In Vitro Fertilization and the Beginning of Human Life

Gayle E. Woloschak

IVF and Fertility Disorders

In recent years, scientific approaches have been developed to treat some "fertility disorders" through in vitro fertilization or IVF, an alternative to the natural route of sperm fertilization of the egg in the womb of the mother. IVF has been used in many situations around the world to help couples who are unable to conceive children by natural means. The egg and sperm are joined together in vitro (that is, in a test tube), given appropriate proteins and "feeder cells" to enable growth to the multi-cell stage, and then implanted into the womb of a woman who has been treated with hormones to make her body behave as if she were pregnant, so that she can appropriately nurture the implanted embryo.

IVF has become a large industry in the United States and western Europe. In 2014, IVF babies made up 1.5 percent of all births for a total of 3.9 million children.[1] The cost of each procedure is around seven thousand dollars, and much of it is usually covered by medical insurance for treatment of infertility. In a typical IVF procedure, many eggs are fertilized in vitro, several are placed into a woman's womb, and the rest are frozen in preparation for the next opportunity, since the first attempt is often unsuccessful. This act of freezing the extra embryos has provided ample room for ethical discussions over the years.

What is the Orthodox perspective on IVF? Certainly many Orthodox families have conceived and given birth to children using fertility assistance through IVF. Many Orthodox bishops in the U.S. have given a blessing for the use of IVF by particular families, with the caveats that the egg and sperm come from the actual parents of the child, that a surrogate mother not be used, and, in some cases, that the procedure be carried out with only one or two eggs, so that extra embryos are not generated in the procedure. Other Orthodox bishops have refused to give a blessing for IVF. Finally, some families have pursued IVF without bringing the issue up with their priest or bishop. The range of Orthodox responses has been broad and inconsistent.

Most faith traditions, including Christianity, Judaism, and Islam, have struggled with issues of technology and medical care. Roman Catholic, Episcopalian, and some Lutheran communities have all—after much deliberation—provided written documents defining their faith communities' official position on the issues of stem cells, IVF, and similar technologies. In the Orthodox Church such official pronouncements are rare, but there are several reasons why is par-

[1] www.npr.org/sections/health-shots/2014/02/18/279035110/ivf-baby-boom-births-from-fertility-procedure-hit-new-high.

ticularly necessary to ponder these issues.

It is not the object of this paper to examine the entire range of factors behind the Orthodox Church's slow response to contemporary social and moral issues. Among the many explanations for this phenomenon are the lack of unified voice among Orthodox bishops and a diversity of perspectives on whether such pronouncements are even necessary or useful for the faithful. Nevertheless, there is little doubt that one overriding problem is bishops' and priests' limited knowledge about these complex medical techniques and the absence of a formal means of providing advice on them within the Church as a whole. Another issue is the reluctance of the Church to provide strong dogmatic pronouncements on any issue; this can be a strength in many cases, but when families need guidance on issues of concern, it can lead to difficulties in decision-making.

One of the rare written perspectives on IVF has been provided by the Russian Orthodox Church in its millennial document *The Basis of the Social Concept of the Russian Orthodox Church*. This document is significantly flawed, not only in its tone and perspective—it takes a legalistic and formulaic approach to ethical issues that is foreign to Orthodoxy—but also in its reference to scientific facts that have been inappropriately understood and referenced. It states:

> Morally inadmissible from the Orthodox point of view are also all kinds of extracorporeal fertilisation involving the production, conservation and purposeful destruction of 'spare' embryos. It is on the recognition of the human dignity even in an embryo that the moral assessment of abortion by the Church is based.[2]

