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EXTRACORPOREAL EMBRYOS AND THE ABORTION DEBATE

John A. Robertson*

Heraclitus said that you can never step into the same river twice. He might have said the same thing about certain public issues. They do not move as fast as rivers, but when you dip into them at later points in time, the look and feel of the controversy often is different, even if core value positions remain entrenched.

Take the abortion controversy. The debate rages with the same passionate intensity that has marked the thirteen years since Roe v. Wade. Yet there are differences; a hardening here, a loosening there, and a deepening of the context as new data emerges. A few years ago the debate centered on the human life amendment. Last year it was the film, The Silent Scream. Now it shifts to the chance of appointing two justices to the Supreme Court who will vote with the three dissenting judges in City of Akron v. Akron Reproductive Center to reverse Roe v. Wade. In the meantime, Solicitor General Charles Fried's filing of an amicus brief in an abortion case that does not directly challenge Roe becomes a newsworthy event as a lightning rod of Reagan administration thinking on the subject.

Technological changes may also alter public controversies, and are likely to do so with abortion. Indeed, technological determinism was built into the very heart of Roe v. Wade, when the line defining when abortions could be prohibited was fixed at viability, a point that shifts with technological advances in neonatology. Technological developments at the other end of the

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2. J. Robertson, Medicolegal Implications of a Human Life Amendment, in DEFINING HUMAN LIFE: MEDICAL, LEGAL, AND ETHICAL IMPLICATIONS 161 (Shaw and Doudera eds. 1983).
5. Viability was defined in Roe v. Wade as "the ability to exist outside of the mother, albeit with artificial aid." 410 U.S. at 153. As John Ely reminds us, this is a definition based

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spectrum might also affect the abortion controversy by influencing or affecting how we regard the fetus and the interests of the pregnant woman. I am referring here to developments in *in vitro* fertilization (IVF) and embryo transfer that now force us to confront directly the moral and legal status of the extracorporeal human embryo.

The ability to fertilize human eggs extracorporeally and transfer them after several cleavages to a physiologically receptive uterus raises issues that should reflect directly on the abortion debate. It is also an important policy area in its own right. I would like to report on recent developments with extracorporeal embryos and discuss issues of rights and duties toward embryos. Examination of the moral and legal status of the extracorporeal embryo might cast some light on the abortion debate and prevent it from contaminating the policy questions that arise with IVF.

**IVF Technology and the Abortion Debate**

Given the media blitz that has covered each step of the way, a person would have had to be unconscious not to be aware of important developments in recent years with “test-tube babies” or IVF. As a result of long research, physicians can now successfully stimulate a woman’s ovaries, retrieve several eggs, fertilize them in a Petri dish, and transfer them after the fertilized egg has divided several times, to a physiologically receptive uterus, usually of the woman providing the egg.6

Since the first birth in 1978, over 2000 children have been born worldwide as a result of IVF. As work, career, marriage and sexual practices change, the rate of infertility among middle-class women has increased, creating great demand for infertility treatments. The IVF industry is now booming and is likely to grow as infertility rates increase and new extracorporeal variations arise. There are over 120 IVF programs presently in the U.S., including programs in smaller cities without tertiary medical care. Interestingly, most programs have not yet had a pregnancy and even the best programs have less than a twenty percent success rate per laparoscopy cycle.

IVF raises a host of troubling issues, some of which derive from the practices to which it might lead. Routine freezing and thawing of fertilized eggs, which would suspend embryo development indefinitely, are likely to be offered soon in many IVF programs. Novel collaborative arrangements involving egg, sperm and embryo donors and gestational surrogates are also

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possible. The fertilized egg could be transferred to any physiologically receptive uterus, and may be gestated by a woman who does not provide the egg. The gestating woman could then rear the child, transfer the child to the embryo donor for rearing, or have a third party rear it. Other variations are possible, as is the possibility of identifying and then altering the genes of the embryos, which could affect offspring and later generations.

External or extracorporeal conception raises novel issues in several areas that are just now receiving attention. The questions raised concern issues of procreative liberty, the status of embryos, the welfare of offspring, effects on the parties, impact on the family and the reproductive roles of women, and on the moral tone of the community generally. I want to focus on the question of embryo status and relate it to views about the fetus in the abortion controversy, touching only tangentially on the other issues raised by IVF.

