

# Findings

## In Vitro Fertilization

### *Assisted Reproductive Technology Continues to Raise Questions*

By Alysse ElHage

**B**illy and Karen Rice of Winston-Salem, NC, struggled for years with infertility, undergoing various fertility treatments without success before finally turning to in vitro fertilization (IVF) as a last resort. Strong Christians who are active in their local Presbyterian church, they both desired a large family and believed that IVF was morally acceptable in their situation. “We felt it was appropriate for us in the context of the marital bond,” explains Billy, a primary care physician in the area who serves on the advisory board of the Christian Medical and Dental Associations (CMDA). “Our thought was that God has given us this technology that in our context was being used to pursue life.”

The couple underwent one IVF treatment, which resulted in a healthy pregnancy and the birth of their daughter, Hannah. But when Hannah was only five months old, the Rices—who believed they were unable to conceive naturally—were stunned to learn that Karen was pregnant with triplets! Nine months after giving birth to three healthy girls, Karen became pregnant again with another girl. The couple who once feared they would never have children of their own suddenly found themselves raising five beautiful little girls, all under age three. But they were also faced with an unexpected decision—what to do with the 10 embryos left over from their IVF treatment?<sup>1</sup>

The Rice family’s quandary highlights one of the many ethical issues spawned by the rapidly advancing and complex world of assisted reproductive technology (ART). As the most common ART procedure, IVF is credited with over 400,000 births in the United States alone since

the first “test tube” baby was born here in 1981.<sup>2</sup> Today, IVF is part of a booming and mostly unregulated \$4 billion industry in the U.S. that performs hundreds of thousands of procedures a year for one in six infertile couples.<sup>3</sup>

While IVF has given thousands of infertile married couples the opportunity to have children of their own, it is increasingly being used by single women and homosexuals who desire biological children, and by some clinics to screen embryos for genetic defects and other traits prior to implantation. IVF has also been linked to an increase in multiple births in the U.S.,

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and has resulted in nearly a half million “leftover” human embryos frozen in fertility clinics across the nation, awaiting an uncertain fate.

#### **What Is In Vitro Fertilization?**

IVF is defined by the American Society of Reproductive Medicine (ASRM) as “a method of assisted reproduction in which a man’s sperm and a woman’s eggs are combined outside of the body in a laboratory dish. If fertilization occurs, the resulting embryos are transferred to the woman’s uterus, where one or more may implant in the uterine lining and develop.”<sup>4</sup> While IVF may sound pretty straightforward, it involves a complex set of medical procedures, which are conducted over the course of several weeks. The basic steps of IVF are:

**Ovarian Stimulation**—Fertility drugs, such as “Clomid,” are used to stimulate the woman’s ovaries to produce multiple eggs (in a natural fertile cycle, a woman typically produces one egg). IVF requires the retrieval of multiple eggs because some of the eggs will not fertilize once they are retrieved. The ASRM explains: “Pregnancy rates are higher when more than one egg is fertilized and transferred to the uterus during an IVF treatment cycle.”<sup>5</sup>

**Egg Retrieval**—This is typically a minor surgical procedure involving the retrieval of eggs from the woman. After the eggs are retrieved, the healthiest ones are selected for use.<sup>6</sup>

**Insemination**—The sperm is obtained from the male through either ejaculation or a special condom that can be used during intercourse. According to the ASRM, “motile sperm are then placed with the eggs in a process called insemination, and stored in an incubator.” At this point, fertilization is not certain. A relatively new IVF procedure called intracytoplasmic sperm injection (ICSI) can increase the rates of fertilization by injecting a single sperm directly into the egg. ICSI is used in about 40 percent of all ART cycles.<sup>7</sup>

**Embryo Culture**—If fertilization occurs, doctors examine the resulting embryos for viability, and the healthiest embryos are selected for transfer into the woman. Some fertility clinics use a method of embryo analysis known as preimplantation genetic diagnosis (PGD), where cells are extracted from an embryo and tested for genetic diseases and traits. PGD, which will be discussed in detail later, can also help ascertain the sex of the embryo.<sup>8</sup>

**Embryo Transfer**—The final step involves the transfer of one or more embryos into the woman’s uterus through the cervix in the hopes that it will implant. Be-

cause implantation is not certain, fertility doctors often produce more embryos than a couple can use in one transfer cycle, and may transfer more than one embryo during the procedure, depending on the woman's age and other factors.<sup>9</sup>

