

## **98. The Ethics of Human Cloning**

---

### **Introduction**

In early 1997, a research team in Scotland cloned a sheep, Dolly, by modifying technology developed some decades previously with amphibians. Then, in July of 1998, researchers at the University of Hawaii produced mouse clones and developed a process by which mass cloning could occur. The technique used in both cases, somatic cell nuclear transfer, involves taking a nucleus from a somatic cell, placing it in an enucleated ovum, and implanting the ovum into a host uterus.

The cloning of Dolly brought to the forefront a longstanding debate about cloning human beings. The National Bioethics Advisory Commission recommended a five-year moratorium on any attempts to create a child through somatic cell nuclear transfer in the United States and urged the President to work with all other nations to do the same.<sup>i</sup> With the moratorium in place in the United States, legislative attempts to exercise permanent control over human cloning, such as the federal “Prohibition of Cloning of Human Beings Act of 1998,” have been introduced in Congress.

Human cloning is a matter for the medical profession’s attention since it would involve medical procedures and technology, and it may result in the creation of new genetic and psychological conditions that would require professional care. Therefore, the medical profession must evaluate the ethics of human cloning, and in particular, the potential role of physicians in the practice. The Council’s purpose here is to consider whether physicians should participate in human cloning, not to determine whether it should be legal or illegal.

The Council on Ethical and Judicial Affairs offers the following report to assess the ethical uncertainties involved in human cloning. It will address what are currently perceived to be the most widely discussed applications of human cloning, and it will lay the groundwork for future reports. Issues involving embryo research, stem cell research, embryo splitting, embryo twinning, and embryo donor organisms will be addressed in future reports. A scientific analysis of cloning technology can be found in a companion report issued by the Council on Scientific Affairs.

### **Definitions**

For the purposes of this report, the term “cloning” will refer to the production of genetically identical organisms via somatic cell nuclear transfer.<sup>ii</sup> “Somatic cell nuclear transfer” refers to the process in which the nucleus of a somatic cell of an existing (or previously existing) organism is transferred into an oocyte from which the nucleus has been removed. “Human cloning” will be used to refer to the application of somatic nuclear transfer technology to the creation of a human being that shares all of its nuclear genes with the person donating the implanted nucleus.

Cloning is distinct from techniques such as embryo splitting and twinning. Human cloning, as defined in this report, does not include the use of somatic cells to create a pluripotent cell line that could, for instance, also be used for extra-uterine production of transplantable tissues without the creation of an entire being. Nor does it include the use of cloning technology for the production of human tissues or human proteins from transgenic mammals.

### **Existing Limits on Human Cloning**

Coverage of advances in cloning, especially in the popular press, has described the prospects of manufacturing armies of programmed killers, duplicating sports stars or academic geniuses, and recreating deceased loved ones.<sup>iii</sup> Based on the intrinsic limitations of human cloning technology, some

widely mentioned undesirable applications of cloning are impossible, and others, which may be possible technically, are clearly prohibited by existing law, public policy, and professional ethical standards. The following sections describe these issues in more detail. In order to clarify the many misconceptions about human cloning, physicians should help educate the public about the intrinsic technical limits of human cloning as well as the ethical and legal protections that should prevent abuses of human cloning.

#### A. Replicating specific persons

The term “cloning” may suggest that one organism is the exact replica of another. Human clones would be identical insofar as they would have the same nuclear genes as the donor. However, as observed in natural monozygotic twins, having identical genes does not result in two indistinguishable individuals. A clone must—because of the different environment and circumstances in which he or she creates his or her life story—be a different person from the person from whom he or she was cloned. Although human cloning may be thought of as a sort of “delayed twinning,” twins may be more similar than clones since most twins are conceived and nurtured in the same environment *in utero* and often during childhood. Since environment has a profound influence on development, human clones likely would be different in terms of personality and other characteristics.

Because cloning would not produce exact replicas, several applications of human cloning are illogical. In particular, human cloning would not be a solution to terminal illness or mortality. Children are already thought of as a way to “soften the blow of mortality,” and clones may be seen as a more powerful approach since there is no sharing or mixing of genomes.<sup>iv</sup> The possibility of having one’s life to live over again, or of getting back a lost child, might be attractive. But the clone would not be the same person as the cloned individual. The fact remains that the person does die and cannot be replaced.

