# Tissue Bank: Sri Lanka

Human degenerative diseases and congenital defects are common throughout the world. Many people suffer also from burns, fractures and nerve damage resulting from traumatic accidents and outbreaks of violence which occur all too frequently, especially in poorer countries. Far too many people are impaired for life because they have no access to treatment or simply cannot afford it. The Department of Technical Co-operation is sponsoring a programme, with technical support from the Division of Nuclear Medicine, to improve facilities at the Sri Lanka Tissue Bank.

## The need for tissue banks

Human tissue grafts could be the answer for many suffering people but the tissue is scarce and the treatment expensive. They have really only been an option for people living in the developed world or for the small proportion of rich people in developing countries. For many there is now hope on the horizon in the form of a general human tissue bank being established in Sri Lanka with the help of IAEA funds. Based on a successful eye bank directed by Dr Hudson Silva, the new tissue bank is planned to be fully operational by the end of 1998.

## Tissue banks and grafting

- A tissue bank is a facility for procuring and storing human and/or animal tissues for use in orthopaedic or plastic surgery.
- Whereas artificial devices are designed simply to replace damaged tissue, grafts of real tissue actually induce growth of natural replacement material by the host body.
- Various steps are involved in the use of tissues for grafting: collection or harvesting of the tissue, processing and sterilisation.
- Tissues for grafting must be sterilised. Steam and chemical methods have been used in the past but the method favoured for most tissues today is radiation sterilisation.
- Tissue banks can supply a wide range of tissues for grafting including musculo-skeletal tissues (bone, tendon, cartilage, ligament), soft tissues such as amnion and skin and others including cornea, heart-valve and nerve tissues. Many disabilities can therefore be cured by the grafting of human tissues with the result that afflicted individuals can resume normal and productive lives.
- Through the Regional Co-operative Agreement (RCA) for Asia and the Pacific, the IAEA has established tissue banks in various countries in the region including China, India, Indonesia, Malaysia and Thailand.


Processing human tissue prior to sterilisation

The Prime Minister of Sri Lanka, Madam S. Bandaranaike, during the inauguration of the Model Tissue Bank in May 1996, commended the assistance of IAEA. Dr. Hudson Silva is pictured second from right.

## The Sri Lanka Eye Donation Society

Over 30 years ago the dream of one man, Dr Hudson Silva, with the help of his home refrigerator led to the establishment of the International Eye Bank by the Sri Lankan Eye Donation Society, a non-government organisation. The Eye Bank has helped over 10,000 Sri Lankans to regain their sight and has sent more than 36,000 sight-restoring corneas to eye surgeons in 61 countries around the world. Recipient institutions, though receiving the tissues free, have made cash donations enabling the Society to thrive. It now has 325 branches all over Sri Lanka with the active involvement of 15,000 volunteers.

The Human Tissue Act, passed by Parliament in 1987, allowed the Society to expand its activities to include a tissue bank *(see picture)*.

*‘Donation of tissue can save someone’s life or make the quality of a disabled person’s life much better’*

J Mircheva, IAEA

### Amnion

Amnion is the inner membrane of the placenta that cocoons the fetus. It makes an effective wound and burn dressing which allows the patient’s own skin to regrow and causes the patient less pain than conventional dressings. It is also easier to place over joints and results in less scarring. Sterilisation is essential and irradiation is the best method. The amnion is separated from the placenta after the birth of the baby, washed repeatedly in a series of saline solutions until a clear sheet of tissue with minimum biological burden of bacteria remains. This is cut to a convenient size, sealed into a plastic bag which is then subjected to sterilisation by irradiation and stored until needed.

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## Model Project

The appropriate Sri Lankan authorities have approved the tissue bank project in full and are committed to its success. The successful track record of staff at the Eye Bank over ten years has demonstrated their ability to produce high quality corneal grafts and cope with large-scale international operations. The Government of Sri Lanka has provided more than a half share of the total costs of over $800,000. The Ministry of Health has pledged to pay the future costs for all tissue grafts used for non-paying patients in Government hospitals in Sri Lanka. The IAEA has provided the remaining funds for equipment, expert services and training.

Sri Lanka, and eventually the entire region, will benefit through:

- a dramatic increase in the availability of tissue grafts for victims of traumatic accidents, degenerative diseases and congenital defects which will be of most benefit to the poorer section of the population
- a substantial reduction in the wastage of human productivity
- a saving of $200,000 annually which Sri Lanka currently spends on imported tissue for grafts.

It is inherent in Sri Lanka's religious and cultural traditions to offer a body after death for the benefit of others. There has never been a shortage of corneal donations and now that the Colombo tissue bank has the facility to sterilise and store them, other body tissues are being offered and used.

Amnion makes an effective burn dressing and causes the patient less pain than conventional dressings

## The influence of nuclear technology

Increased use of tissue grafting for the cure of so many human ailments is due in part to irradiation techniques. Irradiation is now the preferred method for the sterilisation of most tissues to be used in the health care sector. Irradiation offers several advantages over steam or chemical sterilisation:

- it can be performed in the final packaging thus eliminating the danger of recontamination
- no heat is generated so the biological properties of the tissues are preserved
- no residues are left and there is no need for a quarantine period
- sterility can be assured

## The Model Project: progress and plans

**1994** Constructed building. Purchased equipment including Cobalt 60 radiation facility. Assembled technical and support teams.

**1995** Procured, processed and sterilised tissue. Started interacting with donor public and tissue end-users. Produced amnion, skin and bone tissue grafts for local hospitals. Reduced imports of tissue grafts.

**1996** Expand indigenous graft production and clinical use within Sri Lanka. Aim to cease importing graft tissue by the end of the year and to start providing surgical grafts to other countries.

**1997** Expand production of a full range of tissue grafts for use in Sri Lanka and for other countries, including ligaments, nerves, heart and artery tissues.

**1998** Continue to expand and aim to achieve self-sufficiency by the end of the year.

Left: Preparing bone for grafting. Bone grafts form a bridge across which the patient's own tissue regrows.

Agency support to the Model Project is helping to achieve a quality assurance system and good laboratory practice in accordance with international standards. Seminars have been held to introduce Sri Lankan orthopaedic surgeons to the tissue grafting procedures which are now available to them. As self-sufficiency is reached, the Sri Lanka tissue bank will also become a major supplier of a variety of tissue graft material for the Southeast Asia region and also for other parts of the world.

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