**Success Rates:** Although Billy and Karen Rice achieved a successful pregnancy and birth from their first and only IVF cycle, most couples undergo several rounds of IVF with no assurance of success. According to the ASRM, the risk of miscarriage with IVF is between 15 and 35 percent, depending on the woman's age.<sup>10</sup> The probability of delivering a live baby per IVF cycle also varies by age, and is as high as 35 percent for women under 35 and as low as six to 10 percent for women over 40.<sup>11</sup>

**Cost:** On average, IVF costs about \$12,400 per cycle. Because many couples must go through more than one cycle to get pregnant, IVF can be extremely expensive. Insurance coverage for IVF varies by company, and many couples must pay for it themselves.<sup>12</sup> Only 15 states currently require insurance companies to either offer or cover infertility treatments. North Carolina does not require insurance companies to pay for infertility treatments, although some companies do offer coverage.<sup>13</sup>

## Ethical Questions

Understanding the process of IVF is important because the procedure raises a number of troubling ethical questions including: its potential as a form of eugenics (the study of hereditary improvement of the human race by controlled selective breeding<sup>14</sup>); its use to help unmarried individuals have babies; and the number of excess embryos produced through IVF, and their fate.

**Genetic Selection.** One of the longstanding criticisms of IVF involves its eugenics potential. In 1987, the Catholic Church issued an official statement against IVF and related procedures. In it, the Vatican warned: "the abortion mentality which has made this procedure possible thus leads, whether one wants it or not, to man's dominion over the life and death of his fellow human beings and can lead to a system of radical eugenics."<sup>15</sup>

As discussed earlier, a relatively new IVF procedure known as preimplantation genetic diagnosis (PGD) allows fertility doctors to screen embryos prior to transfer for certain genetic or chromosomal traits. PGD is currently used in an estimated 50 clinics worldwide, mainly in the United States. Among its uses so far: screening

for chromosomal disorders and disease; selecting embryos that would make compatible tissue donors for siblings; and elective sex selection.<sup>16</sup> Because of its potential to determine the sex of embryos, PGD is popular among both fertile and infertile couples. According to a 2004 report by the President's Council on Bioethics, at least one-third of patients using PGD are fertile.<sup>17</sup>

A 2004 *Newsweek* article detailed the story of a mother of three boys who wanted a girl and was willing to pay over \$18,000 for PGD in order to have one. The woman, who had her tubes tied after her third son was born, and her husband underwent a typical IVF procedure overseen by IVF pioneer Dr. Jeffrey Steinberg at his clinic in California. It resulted in 14 healthy embryos (seven male and seven

## Christians on IVF:

Since in vitro fertilization (IVF) began, the most consistent opposition to it and related ART procedures has come from the Catholic Church, which to this day opposes IVF on the grounds that it is morally wrong to create human life outside of the marital sex act. In 1987, the Vatican issued an official statement opposing all forms of IVF and artificial insemination, even for married couples.<sup>1</sup> Rev. Tadeusz Pacholczyk, Ph.D. of the National Catholic Center for Bioethics, wrote in 2005 that IVF "strikes at the very core and meaning of marital sexuality. It substitutes an act of laboratory manipulation for an act of bodily union between spouses. It turns procreation into production. IVF is really the flip-side to contraception; rather than trying to have sex without babies, we try to have babies without sex."<sup>2</sup>

Protestants vary in their beliefs on IVF, and unlike the Catholic Church, there is not one set of ethical guidelines for Protestant couples to follow regarding its use. Those who support IVF limit its use to married couples. For example, the Christian Medical and Dental Associations (CMDA), an organization that consists of over 17,000 Christian medical professionals from a variety of denominational backgrounds, asserts that IVF is "morally justified when such a pregnancy takes place in the context of the marital bond."<sup>3</sup>

Dr. James Dobson of Focus on the Family also supports IVF for married couples, and states in the question and answer section of his web site: "in vitro fertilization is less problematic when the donors are husband and wife—if all the embryos are inserted into the uterus (i.e., no embryos are wasted or disposed of after fertilization and no selection process by doctors or parents occurs). As the woman's body then accepts one or more embryos and rejects the others, the process is left in God's hands. This seems to violate no moral principles."<sup>4</sup>

