

## 11.

# End of life issues: xenotransplantation

## **Ruth Chadwick**

In thinking about end of life issues the perspective of palliative care contrasts sharply with the discussion of developing new technologies to prolong life. I want to use the example of xenotransplantation to discuss this, with reference to the European project on this topic co-ordinated from Lueneburg, Germany, and in which I was responsible for the ethical part. In providing an overview of the ethical results of the project it was decided by the project team to use a framework for analysis based on the ethical matrix developed by Ben Mepham (Mepham, 1995). This approach proceeds by identifying the main interested parties affected by a certain development, in this case xenotransplantation, and applying certain principles to them. The principles used by Ben Mepham are themselves based on the four principles of biomedical ethics advocated by Tom Beauchamp and James Childress - beneficence, nonmaleficence, autonomy and justice (Beauchamp and Childress, 1994). In Mepham's version the three principles are well-being, autonomy and justice.

The groups whose interests may be affected by xenotransplantation include at least the following: animals, organ recipients, the contacts of recipients, scientists, health care professionals, industry and members of the public. The result of setting these out in the form of a matrix is shown in Table 1:

## **Well-Being**

Under the heading of well-being we have to consider the effects of xenotransplantation on the well-being of all the

interested parties. As far as animals are concerned, there are clearly questions about the extent to which suffering is imposed upon them, for example through the process of genetic modification or on account of the conditions under which they are kept.

While it is difficult to articulate any benefits involved in the well-being implications for animals, for the organ recipients the well-being issues include both potential benefits and potential harms. On the one hand, it is said to be the argument from need of potential recipients (the argument from shortage) that provides the justification of efforts to introduce xenotransplantation, although there are reasons to think that while this demand may be the 'pull', the 'push' comes from recent developments in medicine. In any case whereas the greatest demand exists for kidneys and livers, these are not the organs where research effort is concentrated. On the other hand, they are exposed to further risks, such as new viruses, in addition to the experience of undergoing the medical interventions themselves. There are also psychological harms to be considered. These include personal identity issues resulting from having received an organ from a different species and the ways in which this might be perceived. It is known that in human transplantation recipients of organs have experienced identity problems: xenotransplantation may exacerbate this.

The potential implications for recipient contacts introduce a new interest group in the debate about transplantation: in the case of xenotransplantation the possibilities of virus transfer from species to recipient exposes the contacts of the latter also to such viruses. This is an issue for the wider population as well, in the case of the introduction of new diseases into the human population. Health care professionals may have threats to their well-being in so far as new technologies bring with them a redefinition of the scope of medicine, along with new expectations of success and cure including, possibly, false hopes.

	<b>WELL-BEING</b>	<b>AUTONOMY</b>	<b>JUSTICE</b>
<b>ANIMALS</b>	Suffering (e.g. from genetic modification; conditions in which they are kept)	Freedom to fulfil natural <i>telos</i> Integrity of creatures	Speciesism
<b>ORGAN RECIPIENTS</b>	Medical need Exposure to viruses Personal identity issues	Choice Surveillance Informed consent Dignity	Issues of access/distribution Stigmatisation Shortage
<b>RECIPIENT CONTACTS</b>	Risks of infection	Surveillance Informed consent	Stigmatisation
<b>HEALTH CARE PROFESSIONALS</b>	Definition of scope of medicine	Regulation Consent	Shortage of organs
<b>SCIENTISTS</b>		Freedom to research	
<b>INDUSTRY</b>	Investment	Freedom to pursue commercial interests	
<b>PUBLIC</b>	Safety Environment	Participation in decision-making Concerns/trust	

## **Autonomy**

Autonomy is traditionally a principle that is applicable only to rational agents. However in the ethical matrix it may be interpreted slightly differently to have application to animals in the sense of being free to fulfil their natural telos. Xenotransplantation clearly does not allow an animal to fulfil its natural telos, where the telos is defined in relation to what is natural to its kind rather than to the individual member of a species. Thus it would be no defence to argue that this particular animal would not have been brought into existence had it not been intended as an organ source. It is arguably genetic modification, however, that is particularly problematic here. There may be issues over what the natural kind is where species boundaries are crossed.

