



Assisted Reproductive Technology and Natural Law: How Seven Years as an Embryologist Revealed IVF's Disordered Approach to Patient Care

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Abstract

This article is a case study illuminating the experience of a cradle Catholic who pursued a career in the field of Assisted Reproductive Technology (ART) as a laboratory director and embryologist. Twenty years after leaving the field, the observations leading to the crisis of conscience are further amplified by the reports of social, legal, ethical, and medical consequences of the technology. These consequences are explored in detail and can serve as a mini-review of the published scientific literature describing the obstetrical complications, peri-natal outcomes, and the long-term health effects on the offspring. This paper provides the documented evidence that can be used by the religious and medical community for shepherding the flock. The disordered approach to patient care is evidenced by five serious consequences resulting from the use of the technology. These include multiple pregnancy and selective reduction, abandoned and discarded embryos, adverse health effects to the women and children, legal and ethical problems, and human experimentation. An explanation for the adverse consequences can be found by exploring and applying the principles of Natural Law. Natural Law, as embraced by the Catholic Church, can be used as a starting point for conversion of heart for many who struggle with the immorality of ART. Deterring use of the technology coupled with increased motivation by scientist and health professionals to pursue restorative approaches within a moral framework offer our best solution to the treatment of infertility. Natural Law and the consequences of violating it provide evidence that science and medicine should not be practiced in a vacuum void of ethical and moral boundaries grounded in divine Wisdom.

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I can remember sitting at the microscope as I prepared to start an intracytoplasmic sperm injection (ICSI) procedure for another hopeful couple seeking care at our clinic. As I studied the sperm, I was concerned by their appearance and unsure which to select for the injection. While the oocytes were normal by all appearances, the husband had a severe case of what we call *male factor*: He had sperm present, but none of them had any motility and 100 percent of them had abnormal morphology. I decided to choose the sperm that bore the closest resemblance to normal sperm, according to visual inspection. In most cases, we aggressively bent the tail of a motile sperm, rendering it immobile and presumably activating the membrane before injecting it. I decided to mimic that procedure even though each sperm I picked seemed lifeless. I could not help but think that my efforts were futile. One might imagine my surprise when, the next morning, we had what appeared to be normal fertilization. The embryos even proceeded to divide, although the degree of cell fragmentation also told my trained eye that these embryos would not likely result in pregnancy. I remember feeling sorry for the couple.

I talked briefly with the husband following the embryo transfer procedure. He was Catholic and carried a copy of a saint card; he said he trusted this patron would intercede for the couple's conception. Needless to say, his faith was greater than mine. To my amazement, several weeks after the embryo transfer, clinical pregnancy was documented by ultrasound, and the patient's care was transferred to their obstetrician. After that, I lost touch with the couple and I never knew if their child made it to term. I had a strong suspicion that if the child made it to term, there would have to be an abnormality.

During my seven years as an embryologist, directing an Assisted Reproductive Technology

(ART) laboratory, there were many examples of miracles, but there were also many instances of suffering. At first, I did not recognize any disorder in our approach to treating infertility. I accepted the dangers of IVF treatment—its potential for physical and emotional harm, not to mention its financial toll—as part of the consequences of infertility, a manifestation of disease so devastating it prompted couples to seek a “cure” at any cost. Later, I began to connect some of these consequences with the couple's prior behavior, postponing childbearing until it was “convenient” or previously living promiscuously, leading to subclinical chlamydial infections and subsequent blocked tubes. In other words, for many couples, IVF seemed like their only option, but, for others, it was because their prior choices had inadvertently caused infertility. It took me even longer to recognize that the IVF treatment approach itself was disordered, that I actively participated in medical procedures that sometimes led to further harm.

This paper will explore my personal experiences in the field of ART and draw on multiple studies to reveal the ways in which practices in the field result in questionable outcomes, essentially violating natural law. While this paper will not provide an exhaustive review of the literature surrounding those questionable outcomes, it will utilize scientific data to prove the disordered approach of the technology, a disorder that ultimately prompted me to leave the field. I will describe how the negative consequences of the technology eventually appealed to my scientific reasoning and subsequently drew me to Church teaching. This personal experience, substantiated by the literature cited here, may help influence other IVF practitioners, even those who are not Catholic. In the latter section of this paper, Dr. Mary Anne Urlakis will further expand on the ways in which ART violates natural law.

Though my wife and I were blessed with three children, I have witnessed firsthand the deep suffering of couples experiencing infertility. I believe that most IVF practitioners *want* to hold fast to the oath of “do no harm.” Like myself, they genuinely desire to help. There were many patients who touched my life, and I can recall how painful my desire for their success was. But, as I will describe, our disordered approach often directly contradicted that Hippocratic Oath.

