

# A Defense of Embryonic Stem Cell Research

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INTRODUCTION .....	1204
I. SOME DEFINITIONS AND NOMENCLATURE.....	1207
A. INITIAL STAGES OF EMBRYONIC DEVELOPMENT AND EMBRYONIC SOURCES FOR STEM CELLS.....	1208
B. OTHER SOURCES OF STEM CELLS .....	1209
II. THE SCIENCE AND METHODS OF EMBRYO PRODUCTION AND STEM CELL HARVESTING.....	1212
A. CREATION OF EMBRYOS IN A LABORATORY ENVIRONMENT: THE IVF PROCESS.....	1212
B. THE FATE OF LABORATORY-CREATED EMBRYOS.....	1213
C. HARVESTING THE STEM CELLS FROM EMBRYOS.....	1215
III. FIRST PRINCIPLES: THE RIGHT TO REPRODUCE AND THE RIGHT TO CREATE EMBRYOS <i>IN VITRO</i> .....	1218
A. THE RIGHT TO PROCREATE .....	1218
B. THE RIGHT TO EFFECTIVE IVF TREATMENT .....	1220
IV. TERMINATING LIFE-SUPPORTING EXTRAORDINARY MEDICAL TREATMENT .....	1222
A. MORALITY OF REFUSAL OF LIFE-SUPPORTING TREATMENT BY A COMPETENT ADULT.....	1222
B. SUBSTITUTED CONSENT: WHO SPEAKS FOR AN INCOMPETENT INDIVIDUAL?...	1226
C. FROZEN EMBRYOS AS CHILDREN ON LIFE SUPPORT .....	1231
D. WHO IS A “PARENT”? .....	1235
V. ORGAN DONATION AND ITS APPLICATION TO EMBRYONIC STEM CELL RESEARCH....	1236
A. ORGAN DONATION BY ADULTS AND CHILDREN .....	1236
B. STEM CELL DONATION BY EMBRYOS .....	1239
VI. THE OBJECTIONS AND A RESPONSE .....	1241
A. THE “CONSENT” OBJECTION .....	1241
B. THE “CREATION” OBJECTION .....	1245
C. THE “SNOWFLAKE” AND ADOPTION OBJECTION.....	1248
D. THE “REPROGRAMMING” AND “BIOPSY” OBJECTIONS .....	1252
VII. DIFFERENTIATING STEM CELL RESEARCH FROM ELECTIVE ABORTION.....	1254
CONCLUSION.....	1256

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## INTRODUCTION

On November 21, 2007, sensational scientific developments were reported by major newspapers, both in the United States and abroad.<sup>1</sup> The media reported a new breakthrough in the area of stem cell research. According to two articles published in *Science*<sup>2</sup> and *Cell*<sup>3</sup> (both highly respected scientific journals), two teams of scientists were able to “reprogram” adult stem cells into embryonic stem cells, without actually having to experiment on embryos. The discovery was immediately hailed by the White House and other opponents of embryonic stem cell research.<sup>4</sup> The *New York Times* gushed that the “stem cell wars” may be at an end.<sup>5</sup> Two central aspects of the discovery were almost lost in the excitement. First, while the cells were successfully “reprogrammed,” the reprogramming process resulted in altering cells’ own DNA, making the cells more prone to become cancerous, and therefore not useful for therapeutic interventions.<sup>6</sup> Second, any therapeutic progress based on the methodology outlined in *Science* and *Cell* is years, if not decades, away.<sup>7</sup> Thus, at least with respect to the immediate future, the reported discoveries do not obviate the need to conduct research on cells extracted from embryos. Until such time as science will allow us to forgo the use of embryos to extract stem cells, the use of embryos will remain necessary, and the ethical debate attendant to such use will persist. This Article will argue that the use of embryos in such research is permissible *even if* the embryos are viewed as fully human and are entitled to all ethical and legal protections that go along with such status.

The debate over the ethics and propriety of embryonic stem cell research is recent, but not new. The issue was prominently discussed during the 2004 presidential campaign,<sup>8</sup> with both sides hurling (mostly inaccurate) accusations and counter-

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1. See, e.g., Gina Kolata, *Scientists Bypass Need for Embryo to Get Stem Cells*, N.Y. TIMES, Nov. 21, 2007, at A1; Rick Weiss, *Advance May End Stem Cell Debate; Labs Create a Stand-In Without Eggs, Embryos*, WASH. POST, Nov. 21, 2004, at A01; Malcolm Ritter, *Scientists Report Stem Cell Breakthrough from Human Skin*, HINDU, Nov. 21, 2007, <http://www.hindu.com/thehindu/holnus/008200711210320.htm>.

2. Junying Yu, Maxim A. Vodyanik, Kim Smuga-Otto, Jessica Antosiewicz-Bourget, Jennifer L. Frane, Shulan Tian, Jeff Nie, Gudrun A. Jonsdottir, Victor Ruotti, Ron Stewart, Igor I. Slukvin & James A. Thomson, *Induced Pluripotent Stem Cell Lines Derived from Human Somatic Cells*, 318 SCIENCE 1917 (2007).

3. Kazutoshi Takahashi, Koji Tanabe, Mari Ohnuki, Megumi Narita, Tomoko Ichisaka, Kiichiro Tomoda & Shinya Yamanaka, *Induction of Pluripotent Stem Cells from Adult Human Fibroblasts by Defined Factors*, 131 CELL 861 (2007).

4. Kolata, *supra* note 1; Sheryl Gay Stolberg, *Advance on Stem Cells Equalizes Debate*, N.Y. TIMES, Nov. 20, 2007, at A23; Alan Boyle, *Skin Cells Made to Mimic Stem Cells*, MSNBC, Nov. 20, 2007, <http://www.msnbc.msn.com/id/21886974/>; Malcolm Ritter, *Stem Cell Breakthrough Defuses Debate*, WASH. POST, Nov. 21, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/11/20/AR2007112000545.html>.

5. Gina Kolata, *Researcher Who Helped Start Stem Cell War May End It*, N.Y. TIMES, Nov. 22, 2007, at A1.

6. Gretchen Vogel & Constance Holden, *Field Leaps Forward With New Stem Cell Advances*, 318 SCIENCE 1224, 1225 (2007).

7. *Id.*

8. See generally Daniel Smith, *Political Science*, N.Y. TIMES, Sept. 4, 2005, § 6

accusations<sup>9</sup> at each other. In the years following the 2004 election, the debate over embryonic stem cell research continues to intensify. Though the stem cell research debate has not yet reached the pitch and volume of the abortion debate, the battle lines are drawn along the familiar general positions (with some notable exceptions).<sup>10</sup> In the years following the 2004 election, the debate over embryonic stem cell research has not abated. To the contrary, it has picked up new intensity. On March 9, 2009, newly inaugurated President Obama signed an executive order reversing Bush-era policies on embryonic stem cell research.<sup>11</sup> The shift in policy was immediately criticized by social conservatives.<sup>12</sup>

This debate also permeates the political climate of state elections. On election day 2004, California voters overwhelmingly passed Proposition 71,<sup>13</sup> creating the California Institute for Regenerative Medicine and allocating \$3 billion toward research in embryonic stem cells.<sup>14</sup> In 2006, Missourians voted to amend their state constitution to permit stem cell research within the state subject to certain conditions.<sup>15</sup> At the same time, other states have moved in the opposite direction<sup>16</sup> or maintained their long-standing prohibitions on embryonic research of any kind.<sup>17</sup> Additionally, in 2007, New Jersey voters rejected a referendum authorizing the investment of \$450 million over a ten-year period in adult and embryonic stem cell research.<sup>18</sup>

The debate over stem cell research resembles the abortion debate. At its very core, the argument reduces to a single question: When does life begin? Of course this

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(Magazine), at 37 (discussing the role of science in the first George W. Bush administration, the 2004 campaign, and the beginning of his second administration).

9. *Frist Knocks Edwards over Stem Cell Research*, CNN, Oct. 12, 2007, <http://www.cnn.com/2004/ALLPOLITICS/10/12/edwards.stem.cell/>.

10. *Compare* 149 CONG. REC. 5898 (2003) (expressing “sense of the Senate” that “(1) the decision of the Supreme Court in *Roe v. Wade* (410 U.S. 113 (1973)) was appropriate and secures an important constitutional right; and (2) such decision should not be overturned.”), *and* 149 CONG. REC. 5917 (2003) (Senate Roll Call Vote No. 48 on Senate Amendment 260 to Partial-Birth Abortion Ban Act of 2003), *with* 152 CONG. REC. S7692 (daily ed. July 18, 2006) (Senate Roll Call Vote No. 206 approving H.R.810, Stem Cell Research Enhancement Act of 2005). Twelve Senators that voted against supporting *Roe* voted to permit federal funding for embryonic stem cell research.

11. Exec. Order No. 13,505, 74 Fed. Reg. 10,667 (Mar. 11, 2009).

12. *See, e.g.*, Robert P. George & Eric Cohen, Op-Ed, *The President Politicizes Stem-Cell Research*, WALL ST. J., Mar. 10, 2009, at A13, available at <http://online.wsj.com/article/SB123664280083277765.html>.

13. KEVIN SHELLEY, CAL. SEC’Y OF STATE, STATEMENT OF VOTE: 2004 PRESIDENTIAL GENERAL ELECTION 49–51 (2004), [http://www.sos.ca.gov/elections/sov/2004\\_general/sov\\_2004\\_entire.pdf](http://www.sos.ca.gov/elections/sov/2004_general/sov_2004_entire.pdf) (stating that the proposition received 59.1% of the total vote).

14. *See* CAL. CONST. art. XXXV.

15. *See* MO. CONST. art. III, § 38(d).

16. *See, e.g.*, S.D. CODIFIED LAWS §§ 34-14-16 to -17 (2004) (adopted in 2000).

17. *See, e.g.*, LA. REV. STAT. ANN. §§ 9:123, 9:129 (2008) (adopted in 1986); ME. REV. STAT. ANN. tit. 22, § 1593 (2006) (adopted in 1992); MICH. COMP. LAWS §§ 333.2685(1), 333.2691 (2001) (adopted in 1978); MINN. STAT. ANN. §§ 145.421–422 (West 2005) (adopted in 1973).

18. David Chen, *New Jersey Voters Defeat Stem Cell Measure*, N.Y. TIMES, Nov. 7, 2007, at B1; *see also* New Jersey Stem Cell Research Bond Act, 2007 N.J. Laws ch. 117.

argument is no more resolvable, in any legal or moral sense, than the abortion argument.

Interestingly, a number of public figures with solid “pro-life” credentials have come out in favor of embryonic stem cell research. For instance, Senator Orrin Hatch, a Republican from Utah, spoke in favor of stem cell research, asserting that “[a]bortion destroys life; this is about saving lives.”<sup>19</sup> Former Republican Senate Majority Leader Bill Frist, a physician himself, explained his position in support of stem cell research by stating that embryonic stem cell research “isn’t just a matter of faith. It’s a fact of science.”<sup>20</sup> With due respect to the distinguished Republican senators, these pronouncements are not a serious attempt to explain *why* abortion and embryonic stem cell research are not morally equivalent. While Senator Hatch is certainly right that the research is about “saving lives,” that is not the end of the matter. We generally find it morally unacceptable to kill an innocent person even if such a killing is likely to save the lives of other innocent people.

Nor have other public proponents of embryonic stem cell research been much more convincing with their arguments. Their most prominent argument seems to be that “[i]t is . . . ethical to work on embryos that are going to be *destroyed anyway*.”<sup>21</sup> Unfortunately, such an approach simply betrays the view that a frozen embryo is a commodity to be put to “good use.” This view is understandably unacceptable to those who view the embryo as fully endowed with humanity and as worthy of being accorded human dignity and respect. For instance, the observation that an Alzheimer’s patient will “soon die anyway” is an insufficient moral justification for killing said patient in order to harvest his organs. An embryo, if considered fully human, also cannot be treated so cavalierly.

The purpose of this Article is twofold. First, the Article suggests that it is unnecessary to resolve the question of whether a fertilized egg is or is not a human life when deciding on the propriety and morality of embryonic stem cell research. Indeed, it may be conceded that life begins at conception. However, even in the face of such a concession, this Article will argue that it is morally permissible to harvest stem cells from embryos even if such harvesting would result in the destruction (death) of the embryo. Secondly, the Article will attempt to give a justification for embryonic stem cell research while proceeding from the premise that the embryo is to be treated not as a commodity, but as an individual with human dignity. In the process, it should become clear why embryonic stem cell research differs from abortion, and how one can—with philosophical consistency—simultaneously subscribe to an anti-abortion position and be in favor of embryonic stem cell research.

The argument that the Article advances consists of several parts. First, in Part III, I will argue that adults have a right to procreate and that for that right to be meaningful, they should be given an opportunity to use assisted reproductive technologies, such as in vitro fertilization (IVF), if they cannot conceive on their own. Furthermore, I will argue that it is morally permissible to create more embryos than a woman is willing to

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19. Ceci Connolly, *Conservative Pressure for Stem Cell Funds Builds; Key Antiabortionists Join Push for Embryo Research*, WASH. POST, July 2, 2001, at A01.

20. Thomas B. Edsall, *Possible Frist '08 Bid Splits Religious Right; Absent Senator the Talk of 'Justice Sunday'*, WASH. POST, Aug. 16, 2005, at A02.

21. Alison Abbott, *'Ethical' Stem-Cell Paper Under Attack*, 443 NATURE 12, 12 (2006) (emphasis added) (internal quotation omitted).

have implanted because, given the current technological limitations, multiple embryos must be created for the IVF treatment to be a viable option.

In Part IV, I will demonstrate that there is a general consensus across societies and religious beliefs about the permissibility of withdrawing futile treatment from patients, even if such withdrawal causes imminent death. I will further show that there is broad agreement with respect to the proposition that the decision to withdraw life-sustaining treatment can be made either by the patient himself *or* by a proper surrogate if the patient cannot express his own wishes. Next, I will argue that frozen embryos are in the same moral position as individuals on life support.

After establishing that adults seeking to reproduce have the moral authority to create embryos and that the embryos so created are morally equivalent to individuals on life support, I will argue in Part V that—much like family members of an individual being removed from life support can consent to the donation of that individual's organs—parents of an embryo being removed from the freezing tank can consent to the donation of an embryo's cells. This Part of the Article will also lay out criteria under which the decision to donate organs (and also the decision to donate embryonic cells) can be made.

After proposing my paradigm for conducting ethical embryonic stem cell research, I will attempt to answer objections to my approach, of which there are several, in Part VI. Finally, in Part VII, I will explain why my approach, while permitting destruction of the embryo in the context of embryonic stem cell research, is intellectually consistent with an anti-abortion position.

Prior to launching into the argument portion of the Article, it will be necessary to discuss the science underlying embryonic stem cell research and IVF technologies. This will be accomplished in Parts I and II, respectively. The discussion is necessary because it forms the basis for the moral argument presented in the subsequent parts of the Article. Specifically, in order to understand why the frozen embryo is morally analogous to a child on life support, one needs to know the success rate of thawing, implanting, and having it gestate until normal birth. Similarly, in order to understand why harvesting cells from embryos is akin to organ harvesting from already born individuals, one needs to understand the process of collecting and growing embryonic stem cells. Finally, it is my hope that the scientific discussion will help clear up whatever confusion there may be between embryonic and other types of stem cell research.

#### I. SOME DEFINITIONS AND NOMENCLATURE

Often lost in the political debate is the understanding and differentiation of what stem cell research actually entails. To make matters worse, the mass media often simply speaks of “stem cells” generally without bothering to even acknowledge that there is a difference between adult, embryonic, placental, and other types of stem cells.<sup>22</sup> This, in turn, creates confusion, especially when restrictions on research and funding are discussed. Given the lexicon of the mass media (and quite often politicians), the public is apt to think that a “stem cell is a stem cell” and that a given

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22. See Pamela Gehron Robey & Paolo Bianco, *The Use of Adult Stem Cells in Rebuilding the Human Face*, 137 J. AM. DENTAL ASS'N 961, 961–63 (2006).

restriction affects all stem cell research uniformly.<sup>23</sup> This misperception is harmful for both proponents and opponents of embryonic stem cell research. For those who adamantly oppose embryonic stem cell research, this conflation results in opposition to research that in no way involves creating or destroying an embryo, and which is in fact hardly different from any other biocellular research.<sup>24</sup> On the other hand, this conflation causes those who wholeheartedly support embryonic stem cell research to overlook tremendous advances that are made through the use of nonembryonic cells.<sup>25</sup> Thus, common ground for both proponents and opponents of embryonic stem cell research often cannot be found merely because the arguing parties confuse the issues and fail to clearly define their positions. Though the focus of this Article is the morality of embryonic stem cell research itself, it is imperative to differentiate between the different types of stem cells, their provenance, and their uses. These definitions will allow for a more focused discussion and a clearer understanding of the ethical issues involved.

#### *A. Initial Stages of Embryonic Development and Embryonic Sources for Stem Cells*

On a genetic level, human life (and other sexually reproducing life) begins when a male gamete fuses with a female gamete.<sup>26</sup> In humans, this occurs when the spermatozoid (containing twenty-three chromosomes) penetrates the ovum (also containing twenty-three chromosomes), thus fertilizing the ovum.<sup>27</sup> The fertilization results in one cell that has a full complement of forty-six chromosomes.<sup>28</sup> This single, undifferentiated cell, properly called a “zygote,” eventually develops into the fully developed adult organism.<sup>29</sup> The zygote then divides via simple mitotic division<sup>30</sup> into sixteen identical cells or blastomeres.<sup>31</sup> At this stage, all sixteen cells are “totipotent,” meaning that each of the cells is theoretically capable of developing into any cell in the organism.<sup>32</sup> At this point the zygote, now referred to as a “morula,” leaves the fallopian tubes and enters the uterus.<sup>33</sup> The exit from the fallopian tubes occurs roughly on the

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23. See *Stem Cell Research*, GALLUP, <http://www.gallup.com/poll/21676/Stem-Cell-Research.aspx> (pointing out that large percentages of Americans do not or cannot distinguish between various types of stem cells).

24. See *id.*

25. See *id.*

26. RONALD W. DUDEK & JAMES D. FIX, *EMBRYOLOGY* 1 (3d ed. 2005).

27. H.J. Muller, *Genetic Principles in Human Populations*, 83 *SCIENCE MONTHLY* 277, 278 (1956).

28. THE ENDOWMENT FOR HUMAN DEV., *PRENATAL FORM AND FUNCTION—THE MAKING OF AN EARTH SUIT: UNIT 1* (2009), available at [http://www.ehd.org/dev\\_article\\_unit1.php](http://www.ehd.org/dev_article_unit1.php) [hereinafter *PRENATAL FORM: UNIT 1*].