The application of autonomy is clearer in the case of the human interests at stake. Under this heading the concept of human dignity is also important. From a Kantian point of view autonomy is the ground of human dignity, and this concept is important in Germany, for example. There will be a question as to whether it is regarded as contrary to human dignity to introduce organs from another species. Under the umbrella of autonomy and rights we may also consider the issue of privacy and surveillance, which would almost certainly be put in place both for organ recipients and their contacts as continual monitoring would be required of the health status of the patients and their families, certainly in the initial stages when the procedures would still be experimental.

A key issue relating to autonomy will be informed consent. This will apply both at the research stage and at the medical practice stage. There is a problem as to the extent to which a consent in this area can be genuinely 'informed', as with all fields in which there is not only innovation but also rapid change. There are also concerns about the 'consent' aspect

of informed consent, in so far as it may be the case that individuals may be unhappy about consenting to be transplanted with an animal organ but feel that there may be no alternative. This concern leads to the suggestion that it is important to continue to pursue alternative forms of treatment to xenotransplantation.

Where xenotransplantation is available, potential organ recipients have from one point of view an enlarged range of options. (This does not by itself, of course, settle the question of whether their choices are autonomous ones.) From another point of view the consequences of agreeing to receive an organ from another species may be the acceptance of a large degree of future restrictions on one's freedom.

Health care professionals may be subject to increased constraints on their practice - there is an issue over the monitoring and regulation of this area, for example. This may also affect the interests of scientists' freedom to research and the freedom of commercial interests in this area. This leads naturally to the question appropriate to another box on the matrix, namely the extent to which there has been wider public consultation on this issue and support for such medical developments, particularly in a context where there is evidence of increasing mistrust of science, of which there is some evidence in the UK,

## **Justice**

It may be queried whether animals can be incorporated within the sphere of justice as such, even if there are ethical questions that are raised with regard to their treatment. For present purposes, however, this theoretical question will be put on one side - arguably what is at stake here is speciesism, the systematic discrimination in favour of our own species, to the detriment of others, and this may be construed as a justice

issue. Clearly this is not a new thing and the context of xenotransplantation has not of itself given rise to this, but there is a question as to whether the possibility of xenotransplantation introduces something different in kind or only in degree from what has been found in the past with reference to e.g. meat eating and animal experiments.

Moving on to organ recipients, issues of justice arise with regard to access and distribution. If xenotransplantation becomes sufficiently successful to be regarded as a standard form of treatment rather than as an experimental procedure, then there will be problems about allocation of resources. The problem of 'shortage' is unlikely to disappear but to be reinterpreted. While the main driving force towards the introduction of xenotransplantation is said to be the desperate shortage of organs and the impossibility of meeting the demand from human sources, this argument should be subjected to critique as to how, if at all, the shortage is 'constructed', what commercial interests are driving developments, how the present shortage manifests itself in different population groups. It is important to consider how shortage can be made worse if not created by the appearance of new specialisms in medicine, for example, and new target groups for transplantation. For example, one possibility that has been canvassed is that the ready availability of animal organs for transplant may affect the age range considered suitable for transplantation. Whether or not it is constructed, however, shortage is also an issue for health care professionals who have to 'deal' face to face with patients who need help but whom they cannot help.

Justice issues arise, however, not only in relation to possible discrimination in access and distribution but in the subsequent attitudes to those who are involved. Thus there may be possibilities of stigmatisation of those who have received organs and indeed of their contacts, especially if part of the

deal is that they agree to extend their life in quantity but at the same time to restrictions on its quality (e.g. by agreeing not to beget a child). This particular provision may be held to be in conflict with other human rights considerations.