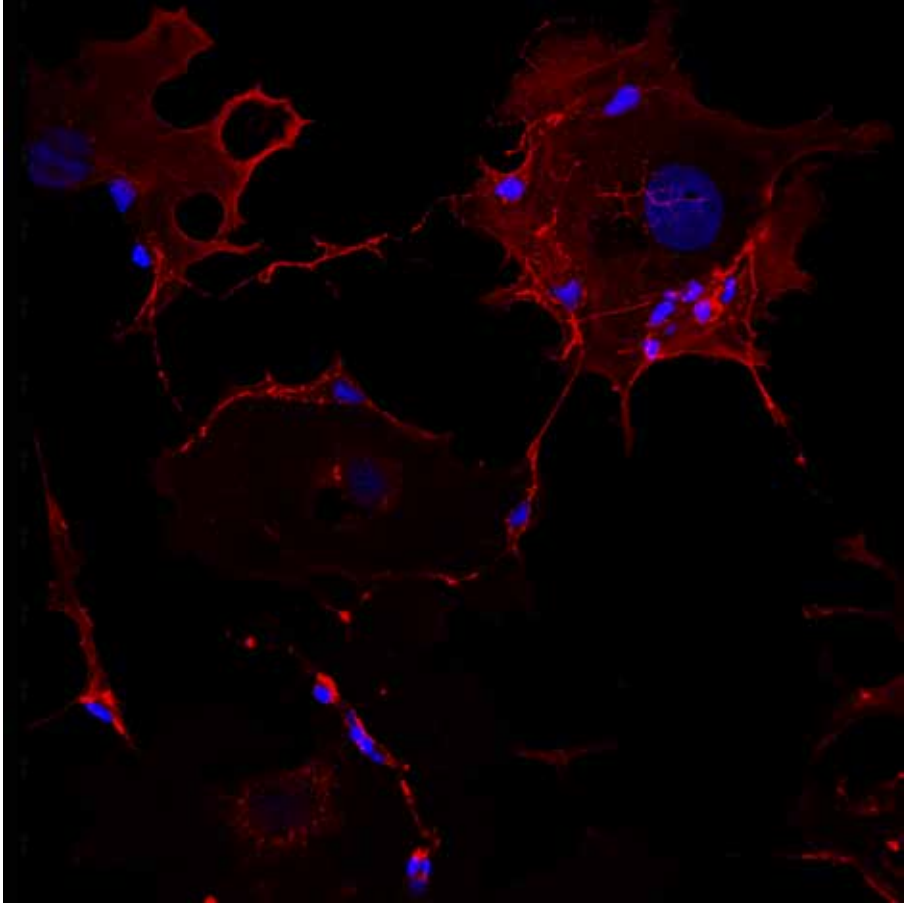
This passage suggests that IVF is prohibited because of the destruction of those embryos that are not implanted into the woman (who is made to be hormonally pregnant), and that those embryos are considered fully human beings. Killing the in vitro–generated embryos would result in abortion, which is considered sinful for Orthodox. Orthodox bioethicists John Breck and H. Tristram Englehardt have essentially accepted a Roman Catholic view on the issue, writing that human life begins at conception regardless of whether that conception occurs in vitro or in vivo.[3] Stanley Harakas has expressed a more measured perspective, commenting in some texts that because "wastage" of embryos occurs in natural conception, wastage of IVF embryos may also be acceptable.[4] This view—that eggs fertilized in vitro are embryos—is shared by some Orthodox bishops in the U.S. who provide a blessing for IVF, insofar as the couple has only one or two eggs fertilized in vitro at any given time. While this practice is more costly than the usual approach, it avoids the generation of "spare" embryos that might be discarded or mishandled.

It should be noted that Orthodox attitudes toward non-IVF issues of reproduction differ significantly from those of the Roman Catholic Church in several regards, most notably in the perspective on birth control. The Roman Church does not give a blessing for the use of birth control as a means of preventing pregnancy, because it considers non-natural actions that make procreation impossible unacceptable. The Orthodox Church does not impose such limitations provided that the method of birth control does not cause destruction of the embryo. For

[2] *The Basis of the Social Concept of the Russian Orthodox Church*, Chapter XII (Moscow: Department of External Church Relations of the Moscow Patriarchate, 2000).

[3] John Breck, *The Sacred Gift of Life: Orthodox Christianity and Bioethics* (Crestwood: SVS Press, 2010); John and Lyn Breck, *Stages on Life's Way: Orthodox Thinking on Bioethics* (Crestwood: SVS Press, 2006); H. Tristram Engelhardt, Jr., *The Foundations of Christian Bioethics* (Lisse: Swets & Zeitlinger, 2000).

[4] Stanley S. Harakas, *Health and Medicine in the Eastern Orthodox Tradition: Faith, Liturgy, and Wholeness* (New York: Crossroad, 1990); Stanley S. Harakas, *Living the Faith: The Praxis of Eastern Orthodox Ethics* (Minneapolis: Light and Life, 1993).