The question of the legal and moral status of the extracorporeal embryo is novel. Since the pre-implantation embryo has not previously been accessible, there has been little occasion to consider its moral and legal status. But now the embryo lies before the gaze of the physiologist or doctor, slowly dividing in a Petri dish. The decisions made about it can have great significance for many people. It can be destroyed, transferred, stored, manipulated or used in research. What limits if any should there be on what can be done with it? Who controls or owns it? What may they do with it? These questions are novel and arise at a time when practices and rituals concerning treatment of the extracorporeal embryo are still nascent. The time is at hand to begin the process of value clarification and value choice that will lead to a set of norms or ethics for decisions concerning extracorporeal embryos.

In thinking about the moral and legal status of the extracorporeal embryo, we must be careful to distinguish our views about abortion. The two often get confused, which ends up muddying each issue. One's views about the extracorporeal embryo tend commonly to track one's views on abortion. A uniform moral status for prenatal life from the moment of conception through birth has often been assumed by right-to-life and pro-choice groups alike. For example, anti-abortionists often take the position that all stages of prenatal life are of equivalent value and should be treated equivalently. If the fetus is to be protected, because it is living and human, they automatically assume that all earlier stages of development, including the stage between fertilization and implantation, must also be protected.

People who are pro-choice also seem to attach the same evaluation to all postconception prenatal stages. Since they view the woman's interest in

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7. These issues are discussed in J. Robertson, Procreative Liberty and the Extracorporeal Embryo (forthcoming 1986).
avoiding pregnancy to be paramount over the interest of the fetus, they assume that the woman's choice would also be paramount over the extracorporeal embryo, even though it is not located within her body. The tenacious rigidity of views on either side, in which the yielding of an inch is fought like the Battle of the Marne, is matched only by lobbyists for the tobacco industry and the National Rifle Association.

The blurring of views about abortion and the extracorporeal embryo is no longer tenable now that embryos are accessible extracorporeally. Extracorporeal embryos created by IVF show important differences from the first or second trimester fetus threatened with abortion. The embryo is but a few cells, with very slight chance of implanting and coming to term even if transferred to the uterus. The fetus is much more complex physiologically, and much more likely to yield a live birth. It has successfully attached to the walls of the uterus, and undergone a whole range of complicated developmental sequences. It is considerably more advanced in structure, size, form, organ and nervous system, and at some point in the mid- or late second trimester might even become sentient.

Another important difference between embryos and fetuses is location. The extracorporeal embryo is not situated within the woman's body, making demands on her physiology. The fetus, however, is attached and growing within her body, instigating other changes, and at some point requiring removal with the attendant consequences, if a live birth occurs, of childrearing or relinquishment. The woman's interest in controlling the fetus within her is much greater than her interest in controlling an extracorporeal embryo that she does not wish transferred to her uterus.

These differences in development and location make it logically possible to be in favor of embryo destruction, but find abortion wrong because of the more advanced developmental stage of the fetus. By the same token, a person could agree that a woman should have a right to terminate a pregnancy, but not award her control over an extracorporeal embryo that she does not wish transferred to her.

Consideration of the moral and legal status of the extracorporeal embryo is not the sword that will cut the Gordian knot of the abortion debate. Yet the extracorporeal embryo may loosen a few of the stays of the more rigidifying arguments and over time lead to more discriminating positions. As more refined distinctions are made, differences may narrow and some areas of agreement may even emerge.

In any event, consideration of embryo status is essential if we are to think clearly about and adopt appropriate policies concerning IVF and embryo manipulation. For there is a danger that the abortion debate will contami-
nate thinking and policy about the very different issues that arise with extracorporeal embryos. One’s views about fetuses located within a woman’s body are not sufficient to determine what decisions are appropriate regarding preimplantation embryos that exist in a laboratory. The following discussion examines more closely the physiological status of embryos and attempts to identify the moral and legal status that should be assigned them.

**EARLY EMBRYONIC DEVELOPMENT**

To assign a moral and legal status to the extracorporeal embryo, we must first examine the facts of early embryo development. Extracorporeal embryos are created as a result of stimulating a woman’s ovaries with drugs such as pergonal, removing one or more eggs before ovulation usually by laparoscopy under general anesthesia, and then inseminating the eggs that have been obtained in a Petri dish with husband or donor sperm. Fertilization can be detected by the emergence of pronuclei in the inseminated egg and subsequent cleavage. In the forty-eight to seventy-two hours between insemination and transfer to the egg source’s uterus, the fertilized egg may divide several times, into four, six or even eight cell masses.