The same reasoning applies to recreating sports stars, dictators, and geniuses—genetics does not wholly define a person. Cloning may allow the persistence of certain genotypes and derived phenotypic traits, but it does not provide individual immortality or replication. A clone of a sports star will not necessarily be a superb athlete, and even if he or she did possess keen athletic ability, he or she would not be identical to the cloned sports star. However, the idea that the clone’s life choices would be affected by other’s expectations raises additional disturbing possibilities that are addressed below.

#### B. Creating clones without consent

There is some concern that human clones would be developed from cells obtained without one’s permission since, unlike traditional procreative methods, isolated somatic cells potentially could yield clones. If this technique becomes a possibility, the moral foundations of the therapeutic relationship would have to apply. These include trust, personal respect, and the healer’s fiduciary obligation to serve the patient’s health interests. Any attempt to clone a patient involuntarily would violate all three of these fundamental precepts of medical ethics.

In addition, the doctrine of informed consent would have to apply if this technique becomes a possibility. In Opinion 8.08, “Informed Consent,” the Council has recognized that “the patient should make his or her own determination on treatment.”<sup>v</sup> This includes procedures for reproduction. Few exceptions exist to this basic social policy. In addition to ethical safeguards, there are legal protections against procreation without consent. Cloning a patient involuntarily would likely violate the patient’s existing constitutional rights to privacy and reproductive freedom.<sup>vi</sup> Therefore, under no circumstances should cloning occur without an individual’s permission.

#### C. Respecting the rights of clones

Many of the other unrealistic applications of human cloning, such as creating armies of clones or creating human organ factories, stems from the underlying fear that clones would be denied the same rights as other individuals in society. Children are entitled to the same protections as every other individual in society. The fact that a human clone's nuclear genes would derive from a single individual rather than two parents does not change its moral standing. This standard should be applied to every supposed use of clones.

### **The Realistic Uses of Human Cloning**

#### **A. Assisted Reproduction**

There are some realistic applications for cloning technology in the medical arena. One of the most likely uses is as a method of assisted reproduction. To the benefit of many patients, the widespread introduction of assisted reproductive technologies has resulted in a great number of pregnancies and births that otherwise could not have occurred. The use of in-vitro methods of fertilization, donor eggs, donor sperm, and/or surrogate mothers have proved to be effective treatments for infertility. Assisted reproductive technologies are also attractive options to individuals or couples who do not choose to reproduce by traditional means. Cloning technology might allow any couple or individual to reproduce with minimal genetic input from another party.

Because of the prevalence of assisted reproductive technologies and the rapid rate of technological development in this arena, cloning rarely would be the only reproductive option available to prospective parents. For example, scientists recently have pioneered a technique in which DNA is transferred from an infertile woman's oocyte to a viable donor oocyte.<sup>vii</sup> In addition, the development of somatic cell gene therapy and other technologies may allow for the treatment of genetic disorders—an alternative to avoiding all genetic contribution from a partner with a disease gene. One issue for this report is whether it would be justifiable to make cloning available to individuals who could use existing or alternative options.

Many of the issues that arise in the context of cloning, for example with respect to medical, psychological, or social harms, can be compared to issues that arise in the use of other assisted reproductive techniques. Generally speaking, the medical profession should be satisfied that the benefits of commonly used reproductive interventions outweigh the risks to individuals, families, and their offspring enough to justify medical cooperation with informed patient requests for these services. Evaluating whether or not this calculus has been done for all of the currently used reproductive technologies is beyond the scope of this report. Regardless, cloning should be subject to such a balancing.

In considering cloning as another reproductive health tool, the profession should evaluate whether the ethical concerns introduced by assisted reproductive technologies will be exacerbated in the case of cloning to the point where they outweigh potential benefits to individuals, families, and their offspring. For example, human cloning appears to represent a significant step toward turning children into "products of human will and design," a situation that many find problematic.<sup>viii</sup> Determining the balance of possible harms and benefits will require further investigation and discussion regarding human cloning with consideration given to the points raised in the next section.