It goes without saying that the basic desire of couples seeking IVF—the desire to conceive and bear a child of their own—is a good, even holy aspiration (Catholic Church 1995a, 1652). But for these couples, ART is like a sadistic rollercoaster ride: For some, the treatment ends in joy but, for others, it ends in devastation.¹ Permit me to demonstrate this dichotomy with an illustration detailing the experiences of one couple that went through our program.

This couple was in their early 30s with unexplained infertility. They went through a total of four IVF attempts in our program.

First attempt: The couple is excited as we begin. They feel empowered and optimistic because they are taking an active approach to solving their infertility. But then each step generates either a high or a low, depending on the outcome. For example:

High: Number of follicles and eggs are good at retrieval.

Higher: The appearance of the eggs and sperm at insemination are good. By all indications, things are progressing successfully.

Deep plunge: The following morning we document complete fertilization failure, and the couple is informed that the procedure is over, the outcome is final.

Second attempt: The couple is hopeful as we begin this next attempt because we use ICSI instead of insemination.

High: They achieve fertilization.

Low: Over the next two days, embryo quality and development are documented as poor, and the couple is informed with a

picture of their less than attractive embryos, containing much fragmentation.

High: Despite their appearance, a total of five embryos are available for transfer and all are successfully transferred to the woman’s uterus.

Higher: Two weeks after the procedure, they achieve a positive HCG pregnancy test.

Deep plunge: When they come for an ultrasound, there is not a viable implantation and the embryos resorbed.

Third attempt: Although less enthusiastic, the couple agrees to try ICSI again.

Deep plunge: The couple experiences the exact same outcome as in the second attempt.

Fourth attempt: Following this, they are advised that some unknown male factor is leading to poor embryo development and that donor insemination is recommended. After taking some time to contemplate this, they decide to use donor sperm. But they also do not want to give up on the chance that the husband could father the child and they request that we fertilize half of the eggs with donor sperm and the other half with the husband’s sperm. They inform us this will be their last try.

High: Two embryos from each father are transferred and one pregnancy is achieved. It goes to term. Without genetic testing, they will not know who the biological father is. They decide that it is best for them not to know (the possible implications of this will be discussed later).

This example demonstrates how the couple, over a period of two or more years, experiences a rollercoaster of emotions. They end up having a baby, which is wonderful. The trauma it took to achieve this gift and the fact that the child is of unknown genetic heritage is minimized and our team is happy for them. But even at the time, a part of me wondered if this was really what was best for this family.

All couples in ART experience this rollercoaster ride to a lesser or greater extent.

Some experience more sorrow, such as ectopic pregnancy or the need for a D&C to remove the non-viable implantation. Relationships are strained and savings are depleted. At times, the health of the woman is put in jeopardy by conditions such as hyperstimulation syndrome or a multiple pregnancy. Nothing is ever as heartbreaking as the couple's decision to undergo selective reduction. While success rates have improved, at the time I was involved, only about one in four achieved the birth of a child. Today, while it is highly age-dependent, success averages about one in every three attempts.

Each year when I attended the annual American Society of Reproductive Medicine (ASRM) meetings, more and more aggressive use of technology was promoted to "overcome" infertility or improve the procedure. What I did not know at the time was that the observations and questions I had would eventually compel me to leave a career in which I had invested 15 years, including seven years of graduate school and two years of postdoctoral training. Before I describe the final crisis that prompted me to leave, let me offer a behind the scenes look at ART and the medical culture that led to increasing personal and spiritual conflict.

The Five Most Undesirable Consequences of ART's Disordered Approach

1. Multiple Pregnancies and Selective Reduction.

During the time I was active in the field (1993–2000), it was common for us to transfer three to five embryos; frequently, this would result in more than two implantations. Women with twins would usually be considered acceptable, but having three or more implantations would typically lead to a recommendation of selective reduction. Multiples put the health of both the mother and the children at risk and they create enormous medical costs. Of course, injecting one or more fetuses with potassium chloride is choosing to sacrifice them to certain death while mitigating

that risk to the others, but it does not entirely eliminate the possibility of further miscarriages. Many NICU's developed in hospitals associated with IVF programs because of the high incidence of multiple pregnancies. If a hospital system had a big IVF program, an NICU would also be necessary to manage the commensurate preterm deliveries. Between 1980 and 1995, the number of NICU beds increased by 138 percent and the number of neonatologists by 268 percent, whereas the number of hospitals grew by only 99 percent (Howell et al. 2002, 121). In contrast, Howell et al. (2002, 120, Table 2) further state that the number of births increased by 17.6 percent but the number of births with infants <1500 g increased by 38 percent. According to Waitzman, Jalali and Grosse (2021, 3), the total cost of a premature birth is \$64,815 per preterm birth, indexed to 2016.

It is important to point out, however, that in 2019 the IVF industry had effectively reduced the number of multiples because 94 percent of the IVF births in that year were singletons and almost all the remaining births were twins ("National Summary Report" n.d.). What we do not know, however, because it is not reported, is how many pregnancies resulted in singleton births because of selective reduction.