29. *Id.*

30. *Id.* Mitotic division is a process where a cell splits into two cells, each being identical to the mother cell. *STEDMAN'S MEDICAL DICTIONARY* 1121 (27th ed. 2000).

31. 1 NAT'L BIOETHICS ADVISORY COMM'N, *ETHICAL ISSUES IN HUMAN STEM CELL RESEARCH* 10 (1999), <http://bioethics.georgetown.edu/NBAC/stemcell.pdf> [hereinafter *NBAC*].

32. *Id.* at 1. This, of course, is not surprising because at this point in the development, each of the sixteen cells is simply an identical copy of the single original cell. See *supra* note 30 and accompanying text.

33. *NBAC, supra* note 31, at 10.

third or fourth day postfertilization.<sup>34</sup> At approximately six or seven days after fertilization, the morula has divided into approximately 100 cells and is ready to attach to the uterine wall.<sup>35</sup> The first differentiation begins at this stage.<sup>36</sup>

During the process of the first differentiation, the morula becomes a blastocyst.<sup>37</sup> The blastocyst differentiates into two types of cells—the outer trophoblast layer which eventually develops into the placenta and the inner layer of twenty to thirty cells called the “inner cell mass” (ICM).<sup>38</sup> The ICM cells themselves are still undifferentiated and are slated to develop into a human organism.<sup>39</sup> However, they are no longer totipotent because a single, isolated ICM cell no longer has the capacity to produce the type of cell required to form the placenta.<sup>40</sup>

The embryonic stem cells are derived from the ICM cells.<sup>41</sup> While no longer totipotent, these cells have the highest potency because they can develop (given the right conditions and stimuli) into any tissue, except for placental tissue.<sup>42</sup> Once these cells are placed in the appropriate conditions, they are “capable of extensive, undifferentiated proliferation *in vitro* and maintain the potential to contribute to all adult cell types.”<sup>43</sup>

### B. Other Sources of Stem Cells

In addition to the sources for stem cells discussed in the previous section, certain types of stem cells can be derived from postnatal organisms.

As is well understood, cells in an adult organism<sup>44</sup> die from regular wear and tear.<sup>45</sup> When the cells deteriorate, they must be replaced. In the human small intestine,

34. *Id.*

35. *See id.*

36. *See id.*

37. *See id.*

38. *Id.*

39. *See id.*

40. *See id.* Again, this makes sense since by that point the trophoblast (cells that will form the placenta) has been separated from the ICM (cells that will develop the human organism itself). *See supra* note 38 and accompanying text. Because an isolated ICM cell would be incapable of developing a placenta, it would be impossible for it to develop into a complete human organism—there would be no way for the nutrients needed to sustain the organism before birth to be delivered.

It is useful to think of cell differentiation as a family tree. An early cell would be able to give rise to anyone within that family. As the cells become more differentiated, they would be able to give rise only to those located within their branch of the family, and not to those who would be their “siblings” or “cousins.”

41. NBAC, *supra* note 31, at 9.

42. *Id.*

43. *Id.* (emphasis in original).

44. Here “adult” is used so as to encompass all postnatal organisms and to differentiate from the developing *in utero* fetus. Of course, a child organism can still be developing and growing, but for the purposes of cellular differentiation, it is essentially no different from a fully grown adult organism. *See id.* at 12–14 (grouping “postnatal” and “adult” organisms into a single category). Thus, “adult” is meant to encompass children as well, and it will be used as such for ease of reference.

45. For instance, a red blood cell has a lifespan of 120 days. BRUCE ALBERTS, DENNIS

approximately 100 billion cells are shed and must be replaced daily.<sup>46</sup> The same is true for almost all cells in an organism, although cell lifespans vary from tissue to tissue.<sup>47</sup> Thus, the human organism maintains a mechanism to produce more differentiated or “terminal”<sup>48</sup> cells from cellular precursors.<sup>49</sup> Although these precursors are capable of multiple rounds of self-propagation,<sup>50</sup> unlike embryonic stem cells, adult stem cells (and lines derived therefrom) are limited in their lifespan and the number of divisions they can undergo because adult stem cells senesce.<sup>51</sup>

There have been a number of groundbreaking discoveries involving adult stem cell research. For instance, work with hematopoietic stem cells<sup>52</sup> led to the discovery of a potential new treatment for leukemia.<sup>53</sup> Based on that discovery, clinical trials are being undertaken to test the efficacy of this treatment in humans.<sup>54</sup> Additionally, some success has been found using adult stem cell therapy for treatment of other ailments.<sup>55</sup> Certainly these breakthroughs are important for the advancement of science and the treatment of disease. Nonetheless, the idea that stem cell research can be successful if limited only to adult stem cells<sup>56</sup> is deeply flawed.

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BRAY, JULIAN LEWIS, MARTIN RAFF, KEITH ROBERTS & JAMES D. WATSON, *MOLECULAR BIOLOGY OF THE CELL* 1169 (3d ed. 1994).

46. NBAC, *supra* note 31, at 12.

47. *See id.*

48. “Terminal” here means “end point,” as in “terminal academic degree,” and it does not connote impending death, as in “terminal disease.” In essence, a terminal cell is a polar opposite of a totipotent cell. *See* WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 2358–59 (Philip Babcock Gove ed., 1971).

49. *See* NBAC, *supra* note 31, at 12.

50. *See, e.g.,* C.S. Potten & M. Loeffler, *Stem Cells: Attributes, Cycles, Spirals, Pitfalls and Uncertainties: Lessons for and from the Crypt*, 110 *DEVELOPMENT* 1001, 1001–05 (1990) (discussing regenerative capacity of certain cells in the small intestine).

51. *See* Zhenyu Ju, Aaheli Roy Choudhury & K. Lenhard Rudolph, *A Dual Role of p21 in Stem Cell Aging*, 1100 *ANNALS N.Y. ACAD. SCI.* 333, 335–38 (2007) (discussing adult stem cell senescence).

52. Hematopoietic stem cells are found in bone marrow and are responsible for the production of all types of blood cells. NBAC, *supra* note 31, at 12.

53. *See* Ömer H. Yilmaz, Riccardo Valdez, Brian K. Theisen, Wei Guo, David O. Ferguson, Hong Wu & Sean J. Morrison, *Pten Dependence Distinguishes Haematopoietic Stem Cells from Leukaemia-Initiating Cells*, 441 *NATURE* 475, 475–76 (2006).

54. *See Michigan Team Singles Out Cancer Stem Cells for Attack*, *SCI. DAILY*, May 6, 2006, <http://www.sciencedaily.com/releases/2006/05/060506234206.htm> (“[A] key difference between normal stem cells and cancer stem cells suggested that drugs that target the metabolic pathway in which Pten acts should have opposite effects on normal blood-forming stem cells and leukemic stem cells. To test this, the team treated the mice with rapamycin, a drug that reduces the activity of this metabolic pathway. The drug is used to prevent tissue rejection in transplant patients, and is currently being tested in clinical trials for activity against a variety of cancers.”).

55. *See, e.g.,* Erika Check, *Cardiologists Take Heart from Stem-Cell Treatment Success*, 428 *NATURE* 880 (2004) (discussing successful treatment of heart failure with adult stem cells).

56. *See, e.g., American Bishops Reaffirm Church Support for Adult Stem-Cell Research*, *CATH. ONLINE*, June 21, 2006,

[http://www.catholic.org/national/national\\_story.php?id=20275](http://www.catholic.org/national/national_story.php?id=20275) (arguing that enough progress is being made with adult stem cell research so as to make embryonic stem cell research unnecessary); Mark Hodges, *Destructive Embryonic Stem Cell Research*, *ORTHODOX RES. INST.*,



First, as previously mentioned, adult stem cells and adult stem cell lines are not perpetually self-sustaining.<sup>57</sup> This limits scientists' ability to continue investigating the cell with a unique genetic composition because after the propagation ceases, no more cells with that particular genetic composition are available. Second, unlike embryonic stem cells, adult stem cells cannot develop into *any* type of tissue and are instead limited to certain biological pathways.<sup>58</sup> This presents a problem because not all adult tissues have stem cells. For instance, there are no adult pancreatic  $\beta$ -cell<sup>59</sup> stem cells.<sup>60</sup> Thus, if  $\beta$ -cells die (as in juvenile diabetes),<sup>61</sup> there are no adult stem cells available to replace the dead cells. As a result, for juvenile diabetes, embryonic stem cell research presents the best hope.<sup>62</sup>

In short, it should be understood that adult stem cell research presents us with multiple opportunities for treating disease, improving the understanding of cellular functions, and generally increasing knowledge.<sup>63</sup> At the same time, in no way is adult stem cell research a substitute for embryonic stem cell research.<sup>64</sup> Nor is embryonic

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[http://www.orthodoxresearchinstitute.org/articles/ethics/hodges\\_stem\\_cell\\_research.htm](http://www.orthodoxresearchinstitute.org/articles/ethics/hodges_stem_cell_research.htm) (arguing that alternatives to embryonic stem cells exist).

57. See *supra* text accompanying notes 50–51.

58. NAT'L INSTS. OF HEALTH, STEM CELLS: SCIENTIFIC PROGRESS AND FUTURE RESEARCH DIRECTIONS 23 (2001),

<http://stemcells.nih.gov/staticresources/info/scireport/PDFs/fullrptstem.pdf> (“Such [adult stem] cells are usually regarded as ‘committed’ to differentiating along a particular cellular development pathway . . .”). Note, however, that recently some adult stem cells have been shown to have limited “plasticity,” that is, the ability to differentiate into cells of different types. See *id.* at 28–37.

59.  $\beta$ -cells are insulin-producing cells in the pancreas. See generally George F. Cahill, Jr., *Diabetes Mellitus*, in CECIL TEXTBOOK OF MEDICINE 1969, 1972 (Paul B. Beeson, Walsh McDermott & James B. Wyngaarden eds., 15th ed. 1979) (discussing function of pancreatic  $\beta$ -cells).

60. Yuval Dor, Juliana Brown, Olga I. Martinez & Douglas A. Melton, *Adult Pancreatic  $\beta$ -Cells Are Formed by Self-Duplication Rather Than Stem-Cell Differentiation*, 429 NATURE 41, 41 (2004). More specifically, while there are  $\beta$ -cells, these cells are not replaced by differentiation from stem cells, but by replication through mitosis. When  $\beta$ -cells die, however, as they do during diabetes, then there are no stem cells to replace the dead cells. *Id.*

61. See Debra Haire-Joshu, Karen Flavin & William Clutter, *Contrasting Type I and Type II Diabetes*, 86 AM. J. NURSING 1240, 1240 (1986).

62. See *ES Cell International and Juvenile Diabetes Research Foundation Collaborate to Develop Clinically Useful Human Embryonic Stem Cells*, BIORESEARCH ONLINE, Sept. 17, 2004, <http://www.bioresearchonline.com/article.mvc/ES-Cell-International-And-Juvenile-Diabetes-R-0001> (“As a result of past research funded by the JDRF [Juvenile Diabetes Research Foundation], it has been determined that the transplantation of insulin-producing islet cells currently offers the best hope for a cure for people with Type 1 diabetes.”).

63. See, e.g., David A. Prentice, *Adult Stem Cells*, 19 ISSUES L. & MED. 265, 265 (2004) (discussing various types of “adult stem cells, including current and potential clinical applications”).

64. See, e.g., JUVENILE DIABETES RESEARCH FOUND. INT'L, ADULT STEM CELLS CANNOT SUBSTITUTE FOR EMBRYONIC STEM CELLS (2005), [http://www.jdrf.org/files/legislative\\_action/2005\\_Stem\\_Cell\\_Facts\\_Sheets/5.AdultLimitations.pdf](http://www.jdrf.org/files/legislative_action/2005_Stem_Cell_Facts_Sheets/5.AdultLimitations.pdf).

stem cell research a substitute for adult stem cell research. The two fields are complementary and should be explored in tandem.<sup>65</sup>

## II. THE SCIENCE AND METHODS OF EMBRYO PRODUCTION AND STEM CELL HARVESTING

At this point, it is useful to discuss—at least in general terms—the procedures for creating and storing the embryos that serve as a source for a variety of stem cells. Because most stem cells are derived from the embryos created *in vitro*, in order to understand the ethical issues attendant to experimenting with these embryos, it is helpful to understand what that process entails. To that end, this Part will first discuss the process of creating and storing embryos, and then focus on the means of extracting stem cells from said embryos.

### A. Creation of Embryos in a Laboratory Environment: The IVF Process

The first step in creating an embryo *in vitro* (after initial testing to make sure that the patient is a good candidate for IVF)<sup>66</sup> is obtaining the two cells that make an embryo—that is, a sperm and an ovum.<sup>67</sup> Little needs to be said about extraction of sperm.<sup>68</sup> Ova extraction, on the other hand, is significantly more burdensome, complicated, and risky.

Generally speaking, the IVF process involves three types of drugs, all designed to regulate a woman's hormonal levels.<sup>69</sup> The oocyte extraction is a minor surgical procedure, usually performed on an outpatient basis.<sup>70</sup> The procedure involves ultrasound guided needle retrieval performed under local anesthesia.<sup>71</sup> However, sometimes a more invasive laparoscopic procedure is required.<sup>72</sup> Usually between eight

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65. See, e.g., AUSTL. STEM CELL CENTRE, RESEARCH PROJECTS & PROGRAMS, [http://www.stemcellcentre.edu.au/research-development\\_research-projects-programs\\_programs.aspx](http://www.stemcellcentre.edu.au/research-development_research-projects-programs_programs.aspx) (describing how research in both fields is necessary for complete understanding of cellular and molecular function).

66. See AM. SOC'Y FOR REPROD. MED., ASSISTED REPRODUCTIVE TECHNOLOGIES: A GUIDE FOR PATIENTS 14–15 (2007), available at <http://www.asrm.org/Patients/patientbooklets/ART.pdf> [hereinafter ART GUIDE].

67. See PRENATAL FORM: UNIT 1, *supra* note 28.

68. Of course, sperm extraction is not always as straightforward as it may seem at first blush. For example, there have been reported instances of surgically extracting sperm from dead males. See Charles Arthur, *Woman Is Pregnant by Sperm of Dead Man*, INDEPENDENT (London), July 16, 1998, available at [http://findarticles.com/p/articles/mi\\_qn4158/is\\_19980716/ai\\_n14178686](http://findarticles.com/p/articles/mi_qn4158/is_19980716/ai_n14178686). However, such esoteric methods are not the norm and are beyond the scope of this Article.

69. Advanced Fertility Ctr. of Chi., Ovarian Stimulation Details and Medication Protocols for IVF, <http://www.advancedfertility.com/ivfstim.htm>. During the treatment, the woman undergoes blood and ultrasound testing to determine the level of hormones in the blood and to monitor follicle development. See ART GUIDE, *supra* note 66, at 6.

70. See ART GUIDE, *supra* note 66, at 6.

71. See *id.* at 6–7.

72. See *id.* at 7.

and fifteen eggs are retrieved per procedure.<sup>73</sup> The extracted eggs are then fertilized by mixing them with sperm under the right laboratory conditions.<sup>74</sup> Between forty percent and seventy percent of the retrieved oocytes undergo fertilization successfully.<sup>75</sup> Eggs that are successfully fertilized are then implanted, stored, or discarded.<sup>76</sup> The transfer procedure usually involves injecting embryos—suspended in proper culture media—into the uterus with the help of a catheter and a syringe.<sup>77</sup>

The oocyte retrieval procedure poses certain risks. In addition to risks associated with every surgical procedure (such as infection, adverse reaction to anesthesia, etc.),<sup>78</sup> there are risks stemming from the hormonal treatment. The primary risk from hormonal stimulation is ovarian hyperstimulation syndrome (OHSS).<sup>79</sup> In fact, at least a third of IVF patients suffer from a mild form of OHSS.<sup>80</sup> Mild OHSS is easily treatable with painkillers and a temporary reduction in activity.<sup>81</sup> However, a small percentage of women develop severe forms of OHSS, which include “excessive weight gain, fluid accumulation in the abdomen and chest, electrolyte abnormalities, over-concentration of the blood, and rarely the development of blood clots, [or] kidney failure . . . .”<sup>82</sup> In a small percentage of cases, severe OHSS can be fatal.<sup>83</sup>

It must be understood that the embryos created via the just-described protocol can be initially created for the purpose of producing a viable pregnancy or for the express purpose of scientific experimentation.<sup>84</sup> This difference in motivation for the creation of the embryo is, in my view, critical, and it will be discussed in Part V.A. However, at this stage, it is sufficient to understand that the same IVF process is used to create embryos that are initially intended for pregnancy and to create those initially intended for research.

### *B. The Fate of Laboratory-Created Embryos*

As explained in the preceding section, a number of ova are extracted at each given cycle<sup>85</sup> (unlike a single ovum that would be released during a regular monthly female cycle).<sup>86</sup> Postfertilization, some of these fertilized eggs are transferred into the

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73. SOC’Y FOR ASSISTED REPROD. TECH., ART: STEP-BY-STEP GUIDE, [http://www.sart.org/Guide\\_ARTStepByStepGuide.html](http://www.sart.org/Guide_ARTStepByStepGuide.html) [hereinafter ART: STEP-BY-STEP].

74. See ART GUIDE, *supra* note 66, at 7.

75. See ART GUIDE, *supra* note 66, at 8; ART STEP-BY-STEP, *supra* note 73.

76. See *infra* text accompanying notes 85–91.

77. See ART GUIDE, *supra* note 66, at 9.

78. *Id.* at 13.

79. *Id.* at 12.

80. *Id.*

81. *Id.*

82. *Id.* at 13.

83. See generally Alison D. Cluroe & Beth J. Synek, *A Fatal Case of Ovarian Hyperstimulation Syndrome with Cerebral Infarction*, 27 *PATHOLOGY* 344 (1995); Annick Delvigne & Serge Rozenberg, *Epidemiology and Prevention of Ovarian Hyperstimulation Syndrome (OHSS): A Review*, 8 *HUM. REPROD. UPDATE* 559 (2002).

84. See NBAC, *supra* note 31, at 55 (discussing creating embryos strictly for the purposes of research via IVF procedures).