Individuals do not have a right to demand that physicians participate in human cloning. Before physicians would be justified in participating in human cloning, the harms and benefits need to be evaluated further with some of the issues requiring discussion on a societal level. Until these issues are brought closer to resolution and benefits clearly outweigh harms, it would be inappropriate for physicians to participate in human cloning.

## B. Tissue Donation

Cloning technology also potentially may be used to create a person with tissues immunologically matched to an existing individual. If the technology uses somatic nuclear transfer for cell or tissue production without creating a human being, then this is not human cloning by the definition used here. One scenario that has been discussed in the context of human cloning is the possibility of manufacturing “donor organisms.” In this context, donor organisms are humans in early stages of development created for the sole purpose of harvesting their organs.<sup>ix</sup> The creation of human embryo or fetal donor organisms will be addressed in a future report.

Legal and ethical protections already preclude the use of cloned children as discardable donor organisms. Medical ethics is grounded in the principle of nonmaleficence, or the avoidance of harm. Any involvement by a physician in the deliberate sacrifice or harm of children in order to harvest organs would violate this axiom. Further, this practice would be considered murder.

Even where the clone would not be destroyed, the ethical prohibition against using human beings merely as means rather than as ends in themselves makes the possibility of using human cloning to create an organ donor controversial. Nevertheless, even without human cloning, the practice of having children in order to create matching tissue for an older sibling already occurs. One couple unable to find a matching donor for their first child’s bone marrow transplant decided to have a second child on the chance that he or she would also have the rare marrow type.<sup>x</sup> Notably, the couple indicated that they had wanted another child and that they would care for the resulting child irrespective of his or her marrow type. In this situation, hoping the child had the same marrow type as its sibling did not preclude the couple from valuing the child for its own sake.<sup>xi</sup> A cloned person, however, would be born with assurance of tissue compatibility, and perhaps with the expectation of tissue donation.

There are limits on the types of procedures to which parents can consent. In a previous report, “The Use of Minors as Organ and Tissue Donors,” the Council has described the standards that proxies should use when making a decision to donate a minor’s organs.<sup>xii</sup> One of the standards the Council recommends is a “best interests test” based on the principles of beneficence and nonmaleficence in which the proxy “attempts to ascertain what would bring the most good to the person...and at the very least...do no harm to that person.” Physicians can help parents with the calculus of determining the best interest of the child.

Technological advances in organ and tissue research might alleviate the need to develop a human being in order to produce a matching organ. For example, somatic cell nuclear transfer may be used to produce only the matching, transplantable tissues. Improved pharmaceutical interventions to lower the rate of organ and tissue rejection could also reduce the need for tissue compatibility.

### **Ethical Concerns Regarding Human Cloning**

Physicians have an ethical obligation to consider the harms and benefits of new medical procedures and technologies. In weighing the harms and benefits, physicians should consider the possible implications of human cloning. Potential physical harms, psychosocial harms, adverse effects on familial relations, and changes to the gene pool are all legitimate issues. Compared to other technologies that might be used to address reproductive limitations and organ and tissue shortages, these potential harms of human cloning appear to outweigh the potential benefits at this time.

#### A. Physical harms introduced by cloning

While the Council will address the harms and benefits of embryo research in a future report, it is important to note that techniques used for cloning humans could potentially endanger the developing individuals. The Human Embryo Research Panel of the National Institutes of Health (NIH), in its 1994

study, advised that embryos should be transferred to a woman's uterus only when "there is reasonable confidence that any child born as a result" will not be harmed.<sup>xiii</sup> At present, this cannot be assured with any degree of certainty with human cloning. Somatic cell nuclear transfer has not yet been refined and its long-term safety has not yet been proven. The possibility of genetic or cellular conditions, and perhaps an array of illnesses associated with cloning, is of great concern. While the demise of countless amphibian, lamb, and mouse fetuses may be disturbing, similar wastage and mortality among human fetuses is unacceptable. Moreover, we might have significant concerns about offering such technology to women as a mechanism to facilitate reproduction given the potential harms from the expected high miscarriage rate.

