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Comment: The Elderly Heart Transplant Patient

Heart transplantation in selected patients 60 years and older results in survival comparable with that of younger patients.

Philippe Demers, 2003¹

Transplantation is a bittersweet present of science, which gives life to so many and – because of the shortage of donor organs – leaves hopeless even more. This shortage of organs has been addressed in different ways in different areas of the world. The method of rationing emerged as a regrettable, but inevitable component of organ-distribution, which oversteps country boundaries. Today the question is not “ration or not?” – but “what guidelines to use in rationing?”

Customarily, priority to access donor organs is established according to the acuteness of need and the probability of long-term survival. As it stands, the latter is dictated primarily by age, which is often substituted for more complex considerations for expected extent of survival. In the mirror of developments in the past decades, this stance now needs to be re-evaluated.

The first issue to be reemphasized is that while heart transplantation is expected to improve both the quality and the extent of the recipient's life, it is certainly not a *restitution ad integrum*; the patient will continue to be in need of ongoing clinical support, and his life-expectancy will remain below that of the general population. In the year of 2000, the International Registry for Heart-Lung Transplantation, based on 55,359 heart transplants, established the recipients “half-life” (50% survival) as 9.8 years. The “fall-off” for the survival curve is almost a straight line from Year 1 through Year 14, with a constant yearly mortality rate of 4%.² At the same time survivorship of the general population has changed dramatically in industrialized countries. In the United States, for example, the median age at death was 58 years in the year 1900, and only 0.03 per cent of the population survived to the age of 100.

Now 52% of the population is expected to survive to the age of 80 years and about 2% to age 100.³ Even more importantly, the average person who reaches the age of 65 years, is now likely to live into his ninth decade.⁴ Also, while in the 1970s the mortality of cardiac surgery was significantly higher in patients over 65 years of age, due to improvements in technique, technology and care, the risk of cardiac interventions in septuagenarians with no significant co-morbidities is comparable to that of younger patients.⁵

All these data suggests that the chance of living through the predicted 10 years of mean post-transplant period now exists up to a recipient-age of 70 years.⁶ For this reason our moral and legal obligations dictate that appropriately screened patients up to that age should have the same access to donor hearts as younger individuals. These events so far had only a moderate impact upon the written and unwritten rules as how heart transplantation is practiced today. The criteria established by the different systems of organ allocations are ambiguous regarding the age of potential recipients. While usually it is spelled out that ethnicity, gender, religion and financial status are not to be considered, age is usually not specifically listed among these issues. On the contrary, while arbitrary age limits are not set, “age or co-morbid conditions” are to be considered in organ allocation. It is debatable if the wording is of intent or just schematics, but it gives the impression that age is an independent issue and not one among several risk factors of similar or even more significance, which are used to estimate expected life span upon which organ allotment is based.⁶ Several studies considered as how advanced age of the recipient may affect long-term survival following heart transplantation. The results of these studies are mixed. Some of these indicated that life expectancy is lower after transplantation in older patients⁷, while others⁸⁻¹⁰ found comparable outcomes regardless of age. The reasons for this controversy may have been the lack of multivariate analysis in some of the se-

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ries and the difference in definition of "older" age, which varied between 45-65.

Nowadays most transplantation centers are more liberal in extending the age limit of recipients. However, sometimes a specific age is still regarded as a "cut-off" for acceptance despite that statistics¹¹ indicate that age *per se* increases neither the surgical risk of transplantation nor the extent of survival thereafter, but a *potentiating condition which in the presence of other factors such as acuteness, repeat transplant, donor ischemia time, pulmonary hypertension, etc. may indeed create a higher or even forbidding risk.*

The practice to give donor hearts necessarily to the younger patients, who, for reasons of different risk factors, may have a lower chance of long-term survival, is faulty by any reasoning. Our society never authorized either morally or legally that the life of one individual is more precious than another, only because he is younger. An added insult to senior citizens is that while we counted 56 studies recommending the acceptability of hearts from older donors, only 12 articles suggested the age-extension of the recipients.