2. Abandoned and discarded embryos.

Most patients decide to have all the oocytes collected during an IVF procedure inseminated, allowing the couple to have the maximum number of embryos to select from for transfer. After the best embryos are transferred, the remaining embryos are typically frozen. Occasionally, some patients decide to discard the "spare" embryos. Based on data reported by the Society for Assisted Reproductive Technology ("National Summary Report" n.d.) for 2019, there were a total of 298,689 cycles initiated and 56,067 of those cycles used previously frozen embryos. This means that there were 242,622 newly stimulated cycles. If one uses the median number of eggs per retrieval of 9 (Sunkara et al. 2011, 9), it would indicate that an annual estimate of 2,183,598 embryos per year are created in the

United States. From these 2,183,598 embryos, there are about 55,000 babies born per year (Dusenbery 2020), leaving over 2 million embryos per year that are either placed in cryostorage, used for research, or discarded in medical waste. Between 48 and 85 percent of the embryos are cryopreserved (“National Summary Report” n.d.), but, eventually, many of the frozen embryos are abandoned. They are either left in suspended animation indefinitely, discarded, or used for research (Simopoulou et al. 2019, 2448). This abandonment is a prime example of the immoral approach of ART resulting in additional problems with no morally licit solution.

There are a few organizations trying to address this dilemma. Snowflakes, a division of Nightlight® Christian adoption services, facilitate embryo adoption. However, there has not been an official ruling on the issue by the Catholic Church, and most of the discussions by theologians and ethicists have not been supportive (Pacholczyk 2009). The theological discussion regarding embryo adoption is a complicated one and beyond the scope of this text.

The ASRM supports embryo adoption and their ethics committee has published guidance for the use of compassionate transfer (“Compassionate Transfer: Patients Requests for Embryo Transfer for Nonreproductive Purposes” 2020, 62). This is the transfer of embryos during a time that is highly unlikely to result in pregnancy. Another moral conundrum, the guidance basically asserts that it is ethically permissible for IVF programs to accept or reject this patient option. This guidance, however, violates the ethical principle of subsidiarity because it allows programs to take the decision away from the parents. For the parents, knowingly transferring embryos without the chance of survival would not be morally licit either.

Another organization, Sacred Heart Guardians and Shelter (“Home – Sacred Heart Guardians and Shelter” n.d.), is a non-profit organization that provides burial services for embryo remains when they die in the lab. Since many embryos do not survive

the freezing and thawing process, this at least provides dignity for the embryos as human persons. As a past provider of IVF services and member of the board of Sacred Heart Guardians and Shelter, I can testify that just the thought of offering burial service for embryos is a powerful witness to other providers who no longer perceive a connection between embryonic life and humanity.

3. Risk to the health of Mother and Child.

I believe the potential harm to the mother and child embodies the most significant argument against ART and forms a solid basis for the premise that ART is a disordered approach that creates more problems while trying to solve one. The goal in this paper is not to present an exhaustive scientific review, but to provide adequate evidence to substantiate the disordered nature of ART. It is essential that health professionals and the religious who shepherd the flock be armed with information on the potential dangers of ART because these consequences are often not covered adequately in educational institutions.

To remain credible, it is just as important to know the limitations in the data as it is to know that there is data supportive to this argument. There is in fact a large body of evidence citing deleterious effects, but the data is complicated by confounding variables, such as the effect of multiple pregnancy and the fact that infertility is often a phenotypic expression of other health issues. Pregnancy complications, as well as genetic and epigenetic effects to the children resulting from conception through artificial means, have the potential to impact almost every specialty in medicine, particularly because of the growing number of offspring conceived this way. In fact, the question “Were you conceived through ART?” should probably be a question on patient intake forms because of the unique health challenges these patients may present and the volume of patients who will soon be reaching childbearing age and older.

First, I will discuss the reports about the health of the woman. An excellent review of this topic can be found in Sullivan-Pyke

et al. (2017). An important design in any of these studies is to control for the confounding effect of multiple pregnancies on these outcomes. They must look at singleton IVF pregnancies to rule out this obvious confounder. Nevertheless, all of the data also reinforces the need for diagnosing and treating underlying causes of infertility as opposed to using technology to enable pregnancy without first restoring health.

Gestational hypertension: Pandey et al. (2012, 495) published a 15 study meta-analysis, with over 12,000 singleton IVF pregnancies and reported a relative risk of 1.49. A retrospective cohort study later published by Zhu et al. (2016, 3, Table 2) compared 2641 IVF to 5282 unassisted singleton pregnancies and reported an adjusted odds ratio of 1.99 ($p < .001$). These studies demonstrate a 50–100 percent higher incidence of gestational hypertension with large sample populations and statistical significance while also controlling for multiple pregnancy. Future studies, however, need to be controlled for maternal comorbidities such as PCOS or other causes of infertility.