## **The European dimension**

In looking at how the different European countries approached the issues identified above a number of considerations need to be borne in mind:

(1) while the matrix identifies the issues in the application of three principles, using it as a comparative tool can show up the dominance, where it exists, of one particular principle in the approach of an individual or group. For example, the Greek report to the project suggests that in Greece the dominant approach is the concept of human dignity.

(2) similarly, on the horizontal axis, it can show the priority given to particular sets of interests when compared with others.

## **Animals**

All countries saw the interests of animals as being a key if not the key ethical issue in considering xenotransplantation. While it may seem obvious, however, it is important to note that of 7 rows in the matrix only 1 concerns animal interests while the other 6 are related to human interests. The Spanish report specifically comments that the approach to ethics is an anthropocentric one. This is important to note at a time when non-anthropocentric ethics is growing in influence, and while the matrix does have the ability to demonstrate whether an anthropocentric approach is being taken, it may not always be explicit.

While the first horizontal line of the matrix deals with the interests of 'animals' there is also an issue, however, about

the specification of the membership of that class - in other words, which are the animals whose interests are at stake? This is discussed in several of the ethical country reports. There is concern about the use of primates for transplantation purposes because of the closeness of humans and primates in evolutionary terms (cf. Nuffield Council on Bioethics, 1996) Pigs are the source animals of choice, although there are ongoing concerns about the justification of this (cf. the German report). It is important to the ethical discussion also that xenotransplantation can include the use of cells rather than whole organs. This may affect the personal identity issues, for example, but not eliminate them, because the possibility of transplanting animal cells into e.g., the brain may still give rise to personal identity concerns.

From a theoretical ethical point of view there are different approaches to the question of animal interests and these broadly correspond to the columns in the matrix. Thus the well-being column broadly corresponds with a consequentialist approach; the autonomy and rights column with a deontological one. This is another advantage of the matrix, that it enables us to see what ethical stances are being adopted, and their implications. Historically utilitarian approaches have focused on the relevance of the fact that animals, like people, suffer, whereas a Kantian approach has concentrated on what it is about humans that sets them apart, e.g. rationality and personhood. For Kant it was the differences between humans and animals that were important, rather than the similarities. Contemporary deontologists, such as Tom Regan (1983) have argued that what qualifies human beings for personhood is also present, to some degree, in other species. Every being that satisfies Tom Regan's 'subject of a life'-criterion has an inherent value and should not be used merely as a means to certain ends. Regan widens the scope of Kantian thinking to include non-human animals. A present-day consequentialist approach such as we find in



Peter Singer (1975), suggests that the equal consideration of interests requires us to use humans with a similar intellectual capacity to animals we might wish to use for xenotransplantation, too, or to use neither of these. The reasoning consequentialist ethicists employ is that there is no morally relevant difference between some humans and higher mammals (cf. Chadwick and Schüklenk, 2001).

Well-being considerations were paramount in several countries - in the UK for example, the Kennedy report (1997) proceeded by weighing up benefits and harms, but as in that report the well-being approach to animal interests is not considered to be overriding:

While the pig may be exposed to harm we do not regard it as so unjustifiable as to make the use of the pig unacceptable in principle. Instead, as regards the pig, the issue is one of balancing the rights of the pig to be free from harm, as we understand them, against the rights of the human who, as we have seen, could benefit from xenotransplantation.

The weighing up approach, as here, typically concludes that, subject to certain provisos, human interests can take priority. The Netherlands however takes a 'no, unless' approach, meaning that animals are not purely of instrumental value but they may be used for valid reasons. Another possibility is the introduction of a notion of proportionality. For example the Spanish report quotes the Pontifical Academy of Life to the effect that it is not acceptable to cause suffering without a reason proportional to social utility.

Where autonomy and rights are concerned, the Greek report says that although there has been increasing concern about animal suffering over the last twenty years, the debate about animal rights is virtually non-existent in Greece. However elsewhere there is not inconsiderable support, e.g. in

Switzerland, for an argument based on the integrity of creatures and the concept of a 'good animal life'. This seems not unrelated to the idea identified in the matrix of freedom of the animal to pursue its natural telos.

