Invited Commentary

In 1954, Joseph Murray and colleagues carried out the first successful renal transplantation operation at the Peter Bent Brigham Hospital in Boston, the kidney donated by a healthy boy to his identical twin brother who was in end stage renal failure.

This historic event was preceded by two landmark events; Mendel's amazing observations on the phenomenon of genetic inheritance and Sir Peter Medawar's experiments with the immunological basis of rejection in the 1940s. Joseph Murray went boldly ahead with the transplantation armed with the knowledge that identical twins had genes which produced identical proteins, hence organs that were immunologically tolerant.

Advances in immunosuppression developed rapidly since 1972 with the discovery of cyclosporine and since then developments in transplantation have progressed even more rapidly.

Thomas Starzl, who experimented with Liver transplantation in dogs since 1960 at the Stanford Hospital, USA, carried out the first successful transplantation in 1963. With many of the developments in Transplantation coming up in the last 40 years or so and this operation has now become routine practice worldwide.

We carried out the first renal transplantation operation, using a kidney from a living related donor in 1985. Since then, well over 1000 successful renal transplantations have been carried out in Kandy and in Colombo, both in the Government and private sectors. A significant development has been the setting up of two dedicated Nephrology and Transplantation centres, one in Kandy and the other at Maligawatte. Anti rejection drugs are also provided free of charge at these centres and at the National Hospital of Sri Lanka, Colombo.

We also carried out the first renal transplant from a brain dead donor in 1995. This landmark event was hailed by many who had visions of medical advancement in this field; that we would progress towards liver, heart, pancreatic and other transplantation operations using brain dead donors. The largest pool of such donors is from victims of accidents. We unfortunately could not progress much further due to issues raised by colleagues in the medico legal specialty that refused to give us legal cover to carry out the harvesting operation on such victims.

History and progress usually overrides impediments created by mere mortals and fortunately wiser counsel has prevailed and events have taken a turn for the better.

Although renal and liver transplantations replace irretrievably diseased organs, there are many differences. End stage renal disease has the option of being treated by dialysis or transplantation, one may go back to dialysis if the transplantation operation fails either for technical reasons or due to rejection; there is no such fallback for patients with terminal liver failure. As the article by Siriwardana et al clearly state, liver transplantation operations are technically much more demanding. Complications and deaths of donors have been a direct result of operative errors whereas the few deaths reported in live kidney donors have been mostly due to myocardial infarction or pulmonary embolism.

In renal transplant, the diseased native kidneys are left within the patient whilst the new kidney is transplanted into one or other iliac fossa. In liver transplant, the diseased liver is excised and the donor liver transplanted into its bed. The operation has to be done by two teams in a regular liver transplantation programme whereas there are surgeons who regularly do the renal harvesting from a live donor and transplantation operations in tandem by themselves.

Renal transplantation operations have three simple anastomoses viz. artery, vein and ureter. In the early phase of renal transplantation the commonest postoperative complication was ureteric leaks or stenoses. With the use of ureteric stents this complication is now rarely seen. Complications following liver transplantations are more difficult to deal with, often needing experts in minimally invasive procedures e.g. interventional radiologist to deal with hepatic artery or portal vein thrombosis, endoscopists to

stent the problems arising in the biliary anastomosis, radiologists to drain bilomas etc, not forgetting sophisticated diagnostic imaging.

The point I wish to make is that the team needed for liver transplantation will include more highly skilled specialists who must be willing to intervene at different times of the day. Such demands on their time could increase with an increase in the transplanted population.

Donors of organs for transplantation, whether living or brain dead, are in short supply worldwide. It is easy to persuade a living person to become a kidney donor since it is a paired organ and a single kidney is compatible with a normal long and healthy life, so much so that insurance companies, who are very quick to pick up conditions that would disadvantage them with respect to a life insurance policy, have not increased premiums for renal donors seeking life insurance. Siriwardana has documented the details of the steps at which living donor operations could go wrong and has alarmed us by telling us of the number of liver transplantation units that have been shut down in India and in China.

Just who are these donors? The most accepted are living related donors i.e. parents, children or siblings. In instances where such donors are not available, transplant teams have started stretching the elastic band to accommodate other donors e.g. altruistic donors initially started with husband/wife but later included very close friends and members of the Buddhist clergy. As the elastic stretched thinner and thinner it became difficult to distinguish altruistic donors from commercial donors i.e. those who sold their organs for cash. This brings in a new dimension into the transplantation arena, that of ethics. The world of transplantation has consistently campaigned against commercialism on organ transplantation. The Human Tissue Transplantation Act of Sri Lanka in Section 17 outlaws the sale of organs. The only way that this could be overcome is for the appointment of strict transparent "Authorisation Committees." The model in Germany seems to be the one closest to the ideal where kidney donors and recipients are heavily screened and must appear before two review boards where they are reviewed with medical, ethical and psychological tests.

