

Tracking Caseload Trends

By R. Michael Perry, Ph.D.

Editor's Note: In the past two months, Alcor's staff has embarked on an extensive three year planning process. This three year plan included careful evaluation of our current membership, services and facilities, as well as a conscientious look at the future in terms of all aspects of company operations. Primary to this planning process is careful consideration of how to provide the best possible care and attention to both our members and patients.

One element of the planning process was to scientifically evaluate possible scenarios of membership growth and the subsequent impact on performing cryopreservations. The following article is an abbreviated look at the mathematical evaluation of possible membership increases—and therefore cryopreservations. The author, Dr. R. Michael Perry, has a B.S. in mathematics and a Ph.D. in computer science.

Alcor understands the importance of having the resources necessary to uphold its mission, both during normal operations and during times of unusual or peak demands. For a cryonics organization human cryopreservations are a lengthy, involved operation extending over several days and involving a considerable number of staff and volunteers. Each patient must be handled promptly to achieve the best possible cryopreservation. Unusual caseloads, for example, two or more cryopreservation cases that start within a 24-hour interval, will place extra demands on the system and facilities, and need to be anticipated. Thus we felt we could serve you better by taking the time to estimate the likelihood of such possibilities as well as the more usual, expected demands we may face.

Based on Alcor's current membership base of about 800 people and standard mortality tables, there is an estimated (mean) caseload of about 6.5 cryopreservation cases per year. The lowest number of cases likely to occur is 4 and the most is 8. (This interval covers approximately

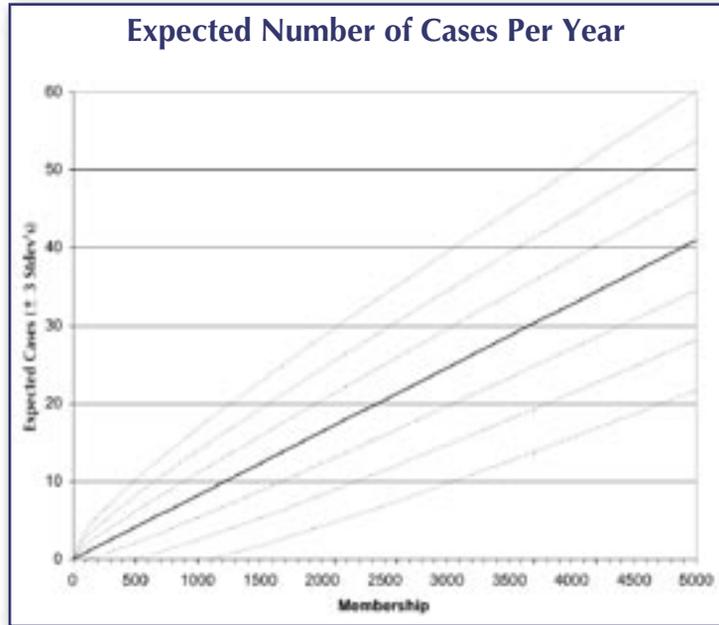
one standard deviation from the mean or what happens about two thirds of time.) Alcor certainly has the capability to handle this. In the past, Alcor has been faced with the possibility of no cases in a given year,

which impacted cash flow. Today, we are almost guaranteed that will not be an issue.

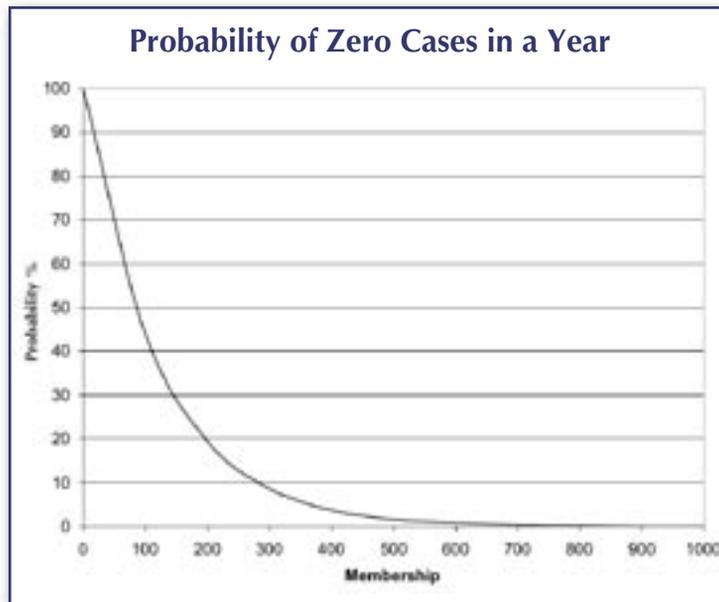
But, the ability to handle multiple cases simultaneously may soon be a requirement. So, how likely is it that a multiple case—two or more cryopreservations—will happen within 24 hours of one another? Our calculations indicate there is a 5.46 percent chance of it happening each year. That being true, multiple cases will only happen once every 17 years on average. As illustrated by these graphs, there is a far greater chance of two simultaneous cryopreservations than three. Realistically, it appears that as of today multiple cases within 24 hours have not been reported by any single cryonics facility or organization. There have been near-misses as was seen at Alcor last October when two cases happened less than three days apart.