A compromising move to accommodate elderly potential recipients is the "alternate recipient list" established in some centers to provide organs considered to be marginal because of low ejection fraction, known coronary disease or other reasons that may otherwise be wasted, to patients "who would otherwise be turned down for heart transplantation solely because of the age over 65".¹² These "high risk" patients have received leftover "high risk" hearts, which placed them in double jeopardy. Despite all this, they showed absolutely no difference either in early mortality or in actuarial survival of those on the "standard" waiting list, indicating that this "alternative recipient list", as established, is neither valid nor ethical for patients up to the age of 70 who otherwise may be ideal candidates. They should be included in the "regular" queue for donor hearts.

Today in many centers, a 30-year old young man with risk factors such as diabetes or pulmonary hypertension, could still receive a donor heart while a 68 year old with no other risk factors but his age, and with a same life expectancy after heart transplantation, will

not. It is time to ask the question: Is this justified?

Our society regards the value of life, as we should, to be equally precious regardless of age in many of its laws and customs. The assignment of donor hearts should not be an exception. The present "cut-off" may be drawn at the age of 70 years, after which life expectancy is less than that of a younger person with the same number of risk factors *including* age. This older generation of heart-transplant recipients, however, will require a more extensive scrutiny to be accepted to the "transplant list" including assessment of conditions commonly seen in the elderly, as well as a detailed psychosocial screening and assurance of strong family support. Because by age definition these patients are already "high risk", any additional risk factors of significance should lead to exclusion from the list of transplant recipients.

What about potential recipients older than 70 years? It has been already shown that well selected cohorts of octogenarians who undergo heart-transplantation do equally well clinically with their younger counterparts. Also, probably even more importantly their quality of life was also judged to be excellent.¹³ However, because the estimated life expectancy for octogenarians is less than that of a younger person, it would appear reasonable to place them into a different category of organ allotment using a modification of the "alternate list", which *may provide highly selected patients over 70 years of age with highly selected elderly donor hearts.*

It is our stipulation that within the principle of matching donor heart and recipient life spans, it would be reasonable to use older (>65 y.o.) hearts that would not be suitable for younger recipients. Because older donor hearts carry a higher risk of coronary disease, the integrity of the donor heart needs to be established by conventional heart catheterization before explantation, or if this is not feasible, by a simple method we have described in 1985 and coined as "bench coronary angiography", in the course of which the coronary arterial tree of the heart to be transplanted is imaged on the operating table before the intended recipient is put to sleep. Our studies not only documented that this technique provides accurate and detailed imaging of the coronary system

but also that it does not affect myocardial function.¹⁴ Hearts from older donors already have been proven fairly safe for transplantation.⁹ Adding the additional screening provided by bench coronary angiography should further enhance their usage.

Allotment of donor organs that is not based on acuteness and expected survival is wrong, and selected discrimination based on age alone is even worse. Young recipients under the age of 30 tend to do worse in univariate analysis and females were estimated at 1.5-7.5 times more likely to have fatal rejection.¹⁵ We shouldn't and we don't discriminate against the very young and against females. We shouldn't discriminate by age alone either.

Where do all these considerations lead us?

One may argue that while a quarter of our patients die while on the waiting list for heart transplantation, the last thing we need is to increase the number of those who may be placed on that list. However, the pressure upon the profession regarding potential elderly heart recipients will increase in the near future, undoubtedly by both advocates of elderly patients from one direction and by efforts of rationing by governmental and insurance agencies from the other. Those of us who are in the foreground of heart-transplantation must lead and not just follow trends of reforms. It is now the time for constituents of different donor allocation systems to reconsider clinical, ethical and legal issues relevant to age. While it is unlikely that we ever can make the system perfect, we should seek solutions that approaches realistically the issue of shortage of heart donors, but also fulfill our moral and legal obligations toward the older generation. We should preserve the basic principle of donor-heart allotment, i.e. expected longevity and the urgency of need, but within this system, however, we suggest that:

- a) Considering that the average age limit of our population is now about 80 years and the average survival rate after heart transplantation is 10 years, it seems reasonable to extend the age of the accepted general transplant waiting list to well selected older patients up to 70 years.
- b) The age of a potential recipient should continue to be regarded as an important risk factor for ex-

tended survival and should be taken into consideration as such, but not be used as a sole criterion of exclusion.

- c) Access should be given to rigorously selected patients over 70 to receive carefully screened older donor hearts judged to be non-suitable for younger recipients.

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