Pre-eclampsia: The same study as above (Zhu et al. 2016, 3, Table 2) reported a relative risk of 1.71, but it did not reach significance ($p < .21$). Watanabe et al. (2014, 5, Table 3) compared 474 IVF versus 2,610 spontaneous pregnancies and found an incidence of more than 2x in the IVF group (odds ratio 2.72, $p = .002$). But when the data were adjusted for parental factors or propensity score matched, it was no longer significant (*adjusted* odds ratio 2.32, $p = .031$, *propensity score matched* odds ratio 2.50, $p = .273$). Clearly other health issues are playing a part in the cause of pre-eclampsia, making it hard to make conclusions about IVF being the cause of an increased incidence of pre-eclampsia.

Gestational diabetes: Studies by Zhu et al. (2016, 3, Table 2) and Pandey et al. (2012, 498) both demonstrated increases in the incidence of gestational diabetes (odds ratio 2.23 and relative risk 1.48, respectively) in IVF singleton pregnancies. Furthermore, there is still evidence that IVF pregnancies are at higher

risk even after controlling for other health variables. A study published by Ashrafi et al. (2014, 150–151) compared 215 naturally conceived pregnancies to a combination of 95 IVF and 50 IUI (145 total) conceived pregnancies. They also excluded some conditions that were identified that could act as confounders such as PCOS, women over 39 years old, and any history of diabetes in the patient or first-degree relative. The women who conceived through IVF had a 43 percent higher incidence of gestational diabetes compared to naturally conceived pregnancies.

In a large prospective cohort study published by Qin et al. (2017, 603), researchers looked at adverse obstetrical outcomes in pregnancies naturally achieved in fertile women, sub-fertile women, and women who conceived through IVF. They found that gestational diabetes was higher in the IVF group compared to both the fertile (adjusted odds ratio 2.36) and the sub-fertile groups (adjusted odds ratio 1.40). This indicates that the diagnosis of infertility puts the women at a higher risk of gestational diabetes but that using IVF to achieve pregnancy further increases this risk.

Pre-term delivery: The work of Pandey et al. (2012, 498), cited previously, evaluated over 27,000 IVF pregnancies and looked at preterm deliveries. Their data set revealed a relative risk of 1.54 for women who conceived through IVF. A more recent study by Qin et al. (2017, 603) showed an increased incidence of pre-term delivery in a group of women in China who had conceived by IVF (odds ratio 2.19). Their study compared obstetrical outcomes between pregnancies from 2480 fertile women and 1899 sub-fertile women, conceiving spontaneously, and 1260 women conceiving through IVF.

When Sullivan-Pyke et al. (2017, 4) reviewed evidence of increased risk of preterm (<37 weeks) delivery, they cited another study by Marino et al. (2014) out of Australia, causing them to propose that there may be a difference in outcome between “fresh” (embryos transferred without being cryopreserved) and “frozen-thawed” (embryos

that are transferred after being cryopreserved) IVF pregnancies. The frozen embryo transfers differ because they are not immediately following the ovarian stimulation procedure while the woman is experiencing supraphysiologic levels of hormones. This observation deserved further explanation below.

The data from Marino et al. (2014, 2–8) were obtained from a statewide database for all births, both live and stillborn, in South Australia from 1986 to 2002. The data included 327,378 registered births with 5,949 of those births achieved by assisted conception. Singleton pregnancies that were achieved by any form of assisted conception were nearly 2x more likely to result in stillbirth than spontaneously achieved pregnancies. For pregnancies that went on to live birth, the assisted conception infants were significantly more likely to be born preterm. They were also more likely to weigh less and die as a neonate than those infants born of spontaneous pregnancies.

In the IVF pregnancies, some were fertilized by ICSI and some of the pregnancies were the result of frozen-thawed (cryopreserved) embryo transfer. The naturally fertilized embryos that were transferred after being cryopreserved no longer resulted in *very early* (<32 weeks) preterm births, but they were still more likely to result in preterm birth less than 37 weeks. These infants were also more likely to be born abnormally large (> 90th percentile). When the pregnancies had been fertilized by ICSI, transferring the embryos after being cryopreserved removed the risk of preterm birth. But it also further increased the risk that the infants would be born heavier and larger than normal.

Summary—health of the woman: Taken together, the evidence points to the fact that infertility can be an expression of other endocrine or metabolic health issues in the woman and that using technology to bypass these health issues, when they exist, is not in the best interest of the patient. Furthermore, there appears to be an additive effect of the IVF procedure on perinatal outcomes, and this could be partially due to the supraphysiologic

levels of hormones caused by the ovarian stimulation procedure.