The risk of producing individuals with developmental anomalies is serious and precludes human cloning for the time being. Producing disabled human clones would give rise to an obligation to seek better understanding of—and potential medical therapies for—the unforeseen consequences that could arise from human cloning.

#### B. Psychosocial harms introduced by cloning

Human cloning has the potential to introduce psychosocial harms to individuals. If a person with known genetic predispositions and conditions is cloned, the cloned child's genetic predispositions and conditions will, due to the very nature of cloning, also be known to a certain extent. For the most part, environment will also play a significant role. Presently, a child's genetic predispositions can be predicted to varying degrees if the parent's genetic predispositions have been determined. Knowledge of a child's genetic predispositions raises concerns about the autonomy and best interests of the child. The Council has urged caution in this area in its ethical Opinion 2.138, "Genetic Testing of Children."<sup>xiv</sup> Knowledge of genetic information holds great significance to an individual. The harm of preempting the child's future choice in knowing or forgoing knowledge of his genetic status and the danger of abrogating the child's right to privacy with respect to this status must be weighed carefully.

Foregoing choice in learning one's genetic predispositions may seem trivial compared to the concerns about identity raised with human cloning. If raised by the clone-parent, a clone-child could see what he or she has the potential to become. In this respect, human clones would differ dramatically from monozygotic twins who develop simultaneously. The timing of development is a key difference between monozygotic twins and human clones. Having insight into one's potential may cause enormous pressures to live up to expectations (or inappropriately relieve pressure to do so), even more so than those generally experienced by children.

Presumably, a person would clone him or herself or another individual because that person has desirable characteristics that would be reflected in the clone. For example, the person who cloned a sports star presumably would hope that the clone-child develops into another sports star. A sports star's clone-child unable to live up to these expectations could be dubbed a failure unable to capitalize on his or her genetic gift. Moreover, although the clone-child of a sports star might feel more confident of his or her abilities from the outset, other clone-children may feel limited by their genetic lot. If a clone-child saw that he or she was likely to develop certain diseases or had failed at certain tasks, his or her undertakings might be bounded by what the clone-parent had done. Therefore, cloning might limit the clone-child's perception of self and increase external pressures. Human cloning may diminish, at least psychologically, the seemingly unlimited potential of new human beings and may exacerbate disturbing motivations for having children.

#### C. The impact of human cloning on family and society

In addition to concerns about individual privacy and identity, the implications of cloning for family and broader social relationships remain uncharted. What would be the consequence to, say, the father-daughter relationship if the daughter and wife were genetically identical? Would a woman have a normal

mother-daughter relationship with her clone?<sup>xv</sup> These examples illustrate that the family unit might be quite different with the introduction of cloning. As one philosopher wrote: “cloning shows itself to be a major violation of our given nature as embodied, gendered, and engendering beings—and of the social relations built on this natural ground.”<sup>xvi</sup>

Additionally, some problems are technical and legal in nature. For instance, birth cousins could be genetic siblings, and this might result in a need to revisit laws governing marital eligibility. Also, the courts have had difficulty sorting out parental rights in cases of assisted reproduction. In one case, a court found a child conceived using assisted reproductive technologies to have no parents despite having eight individuals from which to choose.<sup>xvii</sup>

While discussion and resolution of these issues is not the province of physicians, the impact of human cloning on family and society is an important factor for physicians to consider when weighing the costs and benefits of cloning. Until more thought is given on a societal level regarding how to construct familial relations in this context, physicians should not participate in human cloning.

#### D. The effects of human cloning on the gene pool

Although not the most imminent threat, human cloning has the potential to alter the gene pool. In order for human cloning to have a significant effect on the gene pool, cloning would have to be widespread, and clones would have to reproduce. If cloning became widespread, human genetic diversity would decrease. Over time, the benefits of genetic diversity, from having individuals with disease immunity to fostering a population with a wide variety of talents, have helped human beings survive and succeed.