85. See ART: STEP-BY-STEP, *supra* note 73.

86. See DELTHIA RICKS & LLOYD B. GREIG, 100 QUESTIONS & ANSWERS ABOUT

woman's uterus<sup>87</sup> with the hope that at least some of the transferred eggs will implant and develop into a fetus, eventually resulting in a birth of a child. Though as many as eight to fifteen eggs may be harvested per cycle<sup>88</sup>—of which about seventy percent are successfully fertilized<sup>89</sup>—generally no more than four embryos are transferred for implantation.<sup>90</sup> This, of course, results in a surplus of embryos—that is, embryos that are created but not implanted. Some of these “surplus embryos” are either discarded or cryogenically preserved.<sup>91</sup> Other embryos, due to a variety of abnormalities, cannot successfully develop and stop the cellular division.<sup>92</sup> These embryos can never be implanted and must be discarded.<sup>93</sup>

The remaining normal embryos that are not implanted are usually frozen<sup>94</sup> because there is no guarantee that the transferred fertilized eggs will implant successfully<sup>95</sup> or, even if they will, that the pregnancy will end in a favorable outcome.<sup>96</sup> In fact, only 27.7% of IVF treatments result in live births.<sup>97</sup> Thus, most of these surplus embryos are stored for subsequent rounds of embryo transfer.<sup>98</sup> The embryos are generally frozen at the two- to eight-cell stage.<sup>99</sup>

The stored embryos are kept under very specific physical conditions, with temperature, culture media, and other factors being tightly controlled. The precise protocol is highly technical and is beyond the scope of this Article, but its main features are as follows. The embryos are first placed in a culture medium which contains some nutrients and building blocks necessary for embryo survival.<sup>100</sup> After embryos are properly cultured, those slated for storage are transferred sequentially to

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HYSTERECTOMY 59 (2007).

87. See ART GUIDE, *supra* note 66, at 9.

88. See ART: STEP-BY-STEP, *supra* note 73.

89. See ART GUIDE, *supra* note 66, at 8; ART: STEP-BY-STEP, *supra* note 73.

90. Less than seven percent of all cycles transfer more than four embryos (6.7%) and a vast majority of cycles involve transfers of two (39.4%) or three (31.8%) embryos. U.S. DEPT. OF HEALTH & HUMAN SERVS., CTRS. FOR DISEASE CONTROL & PREVENTION, 2004 ASSISTED REPRODUCTIVE TECHNOLOGY SUCCESS RATES: NATIONAL SUMMARY AND FERTILITY CLINIC REPORTS 41 (2006) [hereinafter CDC REPORT].

91. See NBAC, *supra* note 31, at 17 (“When the zygote has reached the four- to eight-cell stage, between three and six zygotes are transferred to the uterus, and the untransferred embryos, if they are developing normally, are usually frozen. Nonviable embryos are discarded.”).

92. See Donald W. Landry & Howard A. Zucker, *Embryonic Death and the Creation of Human Embryonic Stem Cells*, 114 J. CLINICAL INVESTIGATION 1184, 1185 (2004).

93. See *id.*

94. See NBAC, *supra* note 31, at 17 (“Embryos that are not transferred can be cryopreserved and stored indefinitely.”).

95. See CDC REPORT, *supra* note 90, at 20 fig.8 (stating that 65.6% of all cycles failed to result in a pregnancy).

96. See *id.* at 21 fig.9 (noting that only 82.1% of all pregnancies resulted in a live birth).

97. *Id.* at 19 fig.7. The percentage is slightly higher, though still underwhelming, if one excludes women who started the IVF treatment, but whose eggs could not be collected. Using that formula, the live birth rate is 31.6% per retrieval procedure.

98. See NBAC, *supra* note 31, at 17.

99. John A. Robertson, *In the Beginning: The Legal Status of Early Embryos*, 76 VA. L. REV. 437, 443 (1990); see also NBAC, *supra* note 31, at 17.

100. See generally David K. Gardner & Michelle Lane, *Culture Systems for the Human Embryo*, in TEXTBOOK OF ASSISTED REPRODUCTIVE TECHNOLOGIES: LABORATORY AND CLINICAL PERSPECTIVES 211, 211–34 (David K. Gardner, Ariel Weissman, Colin M. Howles & Zeev Shoham eds., 2d ed. 2004) [hereinafter TEXTBOOK OF ART].

various freezing solutions and are cooled.<sup>101</sup> The vials with the proper culture media and freezing solutions are stored at  $-196^{\circ}\text{C}$  ( $-321^{\circ}\text{F}$ ).<sup>102</sup> The nitrogen in the storage container needs to be regularly “topped up” due to evaporation.<sup>103</sup> Failure to top up the tanks can result in the temperature rising above the level necessary to protect the embryos—therefore causing the destruction of the embryos.<sup>104</sup>

As can be seen, the conditions for embryo storage are quite detailed and precise. Deviation from these conditions is likely to result in deterioration of the embryo and its demise.<sup>105</sup>

### C. Harvesting the Stem Cells from Embryos

#### 1. Traditional Extraction Method

The most widely used method for extracting stem cells from embryos was described by Dr. James Thomson in 1998.<sup>106</sup> The procedure involves culturing the embryos to the blastocyst stage.<sup>107</sup> The throphoblast cells are then removed from the rest of the embryo by the aid of immunosurgery.<sup>108</sup> Recall that trophoblast, in a normal embryo, is responsible for giving rise to the placenta, and without trophoblast cells, no placenta can form—thus precluding growth and development of the fetus.<sup>109</sup> Consequently, removal of the trophoblast cells dooms the embryo, even if subsequent steps do not damage the remainder of said embryo.

After separating the throphoblast from the ICM,<sup>110</sup> ICM cells are cultured in an appropriate media for a period of several days to weeks.<sup>111</sup> The cells are then removed

101. Lucinda L. Veeck, Rosemary Barrios, Richard Bodine, Robert N. Clarke & Nikica Zaninovic, *Slow Freezing of Human Embryos*, in TEXTBOOK OF ART, *supra* note 100, at 267, 269.

102. Harvard Safety Comm., Information Specific to Liquid Nitrogen, <http://www-safety.deas.harvard.edu/services/nitrogen.html> (stating that the boiling point of liquid nitrogen at 1 atm is  $-345.0^{\circ}\text{F}$  ( $-195.8^{\circ}\text{C}$ ,  $77^{\circ}\text{K}$ )).

103. See Phillip Matson, Denise Mehmet & Tinka Mehta, *Managing the Cryopreserved Embryo Bank*, in TEXTBOOK OF ART, *supra* note 100, at 291, 293.

104. *See id.*

105. *See id.*

106. See James A. Thomson, Joseph Itskovitz-Eldor, Sander S. Shapiro, Michelle A. Waknitz, Jennifer J. Swiergiel, Vivienne S. Marshall & Jeffrey M. Jones, *Embryonic Stem Cell Lines Derived from Human Blastocysts*, 282 SCIENCE 1145, 1145–47 (1998).

107. *Id.* at 1145.

108. *Id.* at 1147 n.6. Immunosurgery is a process that involves labeling certain tissues with antibodies, which in turn are tagged with material that can fluoresce under the right conditions. Then the material that fluoresces or “lights up” can be excised. *See generally* Davor Solter & Barbara B. Knowles, *Immunosurgery of Mouse Blastocyst*, 72 PROC. NAT’L ACAD. SCI. U.S. 5099 (1975) (describing the process).

109. *See supra* notes 37–40 and accompanying text.

110. Dr. Thomson used the same protocol for human stem cell extraction as the one he previously used for nonhuman primate stem cell extraction. *See* Thomson et al., *supra* note 106, at 1145. The protocol is described in James A. Thomson, Jennifer Kalishman, Thaddeus G. Golos, Maureen Durning, Charles P. Harris, Robert A. Becker & John P. Hearn, *Isolation of a Primate Embryonic Stem Cell Line*, 92 PROC. NAT’L ACAD. SCI. U.S. 7844, 7844 (1995) [hereinafter Thomson et al., *Primate Stem Cells*].

111. The initial Thomson protocol for rhesus monkeys called for sixteen days. *See* Thomson

from the culture and are mechanically disassociated from one another via a micropipette.<sup>112</sup> Thus, the procedure results in literally separating the embryo into individual cells.<sup>113</sup> In addition to the trophoblast removal, the disaggregation ensures the death of the embryo. The individual ICM cells are then further cultured on appropriate media and in appropriate conditions, with each cell giving rise to a colony of cells sharing the same characteristics with the original cell.<sup>114</sup> Colonies of cells with favorable characteristics are then isolated and propagated.<sup>115</sup> These lines are capable of prolonged undifferentiated proliferation,<sup>116</sup> but they retain the ability to differentiate into a variety of human tissues.<sup>117</sup> The undifferentiated cells can then be given appropriate chemical signals that will cause them to differentiate into a particular type of somatic cell (for example, a muscle cell, a blood cell, etc.).

## 2. Extraction from Non-Viable Embryos

Up to two-thirds of embryos that are fertilized are not viable.<sup>118</sup> Additionally, some of the thawed embryos are unable to divide.<sup>119</sup> Because these embryos will never be biologically able to develop into adults (even if the parents wished to implant them and carry them to term) they are usually discarded as being incapable of carrying out their original reproductive function.<sup>120</sup> A proposal has been made to classify such embryos as “dead” and use them as a source of stem cells.<sup>121</sup> These embryos can be used despite their biological abnormalities because some of them are “mosaic,” that is, they have a combination of both abnormal cells that prevent further development and normal cells that could be used for research.<sup>122</sup>

The procedure for extracting cells out of these embryos is the same as the one outlined in Part II.C.1.<sup>123</sup>

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et al., *Primate Stem Cells*, *supra* note 110, at 7844. As previously mentioned, Thomson used the same protocol for human embryos. *See supra* note 110 and accompanying text.

112. Thomson et al., *Primate Stem Cells*, *supra* note 110, at 7845.

113. *See id.*

114. *See id.*

115. *See id.*

116. *See id.* at 7848.

117. *See id.*

118. *See Landry & Zucker, supra* note 92, at 1185 (“Approximately 60% of IVF embryos fail to meet criteria for viability and are rejected for uterine transfer.”).

119. *See H. Laverge, J. Van der Elst, P. De Sutter, M. R. Verschraegen-Spae, A. De Paepe & M. Dhont, Fluorescent In-Situ Hybridization on Human Embryos Showing Cleavage Arrest After Freezing and Thawing*, 13 HUM. REPROD. 425, 426–27 (1998) (stating that sixty-one out of eighty-five embryos that survived the thawing process showed no signs of further cellular cleavage).

120. *See* PRESIDENT’S COUNCIL ON BIOETHICS, ALTERNATIVE SOURCES OF HUMAN PLURIPOTENT STEM CELLS 9 (2005) (“The vast majority of these arrested embryos do not resume cell division, never form blastocysts, and are incapable of successfully implanting in the uterus.”) [hereinafter ALTERNATIVE SOURCES].

121. *See id.* at 8–23

122. *Id.* at 9. Additionally, abnormal cells could be used to study how specific genetic abnormalities affect cellular processes. *Id.* at 20.

123. *See supra* text accompanying notes 106–17. *See generally Landry & Zucker, supra* note 92, at 1184, for a description of the process for extraction of cells that is identical to the one previously described. *See supra* text accompanying notes 110–15.

### 3. Potential Alternative Methods

As mentioned in the Introduction, two groups of scientists discovered a method of creating embryonic stem cells without using embryos at all in late 2007.<sup>124</sup> The exact process is too complicated to discuss within the confines of this Article, but at its core, the method involves infecting an adult cell with a virus, which in turn activates certain genes within the cell—causing it to shed the characteristics of a terminal adult cell and, instead, to begin expressing characteristics of an embryonic cell.<sup>125</sup> The method is promising, but at the current stage it is problematic because a side effect of infecting the adult cell with a virus is the expression of the virus's own genes. Expression of the virus's genes causes the infected cell to take on cancerous characteristics.<sup>126</sup> Until scientists can figure out a way to turn on the genes responsible for “reprogramming” the cell back into an embryonic stage without infecting it with a virus, this method does not have therapeutic utility.<sup>127</sup>

Another new procedure that has been recently developed is preimplantation genetic diagnosis (PGD).<sup>128</sup> This procedure allows for the genetic testing of the embryos prior to implantation. Under PGD, a single blastomere<sup>129</sup> is extracted from the embryo at the six- to eight-cell stage.<sup>130</sup> Recall that at this stage, all of the cells are identical<sup>131</sup> and thus are ideal for testing for any potential abnormality. The cells are also totipotent,<sup>132</sup> which means that they can give rise to any human cell if they are given the proper chemical signals. Reports show that over 1000 children have been carried to term and born with no abnormalities from embryos that have had a single blastomere extracted.<sup>133</sup> There are, however, no long-term studies on the safety of this procedure.<sup>134</sup> The combined success of the animal-based models and PGD does provide hope that, in the future, it will be equally possible to extract a single human blastomere (without damaging the embryo) and to grow that single blastomere into viable stem cell lines.

Should this method prove successful, it may obviate the need to destroy an embryo in order to derive embryonic stem cells.<sup>135</sup> At the same time, even if successful (and ultimately harmless, which is a question yet to be answered), this method still raises several ethical issues—the most glaring of which is the issue of human experimentation

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124. *See supra* notes 1–8 and accompanying text.

125. *See supra* text accompanying note 7.

126. *See* Vogel & Holden, *supra* note 6, at 1225.

127. *See id.*

128. *See* ALTERNATIVE SOURCES, *supra* note 120, at 24.

129. *See supra* text accompanying note 31.

130. ALTERNATIVE SOURCES, *supra* note 120, at 24.

131. *See supra* note 32.

132. *See supra* text accompanying notes 31–32.

133. ALTERNATIVE SOURCES, *supra* note 120, at 24–25.

134. *Id.* at 25.

135. *See* ALTERNATIVE SOURCES, *supra* note 120, at 25 (referencing Strelchenko studies and discussing how this study may lead to the ability to obtain embryonic stem cells without destroying an embryo). *See generally* Nick Strelchenko, Oleg Verlinsky, Valeri Kukharenko & Yury Verlinsky, *Morula-Derived Human Embryonic Stem Cells*, 9 REPROD. BIOMEDICINE ONLINE 623 (2004) (discussing complete disaggregation of the embryo).

without the subject's informed consent. The ethical approach proposed below, however, avoids this problem, and though allowing for the destruction of the embryo, constitutes—in my view—a sounder approach.

### III. FIRST PRINCIPLES: THE RIGHT TO REPRODUCE AND THE RIGHT TO CREATE EMBRYOS *IN VITRO*

If, as I conceded, newly created embryos are fully human, prior to deciding whether or not the parents can consent to letting an embryo die, one must discuss whether the parents have moral authority to create these embryos—knowing full well that at least some of them are slated to die. If the very creation of surplus embryos is morally impermissible, then the question of whether parents can consent to withdrawing the embryos from the cryogenic tanks and to letting them die becomes moot. It is my position, for reasons explained immediately below, that parents do have a moral right to create surplus embryos.

#### *A. The Right to Procreate*

The right to reproduce is perhaps one of the most fundamental rights of man. As Justice Douglas noted in *Skinner v. Oklahoma ex rel. Williamson*,<sup>136</sup> that right is “fundamental to the very existence and survival of the race.”<sup>137</sup> The existence of this right can be traced back to biblical times. Indeed, the very first biblical commandment is “[b]e fruitful and multiply.”<sup>138</sup> The biblical tradition holds the right to be so fundamental that it permitted and encouraged taking another wife to fulfill it.<sup>139</sup> Not only is this a right of ancient lineage, but it is also almost universally recognized. For example, the United Nations Universal Declaration of Human Rights proclaims that “[m]en and women of full age . . . have the right to marry and to found a family.”<sup>140</sup> The United Nations International Covenant on Civil and Political Rights<sup>141</sup> and the European Convention on Human Rights<sup>142</sup> also adhere to this view. Nor is this only a Western view. The Cairo Declaration on Human Rights in Islam<sup>143</sup> adopted in response

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136. 316 U.S. 535 (1942).

137. *Id.* at 541.

138. *Genesis* 1:28 (King James).

139. *See id.* at 16:1–3.

140. Universal Declaration of Human Rights, G.A. Res. 217A, at 74, U.N. GAOR, 3d Sess., 1st plen. mtg., U.N. Doc. A/810 (Dec. 12, 1948).

141. International Covenant on Civil and Political Rights, art. 23(2), *opened for signature* Dec. 16, 1966, 999 U.N.T.S. 171 (“The right of men and women of marriageable age to marry and to found a family shall be recognized.”). The United States is a signatory to this covenant and has ratified it, but with some reservations. *See* 138 CONG. REC. S4781–84 (daily ed. Apr. 2, 1992).

142. Convention for the Protection of Human Rights and Fundamental Freedoms art. 12, Nov. 4, 1950, 213 U.N.T.S. 222 (“Men and women of marriageable age have the right to marry and to found a family. . . .”).

143. World Conference on Human Rights, Apr. 19–May 7, 1993, *Cairo Declaration on Human Rights in Islam*, U.N. Doc. A/CONF.157/PC/62/Add.18 (June 9, 1993), available at <http://www1.umn.edu/humanrts/instree/cairodeclaration.html> [hereinafter *Cairo Declaration*].



to the Universal Declaration of Human Rights<sup>144</sup> states that “[t]he family is the foundation of society . . . .”<sup>145</sup>

As Justice Dorner of the Supreme Court of Israel pointed out,

In human society, one of the strongest expressions of an aspiration without which many will not regard themselves as free in the fullest sense of the word is the aspiration to parenthood. We are not speaking merely of a natural-biological need. We are speaking of a freedom which, in human society, symbolizes the uniqueness of man.<sup>146</sup>

There is good reason for being so solicitous of the right to procreate. “The moral right to reproduce is respected because of the centrality of reproduction to personal identity, meaning, and dignity.”<sup>147</sup> Indeed, the very reason that more and more people resort to assisted reproductive technologies is testament to the fact that many of these individuals view their lives as incomplete and of lesser value without children of their own.<sup>148</sup> While the concepts of “personal identity and meaning” may not be a sound basis for constitutional adjudication,<sup>149</sup> they do serve as a basis of defining moral rights.<sup>150</sup>

This is not to say that the right to procreate is absolute and can never be limited. Like any other right, the right to reproduce must occasionally give way to competing rights and demands.<sup>151</sup> However, absent these specialized circumstances, individuals and couples have a moral right to procreate.

144. Some Muslim countries objected to the Universal Declaration on Human Rights on the basis that, in part, it was not compatible with Sharia. The Cairo Declaration was adopted in response to such concerns. David Littman, *Universal Human Rights and “Human Rights in Islam,”* MIDSTREAM, Feb.–Mar. 1999, at 2, available at [http://www.dhimmitude.org/archive/universal\\_islam.html](http://www.dhimmitude.org/archive/universal_islam.html).

145. *Cairo Declaration*, *supra* note 143, at art. 5(a).