There are also more recognizable risks associated with ovarian stimulation when the goal is to bypass the normal physiological processes and drive the production of 10–20 or more mature follicles. Even the field of assisted reproduction has identified the need to reduce the side effect of hyperstimulation syndrome (Pfeifer et al. 2016, 1634). Hyperstimulation syndrome occurs when the supraphysiologic levels of hormones cause vasodilation and capillary permeability, leading to fluid buildup, abdominal pain, labored breathing, and difficulties urinating. If it cannot be brought under control, the woman will be hospitalized. When the woman makes it to the egg retrieval and her condition has not improved, the embryo transfer procedure is postponed and the embryos cryopreserved. This consequence of the ovarian stimulation process frequently occurs in women with polycystic ovarian syndrome (PCOS). This is because IVF does nothing to treat PCOS and the ovarian abnormality still exists, leading to a potentially excessive ovarian response. When I was a practicing embryologist, it was common to collect as many as 30 to 40 oocytes from one procedure. I even witnessed a procedure where over 70 eggs from one woman were collected and most of them were fertilized to become embryos.

Health of the Child

When it comes to the health of the child, the disorder of IVF becomes even more alarming. Much has been published leading to several review articles and there is a significant amount of data pointing to a higher incidence of congenital birth defects cited in these reviews, but they are confounded by the other variables of multiple pregnancies, parental health, and the cause of infertility. Nevertheless, couples who use IVF to conceive can expect their children to have a 30–40 percent higher risk of birth defects (Chen and Heilbronn 2017, 390), affecting either

the nervous, genitourinary, digestive, circulatory, or musculoskeletal systems or the eye, ear, and face (Lu, Wang and Jin 2013, 361). At the same time, it is evident that improving preconception health of the parents will improve pregnancy outcomes and child health (Berglund and Lindmark 2016, 216–217) and improve reproductive health (Vigil et al. 2017, 347–350). This restorative approach should be the goal of any couple wishing to become pregnant. Once again, however, ART rarely focuses on restoring the health of the couple and rather bypasses the underlying causes of infertility. Restorative reproductive medicine, on the other hand, used in combination with natural family planning, offers a morally licit alternative for helping couples conceive.

It may be that the effect of IVF has a more subtle and long-term influence on the health of the offspring. Such influence would have profound consequences since it is estimated that there has been 8–9 million people born through IVF in the world (More Than 8 Million Babies From IVF Since the World's First in 1978: European IVF Pregnancy Rates Now Steady at Around 36 Percent, According to ESHRE Monitoring", 2018). Evidence is mounting that IVF conceived individuals experience a higher rate of cardiometabolic health issues and that these issues are caused by epigenetic changes to the embryo (Sullivan-Pyke et al. 2017, 7–10; Lu, Wang and Jin 2013, 365–366). In fact, a recent study by Yeung et al. (2021, 497) has shown altered DNA methylation levels at birth as well as continued presence when testing is performed at nine years of age. Cardiometabolic issues include an increase in BMI, body fat, blood pressure, fasting glucose levels, alteration in serum lipids, and cardiac or vascular dysfunction (Chen and Heilbronn 2017, 395). With the oldest offspring conceived through IVF in their late 30's to early 40's, this "experiment" is still ongoing.

4. Legal and Social Challenges

Combining multi-party reproduction and frozen gametes/embryos with relationships that result in divorce, separation, or death of a

partner, produces a high likelihood of social problems, moral dilemmas, and strange custody battles. To illustrate this, I provide some examples taken from the literature or from reports provided by the American Society for Reproductive Medicine. Again, this is not meant to be a comprehensive list, but can rather serve to demonstrate briefly the hardship that is caused to individuals and society by the conventional approach to fertility treatment.

Social Problems

The Institute for American Values published a report in 2010 (Marquardt, Glenn and Clark 2010, 111–112) evaluating the well-being of young adults conceived through donor insemination. They looked at the incidence of three types of social problems young adults could experience, including problems with the law, mental health, and substance abuse. They reported the incidence of these social problems in young adults raised by biological parents compared to donor-conceived young adults from three different family structures. The family structures included donor conceived children of lesbian mothers, single mothers, and heterosexual married parents. There was a slight increase in mental health issues in donor conceived children, but it did not reach significance. Problems with the law and substance abuse, however, were statistically higher in donor conceived children, with the effect most pronounced in children from single mothers.

Furthermore, when and how the children were informed of their origin could either make the prevalence of social problems better or worse. The study looked at the same three social problems and analyzed it in relation to when the children were notified of being donor conceived. The groups included children whose parents were always open about their child's origin, children whose parents revealed their origin at 12 or younger, children who were informed at 13 or older, or children whose parents attempted to keep their origin a secret indefinitely.

When parents delay or attempt to conceal how they were conceived, it causes a greater incidence of social problems. The worst group by far were the children whose parents attempted to conceal their origin from them indefinitely. It is not possible to keep this truth from your loved ones for their entire life. As in the previous example of the couple who decided to transfer a combination of embryos conceived through donor sperm and the father's sperm, the couple's inability or refusal to confirm the biological father makes it difficult to be honest with the child about his or her origins; if the child later discovers the secret, it will inevitably strain the relationships in the family. Donor conceived individuals struggle most with the fact that their biological father allowed for their conception but did it for money and then chose to have nothing to do with them.