Embryonic pluripotent cells are able to differentiate into various cell types. In this case, NTERA-2 cells will develop into neuroectodermal cell lineages. This model system was used to study neuronal diseases such as Alzheimer's disease. Courtesy of Gayle Woloschak and Tatjana Paunesku.

example, the "morning-after pill," also called "Plan B," despite its name does not cause the destruction of an embryo but rather delays ovulation by up to seveny-two hours, and thus would be acceptable for Orthodox but not for Roman Catholic Christians. Directly transferring concepts about reproduction from the Roman Catholic Church to the Orthodox Church seems, therefore, to present some conflicts.

Lessons from Science

Obviously, no biblical commentaries or Church Fathers' writings can provide precise information on the issue of IVF. While there are texts that relate to sanctity of life, they do not consider technological issues such as the challenges of applying beginning-of-life IVF technologies. The Russian Orthodox *Social Concept* document relies upon statements by the Church Fathers and in the Canons indicating that human life begins at conception, but these statements were written at a time when eggs and sperm were unknown, and a man was considered somehow to insert a "life force" into a woman. Not to argue semantics, but it needs to be noted that scientists do not consider IVF to be conception. Conception is something that occurs in a womb, not in a test tube: it is a mother, not a scientist working with cells, who conceives a child. For a scientist, it is hard to imagine that a cluster of cells of as yet undetermined types and functions is a human being. Are the cells human? Of course, but so are the skin cells we lose each day in the shower. What is important is not whether the cells are human-derived but whether, in fact, they constitute a human being. These cells cannot grow into a human

being unless they are implanted into a woman who has been made to be hormonally pregnant. This question of the treatment of in vitro fertilized eggs as human beings is a point of inconsistency between science and Orthodoxy.

Science can contribute to this discussion by offering a better understanding of the twinning process. While identical twins share the same womb and the same genetic material, they are considered by the Church to be separate persons with their own paths to salvation, their own separate souls, their own individualities. This would no doubt be the case even for conjoined twins. From a scientific or medical perspective, there are four processes that can lead to twinning, but the upshot is that if the embryo splits within the first thirteen days, twins can result.[5] In the United Kingdom, it is illegal to grow in vitro–generated embryonic cells in culture beyond fourteen days because this time is viewed by scientists and ethicists as the demarcation point for twinning; since twins cannot develop at fourteen days or later, one can claim that the embryo at this point may now be an individual. In general, however, there have been no techniques available to keep in vitro–fertilized embryos alive in a test tube beyond the seven-day limit. Recently, investigators have managed to keep embryos alive following IVF for up to thirteen days in a culture plate, although they did not have the same structure as one would find in the womb.[6] These studies were done to try to understand the process of embryogenesis and not to create life in a test tube. The major findings of this work were the identification of the different gene regulatory programs turned on and off in each cell of the embryo. There is of course, no evidence that the process observed in the test tube is identical to what occurs in the human being, and in fact it is very likely that the culturing of the cells alone modifies events, as is known to occur in most other cells grown in culture. What is the point of all of this? If twinning can occur as late as thirteen or fourteen days into embryogenesis, then it is very difficult to claim that an embryo in the womb prior to thirteen or fourteen days is a human being, and even more difficult to claim that an embryo in the test tube prior to thirteen or fourteen days is a human being. If twinning can occur as late as thirteen days after conception, then it is not clear how the cells prior to this point can represent a full person with a soul and individual determination, when in fact the embryo could become two—or in rare cases even three or four—persons.

Many use the production of pregnancy hormones as a point of demarcation for the beginning of human life. This production does not occur in the test tube and requires the relationship of the mother and embryo. Close to the time of twinning, a structure formed within the embryo called the blastocyst starts to produce unique hormones that lead to positive pregnancy tests. Many physicians consider this point to be the start of pregnancy because it marks the first point of a unique response from the embryo to the mother's body. At this point, the embryo is producing hormones in response to interaction with the mother, and thus a relationship is being established.

Some scholars taking a view similar to that of Harakas have suggested that implantation is a good demarcation point for defining the human being. Again, this is a process that cannot occur in a test tube and requires the mother's womb. From a biological perspective, this point of demarcation also makes sense because implantation occurs between seven and twelwe days

[5] www.babymed.com/twins/twins-monozygotic-vs-dizygotic-and-monochorionic-vs-dichorionic.