What can we say biologically about a four- or eight-celled fertilized egg just prior to transfer (this is the stage at which freezing and embryo biopsy is likely to occur)? Clearly it has the potential, if transferred to a uterus, to implant and come to term. A new person will then come into existence.

However, a very complicated developmental sequence must occur if the embryo is to implant in the walls of the uterus and begin a pregnancy. Successive cleavages or cell divisions, first into a morula stage, and then into a blastocyst, must occur. At these stages the individual cells are called blastomeres. They become increasingly adherent and closely packed as they pass into the morula and then blastocyst stage. As they continue to increase, some become established as a surface layer, surrounding others within, that develops into the placenta. The cells within become the embryo proper, which emerges only after implantation occurs some ten to fourteen days after fertilization.8

Clifford Grobstein describes the developmental process in the blastocyst stage as follows:

The outer cells are now changing in properties toward trophoblast (feeding layer), destined to be extra-embryonic (placental) rather than embryonic in their eventual role. . . .

It is the outer population which is clearly exchanging and increas-

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ingly moving out into the surrounding maternal tissue, thereby opening up blood-filled spaces for nutritional exchange. Thus the first cellular differentiation of the new generation is to ensure physiological interaction between offspring and mother.

It is not until the blastocyst is well-established in the uterine wall (early in the second post-ferilization week) that the inner cell mass reorganizes into two layers that together make up the embryonic disc. This first true rudiment of the embryo is the site of the formation of the embryonic axis, simultaneously with the appearance of a third cell layer between the first two. With this step, so far as known, the embryonic disc is committed to forming a single individual—beyond this point twinning is not believed to occur, either naturally or experimentally.

. . . .the information strongly suggests that early events in mammalian development, very likely including human, relate more to the formation of extra-embryonic rather than embryonic structures and functions. This is not surprising since the commitment of mammals to internal gestation requires effective physiologic interaction between offspring and mother very early in development. In consequence, the first developmental steps do not establish an embryo, but a feeding layer or trophoblast. The trophoblast has already begun to function before an embryonic rudiment is demonstrable.

Accordingly, the zygote, cleavage stages and early blastocyst may be regarded not as embryonic stages but as pre-embryonic stages (sometimes referred to as the conceptus). This terminology reserves the term embryo for the rudiments of the whole individual that appears in the second week after fertilization.

. . . .Developmental individuality in the sense of singleness is not established until an embryonic axis is formed, an event that roughly corresponds to the time of implantation and initiation of physiological changes of pregnancy in the mother.9

To summarize, the extracorporeal embryo is a living human entity of a few nondifferentiated cells that has the potential, if transferred to a uterus, to attach and eventually produce a live birth. Unlike a fetus, however, the extracorporeal embryo has no organs, no neuromuscular structure or spinal column. Indeed, it will first develop a trophoblastic or placental layer before the embryo proper that could develop into an individual is formed. Not until ten to fourteen days after fertilization will the most rudimentary of all embryo structures emerge—the embryonic disc out of which the embryonic axis and spinal column will eventually, if development continues, emerge.

Only later will an organ, neuromuscular and nervous system develop. At some later point the capacity for sentience will also emerge. Wherever we place the point of sentience in the fetus, it is clear that the external, pre-implantation embryo (or pre-embryo, to be accurate) has no differentiated organ structure, and has not even developed the rudimentary structure of the embryo itself, which develops after implantation in the uterine wall occurs.

Now clearly the pre-embryo is a genetically unique, living human entity. It has the potential if certain other conditions and events occur to develop into a fully sentient person. However, the chances of any one embryo implanting after transfer and coming to term are quite low, considerably less than ten percent. At this point it is not sentient, it does not feel pain, it is not conscious, and there is no ability to interact. While people might choose to treat the embryo as an object of respect, it clearly is not a person in the usual sense that we use the term person, for it does not even have differentiated organs, much less a developed brain and nervous system which persons ordinarily have.

The pre-implantation embryo is similar to blood, bone marrow and other tissue or even solid organs, though there are important differences. Both tissue, such as bone marrow, and embryos are living and human. They both have the potential to enable another person to live, indeed, bone marrow and solid organs have a higher potential for doing so than the pre-embryo. The chief difference between them is that successful transfer of the embryo could produce a new person, while successful transfer of solid organs and tissues will allow an already existing person to continue to live. That difference suggests that there is a greater obligation to transfer transplantable tissue and organs than there is to transfer an embryo to a uterus, because of our greater duties to existing rather than to potential persons. Indeed, the homicide laws would classify knowing destruction of transplantable organs and tissues in certain circumstances as murder. Embryo destruction in no circumstances could be murder.