Legal Problems

Examples for how the technology can lead to strange custody and legal battles further demonstrate the disordered approach. These titles were taken from current and past reports issued by the ASRM ("Legally Speaking" n.d.).

- Connecticut Supreme Court Upholds Clinic and Couples' Frozen Embryo Agreement
- INS Citizenship Challenges Continue for Foreign Born Children via Surrogacy
- Colorado Doctor Relinquishes License but Refuses to Acknowledge Impregnating Patients with his Sperm
- Former Medical Student Sues, Alleging Donated Sperm Misused for Excessive Number of Offspring in Nearby Areas
- Sperm Donor Sues Sperm Bank Over Sperm Allegedly Withdrawn from Donation
- California Court Denies Widow Right to Posthumous Reproduction
- HFEA Changes Surrogacy Rules on Exporting Sperm, Eggs and Embryos from U.K. to U.S.

Without getting into the details of each case, the titles alone suffice in demonstrating the problems that are created through ART. The American Society for Reproductive Medicine's legal professional group is clearly on the cutting edge of the intersection of law and human reproduction, and these legal cases have challenged the imagination for four decades. In the legal system, the embryo has the status of something in between "property" and an "individual human being." In 2015, the California courts ruled that a divorced couple's embryos were to be thawed and discarded per a signed consent agreement, instead of the wife being able to use them for procreation against her husband's wishes (Moyer 2015). If one accepts that human life begins at conception, this would be analogous to the courts honoring an agreement between the parents that upon divorce, the children were to be "humanely" executed.

5. Human experimentation

While there are many examples of the IVF profession using a couple's desperation to have a child as a means to justify experimentation, none have been as widely accepted and applied as the laboratory technique called ICSI. ICSI was never adequately tested in animal models before there was universal application in human reproduction. This procedure takes a human sperm and injects it into the cytoplasm of the egg. What the lay public do not understand is the need to be aggressive enough with the procedure to achieve results. It requires injuring the tail of the sperm as to render it immobile (Devroey and Van Steirteghem 2004, 20), presumably activating the cell membrane, and then aspirating part of the cytoplasm of the egg to confirm that the glass injection needle has penetrated through the elastic cell membrane. In an Orwellian twist, it was the success of ICSI in humans that propelled scientists to finally succeed in lab animals more consistently, such as rabbits and mice (Kimura and Yanagimachi 1995, 709). There is no doubt that the technology has led to thousands of men becoming fathers who would otherwise not have. But what are the costs?

1. A 20+ year suspension in the scientific pursuit of underlying causes and therapeutic cures to male infertility. Why bother treating the disease when ICSI achieves the desired outcome?
2. The passing on of heritable traits of infertility in the offspring, some of which are linked to other genetic illnesses (Devroey and Van Steirteghem 2004, 21).
3. Complication and lack of clarity on potential epigenetic alterations, including specific gene expression and down regulation in IVF and ICSI children (Palermo et al. 2008, 827).
4. Subjecting an otherwise healthy spouse (when there is no female infertility) to invasive and potentially health altering procedures for the purpose of having a baby. The child becomes a product of a technical manufacturing process rather than the result of the procreative act.

Other examples of ART leading to experimentation on humans include cytoplasmic transfer, germinal vesicle (GV) transfer, and CRISPR offspring. Cytoplasmic transfer is taking a small amount of cytoplasm from a younger woman's egg and transferring it to an older woman's egg to "rejuvenate" it (Barritt et al. 2001, 429). A 2001 literature review estimated that about 29 offspring had been born after cytoplasmic transfer in humans (Barritt et al. 2001, 429, Table 1), but it is unknown how many children have been born as of today and what the long-term outcomes of this experimental treatment are.

A related procedure called GV transfer involves taking the nuclear genetic material from an older woman's egg and transplanting it into an enucleated younger woman's egg, thereby completely replacing the cytoplasm of the older woman's egg with a younger egg (Zhang 2015, 314). These initial experiments have included cross species GV transfer between mice and humans (Zhang 2015, 315) although there is no indication that these oocytes were subsequently fertilized. Both

cytoplasm and GV transfer are essentially the creation of a person from three people since the organelles of the younger woman's egg would be replicated. This replication would include the mitochondria, resulting in mitochondrial DNA heteroplasmy in the offspring with unknown consequences to their health (Moffa et al. 2002, 183). In 2015, the UK made the procedure of mitochondrial donation legal (Craven et al. 2015, 265), a procedure that employs the use of related technology. Under this terminology and purpose, the use of this technology is gaining momentum across the world (Sharma et al. 2020, 2–4).

