Case Studies in Organ Transplantation

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I. Using Human Cells

Burn patients often require extensive skin grafts. Using current technology, physicians routinely take small skin samples from burn victims, expand the cells in tissue culture, and proceed to grow skin in sheets. These sheets are then transplanted to the burn site.

Discussion questions:

1. What is your initial ethical reaction to cloning human cells in this manner? Is this a good or bad thing overall?
2. What facts support your response?
3. Is there any underlying moral principle that supports your response?
4. Are there viable arguments against your position?

II. Transplanting Animal Organs, Part A

Cats occasionally require renal transplants to survive. Currently, the owners of pet cats needing kidneys are required to obtain a donor cat. If a home cannot be found for the donor cat following transplantation of one of its kidneys, then the life of the donor cat may be sacrificed in order to save the life of the cat needing the kidney. Recipient cats require chemotherapy to prevent kidney rejection.

1. What is your initial ethical reaction to our current donor program? Is this a good or a bad thing overall?
2. What facts support your response?
3. Is there an underlying moral principle that supports your response?
4. Are there viable arguments against your position?
5. Is there a creative way to honor all conflicting moral obligations to some extent?

Break into groups of five. Each member will play one of the following roles:

1. The veterinarian who wants to perform the procedure;
2. The loving cat owner who wants to save her cat's life;
3. The animal rights activist who opposes killing a healthy cat to save a sick one;
4. The employee of the Society for the Prevention of Cruelty to Animals (the source of many donor cats) who is willing to supply donor cats for the procedure rather than having to euthanize the animals; and
5. The unhappy cat lover who has lost pets in the past, and is concerned that a pet could end up as an unwitting donor.

Conduct a conversation in which each student attempts to justify their position using ethical principles and arguments.

II. Transplanting Animal Organs, Part B

A combination of two recent scientific breakthroughs now provides a unique opportunity for organ replacement. Mammal clones have been developed from cells of adult sheep. Researchers have also
recently used biotechnology to produce headless fetuses in mice by knocking out a gene responsible for the development of the head. By performing this action at an early stage in morphological development, the researchers can produce a mouse fetus that is born with its head missing (see Figure 1). In other words, when the fetus is born, it has all of its organs except the brain. Thus, it has no means of receiving or acting on any impulses generated by the peripheral nervous system, and is essentially nonsentient. Mice fetuses occurring naturally with this gene deficiency do not usually survive the early stages of pregnancy. Most of the mutant mice die at midgestation with placental defects but a rare few progress all the way to birth.

This technology would require further development before headless cats could be achieved. However, by combining this technology with mammalian adult cell-cloning technologies, it may be possible to produce headless cat fetuses. These headless cats would be an excellent source of tissue-type-matched tissues such as bone marrow, or organs, such as the liver. These tissues or organs could save the lives of sick cats. Thus, no healthy cats would have to be euthanized in order to save a sick pet.

**Homework**

Fill out the form titled, 3: Case Study Response: Individual, 2 (Appendix 1)*. Bring it to the next class session.

Next class session: Break into the same groups of five that performed the role-playing exercise in Part A. Each student will receive a copy of the form 3: Ethics Case Study Response: Group 2 (Appendix 2). Drawing on the results of your individual homework assignment, work with your group members to produce a collective answer to each question.

Discuss your group's results.

### III. Transplanting Human Organs, Part A

The same headless-fetus technology could be developed further to apply to people. That is, researchers could use biotechnology to clone your cells, and produce a headless human fetus that matched you. If we went forward with the technology, the fetus would be born with most of its organs present except the head. Thus, having no means of receiving or acting on any impulses generated by its peripheral nervous system, it would essentially be nonsentient. The fetus might be an excellent source of tissue-type-matched organs for you. It might, for example, provide you with a bone marrow transplant or a liver transplant should you need it, and painful chemotherapy following the transplant operation would be unnecessary.

**Discussion questions:**

1. What is your initial reaction to this proposal? Is this different than your response to transplanting animal organs in II.B? Why?
2. What reasons support your response?
3. Is there an underlying moral principle that supports your response? Is this a different underlying moral principle for this case versus Scenario II.B? Are there viable arguments against your position?

### III. Transplanting Human Organs, Part B

Should the government permit research to develop headless human clones? What role should ethics play in such public policy discussions?

Break into new groups of five. Prepare testimony for a U. S. Senate hearing on the question of whether the government should permit research to develop headless human clones. Each student will play one of the following stakeholder roles:

1. The ethicist, who identifies critical moral issues on both sides of the question;
2. The medical researcher in the organ-transplant community, who explains issues of equity and medical utility;
3. The representative from the insurance industry, who explains the costs of current medical procedures and how they affect health-insurance rates;
4. The family member of a patient needing a transplant, who portrays the emotional frustrations associated with being unable to receive a timely transplant;
5. The religious representative, who explains the theological resources offered by some tradition (e.g., Judaism, Christianity, Islam).

• Appendices 1 and 2 were developed by Gary Comstock, and originally appeared in the Iowa State University Bioethics Institute Handbook, May 1998.

**Appendix 1**
Case Study Response Form: Individual
Your Name: _________________________________________________ What ethical question are you trying to answer? (Your question should include a normative word, such as "should" or "ought" For example: "Should I support the production of headless cats?")
Give your first, intuitive, answer to your question.
List three reasons for your answer.
List three facts that support your answer (e.g., "Headless cats do not feel pain. Chances are that a homeless cat will be euthanized.")
List one moral principle that supports your answer. (For example, "We ought to do good. We ought not to cause unnecessary pain.")
Using at least one of your three factual premises, and at least one moral principle, construct a valid moral argument that leads logically to your first, intuitive, answer. Write a factual premise on line A.; a moral principle on line B.; and your conclusion on line C.
A. ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________
B. ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________
C. ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________
List two potential objections to your argument.
A. ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________
B. ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________
Describe how you would respond to each objection.
A. ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________
B. ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________

**Appendix 2**
Case Study Response Form: Group
Your Name: _________________________________________________
What ethical question are you trying to answer? (Your question should include a normative word, such as "should" or "ought." For example: "Should I support the production of headless cats?")
Give your first, intuitive answer to your question.
List three reasons for your answer.
List three facts that support your answer (e.g., "Headless cats do not feel pain," "Chances are that a homeless cat will be euthanized.")
List one moral principle that supports your answer. (For example, "We ought to do good," "We ought not to cause unnecessary pain.")
Using at least one factual premise that you wrote above, and at least one moral principle, construct a valid moral argument that leads logically to your answer. Write a factual premise on line A.; a moral principle on line B.; and your conclusion on line C.

A.__________________________________________________________________________________

B.__________________________________________________________________________________

C.__________________________________________________________________________________

List two potential objections to your argument.

A.__________________________________________________________________________________

B.__________________________________________________________________________________

Describe how you would respond to each objection.

A.__________________________________________________________________________________

B.__________________________________________________________________________________

**Teacher's Note:**
Students not familiar with the current realities of donor adoption may respond adversely to the statement that donor animals are summarily euthanized. It is important to note that most veterinary colleges performing renal transplants require owners of recipient cats to adopt the donor cat. Therefore, in a typical case, the donor cat is not euthanized. We intentionally omit this information in order to encourage students to come up with the idea on their own. Discussion of the point may stimulate additional consideration of the range of ethical issues involved in the adoption and euthanization of unowned animals. The practice of adopting animals for the use of their organs benefits the donor animals insofar as the animals probably would have been killed otherwise. But the donor animal does suffer a cost: the loss, say, of a kidney.

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