[6] Alessia Deglincerti, Gist F. Croft, Lauren N. Pietila, Magdalena Zernicka-Goetz, Eric D. Siggia, and Ali H. Brivanlou, "Self-Organization of the In Vitro Attached Human Embryo," *Nature* 533 (2016): 251–254.

after fertilization, and thus falls easily into the timeframe when individuation occurs (that is, when the possibility of forming twins has ended). In addition, personhood from an Orthodox perspective requires the development of relationship, and one could argue—particularly for IVF-generated embryos, which have only the hands of scientists to manipulate them—that the relationship of mother and child is established at the point of implantation, although one could make this same case for the hormone production noted above. After that point, wastage—loss of unimplanted embryos, which makes up about 90% of all fertilizations in utero—generally no longer occurs. Thus, this approach for demarcation would place the beginning of human life well before twinning and yet still in the multi-cell stage rather than the single in vitro fertilized egg.

Let me summarize the different views:

1. Human life begins at the moment when the egg is fertilized, whether in vitro or in vivo.

2. Human life begins at the time when twinning is no longer possible in vivo (day twelwe or thirteen). This is not a point that can be considered in vitro, because twinning cannot occur in the absence of a womb.

3. Human life begins at the time when the embryonic cells begin to release hormones in response to interaction (day twelwe or thirteen). This is a practical demarcation point because pregnancy can be easily detected clinically. It also marks a point of relationship between the embryo and the mother. Again, this cannot be mimicked in vitro.

4. Human life begins at the point of implantation (day nine–twelwe). This too is a point of relationship between the mother and the embryo. It occurs after "wastage" has been eliminated (that is, after embryos that will not survive have been sloughed off from the body) and again cannot occur outside of the womb.

The first view is that expressed by the Russian Orthodox Church, the Roman Catholic Church (although the Roman Catholic Church does not support IVF, because it prohibits any process that can interfere with procreation), and many Orthodox bishops. I believe that the latter three arguments provide a basis for reconsidering the timeframe for the question of the beginning of human life.

Decisions about IVF

Finally, there is one issue related to IVF that has not been addressed in the arguments expressed above or in the Russian Orthodox *Social Concept* document, and that is the question of why should IVF be undertaken at all. When trying to discern whether a behavior is appropriate or even ethical, motivation is a major factor in the consideration. Why would a couple want to have IVF rather than adopt a child? There may be many reasons, but discernment here is essential. Motivations that involve "making sure my genes are passed on to the next generation" or egotistical ideas that "I must leave my own children in the world when I die" may not be appropriate reasons for making the IVF choice. Discernment of reasons requires interacting with a spiritual mentor who can help in the decision-making process. Too often, couples make these decisions outside the realm of the Church and do not consider it necessary or even useful to approach a spiritual mentor to aid them. Involvement of priests, bishops, and other spiritual advisors

in the process is important and useful for the family.

In today's world medical technologies are increasing the number of decision points in people's lives. In the past, questions about whether a couple should have a child when fertility was compromised were limited to the consideration of adoption. With new technology, the choices have increased—whether to have a child by in vitro fertilization, whether to have the "donor" sperm or eggs be derived from the parents or from another individual, whether to use a "surrogate mother," and more. These decisions are difficult and require insight and careful consideration. They are not merely economic or practical discussions but call for spiritual reflection, insight, and guidance. ❋

Dr. ***Gayle E. Woloschak*** is professor of radiation oncology, radiology, and cell and molecular biology at Northwestern University. She is also associate director of the Zygon Center for Religion and Science as well as an adjunct professor at the Lutheran School of Theology at Chicago, Pittsburgh Theological Seminary, and St. Vladimir's Orthodox Theological Seminary.

POETRY DESK

Pre-Post-Liturgical Nap

David O'Neal

After having spent time at the heart of all things,
I feared I might miss it, but as it turned out,
The center of the cosmos kindly followed me,
Remaining just under my feet wherever I went,
Until it was at last revealed to be located
Just under yours as well. Then
I saw a muskrat in Irkutsk on
The TV, and it turned out to be
Under his too.

David O'Neal is a book editor who lives in Boston, Massachusetts. His essays and poetry are archived on his blog, *Nonidiomatic* (http://davensati54.blogspot.com/).