Albert Mohler, Ph.D., president of Southern Baptist Theological Seminary, the "flagship school" of the Southern Baptist Convention, wrote in a 2006 column: "Christian couples must not embrace the new reproductive technologies without clear biblical and theological reflection. At a bare minimum, Christian couples must commit to the implantation of all embryos, and the selective reduction of none. But this does not alter the fundamentally artificial character of the technology or the moral status of the embryos, and thus IVF presents grave moral issues to the Christian conscience."<sup>5</sup>

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- 3 *Christian Medical and Dental Association (CMDA), Position Statement on In Vitro Fertilization, Approved May 13, 1983.*
- 4 *Focus on the Family, "What are your views on in vitro fertilization and embryo adoption (donation)?" Ask a Question, www.family.org, Accessed 11/30/07.*
- 5 Mohler, Albert, Ph.D., "Christian Morality and Test Tube Babies, Part II," *Commentary, 5/12/06, Available at: www.albertmohler.com.*

female), and Dr. Steinberg transferred three of the female embryos into the woman, who became pregnant with twin girls as a result.<sup>18</sup>

In its 2004 report on ART in America, the President's Council on Bioethics distinguished between PGD and other current screening technologies, such as amniocentesis, by noting that "What is novel about PGD, though, is that it can be used to select 'for' desirable traits, not just 'against' markers for disease." The Council raised concerns about the unregulated nature of the procedure, and warned against using PGD for non-medical purposes, such as sex selection.<sup>19</sup>

**Alternative Families.** The technological ability to make babies without sexual intercourse through procedures like IVF has opened the door for single women to have babies and for individuals in homosexual relationships to have biological children (through donor eggs and donor sperm and surrogacy). The majority of fertility clinics in the U.S.—89 percent—offer their services to single women, including most fertility centers in North Carolina.<sup>20</sup> While some countries, through law or custom, allow only heterosexual couples who are married or in stable relationships to utilize ART procedures, the U.S. has no such restrictions in place.<sup>21</sup> In 2006, the ASRM Ethics Committee concluded that there is "no sound, ethical basis for licensed professionals to deny reproductive services to unmarried or homosexual persons."<sup>22</sup>

In addition to single women, a growing number of homosexual couples are taking advantage of IVF and other fertility procedures. The 1999 PBS Frontline report, "Making Babies," featured the story of a lesbian couple in California—Susan Vaughan and Deb Wasser—who used a sperm donor to conceive a child through IVF. In a complicated process, Deb's eggs were removed and fertilized with donor sperm, which the women had selected through a sperm bank, and the resulting embryo was transferred into Susan's womb. "Deb actually has to adopt the baby, even though it's her egg," Susan, who became pregnant with a girl as a result of IVF, told Frontline. "So it's sort of really messing around with, you know, how things usually work."<sup>23</sup>

**IVF and Multiple Embryos.** One of the most troubling ethical dilemmas related to IVF is the production of multiple embryos. A typical IVF treatment involves the retrieval and fertilization of multiple eggs in an effort to increase the patient's

chances of becoming pregnant. This not only saves time for the patients but also money, since IVF often takes several attempts. The production of multiple embryos through IVF has resulted in two problems—an increase in multiple pregnancies and births, and a growing surplus of human embryos that are currently warehoused in fertility center freezers nationwide.

**Multiple Births.** Because the ultimate goal of IVF is a successful pregnancy, fertility doctors sometimes transfer multiple embryos at a time, especially in older women. The problem is that transferring multiple embryos can lead to pregnancies with three or more babies (multiples). According to the March of Dimes, more than one out of three ART births are multiples.<sup>24</sup>

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Multiple pregnancies are a concern because they carry high risks for both the mother and the infants. Risks to mothers include: anemia, excessive blood pressure and preeclampsia. The rate of premature birth is also higher in multiple pregnancies, and babies born prematurely have a higher rate of respiratory problems, brain damage, cerebral palsy, developmental problems and death.<sup>25</sup>