Thus far we have assumed that all events are independent. Experience has shown this is a reasonable assumption, though certainly it is possible for dependencies to occur—multiple cryopreservations resulting from a single accident, for instance. Such exceptional occurrences have so far not been reported in the cryonics field. Eventually, one could expect two or more such events to occur or commence in a short timeframe, thus obviating the presently assumed independence. However, this prospect should remain insignificant with a membership population near current levels.

But what if Alcor were to double its membership? Well, we know that doubling the membership would result in a doubling of the annual caseload. Thus, with 1600 members, there would be about 13 cryopreservations each year. In turn, this would increase the per-annum likelihood of a multiple cryopreservation by nearly a fac-



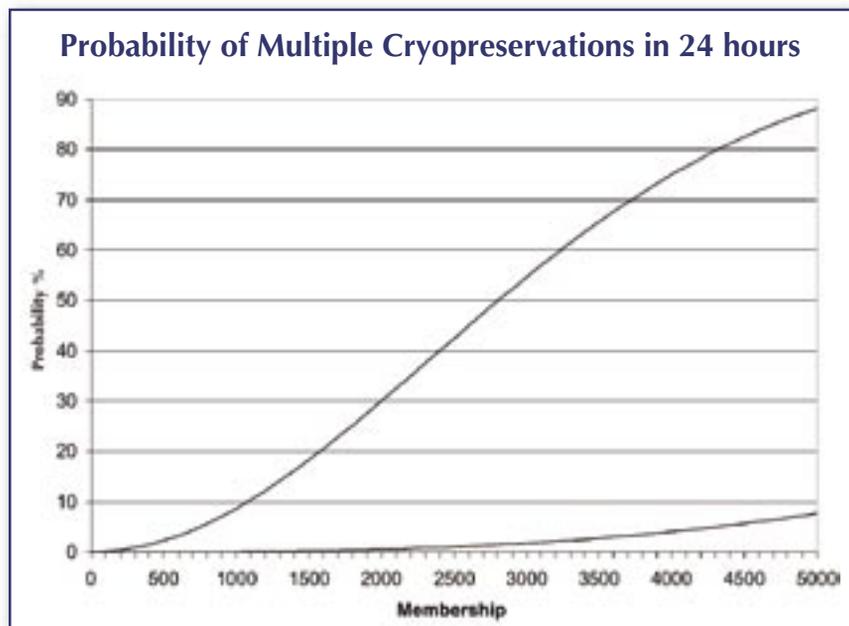
This graph shows the expected range of annual cases as Alcor's membership grows. At 800 members, the expected caseload is approximately 6-7 cryopreservation cases per year.



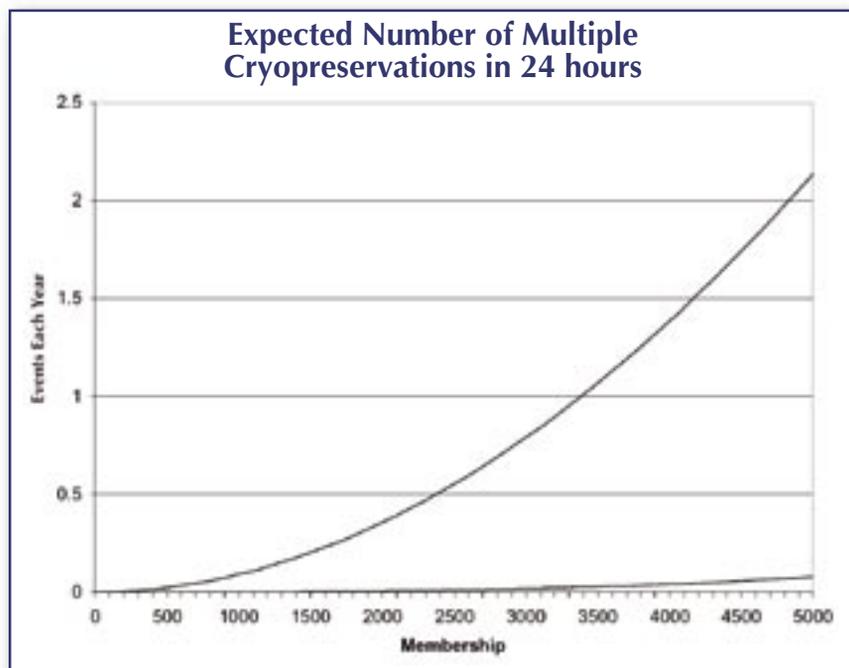
This graph shows that Alcor is nearly guaranteed to have at least one case every year. Knowing this helps the organization project its expected expenses and income.

tor of four. Such an event would now be expected about every 4.4 years, as opposed to every 17 years. Rest assured, we have time to prepare. At present growth rates, Alcor will not face a doubling of its membership until the year 2021, another 15 years. ■

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The upper line shows the probability of occurrence, within a year, of two or more cryopreservations starting within a 24-hour interval of one another. The lower line shows the probability of three or more cryopreservations happening. The increasing importance of being prepared to take on multiple cases simultaneously motivated our decision to build an expanded operating suite.



The upper line shows the expected number of times per year that two or more cryopreservations will start within a 24-hour period. The lower line shows how many times per year three or more cryopreservations will occur. Our present ability to perform two simultaneous cryopreservations should be sufficient to meet the membership's needs well into the future.