146. CA 2401/95 Nahmani v. Nahmani [1996] IsrSC 50(4) 1, 62 (opinion of Dorner, J.), available at [http://elyon1.court.gov.il/Files\\_ENG/95/010/024/z01/95024010.z01.pdf](http://elyon1.court.gov.il/Files_ENG/95/010/024/z01/95024010.z01.pdf).

147. JOHN A. ROBERTSON, CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES 30 (1994).

148. I do not mean to suggest that people who voluntarily choose to forgo having children have somehow diminished their lives’ value or made a wrong choice. Rather, I am making an observation that many people who want children view reproduction as central to their life. Such a view of one’s own life should in no way be construed as passing judgment on the reproductive decisions and lives of others.

149. *See, e.g.*, *Lawrence v. Texas*, 539 U.S. 558, 588 (2003) (Scalia, J., dissenting) (criticizing “sweet-mystery-of-life” as basis for constitutional adjudication); *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833, 980 (1992) (Scalia, J., concurring in part and dissenting in part) (rejecting the “concept of existence, of meaning, of the universe, and of the mystery of human life” as a basis for constitutional adjudication).

150. *See generally* Christine M. Korsgaard, *Personal Identity and the Unity of Agency: A Kantian Response to Parfit*, 18 PHIL. & PUB. AFF. 101 (1989) (discussing the importance of the concept of “self” to a moral philosophy).

151. *See, e.g.*, *Gerber v. Hickman*, 291 F.3d 617, 623 (9th Cir. 2002) (en banc) (holding that prison inmates lose their right to reproduce); *State v. Oakley*, 629 N.W.2d 200, 201–02 (Wis. 2001) (upholding a condition of probation requiring a “deadbeat” to avoid having another child).

*B. The Right to Effective IVF Treatment*

The next question is whether, given the right to procreate, individuals who are unable to realize that right by “traditional” means have a right to resort to scientific interventions. Professor John Robertson, in his book *Children of Choice*, argues that the right to artificially assisted reproduction is just as unlimited, ethically privileged, and constitutionally protected as a right to procreate the old-fashioned way.<sup>152</sup> While I do not agree with the entirety of Professor Robertson’s argument, much of its logic is compelling.

Artificial insemination—and other assisted reproductive technologies (ART)—are primarily used by couples that are unable to conceive on their own, but wish to fulfill their desire to have children nonetheless.<sup>153</sup> And if there is an available medical procedure that will “cure,” or at least alleviate, the physical shortcoming of an infertile couple, the couple’s right to access that procedure is no less than a right to access any other medical treatment which would allow for an ability to live a full life. There is no principled distinction between infertility treatment that involves corrective surgery<sup>154</sup> or fertility drugs<sup>155</sup> followed by coital conception and surgery plus drugs followed by noncoital conception.<sup>156</sup> All of the procedures involve intervention into and fiddling with human reproductive organs and cycles, and there is little moral difference between these various procedures.<sup>157</sup>

If there is a right to attempt pregnancy with the help of ART,<sup>158</sup> then the right must be meaningful and not merely ephemeral. Unfortunately, present-day science has not

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152. ROBERTSON, *supra* note 147, at 29–42.

153. To be sure, there may be couples (or individuals) who are perfectly capable of reproducing *in vivo*, but who utilize ART for other ends, such as creating “designer babies.” See, e.g., Lisa Belkin, *The Made-to-Order Savior*, N.Y. TIMES, July 1, 2001, § 6 (Magazine), at 36. This use of ART raises a number of ethical questions that are best left for another article. However, the majority of ART patients resort to the procedure for the simple reason that they cannot conceive. See WORLD MED. ASS’N, THE WORLD MEDICAL ASSOCIATION STATEMENT ON ASSISTED REPRODUCTIVE TECHNOLOGIES (2006), <http://www.wma.net/e/policy/r3.htm> (“Assisted reproductive technology encompasses a wide range of techniques designed primarily to aid couples unable to conceive without medical assistance.”).

154. See Judith Randal, *Trying to Outsmart Infertility*, FDA CONSUMER, May 1991, at 22, 25, available at <http://www.enotalone.com/article/7877.html> (“Surgery is another tool often used to treat infertility in both men and women.”).

155. See *id.* at 24 (“When blood and urine tests of an infertility workup suggest some sort of hormone imbalance in one or both partners, corrective therapy with so-called fertility drugs is frequently prescribed.”).

156. See *supra* text accompanying notes 66–83.

157. There may be objections to noncoital reproduction for various religious reasons. For instance, the Catholic Church rejects IVF on the grounds the technique “infringe[s] the child’s right to be born of a father and mother known to him and bound to each other by marriage. [It] betray[s] the spouses’ ‘right to become a father and a mother only through each other.’” CATECHISM OF THE CATHOLIC CHURCH § 2376 (U.S. Catholic Conference, Inc. trans., 1994) (internal quotations omitted). This objection, however, is made on purely theological grounds and, as such, is not susceptible to a rational analysis. Leaving theology aside, in my view, there is no principled distinction between assisted coital and assisted noncoital reproduction.

158. I do not mean to imply that there is any sort of positive right to access ART, much like

found a way to achieve a high rate of success with IVF. According to the Centers for Disease Control, only about twenty-seven percent of all ART cycles using fresh (i.e., nonfrozen) eggs or embryos resulted in live births.<sup>159</sup> Thus, in order for IVF treatment to be successful, quite often multiple attempts at egg retrieval, fertilization, and implantation are needed.<sup>160</sup> At the same time, ART procedures are not without risk to the woman.<sup>161</sup> Thus, to give women a meaningful chance of success at IVF while minimizing the risks, multiple ova must be retrieved per cycle. Once oocytes are retrieved, they must either be fertilized or cryogenically stored. The problem is that the rate of successful pregnancy with frozen ova is only two to three percent,<sup>162</sup> as opposed to eight percent with frozen embryos.<sup>163</sup> Thus, eliminating the option to create and freeze embryos would be tantamount to preventing some couples from having children. This contention is borne out by empirical data. In 2004, Italy enacted a law prohibiting the creation of more than three embryos per ART cycle and mandating that all embryos created be implanted.<sup>164</sup> As a result of this law, the success rate for IVF in Italian clinics has significantly decreased, especially when measured on a cumulative basis.<sup>165</sup> Thus, the practical effect of such a limitation is to leave some couples childless.

It is, of course, true that for a medical procedure to be ethically permissible, it cannot be injurious to the health or well-being of a nonconsenting third party.<sup>166</sup> Thus, if the IVF treatment—as it is currently practiced—harms the third party (the embryo), then its morality may be questionable. I am, however, not convinced that such a showing can be made.

Suppose a couple knows that they can conceive through regular sexual intercourse, but that because of anatomical abnormalities in the female partner, the embryo will be highly unlikely to implant or, alternatively, highly unlikely to gestate to term. Yet, the couple wishes to try to have a child. If the fact that birth is impossible (or highly unlikely) makes conception morally problematic, then it follows that this hypothetical couple would be morally prohibited from having sex to try to have children. (Incidentally, under that logic, they would be morally prohibited from using IVF as well, thus leaving them in a childless, sexless relationship.) This sort of restriction

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there is no positive right to have sexual intercourse (i.e., much like one does not have a right to be provided with a sexual partner, one does not have a right to be provided with ART). Rather, I am arguing that there is a moral right to be free from interference when one attempts to treat her own infertility by resorting to ART.

159. See CDC REPORT, *supra* note 90, at 19.

160. See Sharon Hoffman, *Unmanaged Care: Towards Moral Fairness in Health Care Coverage*, 78 IND. L.J. 659, 694 (2003) (“[O]ften, multiple cycles are needed for a successful pregnancy. . . .”).

161. See *supra* text accompanying notes 77–82.

162. See *infra* text accompanying note 327.

163. See *infra* note 251 and accompanying text.

164. Law No. 40, Feb. 19, 2004, Gazz. Uff. No. 45, Feb. 24, 2004.

165. See G. Ragini, A. Allegra, P. Anserini, F. Causio, A. P. Ferraretti, E. Greco, R. Palermo & E. Somigliana, *The 2004 Italian Legislation Regulating Assisted Reproduction Technology: A Multicentre Survey on the Results of IVF Cycles*, 20 HUM. REPROD. 2224, 2227 (2005).

166. This rule stems from two principles of medical ethics: the “no harm” principle and the “autonomy” principle. See Mark A. Hall, *Rationing Health Care at the Bedside*, 69 N.Y.U. L. REV. 693, 727 (1994) (“Medical ethics is dominated by two branches of analysis that are encapsulated in the twin principles of beneficence and autonomy.”).

would run counter to a moral right to “found a family”<sup>167</sup> and a moral right to procreate.<sup>168</sup> Thus, that position cannot be right. The couples attempting IVF treatment and creating extra embryos are in the same position. They know when they create the embryos that some of them are highly unlikely to be born. That fact, however, should not preclude them from attempting to “found a family.”

Additionally, the only conceivable harm that can befall an embryo postcreation is its inability to be carried to term and born. The problem with that argument is that it suggests that “meaningful” life begins at birth and not at conception. In other words, that argument rejects the very notion that an embryo’s extra-uterine existence is worthwhile in and of itself. If that notion is rejected, then it is hard to see on what basis one would object to the creation of embryos. That is, if one believes that life begins at conception and that it is endowed with all the rights of born humans, then the mere possibility that birth will not occur cannot constitute “harm.” Much like one cannot claim that it is a harm to have been born, even if born handicapped,<sup>169</sup> one cannot claim that it is a harm to be conceived, even if conception does not ultimately lead to “full life” via birth.

Because the ART treatments provide an opportunity for otherwise infertile couples to realize their right to procreate and because the treatments cannot be shown to harm a nonconsenting third party, they are morally permissible. Furthermore, because of present-day scientific limits, creation of surplus embryos is often required for successful treatment, and because this creation also cannot be shown to harm a nonconsenting third party, parents are morally permitted to create these surplus embryos.

#### IV. TERMINATING LIFE-SUPPORTING EXTRAORDINARY MEDICAL TREATMENT

Having conceded that the embryo is fully human, I now address what—if any—duties are owed to it from its parents or guardians.

##### *A. Morality of Refusal of Life-Supporting Treatment by a Competent Adult*

Today, it is almost uniformly accepted that a patient has an ethical right to control his body and to decide what treatments to accept and what treatments to forgo. The discussion is most relevant when the patient is either suffering from an incurable disease (e.g., cancer) or is in a coma or a persistent vegetative state.

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167. See *supra* text accompanying notes 139–46.

168. See *supra* Part III.A.

169. See, e.g., Michelle McEntire, *Compensating Post-Conception Prenatal Medical Malpractice While Respecting Life: A Recommendation to North Carolina Legislators*, 29 CAMPBELL L. REV. 761, 767 n.62 (2007) (listing cases that discuss the nonrecognition of the tort of “wrongful life”). Even states “that have recognized such a cause of action have not permitted general damages for the pain of experiencing life as opposed to having no life at all.” Steven R. Smith, *Disabled Newborns and the Federal Child Abuse Amendments: Tenuous Protection*, 37 HASTINGS L.J. 765, 778 n.56 (1986) (citing *Turpin v. Sortini*, 643 P.2d 954 (Cal. 1982); *Procanik v. Cillo*, 478 A.2d 755 (N.J. 1984); *Harbeson v. Parke-Davis*, 656 P.2d 483 (Wash. 1983)).

I have argued previously that a person's consent to medical procedures (and concomitant right to refuse the same) are of paramount importance,<sup>170</sup> because only when a person possesses such rights is the Kantian requirement of treating the individual as an "end" and not merely a "means" is obtained.<sup>171</sup> The notion of bodily integrity<sup>172</sup> has been firmly entrenched in American law. Tort law, an area of law traditionally thought most tied to ethics and morality,<sup>173</sup> has long recognized that treatment without consent is immoral and, therefore, battery.<sup>174</sup> While this Article is not meant to argue that refusal to accept or continue medical treatment is constitutionally protected, the long tradition of the judicially enforced requirement that medical treatment be consented to, including the admittedly more recent decisions that life-sustaining treatment must be consented to,<sup>175</sup> indicates society's moral judgment that it is morally acceptable for individuals to refuse medical treatment.

Not only has the legal profession recognized the moral right of an individual to refuse treatment—even in a life-and-death situation—but so too has the medical profession. The Council on Ethical and Judicial Affairs of the American Medical Association<sup>176</sup> opined that it is permissible for a patient to refuse medical treatment when, in his considered judgment, the treatment provides more harm than benefit.<sup>177</sup>

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170. Gregory Dolin, *A Healer or an Executioner? The Proper Role of a Psychiatrist in a Criminal Justice System*, 17 J.L. & HEALTH 169, 205–07 (2004).

171. IMMANUEL KANT, THE PHILOSOPHY OF LAW 195 (W. Hastie trans., 1887). ("For one man ought never to be dealt with merely as a means subservient to the purpose of another, nor be mixed up with the subjects of Real Right. Against such treatment his Inborn Personality has a Right to protect him, even although he may be condemned to lose his Civil Personality.")

172. The term "bodily integrity" as used here incorporates only the procedures one wishes to have performed (or not performed) on his own body, where the decision does not involve another person. Thus, abortions are not covered under this rubric precisely because the decision to undergo an abortion procedure does involve another person (assuming that one believes that fetus is a person).

173. See, e.g., Michelle Oberman, *Sex, Lies, and the Duty to Disclose*, 47 ARIZ. L. REV. 871, 930 (2005) ("[T]ort law imposes a set of background legal duties grounded in social morality or custom, regardless of a person's purposive choice." (quoting Jane E. Larson, "Women Understand So Little, They Call My Good Nature 'Deceit': A Feminist Rethinking of Seduction, 93 COLUM. L. REV. 374, 413 (1993))).

174. See *Schloendorff v. Soc'y of N.Y. Hosp.*, 105 N.E. 92, 93 (N.Y. 1914).

175. *Cruzan v. Dir., Mo. Dep't of Health*, 497 U.S. 261 (1990); *In re Quinlan*, 355 A.2d 647 (N.J. 1976).

176. "The Council on Ethical and Judicial Affairs (CEJA) develops ethics policy for the AMA. Composed of seven practicing physicians, a resident or fellow, and a medical student, the Council prepares reports that analyze and address timely ethical issues that confront physicians and the medical profession. CEJA maintains and updates the 160-year-old *AMA Code of Medical Ethics* widely recognized as the most comprehensive ethics guide for physicians who strive to practice ethically." Am. Med. Ass'n, Council on Ethical and Judicial Affairs, <http://www.ama-assn.org/ama/pub/category/4325.html>. In some states, the Code of Medical Ethics constitutes binding guidelines for physicians, and failure to observe the Code is grounds for professional discipline. See, e.g., KY. REV. STAT. ANN. § 311.597(4) (LexisNexis 2007); OHIO REV. CODE ANN. § 4731.22(B)(18) (LexisNexis Supp. 2008).

177. AM. MED. ASS'N, POLICY COMPENDIUM 86 (1997) [hereinafter POLICY COMPENDIUM] (articulating the AMA's opinion on "Withholding or Withdrawing Life-Sustaining Medical Treatment").

The American College of Physicians,<sup>178</sup> the American Osteopathic Association,<sup>179</sup> and other organizations of medical providers<sup>180</sup> have taken identical positions. In fact, this view is nearly uniform across medical professionals trained in the Western world.<sup>181</sup> In addition, this position extends beyond the Western medical profession, as demonstrated by medical practice in Malaysia.<sup>182</sup>

Just as importantly, moral acceptance of the right to withdraw from treatment has been adopted not only by secular society, but by all major religions. For example, the Roman Catholic Church accepts that “[a] person may forgo extraordinary or disproportionate means of preserving life. Disproportionate means are those that in the patient’s judgment do not offer a reasonable hope of benefit or entail an excessive burden, or impose excessive expense on the family or the community.”<sup>183</sup> Thus, while flatly prohibiting suicide (including the physician-assisted kind) and euthanasia, the Catholic Church allows the patient to decide to forgo a procedure “which is already in use but which carries a risk or is burdensome.”<sup>184</sup>

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178. Lois Snyder & Cathy Leffler, *Ethics Manual: Fifth Edition*, 142 ANNALS INTERNAL MED. 560, 568 (2005), available at <http://www.acponline.org/ethics/ethicman5th.htm> (“Withdrawing and withholding treatment are equally justifiable, ethically and legally.”). “The American College of Physicians (ACP) is the nation’s largest medical specialty society. . . . Members are physicians in general internal medicine and related subspecialties . . .” Am. Coll. of Physicians, About the American College of Physicians, <http://www.acponline.org/college/aboutacp/aboutacp.htm?hp>.

179. Am. Osteopathic Ass’n, *American Osteopathic Association’s Policy Statement on End-of-Life Care*, 107 J. AM. OSTEOPATHIC ASS’N ES32, ES32 (2007) (“Adults with decision-making capacity . . . have the legal and ethical right to make their own decisions about their end-of-life care, including the right to receive or refuse recommended life-sustaining or life-prolonging medical treatment.” (emphasis omitted)).

180. See Dana Bacon, Michael A. Williams & James Gordon, *Position Statement on Laws and Regulations Concerning Life-Sustaining Treatment, Including Artificial Nutrition and Hydration, for Patients Lacking Decision-Making Capacity*, 68 NEUROLOGY 1097, 1099 (2007) (listing various national health care societies that endorse the position that patients have a right to refuse treatment).

181. See, e.g., BRITISH MED. ASS’N, END-OF-LIFE DECISIONS 2 (2007) (“In terms of treatment refusal, the law and codes of ethical practice emphasise that adults with mental capacity can refuse medical treatment, including life-prolonging procedures.”); CAN. MED. ASS’N, CODE OF ETHICS 2 (2004) (stating physicians must “[r]espect the right of a competent patient to accept or reject any medical care recommended.”), available at <http://policybase.cma.ca/PolicyPDF/PD04-06.pdf>; ORDRE NATIONAL DES MEDECINS, CODE DE DEONTOLOGIE MEDICALE [CODE OF MEDICAL ETHICS] art. 36 (2003) (stating that the physician must respect the patient’s decision to forgo treatment).

182. MALAY. MED. ASS’N, CODE OF MEDICAL ETHICS § 2, art. 5 (2002) (“[F]utile therapy could be withheld, withdrawn or one may allow irreversible pathology to continue without active resuscitation. One should always take into consideration any advance directives and the wishes of the family in this regard.”).