**Moral and Legal Status of the Extracorporeal Pre-Embryo**

Does the potential to become a person confer a particular moral and legal status on the embryo, a status that entails duties that limit what might be done with extracorporeal embryos?

I argue that the embryo does not have a moral status in and of itself, as it presently is, but does have moral status if it might be transferred to a uterus

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10. This action would constitute murder if it were done to intentionally cause the death of a person who would have lived if the organ or tissue had been transplanted in them.
and thus become a person. When transfer does not occur and no duty is
owed, decisions about embryos become occasions to use embryos as a sym-
bol of life or persons generally. The need for such a symbol must be weighed
against the costs to autonomy or future knowledge that symbol-making nec-
essarily involves.

1. Transfer to Uterus Intended

Let's first take the case where the embryo will be transferred to a uterus.
This is the usual situation now with IVF as an infertility treatment and is the
most common practice. Embryo storage techniques, which are on the verge
of being routinely practiced, would also be undertaken with the intent of
transferring the embryos to a uterus.

The intent or possibility that the embryo will be transferred to a uterus
necessarily confers a special moral and legal status upon it. What is done to
it necessarily risks affecting the person who is born as a result. Respect for
persons requires that we respect them by our actions and omissions before
they are born as well as after. Thus, we should refrain from actions that are
reasonably foreseeable as likely to produce harm, if healthy offspring could
otherwise be born.

There is a well-developed tradition both in criminal and civil law that
recognizes prenatal torts and obligations to avoid prenatal injury to people.11
If one is going to do something that will affect someone who is not yet in
being but who is likely to come into being, one has an obligation to avoid
harm to such a person. This duty is legally enforceable in tort and criminal
law only when the person injured by the action has been born. The condi-
tional nature of the duty, however, still has a great deterrent effect, for peo-
ple will avoid actions that could harm potential offspring. An example of
such a conditional duty to future persons, who can enforce it only if they
actually are born, are the legal questions that have arisen around prenatal
fetal surgery and fetal therapy, currently a much debated topic in obstetrics.12

This body of law would clearly apply to actions regarding embryos that
might be transferred to a uterus. Such choices could affect the welfare of
future persons in significant ways, and therefore should be made with care.
Indeed, the development of IVF has been sensitive to this risk. At a certain
point physicians have been willing to run risks that others would not, but

11. Robertson, Procreative Liberty and the Control of Conception, Pregnancy and Child-
12. Robertson, Legal Issues in Fetal Therapy, 9 Seminars in Perinatology 136-42
(1985).
they would not have gotten very far if the risk of defective births was very high. As far as is known, IVF and the whole process of extracorporeal conception and early development do not appear to have a higher rate of congenital defects than does coital reproduction.\textsuperscript{13}

A higher rate of handicaps would doubtlessly affect the willingness of people to use IVF, but it would not necessarily mean that those persons who were willing to take the risk of defects would be wronging the offspring or be accountable to them for their existence. A central feature of the IVF situation is that absent IVF there is no way for the child to be born undamaged. If offspring are to be born, they must run the risk of damage because IVF, the procedure posing the risk, also makes the birth of the person possible. However, risking a damaged child by noncoital means, even when an undamaging alternative is not possible, could harm those persons who end up bearing the costs of rearing handicapped offspring. Reproductive responsibility in the face of risks of unavoidably handicapped offspring is thus a question of avoiding harm to others rather than to the offspring, since the offspring cannot be born without the damage that is of concern.

These distinctions must be remembered in considering future developments such as embryo freezing, research, and donation. Even if embryo freezing and thawing were more likely to cause damaged offspring, running the risk would not wrong offspring born after storage. If freezing does not occur, the damaged person would never come into being. Similarly, transfer of embryos that have been the object of research may also be justified on this ground, for absent the research, they might never have been transferred and thus had the chance to become persons.

Finally, the use of gamete donors and surrogates cannot be said to wrong offspring, since there is no way for those offspring to be born absent the collaborative arrangement that raises concerns about offspring welfare. The use of donors and surrogates raises potential conflicts between procreative liberty and the welfare of offspring. Since the interests of offspring are at stake, the right of the participants to enter into enforceable reproductive contracts that assign rearing rights and duties in offspring is at issue.\textsuperscript{14} In considering the effect of donors and surrogates on offspring, we must remember that without the donor or surrogate the offspring would never have been born. Regulation of procreative contracts must confront this fact; otherwise there will be no offspring to protect.