Finally, CRISPR is an acronym for a method of genetically editing the genome of an organism. In 2018, twin girls were born after embryos were gene edited to make them resistant to HIV infection. The technology is being explored to prevent heritable diseases from passing from parents to offspring (Ledford 2019). While all these techniques seem to have good intentions driving their implementation, the dignity of the human person is undermined in the process of experimentation. Furthermore, the long-term health implications to the children born from the procedures are unknown.

The Final Crisis

I voluntarily pursued a career in the lucrative field of ART despite being raised Catholic. Even though my wife and I followed the Church's teaching on contraception in our own marriage, I pursued this work in opposition to Church teaching because I believed I was helping couples have children as the fruit of their marital union. But, eventually, the disorder, low success rates, and examples of harm caused by the technology forced me to question that premise. My turning point occurred when the hospital and the medical director for our program insisted that I follow a couple's wishes to allow their "spare" embryos to die and be discarded. This resulted in some conflict between me and my employer and a review by the ethics committee of the hospital. Ultimately, I

followed the orders and allowed the embryos to remain in culture until they died, after which I discarded them into the medical waste. The ethics committee review subsequently ruled in favor of doing what the patients wanted. Up until that time, I had thought that my due diligence and efforts were in support of helping create a child, and it was irreconcilable to perform an action that directly contradicted that objective. After that incident, I realized the direction the industry was following would result in repeated violations of my conscience if I stayed in the field. When I found suitable work, I quit my profession.

Bioethical Considerations and Analysis

Initially it was not Church teaching that finally led me to leave my profession. Rather, it was observing the financial, physical, and emotional difficulties experienced by patients and the harm done to their relationships, health, and life that finally propelled me to leave. It was like the reflex to draw away after putting a hand on a hot stove, a natural consequence of taking the wrong path. It was afterwards that I came to respect and appreciate the guidance of the Catholic Church, and it is clear to me now that the Church's teaching is grounded in wisdom. This understanding led me to begin exploring the tenets of natural law and to seek assistance on its application to my experience in the ART field. For this I sought the advice of Dr. Mary Anne Urlakis, President of Dignitas Personae Institute for Nascent Human Life, a Catholic Bioethicist, and fellow board member of Sacred Heart Guardians and Shelter. She emphasizes that the Magisterium has issued some magnificent documents regarding the sanctity of marriage, human life, natural law, and the necessary limits of technology. These include *Humanae Vitae*, *Donum Vitae*, and *Dignitas Personae*. In the final section of this paper, Dr. Mary Anne Urlakis will analyze the bioethical status of the human embryo and the use of ART while comparing secular

bioethical principles in contrast to natural law. Dr. Mary Anne Urlakis will evaluate what I experienced in clinical practice, which led to my conversion, and further explore the premise that the adverse consequences of ART are due to violation of natural law. She explores and validates the argument that ART is a disordered approach that should be rejected. Like in my own experience, these symptoms of disorder can be used as evidence to guide others through their ethical journey and bring transformation.

Explanation of Contemporary Secular Principle-Based Moral Praxis

As described it in the initial section of this paper, Dr. Turczynski's early moral reasoning adheres closely to the prevailing principle-based approach first published in 1979 by Beauchamp and Childress, which has profoundly shaped secular bioethical moral praxis (Beauchamp and Childress 2001). Now in its eighth edition, the principle-based approach developed by Beauchamp and Childress has become normative and underpins the ethics curriculum taught in medical schools, nursing programs, allied health schools, and graduate programs in bioethics.

Beauchamp and Childress argue that the four *prima facie* principles of Autonomy, Beneficence, Non-Maleficence, and Justice arise out of a common morality, and that the act of balancing and specifying principles and obligations to create coherence yields a legitimate framework for moral praxis in biomedical settings. Specifically, Beauchamp and Childress have worked to develop an accepted ethical framework that is independent of natural law, and other normative, objective approaches to moral praxis. They state: "Our objective is to show how ethical theory can illuminate problems in health care and help overcome some of the limitations of past formulations and ethical responsibility" (Beauchamp and Childress 2001, 3).

The principle-based approach rejects natural law. Natural law, on the other hand,

argues that just as the physical universe is governed by a set of natural laws which can be elucidated through observation and the use of human reason, so too human morality and right conduct are governed by a set of universal, unchanging, immutable laws that can be ascertained through the use of human reason. Rather than grounding in human reason or adhering to the belief in an essential Truth from which all morality stems, Beauchamp and Childress champion a pluralistic approach to moral reasoning. They argue that their theory, “takes its basic premises directly from the morality shared in common by the members of society—that is, unphilosophical common sense and tradition” (Beauchamp and Childress 2001, 100).

