Dick Jones.

Michael Riskin suggested that we organize an independent "audit" of sorts of our suspension capability, to address recent concerns about problems in this area. He suggested Ralph Merkle or some similar technically oriented and mutually agreeable agent be approached in this regard.

Resolved: That a temporary Patient Care Fund Investment Committee is appointed, to consist of Linda Chamberlain, Michael Riskin, and Courtney Smith, with Michael Riskin serving as the committee Chairman. This committee will examine the current state of Patient Care funds, as well as Patient Care Fund investment actions that have taken place since the dissolution last year of the Patient Care Trust Fund Advisory Committee, and will report on such actions at the September meeting of the Board. At the October meeting of the Board, the Committee will make whatever recommendations for change to Patient Care Investment Policy that they deem appropriate. Unless a permanent committee is established, this committee will remain active until the adjournment of the November meeting of the Board. (Unanimous)

Ongoing investigations by Steve Bridge into the details of creating a Trust to protect Patient Care Fund assets indicate that such a Trust if even possible will probably take a long time to finalize. Though investigations along these lines continue, the following resolution was adopted:

Resolved: That the Patient Care Trust Fund be renamed the Patient Care Fund. (8 in favor, 1 abstention)

Since it was expected that the Patient Care Fund would be a member of the

Limited Liability Company that is purchasing the Acoma Building (like it is a member of Symbex, owner of Alcor's present facility), \$20,000 of Patient Care Fund money was used as a refundable deposit on the Acoma Building. To address concerns that some members have voiced about this use of Patient Care Fund money, the below motion was passed.

Resolved: That we remove \$20,000 from the Endowment Fund and loan it to the Building Fund, and that we then remove \$20,000 (plus interest it should have accumulated) from the Building Fund and repay it to the Patient Care Fund. (Unanimous)

Last year's director election was done by secret ballot. Several directors were in favor of trying an open ballot election this year, so that at the very least we can make an informed decision next year on which method we prefer.

Resolved: That the election of Directors at the September meeting will be by "open ballot," so that after the composition of the new Board is announced, the contents of the individual ballots will be public. (7 in favor, 2 abstentions)

The American Cryonics Society (ACS) is interested in setting up a contract that will enable Alcor to provide suspension services to ACS members, though storage will still be handled by ACS. There was a clear sentiment among Directors and members present that Alcor wished to help ACS and its members in any way that we reasonably can. However, there was concern that Alcor may open itself up to liability or potential for uncompensated expenses, and that ACS may not be in a position to provide Alcor with sufficient financial guarantees. Further, the Alcor staff and Directors are tremendously busy with various projects right now, and they believe that a contractual arrangement such as this requires more investigation and consideration than they have time for.

Resolved: That Steve pursue — or cause to be pursued — arbitration in the matter of acquiring 100% of the One Million A.D. assets, present and future. First, however, Steve should make an offer to take 75%, i.e., "split the difference." (7 in favor, 2 opposed)

The meeting was adjourned at 5:19 pm.

Meetings & Announcements

Meeting Schedules

Alcor business meetings are usually held on the first Sunday of the month (July, Aug., & Sept.: 2nd Sunday). Guests are welcome. Unless otherwise noted, meetings start at 1 PM. For meeting directions, or if you get lost, call Alcor at (714) 736-1703 and page the technician on call.

The **SUN, OCTOBER 3** meeting will be at the home of:
Bill and Maggie Seidel
10627 Youngworth Rd.
Culver City, CA

Directions: Take the San Diego (405) Freeway to Culver City. Get off at the Jefferson Blvd. offramp, heading east (toward Culver City). Go straight across the intersection of Jefferson Blvd. and Sepulveda Blvd. onto Playa St. Go up Playa to Overland. Go left on Overland up to Flaxton St. Go right on Flaxton, which will cross Drakewood and turn into Youngworth Rd. 10627 is on the right (downhill) side of the street.

The **SUN, NOVEMBER 7** meeting will be at the home of:
Virginia Jacobs
29224 Indian Valley Road
Rolling Hills Estates, CA

Directions: Take the Harbor Freeway (US 110) south to Pacific Coast Highway (State 1) and get off going west. Go along Pacific Coast past the Torrance Municipal Airport to Hawthorne Blvd. Turn left (south) on Hawthorne and go up into the hills past the Peninsula Shopping Center (Silver Spur Rd.). Hawthorne takes a long curve around to the left. Indian Valley Road is a little over two miles beyond the Center, on the left. 29224 is about 0.2 mi up Indian Valley Rd., opposite Firthridge Rd.

ALCOR NORTHERN CALIFORNIA MEETINGS: Potluck suppers to meet and socialize are held the second Sunday of the month beginning at 6:00 PM. All members and guests are welcome to attend. For those interested, there is a business meeting before the potluck at 4:00. Once every three months there will be a party or gathering at a local eatery and no business meeting. See details below. If you would like to organize a party, or have a suggestion about a place to eat contact the chapter secretary, Lola McCrary, 408-238-1318. We are also hoping to have speakers on various topics in the near future.