Consideration of this horizontal row of the matrix in the country reports therefore does not tend to lead to the conclusion that xenotransplantation should be ruled out on the grounds of animal interests.

### **Human interests: organ recipients**

It is by no means the case, however, that the interests of organ recipients in having an organ are regarded as the overriding issue in all countries, despite widespread acceptance of the argument from shortage. The Greek report mentions a right to health giving rise to duty on the part of the state to pursue those means necessary to make this possible, while the Swiss report makes the point that there is no right to receive a transplant. There is, on the other hand, considerable concern about the negative effects on well-being of introducing this technology, in terms of both personal identity issues and risks to health.

Personal identity issues are mentioned in several of the reports (e.g., Italy), including the possibility that individual human beings may be regarded as 'genetically modified organisms' (see, e.g. the Swiss report). From a symbolic point of view, as acknowledged in the French report, certain organs or tissues may be more important than others (Chadwick, 1993) and this is likely to vary between societies (Welsh and Evans, 1999). Recent controversies in the UK over the removal of organs from children without the informed consent of their parents have demonstrated the importance that organs can have for conceptions of personal identity. In this case parents who have discovered that their children have been buried

without their organs have spoken in terms of burying only the 'shell' of their child. This gives rise to questions about where, if anywhere, the essence of the person is perceived to lie. From another point of view, the 'essence' of the person may be regarded as located in the genes and so it may be the receipt of genetic material from another species that may be regarded as problematic.

In addition, the risks to the health of recipients, it is argued, may be great not only because of new viruses but also because of the need for higher levels of immunosuppression, although the use of transgenic animals may reduce the need for this. On the other hand awareness of the potential developments in xenotransplantation may lead to unrealistic expectations which will have a detrimental effect on well-being.

There is considerable discussion of the autonomy implications for organ recipients, particularly with regard to privacy, surveillance (which figures prominently in the UK report) and informed consent. While there is a view that the normal standard of consent should be adhered to there are concerns about who should explain about safety and worries about potential disadvantages to those unwilling to participate (Nuffield Council on Bioethics, 1996). There are also specific concerns about minors and incompetent adults (e.g., Switzerland).

Where recipient interests are concerned, the well-being and autonomy issues figure far more prominently than the justice and distribution issues, perhaps reflecting the fact that at the present time the debate is focusing on the desirability of the procedure as a whole rather than issues of access and selection, although there is some discussion over the choice of the first candidates, and the German report recommends that in the event of the implementation of xenotransplantation, it ought to be available to all on the basis of need.

## **Human interests: recipient contacts**

In the UK there is explicit discussion of the issues relating to recipient contacts, including the question of how these are to be defined. The potentially serious nature and extent of the implications for surveillance of contacts constitute an area in which arguably the ethical issues surrounding xenotransplantation are genuinely new.

## **Human interests: science**

The scientific imperative is acknowledged in the reports of Switzerland and Italy. In the latter our attention is drawn to the importance of research as an ethical imperative. The Swiss report points out that science cannot be expected to be neutral and the “primary goal remains the development, confirmation and broadening of generalizable knowledge”. From an ethical point of view this is a striking statement, given the influence of the dominant rhetoric of shortage, and draws our attention to the fact that breaking down the rejection reaction between species is an exciting scientific challenge which has to be taken into account in considering the forces driving the development of xenotransplantation.

The public interest is discussed under all three principles, well-being, autonomy and justice, the latter aspect being less well developed than the other two. First, it is widely acknowledged that health risks may be imposed not only on recipients and their contacts but also on the general population.

Where issues of justice are concerned these are said to include the urgency of not overlooking plurality and minority opinion e.g. of particular religions or ethnic groups. Another important issue concerns the opportunity costs of putting public health care funds into high-tech care (see e.g. Netherlands). Whatever its health care system, every country has problems to face about allocation of its health care budget.