183. U. S. CONFERENCE OF CATHOLIC BISHOPS, ETHICAL AND RELIGIOUS DIRECTIVES FOR CATHOLIC HEALTH CARE SERVICES (4th ed. 2001), available at <http://www.usccb.org/bishops/directives.shtml> (Directive 57) (citing Congregation for the Doctrine of the Faith, *Declaration on Euthanasia* (1980)).

184. *Id.*

Similarly, the Greek Orthodox Church views euthanasia as a “moral alienation,” . . . [but] does not expect that excessive and heroic means must be used at all costs to prolong dying.”<sup>185</sup> According to the Greek Orthodox theology, “the Church may even pray that terminally ill persons die, without insisting that they be subjected to unnecessary and extraordinary medical efforts.”<sup>186</sup> Analogous views are held by the Evangelical Lutheran Church in America,<sup>187</sup> the Church of England,<sup>188</sup> The Church of Jesus Christ of Latter-day Saints,<sup>189</sup> the National Association of Evangelicals,<sup>190</sup> and the Presbyterian Church in America,<sup>191</sup> among others.

Orthodox Judaism<sup>192</sup> also “allows patients who are near the end of life, comatose, and/or suffering from intractable pain to refuse treatment if the treatment is not proven to be effective, is clearly futile, or entails great suffering or significant complications.”<sup>193</sup> Although Orthodox Judaism does *not* view withdrawal and withholding of medical treatment as morally equivalent, there are situations and protocols that do allow treatment to be withdrawn.<sup>194</sup>

Finally, Islamic law also permits patients to refuse or discontinue treatments that are not curative but rather result in simply forestalling death for a short period of time.<sup>195</sup>

This review of various religious groups’ stands on the matter of declining life supporting treatment is not meant to either obscure the fact that there may in fact be groups (religious and secular) who take the contrary view, or to suggest that these religious views should somehow be determinative of public or judicial policy. Rather, the review is meant to illustrate a broad consensus across religious and cultural lines that life-sustaining but not curative treatment is not obligatory for the patient to accept or continue. A broad consensus can be seen over the proposition that one can morally

185. Stanley S. Harakas, *The Stand of the Orthodox Church on Controversial Issues*, <http://www.goarch.org/ourfaith/ourfaith7101>.

186. *Id.*

187. *See, e.g.*, EVANGELICAL LUTHERAN CHURCH IN AM., *SOCIAL ISSUES: END OF LIFE DECISIONS* (1992), *available at* <http://www.elca.org/SocialStatements/endoflifedecisions/>.

188. *See, e.g.*, THE CHURCH OF ENG., *THE ETHICS OF PROLONGING LIFE IN FETUSES AND THE NEWBORN* (2005), *available at* <http://www.cofe.anglican.org/info/socialpublic/science/treatment/treatment.pdf>.

189. *See, e.g.*, THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS, *EUTHANASIA AND PROLONGING LIFE*, *available at* <http://newsroom.lds.org/ldsnewsroom/eng/public-issues> (follow “Euthanasia and Prolonging Life” hyperlink).

190. *See, e.g.*, NAT’L ASS’N OF EVANGELICALS, *TERMINATION OF MEDICAL TREATMENT* (1994), *available at* <http://www.nae.net/index.cfm?FUSEACTION=editor.page&pageID=282&IDCategory=9>.

191. *See, e.g.*, PRESBYTERIAN CHURCH IN AM., *REPORT OF THE HEROIC MEASURES COMMITTEE* (1998), *available at* <http://www.pcahistory.org/pca/2-378.pdf>.

192. “Generally speaking, where there are differences of opinion, the non-Orthodox branches [of Judaism—Conservative, Reform, and Constructionist] tend to be more in keeping with the secular point of view.” Barry M. Kinzbrunner, *Jewish Medical Ethics and End-of-Life Care*, 7 J. PALLIATIVE MED. 558, 562 (2004).

193. *Id.* at 565.

194. *See id.* at 566, 570–71.

195. *See* Abdulaziz Sachedina, *End of Life: The Islamic View*, 336 LANCET 774, 777–79 (2005).

withdraw life supporting but noncurative treatment without such withdrawal being considered the cause of patient's death.

*B. Substituted Consent: Who Speaks for an Incompetent Individual?*

The fact that there is broad agreement with the proposition that a competent patient can decide to decline or discontinue extraordinary life-sustaining treatment does not, in and of itself, answer the question of whether *other* individuals can make that choice for him, should he himself be unable or incompetent to do so. Unsurprisingly, there is similar broad agreement, reflected in both legal enactments and ethical and religious opinions, that under proper medical conditions and given a proper relationship between the patient and a third party, the third party can serve as a decision maker.

It should be preliminarily noted that a question arises in the context of surrogate decision making as to how a surrogate is to make a decision. There are two basic schools of thought on this issue.<sup>196</sup> One holds that the decision is to be made by reference to what the incompetent patient *actually* wants.<sup>197</sup> Under this approach, known as "substituted judgment,"<sup>198</sup> the surrogate does no more than simply vocalize the patient's own desires. While this approach is the most likely to effectuate the patient's own desires with respect to his medical treatment,<sup>199</sup> it suffers from a severe shortcoming. Many people do not think about being incapacitated and unable to decide for themselves; and if they do, their decisions are often not conveyed to their would-be surrogates.<sup>200</sup> Additionally, many patients have *never* been competent and thus have *never* been able to come to any rational decision about their medical care.<sup>201</sup> The most obvious members of this group are children and those born with debilitating mental retardation. In these situations, the surrogate, not being able to ascertain the wishes of the patient (to the extent the patient had any wishes to begin with), has to rely on his

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196. PRESIDENT'S COMM'N FOR THE STUDY OF ETHICAL PROBLEMS IN MED. AND BIOMEDICAL AND BEHAVIORAL RESEARCH, DECIDING TO FOREGO LIFE-SUSTAINING TREATMENT 132-36 (1983) [hereinafter FOREGOING TREATMENT].

197. *See id.* at 132-34.

198. *Id.* This name is perhaps a bit of a misnomer, because the surrogate does not actually substitute his judgment for that of the patient. Rather, he simply effectuates the patient's own judgment, a judgment that the patient (through his current incapacity) can no longer express. *See Mack v. Mack*, 618 A.2d 744, 757 (Md. 1993) ("[F]rom the standpoint of whether the treatment is to be withdrawn, the 'substituted judgment' label is a misnomer. The judgment of the guardian is not accepted by the court in lieu of the judgment of the ward. Rather, because the right is one of self-determination, the inquiry focuses on whether the ward had determined, or would determine, that treatment should be withdrawn under the circumstances of the case.").

199. *See* FOREGOING TREATMENT, *supra* note 196, at 132-33 ("As a result, the patient's own definition of 'wellbeing' is respected; indeed, the patient's interest in 'self-determination' is preserved to a certain extent, given the fundamental reality that the patient is incapable of making a valid contemporaneous choice.").

200. *Id.* at 134 ("Because many people have not given serious thought to how they would want to be treated under particular circumstances, or at least have failed to tell others their thoughts, surrogates often lack guidance for making a substituted judgment.").

201. *Id.* ("[S]ome patients have never been competent; thus, their subjective wishes, real or hypothetical, are impossible to discern with any certainty.").



own determination of what the patient would have wanted had he been able to formulate his desires.<sup>202</sup> This is known as “best interests of the patient” approach.<sup>203</sup>

For the purposes of the present discussion the “substituted judgment” approach is of little interest, because it requires that a patient actually express his views on the desirability of a particular medical treatment. What is more interesting is the view taken by society toward the “best interests of the patient” approach, as it sheds light on the moral acceptability of making medical decisions *for* another person without knowing the *actual* views of that person. As it turns out, there is broad (though not uniform) acceptance of the “best interests of the patient” approach and of reposing these decisions in the next of kin, whenever possible.

For instance, the *Code of Medical Ethics* of the American Medical Association (AMA) states that “[a] patient may also appoint a surrogate decision maker in accordance with state law.”<sup>204</sup> To the extent that the patient is incompetent, the AMA recommends that “a surrogate decision maker should be identified,”<sup>205</sup> and that absent an advanced directive to the contrary, “the patient’s family should become the surrogate decision maker.”<sup>206</sup> The American College of Physicians states that “[w]hen a patient lacks decision-making capacity, an appropriate surrogate should make decisions with the physician,”<sup>207</sup> and suggests that “standard clinical practice is that family members serve as surrogates,”<sup>208</sup> unless the patient has directed otherwise.

State laws also recognize the need to assign a third party for the purposes of medical decision making on behalf of incompetent patients. For example, Alabama has a hierarchy of individuals who, “in consultation with the attending physician, . . . determine whether to provide, withdraw, or withhold life-sustaining treatment . . .”<sup>209</sup> Under the law, the highest ranking individual authorized to make decisions for a child is the parent<sup>210</sup> or a court-appointed guardian.<sup>211</sup> Other (but not all) state legislatures have enacted similar provisions.<sup>212</sup>

202. *See id.* at 134–35 (“In these situations, surrogate decisionmakers will be unable to make a valid substituted judgment; instead, they must try to make a choice for the patient that seeks to implement what is in that person’s best interests by reference to more objective, societally shared criteria.”).

203. *See id.* at 134–36.

204. POLICY COMPENDIUM, *supra* note 177, at 86 (articulating the AMA’s opinion on “Withholding or Withdrawing Life-Sustaining Medical Treatment”).

205. *Id.*

206. *Id.* According to AMA’s ethical opinion, “family” means “persons with whom the patient is closely associated.” *Id.*

207. Snyder & Leffler, *supra* note 178, at 11.

208. *Id.* at 11–12.

209. ALA. CODE § 22-8A-11 (LexisNexis 2000).

210. *Id.* § 22-8A-11(d)(4).

211. *Id.* § 22-8A-11(d)(1).

212. *See, e.g.*, ALASKA STAT. § 13.52.030 (2008); ARIZ. REV. STAT. ANN. § 36-3231 (2002); ARK. CODE ANN. § 20-17-214 (2005); CAL. HEALTH & SAFETY CODE § 24178 (West 2002); DEL. CODE ANN. tit. 16, § 2507 (2003); D.C. CODE § 21-2210 (2001); FLA. STAT. ANN. § 765.401 (West 2005); GA. CODE ANN. §§ 31-9-2, 31-36A-1 to -7 (2006 & Supp. 2008); 755 ILL. COMP. STAT. ANN. § 40/1 to 65 (West 2007); IOWA CODE ANN. § 144A.7 (West 2005); KY. REV. STAT. ANN. § 311.631 (LexisNexis 2007); LA. REV. STAT. ANN. §§ 40:1299.58.1–10 (2008); ME. REV. STAT. ANN. tit. 18-A §§ 5-801 to -817 (1998); MD. CODE ANN. HEALTH-GEN. § 5-605

State courts have also accepted the proposition that when a patient is incompetent, a surrogate, who is more often than not a close family member, can make a decision on the patient's behalf. The first American case was *In re Quinlan*, decided in 1976 by the New Jersey Supreme Court.<sup>213</sup> In *Quinlan*, the court faced a situation where Karen Ann Quinlan—a twenty-one year old female patient with no prior known pathology—temporarily ceased breathing and fell into a deep coma from which she never recovered.<sup>214</sup> Miss Quinlan's parents sought to remove her from the artificial ventilator.<sup>215</sup> The medical staff of Saint Clare's Hospital refused, and Miss Quinlan's parents filed suit.<sup>216</sup> The New Jersey Supreme Court held for the parents, concluding that "Karen's right of privacy may be asserted on her behalf by her guardian under the peculiar circumstances here present,"<sup>217</sup> because "[t]he only practical way to prevent destruction of the right is to permit the guardian and family of Karen to render their best judgment . . . ."<sup>218</sup> Over the last thirty years, other state courts have followed suit.<sup>219</sup> The one federal court that addressed the issue adopted a similar approach.<sup>220</sup>

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(LexisNexis 2005 & Supp. 2007); MISS. CODE ANN. §§ 41-41-201 to -229 (West 2006); MONT. CODE ANN. § 50-9-106 (2007); NEV. REV. STAT. ANN. § 449.626 (LexisNexis 2005); N.M. STAT. ANN. § 24-7A-5 (West 2003); N.C. GEN. STAT. ANN. § 90-322 (West 2007); N.D. CENT. CODE § 23-12-13 (2002); OHIO REV. CODE ANN. § 2133.08 (LexisNexis 2005); OR. REV. STAT. §§ 127.505(12), .535(4), .635 (2007); S.C. CODE ANN. §§ 44-66-10 to -80 (2002); S.D. CODIFIED LAWS §§ 34-12C-1 to -8 (2004); TENN. CODE ANN. §§ 68-11-1801 to -1815 (2006); TEX. HEALTH & SAFETY CODE ANN. § 166.039 (Vernon 2001); UTAH CODE ANN. §§ 75-2-1105, -1105.5, -1107 (1993); VA. CODE ANN. § 54.1-2986 (2005); WASH. REV. CODE ANN. § 7.70.065 (West 2007); W. VA. CODE ANN. § 16-30-8 (LexisNexis 2006); WIS. STAT. ANN. § 50.06 (West 2007). Despite the presence of a New York law authorizing surrogates to consent or decline medical treatment, N.Y. PUB. HEALTH LAW § 2965 (McKinney 2007), the surrogate cannot use the "best interests of the patient" approach, but must rely on the incompetent patient's actual wishes—an obvious impossibility when the patient is a child. See Jill Hollander, Note, *Health Care Proxies: New York's Attempt to Resolve to the Right to Die Dilemma*, 57 BROOK. L. REV. 145 (1991).

213. 355 A.2d 647 (N.J. 1976).

214. *Id.* at 651.

215. *Id.*

216. *Id.*

217. *Id.* at 664.

218. *Id.*

219. See, e.g., *Barber v. Superior Court*, 195 Cal. Rptr. 484 (Cal. Ct. App. 1983) (holding that a wife is a proper surrogate for an incapacitated patient, and that absent a patient's express desires as to treatment, the surrogate can use the "best interests" standard in deciding on treatment); *Newmark v. Williams*, 588 A.2d 1108 (Del. 1991) (holding that parents can decline authorizing chemotherapy treatment that has only a forty-percent chance of success); *In re C.A.*, 603 N.E.2d 1171 (Ill. App. Ct. 1992) (permitting the legal guardian of an infant to enter a "Do Not Resuscitate" order on the infant's chart after applying the "best interests" standard); *In re Rosebush*, 491 N.W.2d 633 (Mich. Ct. App. 1992) (allowing a comatose patient's mother to withdraw further life-supporting care); *In re Guardianship of Crum*, 61 Ohio Misc. 2d 596 (Prob. Ct. 1991) (holding that parents can consent to withdrawing nutrition and hydration from a comatose minor child under the "best interest" test); *In re Fiori*, 673 A.2d 905 (Pa. 1996) (allowing a comatose patient's mother to withdraw further life-supporting care); *In re Guardianship of Hamlin*, 689 P.2d 1372, 1377 (Wash. 1984) ("If the incompetent patient's immediate family, after consultation with the treating physician and the prognosis committee, all agree with the conclusion that the patient's best interests would be advanced by withdrawal of

The President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research has also weighed in on the matter. The Commission, a body composed of doctors, attorneys, and religious figures,<sup>221</sup> stated, in its report, that "a family member ought usually to be designated as surrogate to make health care decisions for an incapacitated patient in consultation with the physician and other health care professionals."<sup>222</sup> The Commission concluded that "[w]hen a patient's likely decision is unknown, however, a surrogate decisionmaker should use the best interests standard and choose a course that will promote the patient's well-being as it would probably be conceived by a reasonable person in the patient's circumstances."<sup>223</sup>

Religious denominations take a similar view of surrogate decision making. For instance, the Catholic Church takes the position that "[i]n the event that an advance directive is not executed, those who are in a position to know best the patient's wishes—usually family members and loved ones—should participate in the treatment decisions for the person who has lost the capacity to make health care decisions,"<sup>224</sup> and that those decisions, if the patient's wishes are unknown, should be made with reference "to the person's best interests."<sup>225</sup> The Lutheran Church—Missouri Synod teaches its followers that if a patient is incompetent to decide for himself, the next of kin, in consultation with the treating physicians, should decide whether or not to continue the provision of additional medical care.<sup>226</sup> The Presbyterian Church in America teaches that "[t]he Biblical authority for decisions concerning heroic measures lies with the family if the patient is not able to make his own decisions."<sup>227</sup> Islamic scholars also agree that family may speak for an incompetent patient and choose to withdraw life sustaining treatment, to the extent that the patient himself, were he competent, would have been permitted under *Sharia* to decline treatment.<sup>228</sup> Orthodox

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life sustaining treatment, the family may assert the personal right of the incompetent to refuse life sustaining treatment . . .").

220. *Gray v. Romeo*, 697 F. Supp. 580, 587 (D.R.I. 1988) ("The right to refuse medical treatment 'must extend to the case of an incompetent, as well as a competent, patient because the value of human dignity extends to both.'" (quoting *Brophy v. New England Sinai Hosp., Inc.*, 497 N.E.2d 626, 634 (Mass. 1986))).

221. Exec. Order No. 13,237, 66 Fed. Reg. 59,851 (Nov. 28, 2001) ("The Council shall include members drawn from the fields of science and medicine, law and government, philosophy and theology, and other areas of the humanities and social sciences."). The Council is a successor to other bioethics advisory Commissions. See The President's Council on Bioethics, Former Bioethics Commissions, [http://www.bioethics.gov/reports/past\\_commissions/index.html](http://www.bioethics.gov/reports/past_commissions/index.html).

222. FOREGOING TREATMENT, *supra* note 196, at 127–28.

223. *Id.* at 136.

224. U. S. CONFERENCE OF CATHOLIC BISHOPS, ETHICAL AND RELIGIOUS DIRECTIVES FOR CATHOLIC HEALTH CARE SERVICES (4th ed. 2001) (Directive 25), *available at* <http://www.usccb.org/bishops/directives.shtml>.

225. *Id.* The decisions must nonetheless remain "faithful to the Catholic moral principles." *Id.*

226. COMM'N ON THEOLOGY & CHURCH RELATIONS OF THE LUTHERAN CHURCH—MISSOURI SYNOD, CHRISTIAN CARE AT LIFE'S END 43 (1993), *available at* <http://www.lcms.org/graphics/assets/media/CTCR/careend.pdf>.