There are donors who say "I do not care to whom my organ goes to, I just want to donate one." If they go into a donor pool, a system needs to exist whereby every potential recipient goes into a register and gets allotted points on an agreed scheme. Knowing the frailties of humans it is difficult to see how this altruistic scheme will work in practice. Equally challenging but much less complicated is the organ/s from a brain dead donor. There is less time for manipulation of the system by interested parties. Each day, 4 to 6 persons will die following road traffic accidents in Sri Lanka. Interested groups, including the Sri Lanka Medical Association, have been lobbying for action to reduce accidents and deaths on our roads. Until such time, there is a harvest to be collected - only if the medical community, whatever the interest or specialty thinks "organ transplantation." This means that every medical officer at every possible opportunity should, when dealing with patients needing cardio pulmonary resuscitation think 'if our efforts fail, could this be a potential organ donor." Or, "a life lost but a life saved"

A sine qua non for a successful "cadaver" donor programme is the Transplant Coordinator. Such a person is usually a paramedical person eg: a nurse administrator who has good interpersonal skills and good persuasive powers to get doctors to work at unfriendly hours of the day diagnosing and confirming brain stem death, getting authorization to harvest organs from relatives, administrators, judicial officers etc. It is a tough and demanding job. Transplantation units around the world, each, have one such gifted and dedicated person. In the midst of all the coordination of operating theatres, staff and consultants, coordinating with other transplantation groups to whom an organ may be sent, they also have to remember to send a wreath and card to the funeral of the deceased! There is no cadre position for such an officer in the Health Services of Sri Lanka.

The subject of organs for donation is covered by the Tissue Transplantation Act No. 48 of 1987. It was a hurriedly drawn up bit of legislation to

which the main contributors were those interested in tissue donation like cornea donation and grafting. It has a number of flaws which need correction.

Transplantation is a costly exercise. It begins with the investment in training, which means not only the surgeon. It is truly a multidisciplinary team effort. For liver transplantation, apart from at least two trained surgeons per unit, a hepatologist, general physician, immunologist, clinical pharmacologist, bacteriologist, histopathologist, cardiologist, nephrologists, radiologist, interventional radiologist and endoscopist, intensivist, anaesthetist, respiratory physician, a well stocked blood bank, comprehensive laboratory services, physiotherapists and intensive care nurses probably are necessary for these units to function optimally and in a sustained manner rather than as a one off transplantation unit. Such units have a regular early morning review group meeting to discuss problems and solutions. Such a group lends support to each other and prevents early "burn out" in members of the team, especially the surgical team which carries the load of the pressures that build up in these units.

The transplantation operation is a costly one. The University of Wisconsin and other solutions used for preservation and vessel flushing takes up quite a bit of the budget as do transfusions, blood products, coagulation factors, immunosuppressives and antibiotics. Although the immunosuppressive regime is simpler than that required for renal transplantation, there is yet a daily cost for the rest of a patient's life.

The question of who should bear the cost of such an expensive operation is an interesting one, especially if the cause of the problem was alcohol induced cirrhosis.

Sri Lanka is proud of its free health service. There is a group which talks of the ethics of resource allocation. While there is a small pie of 3.2% of Gross Domestic Product (GDP) allocated for health, a larger share is given to cardiac surgery, transplantation and neurosurgery whilst very little of the pie is left for preventive medicine, mental health and other "orphan specialties".

This argument is not quite correct. Preventive health is all about infrastructure development: water supply, housing, sanitation, roads and transport etc. for which other Ministries receive funding, whilst curative health deals with the individual who is part of a family unit which, in turn, supports the social fabric. The state has to support this. For an expensive operation like liver and kidney transplantation, a fund like the President's fund must be set up with regular contributions from the industry as part of their corporate social responsibility programmes, a source of this fund could also be from one of the government lotteries, which in reality is a citizen's contribution, and some part must also be the responsibility of the patient.

Liver transplantation is expensive and there are very few individuals who can afford it. We have surgeons trained and capable of delivering this service. They need the support of the public, the ministry of Health and, last but not least, our medical and medico-legal colleagues, if sustained successful programmes are to become established.

Sheriffdeen A.H. FRCS
Consultant in Vascular and Transplant Surgery
Emeritus Professor of Surgery
University of Colombo.
Email: proahs@sltnet.lk