## Comment

Although the matrix is very useful in identifying issues and providing a basis for comparison, there are certain limitations also which become apparent. There is always an issue about the way in which ethical questions are framed and the danger of any framework at all is that it might privilege certain approaches at the expense of others. Given that the principles are derived from the four-principles approach of Beauchamp and Childress, which derive from a cultural setting where individualism is prominent, there may be concern that certain ethical approaches may fit less well into it - for example, feminist ethical approaches. While arguably these could be accommodated in the justice column, in so far as feminist ethics will be concerned with how new technologies will impact upon women (e.g. recipients will be debarred from childbearing and breastfeeding), and with issues of power and control over their development and implementation.

Similarly the principle of solidarity may appear not to fit well into the scheme, although this principle is mentioned in some of the ethical country reports, in different ways, some of which at least are seen as necessary means to well-being. For example, in the Italian report Battaglia is quoted in support of the view that human solidarity must be obtained for the furtherance of human donations to one another, but Berlinguer's argument for 'interspecies solidarity' is also mentioned.

It may also be regarded as problematic to accommodate the concept of the natural although this is a consideration for some countries e.g. Germany, where the idea of natural barriers is something to be considered. The extent to which ideas of the 'natural' can be compatible with the matrix is an interesting question. In so far as what is at stake is a preference for what is perceived as 'natural' in different countries it could be

considered in the box of the matrix at the intersection between 'autonomy' and 'public'. On the other hand it may be associated with well-being. On yet another interpretation there may be a concern for a 'justice in nature' as we find in Heraclitus' saying that even the sun must not overstep his measures - otherwise the Furies, ministers of justice, will seek him out (see Chadwick, 1989). On the other hand, an argument that xenotransplantation just is unnatural and should be rejected in principle on that ground, without any association with preference, well-being, or ideas of justice, may be advanced. It would, however, face problems both of defining 'natural' and of ruling out too much. The point is that in some senses arguments based on the natural can be accommodated in the matrix.

It is worthy of note that although there is considerable consensus about the centrality of animal interests in the ethical analysis of xenotransplantation, the discussion of the part played by genetic modification in this process is not dominant, although this was included in the well-being column of the matrix. In contrast, in the discussion by Welsh and Evans xenotransplantation is presented as an aspect of the 'new genetics' (Welsh and Evans, 1999). The relative unimportance

of this aspect in the country reports may seem surprising in the light of the prominence of the gm food debate over the last few years, and suggests that there may be a need for more work in this area.

*References*

Advisory Group on the Ethics of Xenotransplantation. (1997) *Animal Tissue into Humans*. HMSO: London. (The Kennedy report)

Beauchamp, T.L. and Childress, J.F. (1994) *Principles of Biomedical Ethics* 4th edn. Oxford UP

Chadwick, R F (1989) 'The market for bodily parts: Kant and duties to oneself', *Journal of Applied Philosophy* 6. 129-39

Chadwick, R.F. (1989) 'Playing God' *Cogito*

Chadwick, R. (1993) 'Corpses, recycling and therapeutic purposes' in D.Morgan and R.Lee (eds.) *Death Rites: Law and Ethics at the End of Life* Routledge

Chadwick, R. and Schüklenk, U. (2001) 'Organ transplants and xenotransplantation' in R. Chadwick (ed.) *The Concise Encyclopedia of the Ethics of New Technologies* Academic Press

Mepham, B. (1995) *Food Ethics* Routledge  
Nuffield Council on Bioethics (1996) *Animal to Human Transplants: the ethics of xenotransplantation* Nuffield Council on Bioethics, London

Regan, T. (1983) *The Case for Animal Rights*. Routledge & Kegan Paul  
Singer, P. (1975) *Animal Liberation*. Pimlico

United Kingdom Xenotransplantation Interim Regulatory Authority (UKXIRA) (1999) *Draft Report of the Infection Surveillance Steering Group* London, reprinted in *Bulletin of Medical Ethics* (November 1999)

Welsh, I. And Evans, R. (1999) 'Xenotransplantation, risk, regulation and surveillance: social and technological dimensions of change' *New Genetics and Society* 18 (2/3)