227. PRESBYTERIAN CHURCH IN AM., *supra* note 191, at 385.

228. Farzaneh Zahedi, Bagher Larijani & Javad Tavakoly Bazzaz, *End of Life Ethical Issues and Islamic Views*, 6 IRAN J. ALLERGY, ASTHMA & IMMUNOLOGY 5, 12 (2007) ("[G]uardian may

Jewish tradition generally takes the same approach and permits the next of kin to make a decision on behalf of the incompetent patient, with reference to what the patient *would have wanted*.<sup>229</sup>

Finally, secular pro-life groups are also of the opinion that withdrawal of life-sustaining but not curative treatment is permissible, and that the decision can be made on behalf of the incompetent patient by the next of kin. For example, Physicians for Life—an organization that opposes abortion, physician-assisted suicide, and euthanasia<sup>230</sup>—acknowledges that “[d]iscontinuing medical procedures that are burdensome, dangerous, extraordinary or disproportionate to the expected outcome can be legitimate,”<sup>231</sup> and believes that the decisions of this nature, whether made by “the patient or the person who is making decisions for the patient,”<sup>232</sup> are to be respected by health care providers. The National Right to Life Committee (NRLC)<sup>233</sup> also encourages its devotees to sign the “Will to Live,” a document that appoints a healthcare proxy and allows him to make decisions such as “withdrawal of health care, including, in appropriate circumstances, life-sustaining procedures.”<sup>234</sup>

Again, the discussion above is not meant as a normative statement that surrogate decision making by a family member on behalf of an incompetent patient is a “moral good.” However, the discussion illustrates the broad-based consensus that patients do not lose their autonomy simply because of incompetence. Rather, patients are generally entitled to have a third party speak on their behalf—most often their next of kin. In most situations, the next of kin for a young child will be that child’s parents.<sup>235</sup>

refuse treatments that do not in any way improve their condition or quality of life.”) (citing the rulings of Ayatollah Ruhollah Khomeini), *available at* <http://www.iaari.hbi.ir/journal/archive/articles/v6s5zah.pdf>.

229. Yitzchok Breitowitz, *The Right to Die: A Halachic Approach*, JEWISH LAW, <http://www.jlaw.com/Articles/right.html> (“In the event the patient is incompetent or unable to communicate his decision, next-of-kin may make such a decision based exclusively on what they feel the patient would have wanted.”). Note that this formulation does not require the patient to have expressed his views previously, but rather asks the next of kin to “put himself in the patient’s shoes.” As such, it is more akin to “best interest” than the “substituted judgment” approach. As in Islamic tradition, the next of kin is only permitted to refuse treatment in situations where it would have been *halachically* permissible for the patient himself (were he competent) to have done so. *Id.*

230. Physicians for Life, About Us, <http://www.physiciansforlife.org/content/category/4/99/30/>.

231. Physicians for Life, End of Care Decisions? What to Do? . . . Do No Harm, <http://www.physiciansforlife.org/content/view/682/33/>.

232. *Id.* (emphasis added).

233. The NRLC opposes abortion, euthanasia, human cloning, and embryonic stem cell research. See Nat’l Right to Life Comm., Mission Statement, <http://www.nrlc.org/Missionstatement.htm>. For a detailed description of the NRLC’s positions, see <http://www.nrlc.org/default.html>.

234. See Nat’l Right to Life, Suggestions for Preparing Will to Live Durable Power of Attorney: Maryland, <http://www.nrlc.org/euthanasia/willtolive/docs/maryland.rev0109.pdf>. The NRLC has forms for all fifty states, and while the exact language differs among the forms in order to comply with state-specific requirements, the import of these “approved” forms is the same—withdrawal of life-sustaining treatment is permitted if such treatment is extraordinary and unlikely to improve the underlying condition. For a list of the forms, see Nat’l Right to Life, “Will to Live” Project, <http://www.nrlc.org/euthanasia/willtolive/StatesList.html>.

235. See, e.g., ALA. CODE § 22-8A-11(d) (LexisNexis 2000).

*C. Frozen Embryos as Children on Life Support*

Permitting parents to make medical decisions for their children, even decisions such as withholding or withdrawing life-sustaining treatment, is a relatively noncontroversial and broadly accepted position. Of course, that presupposes that the children in question are on, or about to be put on, some sort of artificial life support with little chance for eventual recovery. Parents, however, do not have the moral or legal right to withhold basic and ordinary healthcare from their children.<sup>236</sup> It is my view that the frozen embryos are morally akin to the children on life support and thus can be, with the consent of their parents, disconnected from life support and allowed to die.

In Part II.B, I discussed the precise conditions under which the frozen embryos are kept. To remain viable, the embryos need to be stored at highly unusual temperatures,<sup>237</sup> be kept on specific culture media,<sup>238</sup> and generally be subjected to a variety of stringent storage conditions.<sup>239</sup> For instance, embryos are kept frozen in liquid nitrogen, which means they are kept at a temperature below  $-196^{\circ}\text{C}$  ( $-321^{\circ}\text{F}$ ).<sup>240</sup> By comparison, the lowest temperature ever recorded anywhere on Earth is  $-89.2^{\circ}\text{C}$  ( $-128.6^{\circ}\text{F}$ ).<sup>241</sup> By any standard then, keeping the embryos at a temperature that is lower by a factor of two than anything observable in nature is an extraordinary intervention. Additionally, the liquid nitrogen must be continually added to the storage tank, in order to compensate for the nitrogen that has evaporated.<sup>242</sup> Thus, the process of keeping embryos alive is not simply passive storage, but is active, requiring constant intervention. The unnatural temperature conditions, in my view, are analogous to a medical ventilator, and constitute “extraordinary” intervention,<sup>243</sup> which is not obligatory for the patients to accept or the patients’ guardians to consent to.<sup>244</sup>

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236. See, e.g., *Jehovah’s Witnesses v. King County Hosp.*, 278 F. Supp. 488 (W.D. Wash. 1967), *aff’d*, 390 U.S. 598 (1968) (holding that a state may ignore and override parental objections to a blood transfusion necessary to save a child’s life); *J.V. v. State*, 516 So. 2d 1133 (Fla. Dist. Ct. App. 1987) (affirming an order that a minor child receive a blood transfusion over the parents’ religious objections); *Levitsky v. Levitsky*, 190 A.2d 621 (Md. 1963) (holding that a mother’s custody of her children was conditioned on the right of a physician to give the children blood or plasma transfusions to protect the life or health of the children without the mother’s consent where the mother had religious objections to such transfusions); *Morrison v. State*, 252 S.W.2d 97 (Mo. Ct. App. 1952) (holding that the State had power to declare an infant a dependent child and administer a blood transfusion over the father’s religious objection).

237. See *supra* text accompanying note 102.

238. See *supra* text accompanying note 100.

239. See *supra* text accompanying notes 100–104.

240. See *supra* note 102 and accompanying text.

241. CHARLES R. COBLE, ELAINE G. MURRAY & DALE R. RICE, *EARTH SCIENCE* 217 (rev. 3d ed. 1987).

242. See *Matson et al.*, *supra* note 103, at 293.

243. Linda Jackson, *Hume Risks Controversy Over Fate of Stored Embryos*, PRESS ASS’N, Aug. 8, 1996, available at LEXIS (“I would myself argue that the least worse [sic] solution is to allow such embryos to die, by withdrawing them from *the freezing process* since this *constitutes an extraordinary means of preserving life*.” (statement of Westminster Cardinal Basil Hume) (emphasis added)).

244. It is debatable whether the culture media on which the embryos are kept is analogous to food and hydration provided to the adult patients—even those in a comatose state who receive food and hydration via nasogastric or other tubes—and therefore constitutes “ordinary” means

There are several reasons why storage in liquid nitrogen constitutes extraordinary medical intervention. First, the temperature in the storage tank is not like anything that can be seen or experienced in nature.<sup>245</sup> Second, “extraordinary measures” are defined as “those that in the patient’s judgment do not offer a reasonable hope of benefit.”<sup>246</sup> Continuous cryogenic storage fits this definition. To be sure, the storage protocol does offer a “reasonable hope” of keeping the embryo intact in its frozen state.<sup>247</sup> This type of preservation cannot be said to be “beneficial” to the embryo any more than perpetually keeping someone alive on an artificial ventilator can be said to be beneficial to that individual. Cryopreservation does not offer a “reasonable hope” of allowing that embryo to actually develop into an adult organism. Thus, its only function is to prevent natural death. Third, even to the extent that the freezing of embryos does provide some hope of success (success being measured by ultimate birth of a child), the rate of that success is so small as to be almost negligible. Whatever hope there is, there is not “reasonable hope” that success will occur; rather, there is hope for a “miracle.”

Embryos may die during the thawing process,<sup>248</sup> they may fail to implant,<sup>249</sup> and even if they do implant, the pregnancy may not be successful.<sup>250</sup> In fact, the Centers for Disease Control reports that only 27.7% of transfer cycles resulted in live births.<sup>251</sup> Keeping in mind that on average 2.5 to 2.9 embryos are transferred per cycle,<sup>252</sup> the actual success rate per unfrozen embryo is as low as eleven percent.<sup>253</sup> If one takes into

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of keeping the embryo alive, or whether it too constitutes “extraordinary” intervention. Whatever the answer may be, the argument does not depend on it, as the “unnaturalness” of the low temperatures in the cryopreservation tank is a sufficient and independent ground to conclude that frozen embryos are being kept alive by extraordinary means.

245. In fact, if human skin comes into contact with liquid nitrogen, even momentarily, a cold burn will result. *See, e.g.*, Noriko Tabata, Masato Funayama, Takuya Ikeda, Jun-ichi Azumi & Mashiko Morita, *On an Accident by Liquid Nitrogen—Histological Changes of Skin in Cold*, 76 FORENSIC SCI. INT’L 61, 61 (1995).

246. *See supra* text accompanying note 183.

247. *See supra* notes 100–105 and accompanying text.

248. For instance, one study showed that depending on the stage of the embryo during the freezing process, only between fifty-six percent and eighty-eight percent of the embryos survive the thawing. Kostas Pantos, Konstantinos Stefanidis, Kostas Pappas, Padelis Kokkinopoulos, Konstantina Petroutsou, Georgia Kokkali, Dimitris Stavrou & Vasilios Tzigounis, *Cryopreservation of Embryos, Blastocysts, and Pregnancy Rates of Blastocysts Derived from Frozen-Thawed Embryos and Frozen-Thawed Blastocysts*, 18 J. ASSISTED REPROD. & GENETICS 579, 579 (2001); *see also* X.J. Wang, W. Ledger, D. Payne, R. Jeffrey & C.D. Matthews, *The Contribution of Embryo Cryopreservation to In-Vitro Fertilization/Gamete Intra-Fallopian Transfer: 8 Years Experience*, 9 HUM. REPROD. 103, 104–05 (1994) (finding that between thirty and forty percent of embryos do not survive the thawing process).

249. *See, e.g.*, Pantos et al., *supra* note 248, at 581 (finding that the rate of implantation ranges from 5.3% to 20.6%).

250. CDC REPORT, *supra* note 90, at 51 (finding that only 4658 live births resulted from 5898 pregnancies, which translates to a miscarriage/other postimplantation failure rate of twenty-one percent).

251. *Id.* at 50.

252. *Id.* at 81.

253. I arrive at this figure by dividing the live birth rate per cycle by the average number of embryos transferred per cycle. Thus, 27.7% rate per cycle divided by 2.5 embryos per cycle results in eleven percent rate of success per embryo.

account that around thirty percent of embryos do not survive the thawing process, then the success rate per frozen embryo plummets to just under eight percent.<sup>254</sup> For comparison, the five-year survival rate for lung cancer is fourteen percent;<sup>255</sup> for hepatic cancer, six percent;<sup>256</sup> and for pancreatic cancer four percent.<sup>257</sup> In these cases, courts<sup>258</sup> and religious groups<sup>259</sup> have both recognized that it is not ethically problematic to refuse treatment, given the low chances of success. By analogy then, the embryo would have a right to refuse the implantation, given the low rate of success, and instead choose the option where it is allowed to naturally expire. The decision to refuse must, of course, be made by the embryo's guardian, as the embryo cannot speak for itself.

Beyond the low rate of success, the burden on the putative mother needs to be considered as well. Pregnancy, of course, is not a condition free of complications.<sup>260</sup>

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254. Since only seventy percent of embryos (on average) survive the thawing process, the eleven percent rate of success postthawing must be multiplied by 0.7 to arrive at the success rate pre-thawing. This results in a success rate of 7.7%.

255. See H. Gerbert Welch, Lisa M. Schwartz & Steven Woloshin, *Are Increasing 5-Year Survival Rates Evidence of Success Against Cancer?*, 283 J. AM. MED. ASS'N 2975, 2976 (2000).

256. See *id.*

257. See *id.*

258. See, e.g., *In re Phillip B.*, 92 Cal. App. 3d 796 (Cal. Ct. App. 1979); *Newmark v. Williams/DCPS*, 588 A.2d 1108 (Del. 1991) (declining to force parents to administer chemotherapy to a child because the success rate was only forty percent); *M.N. v. S. Baptist Hosp.*, 648 So. 2d 769 (Fla. Dist. Ct. App. 1994) (remanding the case for trial judge to consider the "child's own welfare and best interests, in light of . . . the child's chances of survival with and without such treatment"); see also *In re Tuttendario*, 21 Pa. D. 561 (Ct. of Quarter Session of the Peace of Pa.1912) (declining to interfere with parents' decision to refuse surgery for a child suffering from rickets, because of fears that the child may not recover from surgery); *In re Hudson*, 126 P.2d 765 (Wash. 1942) (upholding parents' right to refuse to consent to child's arm amputation where the operation had a high risk of death); cf. *In re Hofbauer*, 393 N.E.2d 1009 (N.Y. 1979) (approving parents' choice to forgo chemotherapy for the child and rely instead on nutritional and other alternative therapies). But see *Custody of a Minor*, 379 N.E.2d 1053 (Mass. 1978) (ordering chemotherapy for a child with leukemia because that was the only hope for survival); *In re Hamilton*, 657 S.W.2d 425 (Tenn. Ct. App. 1983) (ordering chemotherapy for a child despite only twenty-five percent chance of survival).

259. See, e.g., PRESBYTERIAN CHURCH IN AM., *supra* note 191, at 387 (defining chemotherapy for advanced cancer as a "heroic measure" which "Christians of any age . . . may ethically refuse."); Zev Schostak, *Is There Patient Autonomy in Halacha?*, JEWISH MED. ETHICS, May 1995, at 22 n.12 (1995), available at <http://www.jewishvirtuallibrary.org/jsource/Judaism/PatientAutonomy.pdf>.

260. Pregnancy complications "include but are not limited to the worsening of preexisting conditions of cardiac disease, hypertension, renal disease, urinary tract infection, diabetes mellitus, thyroid disease, hepatic disorders, infectious disease, anemia, asthma, autoimmune diseases, malignancy, and disorders requiring surgery." Kristin Connelly McAdams, Note, *On Requiring Responsibility: The Constitutionality of Conditioning AFDC Benefits upon the Insertion of the Norplant Contraceptive Device*, 19 OKLA. CITY U. L. REV. 309, 349 (1994) (citing THE MERCK MANUAL OF DIAGNOSIS AND THERAPY 1883-1902 (Robert Berkow ed., 16th ed. 1992)).

Some of these complications may be life threatening.<sup>261</sup> Pregnancy is also likely to impose a heavy expense on the family.<sup>262</sup> All of these considerations may legitimately militate against consenting to continue with the “treatment” of the embryo.

To be fair, the “expense and burden of pregnancy” argument can also be made in the abortion context, yet it has not proved to be one that would convince many pro-life individuals. In other words, pro-choice groups and politicians argue that because pregnancy imposes a high cost (both material and emotional) on the mother, she should be allowed to avoid having to bear that burden.<sup>263</sup> This argument is flatly rejected by abortion opponents.<sup>264</sup>

However, in the context of frozen embryos, I believe the argument is more convincing. In the abortion context, at the very least (leaving aside the instances of rape or incest) it can be plausibly argued that the woman consented, through her behavior, to pregnancy and has voluntarily assumed the duty to care for the child (at least until birth). Having so consented, and voluntarily taken on the responsibility to care for the baby, the woman may then be prevented from taking actions which would result in the baby’s death.<sup>265</sup> The same paradigm, however, does not hold in the IVF context. In the IVF context, the woman has actually, not just constructively, consented to get pregnant and care for the child inside her. However, the very reason that the surplus embryos exist is, in many cases, precisely because the woman has gotten pregnant with another embryo, has cared for the child, and has given birth to him. Another possibility is that despite the woman’s best attempts to get (or stay) pregnant, her body simply would not permit her to carry a pregnancy to term. Declining further attempts at implantation after multiple failures is not abandonment of the embryos created with the woman’s consent, but rather realization that future attempts at pregnancy are futile. In other words, declining further implantation attempts is permissible because each further attempt will result only in added expense for the woman. In that situation, the embryo will die prior to live birth even if attempts at implantation are made. Refusing to subject embryos to this process is not abandonment, but rather a rational and humane decision to forgo procedures which are highly unlikely to provide any benefit to the embryo.

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261. *See id.*

262. *See* U.S. DEP’T OF AGRIC., EXPENDITURES ON CHILDREN BY FAMILIES, 2006 at ii (2006), available at <http://www.cnpp.usda.gov/Publications/CRC/crc2006.pdf> (estimating the cost of raising a child to age seventeen to range from \$143,790 to \$289,380).

263. *See, e.g.*, Lawrence B. Finer, Lori F. Frohwirth, Lindsay A. Dauphinee, Susheela Singh & Ann M. Moore, *Reasons U.S. Women Have Abortions: Quantitative and Qualitative Perspectives*, 37 PERSP. ON SEXUAL & REPROD. HEALTH 110, 117 (2005).

264. *Cf.* Judie Brown, *Intentionally Uninhibited*, AM. LIFE LEAGUE, May 11, 2006, <http://www.all.org/article.php?id=10782&PHPSESSID=22efcb3a25ef1de298aa501e6486a7f8>.

265. I do not wish to pass a normative judgment on whether such an argument is a valid one, because this Article is not meant to address the morality of abortion. I am merely suggesting that that is an argument that can be plausibly advanced. *See* Judith Jarvis Thomson, *A Defense of Abortion*, 1 PHIL. & PUB. AFF. 47, 57–58 (1971) (“Suppose a woman voluntarily indulges in intercourse, knowing of the chance it will issue in pregnancy, and then she does become pregnant; is she not in part responsible for the presence, in fact the very existence, of the unborn person inside? No doubt she did not invite it in. But doesn’t her partial responsibility for its being there itself give it a right to the use of her body?”).



Given the high uncertainty of success attendant to the proposed medical procedure (implantation), and the potential burden imposed on the embryo's family (specifically the embryo's mother) by the procedure, declining such procedure is consistent with ethical guidelines outlined in Part IV.A. The right to decline treatment has to, for obvious reasons, be exercised by a surrogate, on behalf of the embryo. Such a proxy decision, based on the best interests of the embryo<sup>266</sup> can be made according to the principles laid out in Part IV.B.