Like other interventions that can change individuals’ reproductive patterns and the resulting genetic characteristics of a population, human cloning raises the specter of eugenics.<sup>xviii</sup> The possibility that physicians might play a part in deciding which persons are or are not “worthy” of cloning is contrary to professional medical values by all respectable accounts. For the most part, those individuals thought to possess desirable characteristics or lack undesirable ones would be cloned. In addition, as is the worry with many assisted reproductive technologies, only those who have the ability to pay or are members of favored social groups will have access. This would have the potential to skew the gene pool in the direction of favored social groups and whatever characteristics are thought to be advantageous at the time, even though the long-term desirability of the characteristics is unknown.<sup>xix</sup> The possibility that physicians might be the agents of a social policy that make such judgments is contrary to professional medical values.<sup>xx</sup> The application of cloning for eugenic or discriminatory practices is incompatible with the ethical norms of medical practice.

In addition, since the somatic cell from which clones originate likely will have acquired mutations, serial cloning would compound the accumulation of mutations that occur in somatic cells. Although these mutations might not be apparent at the time of cloning, genetic problems could become exacerbated in future generations. These possibilities need to be investigated further before physicians participate in human cloning.

#### **The Need for International Regulations**

Even if the United States developed sound ethical guidelines and well-crafted regulations to address the practice of human cloning, some fear that human cloning would simply be forced into other locales. Individuals could travel to other countries where human cloning would be available and potentially unregulated. Because cloning technology is not limited to the United States, physicians should help establish international guidelines regarding human cloning.

## **Conclusion**

Human cloning raises a variety of concerns, some realistic and others less so. It would be irresponsible to forge ahead with this new technology in the absence of serious discussion regarding the possible harms and benefits of cloning human beings. Until the benefits of human cloning are thought by society to outweigh the harms, it would be inappropriate for physicians to participate in human cloning.

## **Recommendations**

The Council on Ethical and Judicial Affairs recommends that the following be adopted and that the remainder of this report be filed:

For the purpose of these guidelines, “somatic cell nuclear transfer” refers to the process in which the nucleus of a somatic cell of an organism is transferred into an oocyte from which the nucleus has been removed. “Human cloning” refers to the application of somatic nuclear transfer technology to the creation of a human being that shares all of its nuclear genes with the person donating the implanted nucleus. Human cloning, as defined in this report, does not include the use of somatic cells to create a pluripotent cell line that could, for instance, also be used for extra-uterine production of transplantable tissues without the creation of an entire being. Nor does it include the use of cloning technology for the production of human tissues or human proteins from transgenic mammals. This report does not address the issue of embryo or cloning research, stem cell research, embryo twinning, or embryo splitting.

- 1) In order to clarify the many existing misconceptions about human cloning, physicians should help educate the public about the intrinsic limits of human cloning as well as the current ethical and legal protections that would prevent abuses of human cloning. These include the following:
  - a) using human cloning as an approach to terminal illness or mortality is a concept based on the mistaken notion that one’s genotype largely determines one’s individuality. A clone-child created via human cloning would not be identical to his or her clone-parent.
  - b) current ethical and legal standards hold that under no circumstances should human cloning occur without an individual’s permission.
  - c) current ethical and legal standards hold that a human clone would be entitled to the same rights, freedoms, and protections as every other individual in society. The fact that a human clone’s nuclear genes would derive from a single individual rather than two parents would not change his or her moral standing.
- 2) Physicians have an ethical obligation to consider the harms and benefits of new medical procedures and technologies. Physicians should not participate in human cloning at this time because further investigation and discussion regarding the harms and benefits of human cloning is required. Concerns include:
  - a) unknown physical harms introduced by cloning. Somatic cell nuclear transfer has not yet been refined and its long-term safety has not yet been proven. The risk of producing individuals with genetic anomalies gives rise to an obligation to seek better understanding of—and potential medical therapies for—the unforeseen genetic consequences that could stem from human cloning.
  - b) psychosocial harms introduced by cloning, including violations of privacy and autonomy. Human cloning promises to limit, at least psychologically, the seemingly unlimited potential of new human beings and to create enormous pressures on the clone-child to live up to expectations based on the life of the clone-parent.