\textsuperscript{13} Grobstein, \textit{supra} note 6, at 127.

\textsuperscript{14} \textit{Robertson, supra} note 7.
2. **Nontransfer of Extracorporeal Embryos**

A different set of issues arises if no transfer of the extracorporeal embryo to a uterus will occur. In that case there is no possibility of harm to others, since no person will result from that embryo. This raises the question of whether the embryo itself has rights or interests that need protection. If it does not, under what circumstances might people choose to protect it as a symbol of life or persons generally? These issues arise in the context of decisions about nontransfer or destruction of embryos, and whether nontransferred embryos may be used for research.

### A. Obligation to Transfer or Option to Destroy?

All IVF programs and all persons undergoing IVF must confront the question of nontransfer of embryos. The practice in most IVF programs is to transfer all embryos to a uterus. Some programs adopt this policy to avoid controversy with right-to-life groups. Others choose it to assure the greatest possibility of pregnancy. Some persons may also believe it to be the morally correct action. However, most programs will not require transfer of polyspermic eggs, since there is no chance that a healthy child will be born.

The question of nontransfer could arise in several situations even with healthy eggs. If more than four or five embryos have been created, transfer of all creates an undue hazard of multiple gestation. Patients and physicians might not wish to run that risk. Many programs avoid the dilemma by not fertilizing all eggs retrieved and by limiting the number of eggs removed. However, the number of transferrable embryos might not always be so easily controlled, thus raising the issue of nontransfer of the excess.

Embryo transfer might become impossible for other reasons. In the forty-eight to seventy-two hours between laparoscopy to remove the eggs and transfer to the uterus, some women will die, get sick or change their minds. The greatest pressure to avoid transfer will arise after embryo storage becomes routine. Couples who stored excess embryos for use in later cycles may find that their reproductive plans no longer require them. They may refuse donation to avoid the possibility of the embryo becoming a biological descendant, consenting to the "removal from storage" which will lead to the death of the embryo. The ability to diagnose the genetic makeup of pre-embryos will also lead to decisions against transfer, and embryos used in

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15. This term is used euphemistically to refer to destruction of stored embryos in the Waller Report from the state of Victoria in Australia. See The Committee to Consider the Social, Ethical and Legal Issues Arising from In Vitro Fertilization, Report on the Disposition of Embryos Produced by In Vitro Fertilization (1984).
research may also be destroyed to avoid risk of producing congenital defects in offspring.

Is it morally wrong not to transfer a healthy embryo to a uterus? Is there a legal or moral duty to do so, so that they might realize their potential to become persons? Or is there a right to order destruction, to prevent that potential person from being born? Absent a moral or legal duty to transfer, are there good reasons for adopting mandatory transfer policies?

1. No Duty to Transfer Embryos

It is clear that there is no obligation to transfer embryos based on obligations to the persons who might then be born. Future persons have no claim on us unless our present choices will affect their well-being when they do come into being. If they never come into being, they have not been harmed, since no person has ever existed to be harmed. Thus there is no obligation to the person who might come into being as a result of transfer, because there is no such person. No person exists to whom an obligation can be owed. A view that we are obligated to bring all potential persons into being would prohibit contraception and make overpopulation a duty to those involved in the resulting Malthusian struggle for survival. Menstruation and nocturnal emissions should then be marked by funerals for the person or persons who were prevented from being born. Onanism would amount to homicide (making Onan’s punishment more fitting).

Nor is there an obligation to the embryo in and of itself to be transferred, so that it might have the chance of realizing its potential personhood. To say there is such a duty would be to assume that the nontransferred pre-embryo is a rights-bearing entity in and of itself. It might become such an entity if certain favorable conditions and events occur. But the potential to become a person does not mean that an entity should be treated as a person now, anymore than an acorn’s potential to become an oak tree means that it now be regarded as an oak tree. (Of course, it may be valued because of this potential, but that is a different basis for value than when it has attained its potential.)

Indeed, such treatment would be very difficult in light of the biology of the embryo. As we have seen, it has not even reached the trophoblast or placental stage that is necessary for pregnancy and the embryo proper to emerge. There is no cognition. There is no rationality. There is no consciousness. There is no ability to interact with others. There is no ability to feel pain. There is not even an organ structure or a nervous system. There is a genetically unique entity that might develop those traits and thus have claims on us. But it is not meaningful to speak of a four-celled entity that is not yet
differentiated between placenta and embryo proper as possessing rights by virtue of its present state, regardless of its potential to become a new person.