#### D. Who Is a "Parent"?

Since the right to decline treatment has to be exercised by a surrogate on behalf of the embryo, the question becomes who is the proper surrogate? In the previous section, I argued that for the embryo, just like for a born child, the proper surrogate is the parent. However, who is a "parent" is not necessarily self-evident. In the field of reproductive technologies, the couple that is seeking to have and raise a child may or may not be that child's genetic parents,<sup>267</sup> and the female that intends on raising the born child may or may not be the same person who actually carries that child to term.<sup>268</sup> The mere fact that some man donated his sperm and some woman donated her eggs for the purposes of creating an embryo, does not, *ipso facto*, make that man and that woman appropriate surrogate decision makers on behalf of that embryo.

The reason parents are viewed as proper surrogate decision makers for incompetent minors is because of the family's unique and special status in the society.<sup>269</sup> As the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research observed, "[t]he family is generally most concerned about the good of the patient[, and] will also usually be most knowledgeable about the patient's goals, preferences, and values."<sup>270</sup> Thus, the key consideration in assigning someone the power of a surrogate decision maker is whether that person is concerned about the good of the patient and is knowledgeable of the patient's (would-be) goals and values.

It should be self-evident that anonymous sperm and egg donors cannot possibly be "concerned" or "knowledgeable" about the embryos created with the use of the donor's genetic material. Because they are anonymous donors, they do not even know when and if their sperm or eggs were used. Thus, they are not even knowledgeable of the embryo's existence, much less its would be "goals, preferences, and values." But what about a nonanonymous donor, who may have donated the genetic material for the purpose of creating a child for a specific couple (or a single woman)? Would that donor be in a position to be a surrogate decision maker for the resulting embryo? I would argue that he (or she) would not be, and that the proper decision maker would be the person who received the embryos with the intent to give birth to them. The genetic

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266. In deciding what is in the best interests for the embryo, the decision makers can take into account the burdens imposed on the embryo's family. *See supra* Part V.A.

267. *See, e.g.*, Deborah H. Wald, *The Parentage Puzzle: The Interplay Between Genetics, Procreative Intent, and Parental Conduct in Determining Legal Parentage*, 15 AM. U. J. GENDER SOC. POL'Y & L. 379, 389–90 (2007) (citing *In re Marriage of Buzzanca*, 72 Cal. Rptr. 2d 280, 282 (Cal. Ct. App. 1998)).

268. *See id.*

269. FOREGOING TREATMENT, *supra* note 196, at 215.

270. *Id.* at 128.

parents of an embryo who donate it to someone else are in the same position as a parent who puts up his born child for adoption. Once the child (whether pre- or post-birth) is adopted, the child's family is the adoptive, not biological family, and it is the adoptive family who is most concerned about the child's well being and most knowledgeable about his would-be values.<sup>271</sup>

Thus, in my view, the embryo's family consists of the individuals who created the embryo for the purposes of giving birth to it and subsequently raising it as their child. It is these people who would constitute the child's "family" if the child is born, and consequently, these people also constitute the child's family prior to birth. In short, if an embryo is given the same moral status as a born child, then his moral relationship vis-à-vis other individuals must be determined in the same way as it would be for a born child.

#### V. ORGAN DONATION AND ITS APPLICATION TO EMBRYONIC STEM CELL RESEARCH

Organ transplantation has for decades been nearly uniformly accepted as a moral and ethical medical practice.<sup>272</sup> Even though, initially, there was some opposition to organ transplantation, especially to heart transplants,<sup>273</sup> now a variety of transplantations are considered morally acceptable.<sup>274</sup>

##### *A. Organ Donation by Adults and Children*

Broadly speaking, transplantation can be divided into two categories: cadaveric transplantation and living-donor transplantation.<sup>275</sup> The living-donor transplant involves patients who voluntarily can choose to donate body organs such as a kidney, bone marrow, or a portion of the liver.<sup>276</sup> The cadaveric donor transplant category

271. To be fair, the biologic family may also be knowledgeable and concerned, but the adoptive family is *most* concerned and knowledgeable. The fact that they are more concerned should be evident from their voluntary decision to take legal, financial, and other responsibility for the child.

272. See, e.g., UNIFORM ANATOMICAL GIFT ACT (1987). "A 1985 Gallup Poll commissioned by the American Council on Transplantation reported that 93 percent of Americans surveyed knew about organ transplantation and, of these, 75 percent approved of the concept of organ donation." *Id.* at prefatory note; cf. POLICY COMPENDIUM, *supra* note 177, at 363–68 (setting out guidelines (originally adopted prior to 1977) for organ transplantation).

273. James Paul Pandarakalam, *The Moral and Ethical Aspects of Hybrid Embryos*, BRITISH MED. J., <http://www.bmj.com/cgi/eletters/335/7619/531-a#176562> ("Initially heart transplant operations were met with severe criticism . . .").

274. See UNIV. OF MICH. STUDENTS FOR ORGAN DONATION, RELIGIOUS VIEWS ON ORGAN DONATION, [http://www.umich.edu/~umsod/religious\\_views.html](http://www.umich.edu/~umsod/religious_views.html).

275. M. Lane Molen, Comment, *Recognizing the Larger Sacrifice: Easing the Burdens Borne by Living Organ Donors Through Federal Tax Deductions*, 21 BYU J. PUB. L. 459, 466 (2007) ("There are two types of organ donation: living and cadaver (procuring organs from the deceased).").

276. See Sara Lind Nygren, Comment, *Organ Donation by Incompetent Patients: A Hybrid Approach*, 2006 U. CHI. LEGAL F. 471, 474. For obvious reasons, a living organ donor cannot donate an organ such as a heart.

includes transplantation from those individuals who have suffered either cardio-pulmonary or brain death,<sup>277</sup> and may involve the donation of any organ.

The actual death, however, may come as a result of withdrawing or withholding life-supporting treatment under conditions described in Part IV.A. Once the treatment is withdrawn, the patient is allowed to die, and the organs can then be harvested.<sup>278</sup> In order to keep the inquiry focused on the best interest of the patient in deciding whether to withdraw or withhold life-supporting treatment,

[t]he decision to withdraw life-sustaining treatment should be made independently of and prior to any staff-initiated discussion of organ and tissue donation. The decision should be based on the gravity of the patient's condition and on his or her wishes to stop burdensome treatment (or on guidance from a surrogate decision maker who represents or affirms the patient's wishes). It should follow established hospital protocols for withdrawing support and providing terminal care.<sup>279</sup>

In this approach, the patient is not treated simply as a source of organs, but as an individual human being, whose life and death have meaning and dignity. The decision whether to allow the patient to die is made without reference to the "usefulness" of the patient to others, and thus is made under the same guidelines that I have already shown are commonly accepted.

As with the decision to withhold or withdraw care, the decision to donate organs must be made with consent of the (now deceased) patient or his family. Although some organizations have advocated the "presumed consent" model,<sup>280</sup> and some countries have implemented the model,<sup>281</sup> the United States (as well as most other common law countries)<sup>282</sup> relies on the "informed consent" model instead.<sup>283</sup> The Institute of

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277. The Uniform Determination of Death Act, for instance, defines death as "either (1) irreversible cessation of circulatory and respiratory functions, or (2) irreversible cessation of all functions of the entire brain, including the brain stem . . ." UNIFORM DETERMINATION OF DEATH ACT § 1 (1980).

278. *See id.*

279. INST. OF MED., NON-HEART-BEATING ORGAN TRANSPLANTATION: PRACTICE AND PROTOCOLS 16 (2000), *available at* [http://books.nap.edu/openbook.php?record\\_id=9700&page=16](http://books.nap.edu/openbook.php?record_id=9700&page=16) (emphasis omitted).

280. *E.g.*, The Presumed Consent Found., Solutions, <http://www.presumedconsent.org/solutions.htm>.

281. *See generally* Alberto Abadie & Sebastien Gay, *The Impact of Presumed Consent Legislation on Cadaveric Organ Donation: A Cross Country Study*, 25 J. HEALTH ECON. 599, 617–19 (2005) (listing various countries and their respective legislation on "presumed" versus "express" consent).

282. *See id.*

283. Under the "presumed consent" model, the patient must actively decline to donate his organs; while under the "informed consent" model, the patient must affirmatively state his desire to donate. *Id.* at 600.

Medicine (IOM)<sup>284</sup> also counsels that “organ and tissue donation focus on the patient and the family.”<sup>285</sup> As IOM notes,

The patient’s family plays a critical role in the decision to donate. Family members represent the patient’s wishes, make decisions based on both the patient’s and their own values, and give consent for donation to proceed. In some cases, patients have made their wishes known by discussing donation with family and friends or by signing a donor card. In other cases, the patient’s wishes are not known, and the family acts according to what it knows about the patient’s values or according to the values of the family members involved in the decision.<sup>286</sup>

Federal guidelines also require that “[t]he hospital must . . . [e]nsure, in collaboration with the designated OPO [Organ Procurement Organization], that the family of each potential donor is informed of its options to donate organs, tissues, or eyes or to decline to donate.”<sup>287</sup>

As with the decisions to withhold or withdraw medical treatment, oftentimes the decision to donate organs has never been made by the patient, either due to lack of capacity, or simply because the thought never occurred to the individual.<sup>288</sup> Not surprisingly, the same approach is taken to the question of organ donation as is taken to the question of withholding treatment. In the situations where the patient never made his desire known (or could not have done so), the family members are viewed as surrogate decision makers and can make the decision on this matter. The Uniform Anatomical Gift Act recognizes that in the case of children, parents are the primary decision makers on the issue of organ donation.<sup>289</sup> A similar approach is taken by a number of religious groups. For instance, Seventh Day Adventists take the position that “[t]he individual *and the family* have the right to receive or to donate those organs and tissues that will restore any of the senses or will prolong the life profitably.”<sup>290</sup> The Catholic Church also recognizes that organ donation “is something good that can result from tragedy and *a way for families* to find comfort by helping others.”<sup>291</sup> Jewish law also

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284. IOM is a non-profit organization focused on “biomedical science, medicine, and health.” Inst. of Med. of the Nat’l Acads., About, <http://www.iom.edu/CMS/AboutIOM.aspx>.

285. INST. OF MED., *supra* note 279, at 27.

286. *Id.*

287. 42 C.F.R. § 482.45(a)(3) (2008).

288. See COUNCIL ON ETHICAL AND JUDICIAL AFFAIRS, AM. MED. ASS’N, CEJA Report 7-A-05, PRESUMED CONSENT FOR ORGAN DONATION 2 (2005), *available at* [http://www.ama-assn.org/ama1/pub/upload/mm/369/ceja\\_7a05.pdf](http://www.ama-assn.org/ama1/pub/upload/mm/369/ceja_7a05.pdf) (“[I]ndividuals reluctant to think about death and dying might avoid reflecting on their attitudes toward donation and be wrongly assumed to be willing donors.”).

289. REVISED UNIFORM ANATOMICAL GIFT ACT § 4 (2006) (listing parents as appropriate decision makers for unemancipated minors); UNIFORM ANATOMICAL GIFT ACT § 3 (1987) (listing parents as appropriate decision makers for minors).

290. Mid-American Transplant Services, Religious Beliefs, <http://www.mts-stl.org/Clergy/religious.phtml> (emphasis added).

291. Organ Donor Application, Religious Views of Owner & Tissue Donation, [http://www.thetransplantnetwork.com/religious\\_views\\_of\\_organ\\_tissu.htm](http://www.thetransplantnetwork.com/religious_views_of_organ_tissu.htm) (emphasis added). Since the statement references that it is the family that helps others, presumably it is a

takes the position that either the patient *or* the family may provide the necessary consent.<sup>292</sup>

### *B. Stem Cell Donation by Embryos*

Frozen embryos are generally a collection of relatively undifferentiated cells.<sup>293</sup> As such, they do not have any “organs” to donate. Nonetheless, the embryonic cells are very much akin to vital organs because these cells serve as precursors to those organs and may, under the right conditions, develop into them. Additionally, extraction of these cells causes the complete biological death of the embryo, much like harvesting a heart or an entire liver causes the biological death of an adult human. The embryonic cells are at the very least “biological tissue” akin to other biological tissue such as skin, cornea, and bone marrow that is often harvested from adult donors.<sup>294</sup> In this sense, the embryonic cells are much like the organs of the incompetent or children. And much like the parents or legal guardians of the incompetent or children can make the decision to donate said organs, so too parents of frozen embryos can make a decision to donate the embryo’s cells.

As with other individuals, embryos, because (under a concession made in the Introduction) they are fully human, must not be viewed solely as a source of cells, but rather as unique entities with human dignity. Therefore, the decision to donate their cells must be made independently of, and after, the decision to withdraw the life-supporting treatment such as cryogenic storage. In that scenario, only if the guardians of the embryos have determined, using the “best interest” standard and without consideration of research potential of said embryos, that further life-sustaining measures are not to be applied to said embryos, will the embryos be eligible for destruction. And once the embryos become eligible for destruction under the above criteria, the parents can legitimately make a decision to donate the embryo’s cells. If the decision to withdraw life-supporting equipment from the embryo is made legitimately, no additional ethical problems attend the decision to harvest the embryo’s cells even when such harvesting will ensure the embryo’s speedier biological death.

An objection may be made that unlike organ transplantation, stem cell extraction does not lead to an immediate benefit to other individuals. Whereas in organ transplantation, the recipient is given, quite literally, the gift of life, in the case of embryonic stem cell extraction all that is given to anyone is a biological specimen for basic science research that may or may not bear fruit in some indefinite future. The objection is valid insofar as it is true that embryonic stem cells today do not provide any life-saving therapies, and may not do so for decades to come. Yet, on deeper analysis, the objection cannot withstand scrutiny.

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recognition of the fact that the family makes the decision.

292. *Heart Transplants in Israel*, JEWISH MED. ETHICS, May 1989, at 2, 3, available at <http://www.hods.org/pdf/Chief%20Rabbinat%20English%20and%20Hebrew%20Side%20by%20Side.pdf>.

293. The embryos can be stored in either morula stage, where all cells are completely undifferentiated, identical, and totipotent, or at the blastocyst stage, where some differentiation has occurred, but the ICM cells are still pluripotent. See *supra* notes 36–40 and accompanying text.

294. See Andrew Pollack, *After Stem-Cell Breakthrough, the Work Begins*, N.Y. TIMES, Nov. 27, 2007, at F1.

First, not all organs that are donated by adult donors are used in transplantation. Quite often, organs are used in research or for educational purposes such as medical school anatomy classes.<sup>295</sup> Thus, not all organs currently being donated are being donated with the view of giving an immediate “gift of life.” Second, without research on donated organs, neither the original organ transplantation, nor improvements therein, would be possible.<sup>296</sup> Thus, to the extent that one believes that organ transplantation is an ethically permissible procedure, one must recognize that the procedure would be impossible without research. And therefore, to the extent that one believes that organ donation for the purposes of transplantation is ethically permissible, one must also view organ donation for the purposes of research to be permissible. Under that view, even organs that are not transplanted can still be considered to save lives.

Nor do various religious groups make distinctions between organ donation for transplantation and organ donation for research. For instance, the Greek Orthodox Church views both transplantation and medical research as activities that better human life, and therefore both remain equally permissible goals in organ donation.<sup>297</sup> The Church of Jesus Christ of Latter-day Saints also views transplantation and research as morally equivalent.<sup>298</sup> The Catholic Church believes that “Catholic health care institutions should encourage and provide the means whereby those who wish to do so may arrange for the donation of their organs and bodily tissue, for ethically legitimate purposes, so that they may be used for donation *and research* after death.”<sup>299</sup> Other groups take a similar position.<sup>300</sup> Even Orthodox Judaism, with its traditional prohibition on mutilating dead bodies and receiving benefits from the dead,<sup>301</sup> as well as its insistence on a quick burial,<sup>302</sup> presently permits donation of a body for the purposes of autopsy or other medical studies (provided strict conditions are met).<sup>303</sup>

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295. See, e.g., REVISED UNIFORM ANATOMICAL GIFT ACT § 2(3) (2007), available at [http://www.anatomicalgiftact.org/DesktopDefault.aspx?tabindex=1&tabid=63#\\_Toc148498106](http://www.anatomicalgiftact.org/DesktopDefault.aspx?tabindex=1&tabid=63#_Toc148498106) (“Anatomical gift’ means a donation of all or part of a human body to take effect after the donor’s death for the purpose of transplantation, therapy, research, or education.”).

296. See *id.* at prefatory note (“[T]he need for organs, eyes, and tissue for research and education has increased to assure more successful transplantations and therapies. The improvements in technology and the growing needs of the research community have correspondingly increased the need for more donors.”).

297. See Harakas, *supra* note 185.

298. See Mike Holloway, Organ Donors Religious Views, [http://tafkac.org/medical/organ\\_donors\\_religious\\_views.html](http://tafkac.org/medical/organ_donors_religious_views.html).

299. N.Y. Organ Donor Network, Religious Viewpoints, [http://www.donatelifeny.org/organ/o\\_religious.html](http://www.donatelifeny.org/organ/o_religious.html) (emphasis added) (citation omitted).

300. Seventh-day Adventist Church, Operating Principles for Health-Care Institutions, [http://www.adventist.org/beliefs/statements/main\\_stat31.html](http://www.adventist.org/beliefs/statements/main_stat31.html); United Church of Christ, Health Care Justice, <http://www.ucc.org/justice/health/> (demonstrating that major religions endorse organ donation for transplantation and for research).

301. See Netta Notzer, David Zisenwine, Libi Oz & Yoel Rak, *Overcoming the Tension Between Scientific and Religious Views in Teaching Anatomical Dissection: The Israeli Experience*, 19 CLINICAL ANATOMY 442, 444 (2006).

302. *Deuteronomy* 21:22–23 (King James).

303. See Notzer et al., *supra* note 301, at 445–46.

Thus, in every conceivable respect, donation of cells from an embryo is morally identical to donation of organs and tissues from a dead adult, and to the extent that the latter is morally acceptable, so should be the former.

## VI. THE OBJECTIONS AND A RESPONSE

There are a number of objections that can be raised to my proposed paradigm, and it is important to recognize and address them. Although there are a number of strong and plausible objections that could be made, in my view, each of them can be rebutted. I will address these objections in turn.

