Guidelines for the Blood Transfusion Services

21.10: Cardiovascular tissue retrieval and processing

http://transfusionguidelines.org/red-book/chapter-21/21-10-cardiovascular-tissue-retrieval-and-processing

21.10: Cardiovascular tissue retrieval and processing

21.10.1: General

This section predominantly relates to the banking of heart valves.

21.10.2: Sizing and evaluation of cardiovascular tissue

Aortic and pulmonary valves should be sized at the annulus and the internal diameter recorded in millimetres. The competency of the valves should be evaluated.

The length of the aortic conduit, main pulmonary artery and right and left pulmonary artery remnants should be recorded.

For pulmonary patch allografts, the length and width of the graft should be recorded.

Detailed description of the condition of the valve must be recorded in the donor processing records, which should include a grading system or schematic representation. It may also be helpful to take a retain photographic records of the grafts.

Valve descriptions and evaluation must accompany the allograft distribution and be made available to the surgeon on request.

Heart valves and vessels should be processed using a disinfection process which has been shown to produce decontaminated tissues.

Disinfection time must not exceed that specified in a validated disinfection regime.

21.10.3: Bacteriological testing of tissue

Where tissues are exposed to a decontamination step an assessment of the bacteriological status prior to decontamination must be performed.

Processed tissue must be subjected to bacterial (including Mycobacterium tuberculosis) and fungal testing using validated techniques. Each Tissue Establishment should develop a list of exclusion criteria based on type and/or number of contaminating organisms prior to and following decontamination.

21.10.4: Cryopreservation

Currently accepted optimal procedures involve controlled rate cooling of cardiovascular tissues in the presence of cryoprotectant.

21.10.5: Storage and warming of cardiovascular tissues

For material stored at –135°C or below, if during warming the tissue is warmed too rapidly between the storage temperature and –100°C, fractures can occur. A validated method of warming (e.g. on dry ice) must be used to minimise the risk. This must ensure that the valve has reached a temperature above –100°C before thawing in a 37°C water bath.

Material stored at –135°C, which is subsequently transported with solid carbon dioxide (–79°C), should be maintained in a mechanical freezer (at –80°C) if not used immediately. Thereafter, a maximum storage time of 6 months will pertain.

21.10.6: Distribution

Cryopreserved valves and vessels must be transported either in solid carbon dioxide at –79°C or in a container maintaining a temperature of –135°C or lower. Cardiovascular tissue must not be submerged in liquid nitrogen during transport.