Dr. Turczynski, as described at the beginning of this paper, adhered to the common morality that helping couples conceive through IVF—no matter the emotional, physical, or financial toll—was a good worth pursuing. However, as the years passed, Dr. Turczynski discovered, through the light of natural reason, that attempting to justify IVF and the everyday clinical routine of the ART laboratory was ethically problematic. He realized, through reason, that reordering, balancing, or specifying principles to fit the situation—using the ends to justify the means—was morally unsatisfactory. It was through his personal clinical experience, observation, and philosophical and theological reflection that Dr. Turczynski discovered the validity of the natural law, and the truth that IVF and ART are intrinsically disordered.

The Principles of Beneficence and Nonmaleficence are central to both natural law theory and Beauchamp and Childress’ principle-based approach. Yet, while the principle-based approach denies that any principle is pre-eminent and discoverable by reason, natural law, in contrast, recognizes that the First Principle of Practical Reason is simply: “the good is to be done and pursued, and evil is to be avoided” (Aquinas, *Summa Theologica I-II*. 94. 2).

Reflections on the Validity of Applying Natural Law to ART

As Catholics, we understand that there is indeed a natural law, written by Almighty God on the heart of each human person, eternal, immutable, and binding. As the natural law is written within each of us, intrinsic to it is our very humanness—the knowledge that the human person is a unique and sacred entity from the first instant of its existence, bearing both the Image and the Likeness of Almighty God, created by Love, in love, and for love, with an eternal destiny and immeasurable dignity.

Regarding the natural law, quoting Pope Leo XIII’s encyclical, *Libertas praestantissimum*, the Catechism of the Catholic Church teaches, “The natural law is written and engraved in the soul of each and every man, because it is human reason ordaining him to do good and forbidding him to sin. . . . But this command of human reason would not have force of law if it were not the voice and interpreter of higher reason to which our spirit and our freedom must be submitted” (Catholic Church 1995b, 1954).

Likewise, the Catechism states: “The natural law, present within the heart of each man and established by reason, is universal in its precepts and its authority and extends to all men. It expresses the dignity of the person and determines his fundamental rights and duties” (Catholic Church 1995b, 1956).

The natural law transcends space and time and is accessible to every human person by virtue of the faculty of reason—even those who as of yet do not believe in God. While its application varies widely and takes account of various nuances of culture and conditions, it remains binding on all human persons, and is immutable and permanent (Catholic Church 1995b, 1957–1958).

Rooted deeply within the natural law is the principle that human life is a sacred gift from God, created in the Divine Image and Likeness, which is to be respected and protected for its own sake—never as a means to an end—from its initial moment of existence to its natural end.

From decades of suspended animation while frozen in liquid nitrogen, to “compassionate thawing,” to dissection and dismemberment in experimental biological research, it is self-evident that none of these options is compatible with the dignity owed to human persons made in the Image and Likeness of God. There are millions of discarded and “unwanted” embryos—tiny humans who have been created and rejected as unwanted biological products. Yet these tiny humans are our brothers and sisters in Christ. When we stop to consider the magnitude of this solitary aspect of Artificial Reproductive Technology—the uncomfortable reality of the “leftovers”—we gain an appreciation for both the wisdom of the Church’s teaching regarding natural law and the Magisterial documents, which speak to the limits of human science and technology, limits that ought not be transgressed. In Dr. Turczynski’s very personal reflection in the opening section of this paper, he elucidated the numerous ways in which he was confronted by the natural consequences patients and IVF providers experienced because of violating the natural law. These consequences are indeed heartbreaking for the adults involved—patients and clinicians—and their stakes are even higher when we consider the innocent nascent lives affected by these consequences as well.

Conclusion

This is a case study for how an IVF laboratory practitioner’s personal and scientific observations in the IVF field led to a transformation. Insights on natural law and the Church’s teachings further illuminate the problematic nature of ART. ART violates natural law and is therefore disordered. This is demonstrated by the adverse personal, medical, legal, and ethical consequences it produces. It is hoped that the experiences described in this paper will inform others of these consequences and that the subsequent reflection will inspire the conversion of other health professionals, in addition to helping couples struggling with infertility make more informed decisions

about their treatment. Adequate disclosure of information, including the moral and ethical component, is needed for informed consent, but it is rarely encouraged in conventional fertility care. The efforts to improve reproductive healthcare are part of a battle that goes deeper than flesh and blood. Most professionals are genuinely motivated by the desire to help others, and couples are likewise influenced by the good end and intense desire of having a baby. But with the ever-increasing desire to forge ahead with brazen technological means of controlling reproduction outside of God’s design and the intimate marital embrace between man and woman, this is clearly a spiritual battle. The vast majority of the field of reproductive endocrinology seems intent on redefining the meaning, boundaries, and method by which humans procreate. It is doubtful that we will ever eliminate the evil that is behind this pursuit, but there is hope that, with the help of the Holy Spirit, we can work to change the hearts and minds of individuals and save souls.

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Note

1. ART is a collection of related procedures used in conjunction with and expanding on the application of IVF. It includes technology such as cryopreservation, intracytoplasmic sperm injection, embryo culture, preimplantation genetic diagnosis, and others.

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