A refusal to transfer a healthy embryo to a physiologically receptive uterus is not an injustice to the embryo (nor to the person who will never exist) because nothing is owed to the embryo (or to that potential person). It has no interests, and thus cannot be the subject of moral duties at this rudimentary stage, even if it could become the subject of duties at some later point in time. Moreover, the precise point in time at which an implanted embryo or fetus becomes such an entity need not be resolved. However liberally we construe sentience in the fetus and assign duties as a result, the pre-embryo has many developmental miles to go before it feels and thus deserves similar treatment.

The law reflects such an analysis. Nontransfer or active destruction of extracorporeal embryos would not constitute homicide. (Nor would it constitute abortion, since implantation has not yet occurred). Legal personhood starts upon live separation from the mother after gestation sufficient for viability has occurred.\(^\text{16}\) If the embryo is not going to be transferred, the relevant legal issue is who has dispositional authority and what limits are placed on the use of nontransferred embryos. A person who wrongfully prevented the transfer of a couple’s embryo (intentionally or negligently causing a meltdown in the frozen embryo facility) would not be liable for wrongful death of the embryo, but for interference with a person’s right to control disposition.

Although the extracorporeal pre-embryo is not owed anything in its own right, and justice is not implicated unless a person’s dispositional rights over the embryo are violated, the embryo could still be treated with respect as a symbol of life and persons generally. The embryo itself is owed nothing as a matter of justice, but because of its potential it may still serve as a symbol of persons generally. Indeed, it will be a powerful symbol of human life and personhood (after all, it is human, living, and has the potential to become a person), in the same way that a heart or liver or kidney that could be transplanted to another is a symbol of the importance of life and persons. These living human cells do have a significance and potential that other cells do not, and might properly be treated as objects of respect.

Let us explore a bit further what such symbolizing might entail. Nontransfer of the embryo does not harm a person as would waste or discard of the solid organ. An identifiable other person is not harmed, as would occur if the heart were destroyed rather than transplanted into a 30 year old patient with end stage cardiac disease. The concern is not merely to avoid

actively killing human life, since active destruction of the embryo is not necessary. The embryo equivalent of a "do not resuscitate order" can be written, and the fertilized egg kept in culture until it stops dividing and dies.

Although no wrong is done the embryo or potential person by nontransfer, it nevertheless is an occasion to demonstrate respect for life. A policy of transferring in all or nearly all cases, and limiting how and when disposal of the nontransferred embryo might occur (to mark its difference from blood, urine and other human tissue and fluids) might then make sense and be chosen by many people.

2. Mandatory Embryo Donation Laws

Physicians and patients are certainly free to adopt policies or practices regarding the transfer of all embryos, to the extent that they have dispositional control over the gametes, embryos or services at issue. They may choose to do only certain procedures or none at all and hire or serve only those persons who share their views. As IVF spreads and right-to-life groups get involved, some persons might argue that a law should be passed to assure that all embryos are transferred. Would a law that mandated transfer of all extracorporeal embryos to a willing recipient be constitutional?

The answer depends on the right of persons to avoid having biological descendants, a question not settled by recognizing the pregnant woman's right to abort a fetus. The question of embryo destruction is clearly different from the question of fetal destruction that occurs in abortion. A law mandating transfer of the embryo anonymously to a willing recipient would respect a woman's right not to be pregnant. Instead, the question is whether the woman (and man providing the sperm) have the right to avoid biological descendants. Let us assume a completely anonymous mandatory embryo donation and a foolproof way to prevent any of the parties from learning the identity of the others. Does a person have such an interest in avoiding anonymous biological descendants that they can prevent transfer of an unwanted embryo to a willing recipient?

This question forces us to consider an issue that has never had to be faced so starkly—the meaning of the genetic tie alone, without any of the rearing rights and duties that are normally entailed. The burden of a mandatory donation law is the burden of an unwanted genetic tie *tut court*. No gestation. No parturition. No rearing. No relinquishment for adoption. No contact. No identity. No knowledge of the actual child, and vice versa. No rearing rights and duties. The burden imposed is the knowledge that perhaps a son or daughter exists, offspring that one will never know.
The importance of this interest will depend on the meanings that men and women attach to the genetic tie *tout court*. One can imagine both intense interest or disinterest to the point of boredom in the possibility of unknown offspring. Some people will find that mere biological relationship has great significance. Some people will fear contact and suffer guilt. Others will crave contact and suffer because they cannot have it.