The **SUN, OCTOBER 10** meeting will be held at the home of:
Ralph Merkle and Carol Shaw
1134 Pimento Ave.
Sunnyvale, CA
Tel: 408-730-5224

After the business meeting and potluck there will be an *Introduction to Cryonics* talk at 7 PM, followed by a question and answer period.

Directions: Take US 85 through Sunnyvale and exit going East on Fremont to Mary. Go left on Mary to Ticonderoga. Go right on Ticonderoga to Pimento. Turn left on Pimento to 1134 Pimento Ave.

The **NOVEMBER** meeting will be held November 14 at the home of Rachael Steiner and Forrest Bennett. Dave Ross will present his talk on "Seven Paths to Immortality."

The Southern California chapter of Alcor meets every other month in an informal setting in one of our member's homes. Our primary goals are to provide support and preparedness training for Alcor members. We are making arrangements with the Red Cross in Santa Monica, CA for any interested Alcor members to take Disaster Training. We will offer various other emergency training through the Red Cross in the future. Please call Maureen Genteman at (310) 450-0394 for further information.

Las Vegas Area: *Alcor Laughlin* meets the third Sunday of the month at 1:00 PM at the Riverside Casino in Laughlin, Nevada. FREE rooms at the Riverside Casino on Sunday night are available to people who call at least one week in advance. Take 95 south from Las Vegas, through Henderson,

where it forks between 95 and 93. Bear right at the fork and stay on 95 past Searchlight until you reach the intersection with 163, a little before the border with California. Go left on 163 and stay on it until you see signs for Laughlin. You can't miss the Riverside Casino in Laughlin, Nevada. The time and place of these meetings sometimes changes, so before you come, please call Eric Klien at (702) 897-4176.

Alcor Midwest is in full swing. It produces a monthly newsletter and holds monthly meetings. It has a state-of-the-art stabilization kit and responds to six states: MI, IL, OH, MO, IN, and WI. For meeting information or to receive the *Alcor Midwest Newsletter*, contact Brenda Peters at (312) 587-7050, or; Huron Plaza; 30 E. Huron, Suite 4709; Chicago, IL 60611.

Boston: There is a cryonics discussion group in the Boston area meeting on the second Sunday each month. Further information may be obtained by contacting Walter Vannini at (603) 889-7380 (home) or (617) 647-2291 (work). E-mail at 71043.3514@Compuserve.com.

The *Alcor New York Group* meets on the third Sunday of each month at 2:00 PM. Ordinarily, the meeting is at 72nd Street Studios. The address is 131 West 72nd Street (New York), between Columbus and Broadway. Ask for the Alcor group. Subway stop: 72nd Street, on the 1, 2, or 3 trains. If you're in CT, NJ, or NY, call Curtis Henderson, at (516) 589-4256.

Meeting dates: **Sept 19, Oct 17, Nov 21, Dec 19.**

New York's members are working aggressively to build a solid emergency response capability. We have full state-of-the-art rescue equipment, and four Alcor Certified Techs and four State Certified EMTs.

District of Columbia: *Alcor DC* is a new cryonics group with members from Washington, D.C., Virginia, and Maryland. The Alcor DC Board of Directors meets once a month. Alcor DC also sponsors discussion groups, speaker's bureaus, and seminars. Call Mark Mugler at (703) 534-7277 (home), or write him at 990 N. Powhatan St.; Arlington, VA 22205 for directions or to find out upcoming activities.

Meeting dates: **Oct 17, Nov 14.**

There is an Alcor chapter in England, with a full suspension and laboratory facility south of London. Its members are working aggressively to build a solid emergency response, transport, and suspension capability. Meetings are held on the first Sunday of the month at the Alcor UK facility, and may include classes and tours. The meeting commences at 11:00 A.M., and ends late afternoon.

Meeting dates: **Oct 3, Nov 7, Dec 5, Jan 3.**
The address of the facility is:
Alcor UK, 18 Potts Marsh Estate, Westham, East Sussex
Telephone: 0323-460257

Directions: From Victoria Station, catch a train for Pevensey West Ham railway station. When you arrive at Pevensey West Ham turn left as you leave the station and the road crosses the railway track. Carry on down the road for a couple of hundred yards and Alcor UK is on the trading estate on your right. Victoria Station has a regular train shuttle connection with Gatwick airport and can be reached from Heathrow airport via the amazing London Underground tube or subway system.

People coming for AUK meetings must phone ahead — or else you're on your own, the meeting may have been cancelled, moved, etc etc. For this information, call Alan Sinclair at 0323 488150. For those living in or around metropolitan London, you can contact Garret Smyth at 081-789-1045 or Garret@destiny.demon.co.uk, or Mike Price at 081-845-0203 or price@price.demon.co.uk.