Eye banking: an introduction

What is an eye bank?
Eye banks are the institutions responsible for collecting (harvesting) and processing donor corneas, and for distributing them to trained corneal graft surgeons. Eye banks are regulated and part of the local health system; they may be attached to a hospital or housed in a separate building.

Before harvesting
Corneas can be harvested up to twelve hours after death, but ideally within six hours. The person who will harvest the cornea must first do the following:

- Obtain written consent from the senior next of kin of the deceased.
- Verify the death certificate and ensure there is a stated cause of death.
- Review the donor’s medical and social history to ensure they have no contraindications to donation. (This is done by studying medical records, interviewing the physician under whose care the donor was, and interviewing close family members.

Storing donated corneas
Whole eyes can be stored in a moist chamber at two to eight degrees Celsius. This is the simplest and least expensive way to store whole eyes, but the eyes have to be used within 48 hours. Such a storage method may be suitable for some eye banks with limited resources.

Excised corneas can be stored in intermediate-term preservation media, such as McCain Kaufman medium (MK medium) or Optisol, both maintained at four degrees Celsius. Corneas can be stored for 96 hours in the MK medium and ten days in Optisol. With the availability of MK medium and
Optisol, eye banks should ideally switch over from enucleation to in situ corneal excision procedures. This will enable better viability of donated corneas during storage. With increased resistance to the antibiotics used in preservation media, inclusion of alternative antibiotics must be considered.

After corneas reach the eye bank, they are examined using a slit lamp to check for corneal and stromal pathology. The endothelial cell density is also examined by specular microscope; this is necessary as donor corneas with a low number of endothelial cells are likely to fail soon after surgery. The processing of whole eyes must be done within a laminar flow hood maintained in sterile conditions.

The suitability of a cornea for transplantation is assessed by the corneal surgeon, who will consider the donor screening report, slit lamp and specular microscopic results, and serology reports. Following processing and evaluation of corneas and serological testing, transplantable corneas are transported to hospitals individually sealed and packaged, maintaining the cold chain at four degrees Celsius. The vial containing the cornea must be labelled properly with the eye bank name, tissue number, name of the preserved medium, medium lot number, expiry date of the medium, and date and time of the donor’s death. The surgeon must also be provided with the donor screening, tissue evaluation, and serology reports. It is important that the eye bank follows a fair and equitable system of tissue distribution.

**Standards**

Eye banks should develop and adhere to acceptable standards. This reduces the risk that grafts will fail or that infection will be transmitted. It may help to refer to the technical guidelines and acceptable minimum medical standards of the European Eye Banking Association (see Useful Resources, page 38).

**Finding donors**

Even with an effective eye bank, finding enough willing people to donate their corneas can be difficult.

Public awareness programmes play an important role. They must emphasise that corneas can be donated by anyone, whatever their age, religion, or gender, and that neither enucleation nor in situ corneal excision causes disfigurement of the face or any delays in funeral arrangements. Family pledging is also becoming more important as family consent is usually needed before eyes or corneas can be removed.

Some of these problems may be circumvented by favourable legislation for eye donation, such as a ‘required request’ law. This law requires hospital authorities to identify potential cornea donors and obtain consent from bereaved family members. Another law employed in some countries, such as the United States and Ethiopia, is a ‘presumed consent’ law. Under this law, every person who dies while in hospital is presumed to be an eye donor unless this is actively rejected by their next of kin.

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**OBITUARY PROF BARRIE JONES**

Dear Editor,

It was with great sadness that we learnt of the death of Prof Barrie Jones on 19 August 2009 in Tauranga, New Zealand, aged 88.

He was admired worldwide for his work in developing the concept of prevention of blindness and for establishing the International Centre for Eye Health (publishers of the Community Eye Health Journal) in 1981. He was in fact responsible for encouraging the launch of the first issues of this journal. However, your readers may not be aware of his major contributions, either in his career as first clinical professor of ophthalmology in the University of London, to the science and management of corneal and external eye disease.

Barrie first addressed the range of virus infections of the eye seen in London, writing about adenovirus infection and corneal involvement by the vaccinia virus. He conducted much laboratory research on herpes simplex infection, and randomised trials of interferon, idoxuridine, trifluorothymidine, adenine arabinoside, and ultimately acyclovir. A rational approach was developed to the management of different stages of herpetic keratitis, including mechanical debridement, when to use corticosteroids, antiviral agents, and of course lamellar keratoplasty.

Barrie Jones was widely known as an authority on corneal pathology. In the operating theatre, he and his colleagues cultivated and tested the sensitivity of every fungus isolate to many different potential new drugs. He emphasized that the variations in sensitivity within each species were so great that it was necessary to base rational therapy on the results of sensitivity testing of each patient’s own fungus.

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Barrie Jones, after his retirement, discussing the progress of the clinical trial of ivermectin with Prof Adenike Abiose, NIGERIA.

Although a much less common cause of keratitis than in tropical countries, fungi nonetheless caused serious corneal infections in London. Barrie and his colleagues cultivated and tested the sensitivity of every fungus isolate to many different potential new drugs. He emphasized that the variations in sensitivity within each species were so great that it was necessary to base rational therapy on the results of sensitivity testing of each patient’s own fungus.

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When, around 1980, he turned the full energy of his thinking to the questions of blindness prevention, it was informed by this rich background of laboratory and clinical experience.

Gordon Johnson

**Recommended reading**