The constitutionality of such a law depends upon identifying very precisely the interests at stake and then making a value judgment about its importance. Even if we cannot predict the value that persons will attach, we can identify the interests at stake and begin to think about their relation to other protected values. For example, we do recognize that a person is free to avoid rearing rights and duties and their psychological entanglements by avoiding reproduction altogether. Since mandatory embryo donation does not force people to gestate or rear unwillingly, they would not run afoul of the constitutionally protected right to contraception and abortion.

Given these distinctions and a Supreme Court reluctant to define new fundamental rights, there may be no constitutional barrier to the state enacting such a law. As we have seen, *Roe v. Wade* would not prohibit it, since that decision rests on the woman's interest in avoiding gestation and childrearing or relinquishment burdens. It is not based on avoidance of the genetic tie *tout court*.

Even if a mandatory anonymous embryo donation law were to be found constitutional, the case for use of the full extent of the state's power over reproductive choice is not a strong one. The potential burdens to individuals, in light of the symbolic benefits, are too great. A donation system that attempts to be anonymous could still have leakage that might force some person to deal with unwanted descendants, or lie awake at night fearing (or hoping) that they will. Given a presumption in favor of individual choice over the creation of biological descendants, should we not rely on moral suasion and leave the question of donation of unwanted embryos to the individual?

**B. Research With Nontransferred Embryos**

The moral and legal status of the extracorporeal pre-embryo may also determine when research with embryos may occur. Research followed by transfer to a uterus is morally and legally problematic because of possible adverse impact on future offspring. However, research on nontransferred embryos does not directly affect future offspring. Should embryo research therefore be permitted? What limits and conditions are justified? This issue
again raises the question of treating the nontransferred embryo as a symbol versus treating it as a rights-bearing entity in its own right.

Research on nontransferred embryos could yield useful knowledge in many areas. Studies of early embryo development could improve infertility treatments, for example, demonstrating the optimal conditions for embryo freezing and thawing and leading to micro-injection techniques of fertilization for oligospermic males. Experiments in embryo biopsy, in which a blastomere is removed and karyotyped, could lead to better understanding of genetic disease and pre-implantation gene therapy. No doubt embryo research would yield useful knowledge in other areas as well.

Embryo research has become, however, a matter of controversy and very little is occurring. A bill banning all embryo research passed the House of Lords in Britain last year. Fetal research laws in at least six states could now be read to prohibit embryo research of any sort.\textsuperscript{17} Despite the favorable recommendations of the Ethics Advisory Board in 1979, no human embryo research is federally funded, and little appears to be going on in the private sector.\textsuperscript{18} However, the diffusion of IVF will increase the demands for embryo research and no doubt generate controversy.

The opposition to any embryo research is located in rabid right-to-life groups that view the embryo as an actual person, and who object to embryo destruction, if not also to IVF. The position that research harms nontransferred embryos and therefore should never be permitted has been rejected by several authoritative bodies that have examined the issue. The Ethics Advisory Board in the United States, the British Warnock Committee, the Australian Waller Committee and many other groups have agreed that nontransferred embryos may be used in scientific studies that address important questions and undergo some prior review. The risks to symbolic respect for life are deemed outweighed by the benefits of the knowledge to be obtained.

This conclusion is well-founded, given what we know of pre-implantation embryos. A nontransferred embryo cannot be hurt by research any more than blood or tissue cells can be hurt. The embryo consists of a few cells that lack the capacity to suffer. It has no nervous system, nor even the rudimentary structures from which the capacity to feel and experience pain could develop. Using it as an object of research before it dies could not hurt it, for it lacks interests and thus the capacity to be hurt. Since it is not a


moral or rights-bearing entity in its own right, research cannot harm or wrong it.