To lower the risks associated with multiple pregnancies, some fertility clinics offer parents the option of "fetal reduction" at 10 to 12 weeks or earlier in the pregnancy. This procedure involves the abortion of the weakest unborn baby (determined by the doctor based on size, position and viability).<sup>26</sup> In a procedure called multifetal pregnancy reduction—which is typically performed at 10 to 12 weeks but has been performed as late as 24 weeks—a needle is inserted through the mother's abdomen or vagina, and then a lethal dose of a drug, such as potassium chloride, is injected into the unborn baby's heart. According to the ASRM, the risk of miscarriage (of the remaining fetuses) with fetal reduction is between four and five percent.<sup>27</sup>

A number of countries, such as Great Britain and Germany, limit the number of embryos transferred per cycle through

law, but the U.S. does not have any laws regulating embryo transfer, so the decision is left up to the fertility industry.<sup>28</sup> In response to concerns over multiple births, the ASRM issued voluntary guidelines in 1999 for its member fertility clinics and patients regarding the number of embryos to transfer at one time. Although the guidelines recommend the transfer of a limited number of embryos for healthy women according to age (such as no more than one for healthy women under 35), they leave the door open for more embryos to be used when deemed necessary by fertility specialists.<sup>29</sup>

**Frozen Embryos.** The production of multiple embryos through IVF has also resulted in hundreds of thousands of unused embryos, and a national debate over what to do with them. Many IVF embryos are frozen in a process called cryopreservation, where they can survive for several years.<sup>30</sup> A 2003 survey of fertility clinics found that 400,000 human embryos have been frozen and stored at IVF clinics in the U.S. since the 1970s.<sup>31</sup> These embryos face an uncertain fate that ultimately is decided by the patients who created them. IVF patients who complete their families and do not plan to use the embryos must decide whether to discard the extra embryos, donate them to research where they will be destroyed, or donate them to other infertile couples for adoption.

According to the ASRM, at least one country—Italy—has laws that regulate the production of embryos and what happens to them. Under Italian law, which has been tightened in the past few years, fertility clinics are not allowed to fertilize more eggs than will be used in one IVF cycle, and cryopreservation and donation of embryos are no longer allowed. As discussed, the U.S. has no laws regulating ART.<sup>32</sup>

The use of human embryos for research purposes gained national attention in 2001, when President George W. Bush banned federal funding for embryonic stem cell research, except for about 60 stem cell lines already in existence. Embryonic stem cell research involves the destruction of human embryos and the harvesting of their stem cells, which some scientists believe could lead to cures for a number of diseases.<sup>33</sup> Most IVF patients do not donate their leftover embryos for research but freeze them for future family building. According to a RAND survey of fertility clinics, only about 11,000 of the human embryos in storage at fertility clinics had been designated for research by IVF patients in 2003.<sup>34</sup>

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## Choosing Life

Billy and Karen Rice waited for about a year after the birth of their fifth daughter, Sarah, before they could consider what to do with their remaining 10 embryos. “Then we started thinking and praying a lot,” Billy says. “We were forced to consider larger issues of life that we had never discussed previously.”

“For us, we had only two options—use the embryos ourselves by transferring them into Karen’s uterus, or allow them to be adopted through an embryo adoption agency,” says Billy. “But we felt it would be hard for us personally to have a biological child grow up somewhere else.”

Donating the embryos to research was not an option they considered. “It would have been wrong for us to decide that these 10 embryos did not deserve a chance at life,” says Billy. “That was clearly for God to decide.”

So in 2002 and 2003, Karen went through three separate embryo transfer procedures. She admits they were nervous about the possibility of having more children, and possibly even another multiple pregnancy. “We called it fear and trepidation,” she says, adding that they were open to whatever plans God had for their family. But none of the embryos implanted. “When they called to tell us we were not pregnant,” Karen says. “We did not know how to feel.”

Billy looks at the issue of frozen embryos from several different angles. “As a doctor, I would love nothing more than to be able to have a cure to offer patients who are suffering from various diseases, but we believe God made these embryos,” he explains. “For us, we did not feel like we could choose not to give these extra embryos a chance to implant. We wanted to leave it in God’s hands and leave ourselves wide open to whatever He had planned for us.”<sup>35</sup>

## Embryo Adoption

The Rices took a huge leap of faith in their decision to use their extra embryos themselves, despite the large size of their family. But most IVF patients with leftover embryos are either unable or unwilling to make a similar choice. Another life-affirming alternative that has been promoted in recent years is for IVF patients to donate their leftover embryos to other infertile couples through embryo adoption.