- c) the impact of human cloning on familial and societal relations. The family unit would be different with the introduction of cloning, and more thought is required on a societal level regarding how to construct familial relations.
  - d) potential effects on the gene pool. Like other interventions that can change individuals' reproductive patterns and the resulting genetic characteristics of a population, human cloning has the potential to be used in a eugenic or discriminatory fashion—practices that are incompatible with the ethical norms of medical practice. Moreover, human cloning could alter irreversibly the gene pool and exacerbate genetic problems that arise from deleterious genetic mutations, resulting in harms to future generations.
- 3) Two potentially realistic and possibly appropriate medical uses of human cloning are for assisting individuals or couples to reproduce and for the generation of tissues when the donor is not harmed or sacrificed. Given the unresolved issues regarding cloning identified above, the medical profession should forsake human cloning at this time and pursue alternative approaches that raise fewer ethical concerns.
- 4) Because cloning technology is not limited to the United States, physicians should help establish international guidelines governing human cloning.

Report of the Council on Ethical and Judicial Affairs  
of the American Medical Association  
June 1999

## REFERENCES

1. National Bioethics Advisory Commission. "Cloning Human Beings, Report and Recommendations of the National Bioethics Advisory Commission," Rockville, Maryland; June 1997.
2. Although cloning does not produce exact genetic replicas, it is intended to produce closely identical organisms.
3. "Will We Follow the Sheep?" Time March 10, 1997; p. 69, 70-72.
4. Kass, Leon R. "The Wisdom of Repugnance." In: The Ethics of Human Cloning Kass, Leon R. and Wilson, James Q. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1998.
5. Council on Ethical and Judicial Affairs, American Medical Association. "Opinion 8.08: Informed Consent." *Code of Medical Ethics: Current opinions and annotations*. Chicago, IL, 1998.
6. *Griswold v. Connecticut* 381 U.S. 479 (1965); *Eisenstadt v. Baird* 405 U.S. 438 (1972).
7. "Ethical questions raised by gene transfer for egg cell fertilization." Chicago Tribune Saturday, October 10, 1998, p. 16.
9. Kass, Leon R. "The Wisdom of Repugnance." In: The Ethics of Human Cloning Kass, Leon R. and Wilson, James Q. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1998.
10. Robertson, John A. "The Question of Human Cloning." *Hastings Center Report*, March-April 1994, 24(2): p. 6-14.
11. ABC News Show: ABC 20/20 (10:00 p.m. E.S.T.) November 6, 1997. "Born to Give." Transcript # 97110604-j11
12. Brock, Dan W. "Cloning Human Beings: An Assessment of the Ethical Issues Pro and Con." In: Clones and Clones- Facts and Fantasies About Human Cloning, Ed: Nussbaum, Martha C. and Sunstein, Cass R. New York: 1998. p. 147-8.
13. Report from Council on Ethical and Judicial Affairs "The Use of Minors as Organ and Tissue Donors," House of Delegates Proceedings, American Medical Association. December 5-8, 1993. p. 231-240.
14. National Institutes of Health. Final Report of the Human Embryo Research Panel. September 27, 1994.
15. Council on Ethical and Judicial Affairs, American Medical Association. "Opinion 2.138: Genetic Testing of Children." *Code of Medical Ethics: Current opinions and annotations*. Chicago, IL, 1998.
16. Kass, Leon R. "The Wisdom of Repugnance." In: The Ethics of Human Cloning Kass, Leon R. and Wilson, James Q. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1998.
17. Kass, Leon R. "The Wisdom of Repugnance." In: The Ethics of Human Cloning Kass, Leon R. and Wilson, James Q. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1998.
18. In re Marriage of Buzzanca, 5 Cal. 4<sup>th</sup> 84, 851 P.2d 776 (1993). The appellate court reversed this decision in 61 Cal. App. 4<sup>th</sup> 1410, 1418 (1998).
19. Kitcher, Philip. *The lives to come: the genetic revolution and human possibilities*. New York: Simon & Schuster, 1996. p. 123.

20. Eisenberg, Leon. "Would Cloned Humans Really Be Like Sheep?" New England Journal of Medicine, 1999. 340:6, p. 471-475.
21. Annas, George A. and Gordin, Michael A. *The Nazi doctors and the Nuremberg Code: Human rights in human experience*. New York: Oxford University Press. 1992, p. 29.