The question of doing embryo research is a trade-off between symbolizing respect for life and persons generally and the benefits of the knowledge to be obtained. For most people the question is not difficult, because little seems to be gained from banning all embryo research, including well-designed scientific studies. If embryos are not entities owed moral duties in their own right, then research on nontransferred embryos does not harm them, for they have no interests to be harmed. Embryo research would not then violate a Kantian duty not to use other persons merely as a means to one's own ends. Moreover, research with persons is not always unethical. We do permit the use of incompetent subjects, including fetuses, as objects of research—as mere means if you will—when the research does not harm them. However we characterize nontransferred embryos, it is hard to see how they are harmed by research before they die.

a. Length of Time

Let me address briefly two issues that arise once research on nontransferred embryos is accepted. One issue concerns the length of time that a nontransferred embryo can be grown in culture for research purposes. The authoritative bodies that have pronounced on embryo research recommend that embryos should not be grown in culture beyond fourteen days. This line is chosen to prevent research on embryos that have developed the embryonic axis, the precursor structure from which the spinal column and neuroskeletal system will develop. Such a line minimizes the risk that research will harm the embryo itself, on the assumption that harm can occur once a nervous system or its precursor structures have started to develop.

The fourteen day line has not yet generated problems for researchers, since there is very little embryo research occurring. However, it should not be cast in concrete as an inviolable line never to be crossed. This line should be re-evaluated when the need to research beyond fourteen days arises; otherwise, the fourteen day limit may come to limit useful research without good reason, as if harm to the embryo would not arise until much later. If the line is purely symbolic, then the costs of the line need to be addressed.

b. The Source of Nontransferred Embryos Used in Research

Part of the controversy surrounding embryo research has concerned the source of the embryos used in research. This issue has great practical im-

19. Current federal regulations, for example, allow research both on fetuses and incompetent subjects under certain circumstances. See generally 45 C.F.R. §§ 46.101-211 (1985).
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port, since it is necessary to have embryos in order to conduct embryo research. The debate here concerns whether only spare embryos created in attempts to relieve infertility may be used or whether embryos may also be created specifically for research purposes. The question is purely symbolic, for it arises only if research on nontransferred embryos is permitted and is independent of the precise research maneuver being undertaken.

If enough spare embryos were created in an IVF treatment cycle, limiting research to those embryos would not pose practical problems. However, researchers would prefer to be able to create embryos specifically for research purposes from donated sperm and from eggs donated during a stimulated IVF cycle or secondary to oophorectomy or hysterectomy. Embryos created in this way will assure a greater and more easily coordinated supply of research embryos than a supply system limited to embryos leftover from an IVF treatment cycle.

Although this issue has not yet surfaced in the United States, it generated a great deal of debate within the Warnock Committee. A majority voted to allow embryos to be created for research purposes, but there were seven dissents, three of which were based on opposition to embryo research in all circumstances. When the supply of embryos for research is limited, as appears likely, the case for limiting research to spare embryos is not persuasive. After all, persons who take this view agree that embryos need not be transferred and can be used in research. They find that embryo research itself is justified because there is no harm to the embryo as such and the symbolic gain of a total ban is outweighed by the loss of knowledge that a ban would entail.

Since harm to nontransferred embryos used in research is independent of their origin, the concern about source is purely symbolic. But if symbolic gain is outweighed by research costs in the case of research on spare embryos, why is it not also outweighed by the research costs that will occur if embryos cannot be created solely for research purposes? In my view, persons who would permit embryo research but think it should be limited to excess embryos are drawing inconsistent or arbitrary lines through the symbolic gain from such a restriction. Of course, they might really oppose all embryo research, regardless of source. But that is a different issue.

Persons and physicians are free to adopt such positions in their personal dealings with embryos over which they have lawful control. Persons are free

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to refuse to donate egg and sperm to create research embryos, and are free not to participate in such research themselves. But one's personal views about the propriety of creating embryos solely for research should not prevent other persons from giving gametes and creating embryos for research purposes; nor should it restrict federal funding for embryo research.

Consider the comparable situation with fetal research. We might, for example, object to a woman who agreed to be impregnated and then aborted solely to produce fetuses for research purposes. Putting aside the question of her legal rights to do so, that situation is more extreme in two ways. One is the developmental differences between embryos and fetuses. Intentionally conceiving and then aborting a fetus may cause the fetus harm. Intentional creation of an embryo cannot harm it. The second is that the woman would be taking on a physiological burden that is absent when embryos are created from donated sperm and eggs, particularly when egg retrieval is secondary to other surgery.

**Conclusion**

These are a few of the issues posed by developments in IVF and the ability to create extracorporeal embryos. I have focused on the moral and legal status of the extracorporeal embryo because of its intrinsic importance and because of the light that it sheds on the abortion debate. The discussion shows the need for careful thinking, based on knowledge of biological facts. In order to resolve the complex questions that arise concerning the rights and duties of persons regarding fetuses and embryos, we need to distinguish between these stages of prenatal development and the debates over abortion and IVF in which they lie embedded.