Nathaniel and Rachel Sullivan—native North Carolinians who now live in Nashville, Tennessee—are raising a

toddler whom they adopted as an embryo. The Sullivans married later in life than most couples—he was 41, and she was 35. When they experienced a miscarriage after struggling for several months to get pregnant, they solicited the help of fertility specialists, and through the use of fertility drugs, they were able to conceive their eldest daughter, Erin.

After Erin’s birth, the couple tried again to get pregnant by using fertility drugs without success. At this point, their fertility doctor probably would have suggested IVF. But the couple had discussed this option early on and decided against it. As Christians, they were concerned about the high number of extra embryos that would likely be created, as well as the financial cost of the procedure.

“We had already determined we would not freeze any embryos,” explains Nathaniel. “We did not want to create human lives that would potentially be destroyed.”

He had heard about embryo adoption on a radio program produced by Focus on the Family. When he learned that the fertility center where they were patients had an embryo donation/recipient program, he knew it was the right choice for their family.

“I was thrilled with the prospect of providing a home for a baby who otherwise might not even have a chance to grow and develop,” he says.

The Sullivans were given anonymous profiles of various IVF patients who had donated their leftover embryos to the fertility center for the purpose of adoption, and they picked the donor couple based on characteristics they felt would help the baby feel as much a part of their family as possible, such as eye color, hair color, and height. They ended up adopting three frozen embryos that were leftover from one couple’s IVF treatment.

The next step was for Rachel to undergo an embryo transfer procedure, where the frozen donor embryos are thawed and the surviving embryos are transferred into her uterus. According to the National Embryo Donation Center, only about two-thirds of frozen human embryos survive the thawing-out process.<sup>36</sup> The rate of pregnancy resulting from the transfer of frozen embryos is between 20 and 25 percent.<sup>37</sup>

In February 2005, Rachel, who was 42 years old at the time, underwent an embryo transfer procedure. Aware that a multiple pregnancy could result if more than one embryo was transferred, they initially were only going to have two

embryos transferred. But all three embryos survived the thawing process, leaving the couple with an ethical dilemma. “We felt a responsibility to give every one of these embryos a chance to live,” Nathaniel says.

All three embryos were released into Rachel, and one embryo implanted. In October 2005, Rachel gave birth to a healthy baby girl, whom the couple named Anna.

Today, Anna is a happy, active toddler with chubby cheeks and golden-brown curly hair who is as much a part of the Sullivan family as her older sister, Erin. “Anna’s ours, and that is how we feel. But we want her to know, eventually and in an age-appropriate way, how she came to be ours,” says Nathaniel. “We plan to tell her that her parents loved her very much because they were willing to give her a chance at life.”

Rachel tells Erin, their eldest daughter, “Anna came from a seed outside Mommy’s womb, and you came from a seed inside Mommy’s womb, and both of you are special.”

The Sullivans view embryo donation/adoption as a mission field for Christians and as an ethical solution to infertility. “Embryo adoption is one potential way for Christian couples to become parents who can’t have babies on their own,” says Nathaniel. “There are a lot of embryos out there, frozen in vaults, just waiting for husbands and wives to adopt them. Embryo adoption/donation provides a life-affirming answer to some of the tough questions raised by IVF.”<sup>38</sup>

## A Necessary Debate

There is no question that assisted reproductive technologies such as IVF have helped thousands of infertile married couples have children when they might not otherwise have had the chance. These children, 400,000 and counting, are nothing short of gifts from God. But like any technology, ART can be used for good or for bad. IVF is increasingly employed in ways that go beyond helping married couples procreate, ranging from producing “designer” babies to making babies for single women and homosexuals. In addition, IVF has resulted in a growing excess of frozen human embryos, most of whom will never be given the opportunity to implant and develop, and will die as a result. Although various life-affirming alternatives to destroying these embryos are being employed by some couples, the ethical debate over IVF and where to draw the line in our efforts to have children needs to continue. As Robert P. George,

the McCormick Professor of Jurisprudence at Princeton University, stated on the PBS documentary, *Test Tube Babies*, "We cannot simply lay aside the debate over in vitro fertilization . . . Questions of human dignity and questions of human health are implicated. Those questions have not been answered, and we need to answer them."<sup>39</sup>

*Alysse ElHage is a senior research associate with the North Carolina Family Policy Council.*

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## Endnotes

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