



STATEMENT FROM THE XENOTRANSPLANTATION ADVISORY CONSULTATION

Geneva, 18-20 April 2005

Xenotransplantation: Hopes and Concerns

Transplantation is the treatment of choice for many serious diseases but is severely restricted by the shortage of available human organs, tissues and cells. Xenotransplantation offers a potential solution. It is defined as the transplantation, implantation, or infusion into a human recipient of living xenogeneic cells, tissues or organs, and human bodily fluids, cells, tissues or organs that have had *ex vivo* contact with these living xenogeneic materials.

While animals are a potential source of high quality, readily available live organs, tissues or cells for transplantation, three problems need to be overcome, i.e. inadequate physiological function, rejection of the graft and the risk of transmitting a serious and/or novel infectious disease to the human recipient. Some very serious diseases such as AIDS and SARS have originated from animals and there has been transmission of viruses from xenotransplants using non-human primates. To date there is no evidence that xenotransplantation using other animals, such as the pig, has caused infections. However, xenotransplantation carries a potential risk of such diseases developing at some time. Such infectious disease may pose a major risk, not just to the recipient but also to the wider public because it may be transmitted, even across national boundaries.

Successful xenotransplantation of organs could benefit many people. Xenotransplantation of tissues and cells also offers a potential treatment of diseases such as diabetes and some degenerative disorders. There are some forms of xenotransplantation already in use, such as the treatment of severe burns with human skin cells cultured with mouse cells. Recent advances in the science of xenotransplantation, particularly using pigs, make it likely there will soon be more trials of new forms of xenotransplantation. Considerable effort has already gone into improving the effectiveness and to minimizing the risks. However, more pre-clinical studies are needed before xenotransplantation can be expected to deliver its many potential benefits.

On the other hand, there are xenotransplantation practices that are a matter of concern. Animal cells are being injected supposedly to achieve, for example 'rejuvenation' or as unproven 'treatments' for a variety of illnesses and complaints. In these unregulated practices, many types of animal cells have been used with little attention to quality, safety or effectiveness. These types of practices pose unacceptable infectious public health risks and should not be permitted.

Xenotransplantation poses potential public health risks to all Member States because of the freedom of people to travel. In May 2004, the World Health Assembly adopted Resolution WHA57.18, which urged Member States "to allow xenotransplantation only when effective national regulatory control and surveillance mechanisms overseen by National Health Authorities (NHAs) are in place". It also requested the Director-General of WHO to support Member States in the development and regulation of xenotransplantation.

In order to implement the Resolution Member States are encouraged to:

- undertake an inventory of xenotransplantation practices in their country.
- only allow xenotransplantation if there is an effective regulatory system in place. Procedures should be regulated in proportion to the risks identified and with the aim of minimizing risks and improving safety and effectiveness.
- ensure that their regulatory authorities properly weigh the risks and potential benefits of any clinical trials or procedures before giving authorization; the likely benefits should be supported by evidence from appropriate pre-clinical studies;
- ensure there are regulatory standards relating to:
 - animal husbandry and the use of defined pathogen-free source animals from closed colonies;
 - authorization of procedures, ethical approval for clinical trials and consent procedures;
 - education of patients, intimate contacts and health care workers, including those in public health;
 - quality management of xenotransplantation procedures including laboratory testing; and
 - auditing of outcomes;
- ensure that there are effective surveillance systems in place which would identify and manage events which pose a potential danger to public health. WHO should be notified about major public health problems;
- ensure transparency about xenotransplantation activities; and
- promote public awareness.

Guidance on aspects of xenotransplantation and its effective regulation is already available from WHO at www.who.int/transplantation/xeno. There are links to other relevant websites and further detailed WHO guidance will be available shortly.