### *A. The "Consent" Objection*

One of the potential problems with my approach is the question of the validity of third-party consent to both terminate life-supporting measures and to donate embryonic cells. Unlike a born child who may meet with an unfortunate fate and end up brain dead, a frozen embryo may not have parents who love it unconditionally and who will in fact make decisions in the best interest of the embryo. The objection does have some merit to it, though to the extent that it suggests that parents cannot love a "clump of cells" as much as they love a born child, it rejects the notion that a fertilized egg is fully human. Of course, if a fertilized egg is not fully human, then most of the objections to embryonic stem cell research are necessarily obviated. And if the fertilized egg is fully human, as I am ready to concede, then there is little reason to believe that the parents of a grown child love that child anymore than the parents of a child in the embryonic stage of development love their child. It then follows, that if a parent loves his child irrespective of the child's developmental stage, then the parent is equally likely to bear the "best interest" of the child in mind when making decisions on withdrawing life-sustaining treatment, whether the child is just an embryo or a teenager. Thus, when couched in broad terms, the "consent objection" does not present a substantial obstacle.

However, a narrower consent objection raises a more difficult point. That objection goes to the fact that not all embryo creators have the best interest of the child in mind when making the decisions about the embryo's future. Couched in these terms, the objection is significantly more valid. As I mentioned previously,<sup>304</sup> in my view, motivation for the creation of the embryo plays a critical role in the ethical discussion. The reason is precisely because of the consent objection. As discussed in Part II.A., the IVF protocol used to create and store embryos is identical whether the embryos are meant to be used for reproductive purposes or for laboratory experimentation purposes. Although the protocol for an IVF procedure is the same no matter the ultimate purpose of creation, the creators of embryos for the purposes of research do not stand on the same moral footing as the creators of embryos for the purposes of reproduction. That is not to say that the moral status of the embryo depends on the intentions of his creators. The embryo retains the same moral status no matter how or why it came into being. The intent of the creators goes only to the question of whether or not they are to be invested with the decision-making power over the embryo's future.

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304. See *supra* Part II.A.

### 1. Embryos Created via IVF for the Purposes of Reproduction

When parents create a number of embryos for the purposes of procreation, they intend that each of the embryos created receive an equal chance for a full human life.<sup>305</sup> This does not mean that the parents intend to give birth to every embryo thus created; rather, this means that when the embryos are created they each have an equal chance of developing into an adult organism. Thus, at the moment of creation, the parents view all embryos identically, as their children of equal standing.

Embryos created for the purposes of reproduction thus are treated *ab initio* (consciously or not) as individuals and not simply as means toward advancing scientific frontiers. Because of the parents' *ex ante* equal treatment of their offspring and their desire to bring these offspring to full life, the parents would have moral standing to determine when such a process is not in the best interest of each embryo and the family. In these situations the parents of the embryo are in every sense its family since they brought it into the world with the expectation that it will be part of the family for many years to come. Thus, though the parents may not have had a chance to "get to know" the embryo and to have their love and connection to it grow, they are in at least the same position as the parents of a newborn child.

A further objection may be made that in fact parents of the embryos are not proper surrogates, because by creating surplus embryos they signal, *a priori*, that they are more than willing to let some of these embryos die. Thus, the argument goes, these parents are not really thinking in terms of the best interests of the embryo, but only in terms of best interests of themselves. Accordingly, the parents are not proper guardians for the embryos.

The objection certainly has some appeal. It is quite likely that parents who undergo IVF do in fact think in terms of whether or not they will be able to have children, as opposed to whether or not any given embryo will survive. And it is certainly true that the very creation of surplus embryos betrays a willingness to let some of these embryos die. However, I do not think that it follows, from the above premises, that the parents are improper surrogate decision makers. Simply put, the mere fact that the parents know that their offspring is not likely to survive is not a sufficient basis to vitiate parental exercise of decision-making authority on behalf of their offspring.

One can imagine a circumstance where parents know that any child that they conceive will die in infancy because of genetic abnormalities. Yet, if the parents nonetheless go ahead and conceive such a child, their knowledge of the ultimate outcome should not, and does not, prevent them from serving as the child's surrogate in health care decisions (including decisions to withhold or withdraw life-sustaining treatment). In this hypothetical, it may well be that the major reason for the parents'

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305. This is true even if the parents wish to create an embryo with a very specific genotype (e.g., for the purposes of creating an organ donor for an already-born, but ill, sibling). See, e.g., Susan M. Wolf, Jeffrey P. Kahn & John E. Wagner, *Using Preimplantation Genetic Diagnosis to Create a Stem Cell Donor: Issues, Guidelines & Limits*, 31 J.L. MED. & ETHICS 327 (2003) (discussing the use of preimplantation genetic testing in order to select an immunologically "compatible" embryo for the purposes of organ donation). To be sure, in this situation the parents are going to select a particular embryo to the exclusion of all others (and will likely destroy the remaining embryos). Nonetheless, *at the moment of creation*, all embryos are given an equal chance at life, because the parents do not know which one is the "right" embryo.



conception of the non-viable child is to satisfy the parents' own wants and desires (for example, a woman's desire to experience pregnancy and childbirth, or a couple's desire to hold their own child in their arms, however briefly).<sup>306</sup> The fact that the decision to create such a baby is a result of the parents' concern for themselves and their own desires does not in any way destroy familial relationships that provide the basis for parental surrogacy.<sup>307</sup> So too with embryos. Even though these embryos are initially created to fulfill the parents' own desires and wishes, and despite the fact that the parents know that the creation will likely mean death for at least some of these embryos, the familial relationships are not thereby destroyed.

In the final analysis, an objection to the parents' surrogate decision-making power in IVF cases is really an objection to the very creation of surplus embryos. The substance of, and a response to, that objection are discussed below.<sup>308</sup>

## 2. Embryos Created via IVF for the Purposes of Research

In contrast, if the embryo is created solely for the purpose of research (including stem cell extraction), neither the biological parents of that embryo<sup>309</sup> nor the creator (likely a lab scientist) have the same moral standing as parents of the embryo created for the purposes of reproduction. There are several reasons for that.

As previously discussed, in order for a medical procedure to be ethically acceptable, informed consent must be given.<sup>310</sup> Procedures without such consent violate the requirement that the individual be treated *qua* individual, as opposed to merely an "ends" to some more "noble goal." Given that an embryo is a whole person as much as a newborn, the very notion of creating an embryo for the sole purposes of destroying and extracting scientific information out of it violates the precept of not treating individuals solely as a means to an end. Furthermore, when one creates an embryo for the purposes of research, one does not have the best interest of the embryo in mind; rather, one is concerned with advancing science. To be sure, advancing science is a noble and honorable goal, yet pursuing that goal is an insufficient qualification to act

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306. The analysis may differ somewhat if the parents also knew that the child born to them will not only die soon after birth, but will be in pain throughout his short life. In those cases, the parental decision to have the child may not be moral. See Joan Callahan, *Contraception or Incarceration: What's Wrong with this Picture?*, 7 STAN. L. & POL'Y REV. 67, 69 (1995). But even in that case, I would submit, that however morally blameworthy the parents may be in bringing the child into this world, once the child is brought into the world, parents retain the authority to make healthcare decisions on his behalf.

307. One may argue that parents who create a baby knowing he will soon die are violating Kantian principles by using the baby as a means to their own happiness. See *supra* note 171 and accompanying text. I disagree. The born baby has a life of his own, however brief. During that life he is not used *solely* as a means to his parents' happiness (and one must wonder what parents are actually happy holding a dying child in their arms), but has a dignity of his own. The Kantian principle prohibits using a human *solely* as a means of achieving some end. It does not prohibit a party from deriving satisfaction from interacting with that human, so long as each party to the interaction is accorded its due dignity.

308. See *infra* Part VI.B.

309. For a discussion of the moral status of individuals connected to the embryo by nothing more than mere biology, see *supra* Part IV.D.

310. See *supra* notes 169–74 and accompanying text.

as a guardian for a child, especially when the question concerns intentional withdrawal of life-supporting treatment. After all, the reason family members are given a presumptive say over the fate of other family members is because “[t]he family is generally most concerned *about the good of the patient*.”<sup>311</sup> The concern about the patient’s own well-being is of paramount importance in deciding who speaks for the patient,<sup>312</sup> while considerations about “the greater good” (that is, advancing science) play no role in the equation.<sup>313</sup> Thus, since the stated goal of the individuals who create embryos strictly for the purposes of research is the destruction of the embryos, they cannot, by definition, be viewed as being guided by the best interest of the embryos in deciding on withdrawal of life-supporting measures. Indeed, the decision would have been made even before the embryos came into being.

Finally, and related to the above observation, the individuals who create embryos solely for the purposes of research cannot be proper surrogates speaking for these embryos because of the obvious conflict of interest.<sup>314</sup> The admitted desire of the scientist who made the embryo is to conduct research, not to care for the embryo. Where interests of a putative surrogate decision maker conflict with those of the patient, it is morally impermissible for the surrogate to speak on behalf of the patient.<sup>315</sup> Thus, even if the creator of research-bound embryos could potentially make his decisions based on the best interest of those embryos, he would still not be allowed to do so because of “a serious conflict of interest likely to bias [his] decision.”<sup>316</sup>

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311. FOREGOING TREATMENT, *supra* note 196, at 128 (emphasis added).

312. *See id.* at 132 (“The two values that guide decisionmaking for competent patients—promoting patient welfare and respecting patient self-determination—should also guide decisionmaking for incapacitated patients . . . .”); *see also id.* at 135 (“[T]he best interests standard does not rest on the value of self-determination but *solely* on protection of patients’ welfare.”) (emphasis added).

313. *See* INST. OF MED., *supra* note 279, at 16 (“The decision to withdraw life-sustaining treatment should be made independently of and prior to any staff-initiated discussion of organ and tissue donation. The decision should be based on the gravity of the patient’s condition and on his or her wishes to stop burdensome treatment (or on guidance from a surrogate decision maker who represents or affirms the patient’s wishes).”).

314. This is true even if a researcher may be motivated by a desire to search for a “greater good.” For instance, the research is intended to repair lethal genetic diseases in embryos that prevent their successful implantation in a uterus. By killing one embryo, many others can be saved. Nonetheless, with respect to the embryo that is to be killed, the researcher has a conflict of interest. His motivation is the lives of *other* embryos, and therefore his judgment with respect to the embryo in question is clouded by his desires to help others.

315. *See* FOREGOING TREATMENT, *supra* note 196, at 128 (“The presumption that a family spokesperson is the appropriate surrogate may be challenged for any of a number of reasons: . . . an indication that the family’s interests conflict substantially with the patient’s . . . .”); *see also* ALLEN E. BUCHANAN & DAN W. BROCK, DECIDING FOR OTHERS: THE ETHICS OF SURROGATE DECISION MAKING 142–43 (1989) (describing three principles that rebut the presumptive authority of the family).

316. Samuel J. Tilden, *Ethical and Legal Aspects of Using an Identical Twin as a Skin Transplant Donor for a Severely Burned Minor*, 31 AM. J.L. & MED. 87, 95 (2005); *see also* BUCHANAN & BROCK, *supra* note 315, at 142–43. The presence of a conflict does not necessarily imply that the researcher is personally benefiting from the death of the embryo. In fact, he may well be driven by a truly noble goal to alleviate pain and suffering of millions (including the unborn). Nonetheless, because the researcher’s primary concern is not the embryo for whom the

Thus, where embryos are created strictly for the purposes of research, that is, where either or both the researcher and the embryo's biological parent *a priori* know that the only path for the embryo is destruction in the laboratory, no one is in the proper moral position to act as a surrogate on the embryo's behalf. Consequently, if withdrawal of life support is only morally permissible when a "proper surrogate" has approved it, life-supporting interventions cannot be morally withdrawn from these embryos. Under such a rule, there would of course be no point in creating these embryos in the first place, for they could never be used. That is not a shortcoming of the rule, but, I would submit, its virtue. If embryos are not created for the sole purposes of research, there is no danger that they will be used as a "means," and will instead maintain the dignity accorded human life.

### B. The "Creation" Objection

The next objection that can be raised is the objection to the very creation of the surplus embryos. The argument is that if the surplus embryos did not exist, one would not be faced with difficult moral choices about when and whether to discontinue the life-sustaining intervention for these embryos. Under this approach, IVF treatment would not disappear, but the number of embryos created would not exceed the number that could be implanted in a woman per implantation cycle.<sup>317</sup> Thus, there would be no storage of embryos, and all embryos created would be given a chance to implant and be born.<sup>318</sup>

In some way, this argument proves too much. While it is true that if the extra embryos are not created, they will not die, the same can be said about any human. If one is not born, one will never have to die.<sup>319</sup> That, of course, is hardly an argument against having children. Although children may die young,<sup>320</sup> or even *in utero*, no one would suggest that this is a sufficient cause to forgo pregnancy. It could be argued that unlike frozen embryos, children who are actually born *may* die due to a variety of unforeseen<sup>321</sup> or unfortunate events, but at least the parents gave these children a chance at full life. The same, however, is true about frozen embryos. When parents

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decision to discontinue life support is being made, he has an insurmountable conflict of interest.

317. This is different from the approach of the Catholic Church that rejects IVF treatment altogether. *See supra* note 157.

318. In fact, Italy takes this approach. Under Italian law, no more than three embryos can be created per cycle, and all must be implanted. *See supra* note 164 and accompanying text. However, with the passage of this law, the success rate for IVF significantly declined. *See supra* text accompanying note 165.

319. *Cf.* If You Don't Have an Aunt, <http://www.pitt.edu/~slavic/sli/admin/aunt.html> ("And if you don't have an aunt/You won't be able to lose her./And if you don't live/Then you won't have to die.").

320. This is especially true in less-developed countries where infant mortality is high and foreseen. For instance, in Angola, almost twenty percent of all newborns die within one year of birth. *See* CENT. INTELLIGENCE AGENCY, THE WORLD FACTBOOK: ANGOLA, <https://www.cia.gov/library/publications/the-world-factbook/geos/ao.html>. In Sierra Leone, almost thirty percent of all children die before they turn five. *See* UNICEF, THE STATE OF THE WORLD'S CHILDREN 2004: GIRLS, EDUCATION AND DEVELOPMENT (2004), available at [http://www.unicef.org/publications/files/Eng\\_text.pdf](http://www.unicef.org/publications/files/Eng_text.pdf).

321. Given the facts previously cited, *see supra* note 320, one would question whether in all cases the events are "unforeseen."

create embryos *in vitro*, each individual embryo is given, *ex ante*, a chance to develop into an adult organism. In fact, each embryo is given an equal chance. Not every embryo gets to *realize* that chance, due to a variety of circumstances (e.g., pregnancy occurring during earlier attempts, death of the mother thus precluding the possibility of gestation, realization that successful pregnancy is not biologically possible, etc.), but the chance is in fact given.

Furthermore, not only are the embryos given equal chance at life, their chances of death are also (roughly) equal. Even if an embryo is transferred into the woman, it may still die either through failure of implantation or through post-implantation miscarriage. If on the first attempt, all embryos suffer such an unfortunate fate, then the remaining embryos will be used.<sup>322</sup> In other words, simply because the embryo is picked for the first transfer round does not mean that its chance for life is significantly greater than that of the one not picked. The life and death odds of both groups are the same. In this, the embryos are similar to children born in a country with high infant mortality rate where it is almost a given that some of the family's children will suffer premature death, while others may survive. And much like the families in those situations are not behaving immorally by having children (despite the high probability of a child's early death), neither are the families that create surplus embryos (despite knowing that some of these embryos will in fact die, either *in utero* or as a result of withdrawal of life sustaining interventions).

In addition to the general philosophical reason to reject the creation objection, there is a practical one. The creation of surplus embryos is a necessary consequence of the IVF process as currently practiced.<sup>323</sup> The IVF treatment is not a simple, short, and painless medical procedure. Instead, it is a complicated, costly,<sup>324</sup> painful procedure fraught with risks up to and including death.<sup>325</sup> The oocyte retrieval procedure is also invasive<sup>326</sup> (unlike sperm collection) and painful.<sup>327</sup> Given the difficulty of oocyte retrieval and the risks associated with pre-retrieval hormonal therapy, as well as the risks associated with the surgical retrieval procedure, it is simply good medical practice to minimize the number of interventions. Thus, of necessity, per every round of hormonal stimulation more oocytes than could be implanted per single implantation cycle will be retrieved.

Once the eggs are retrieved, only two options exist, namely, fertilizing all the eggs and freezing the surplus embryos, or fertilizing only the eggs destined for implantation

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322. Even if the first transfer attempt results in live birth, the family may still wish to transfer more embryos in hopes of having another child.

323. It may be that, in the future, the science of IVF will progress to the point where a single embryo could be created and implanted with relatively strong odds of success. If and when such a day arrives the problem of surplus embryos may disappear. This Article, however, has to deal with the present-day realities of IVF and not with what may or may not occur in the future. Under conditions as we know them today, surplus embryos are, in fact, a necessary consequence of the IVF process.

324. Felicia R. Lee, *Driven by Costs, Fertility Clients Head Overseas*, N.Y. TIMES, Jan. 25, 2005, at A1. The average cost in the United States for a single IVF procedure is \$12,400. *Id.*

325. *See supra* text accompanying notes 77–82.

326. *See supra* text accompanying note 69.

327. *See ART GUIDE*, *supra* note 66, at 6–7 (noting that anesthesia is used during egg retrieval and cautioning that post-procedure women may feel cramping and pressure).

in the first round, and freezing the surplus eggs which can be thawed and fertilized later. The second option, on the surface would obviate the problem of surplus embryos. Yet, the option is simply not practicable. As an initial matter, cryopreservation-thawing of eggs has a low rate of success due to the fragile nature of the oocyte.<sup>328</sup> Many eggs do not survive the cryopreservation-thawing process.<sup>329</sup> Second, even when the oocyte can be cryopreserved, the rate of successful pregnancy with thawed oocytes is significantly lower than that with fresh eggs (whether the embryo was frozen or not).<sup>330</sup> Studies show that the success rate per frozen oocyte is two to three percent<sup>331</sup> (compared to around eight percent per frozen embryo).<sup>332</sup> Third, oocyte cryopreservation is a relatively new procedure with only around 100 live births reported worldwide.<sup>333</sup> That is not a large enough number of births to evaluate the long-term safety of the procedure (though at present no long term negative impacts on the children born out of a frozen oocyte are reported). Nonetheless, at least at the present stage, the procedure is only experimental.

A three- to fourfold drop in the rate of success, especially given the high financial and emotional cost of the IVF treatment, is likely not acceptable to many women. The fact that the procedure is still experimental and uncertain only serves to reduce its acceptability as a viable alternative. Thus, embryo cryopreservation is, for all practical purposes, the only option available to women seeking to undergo IVF treatment. To the extent that one accepts IVF as a morally sound medical intervention, one has to accept the creation of surplus embryos as an inevitable part of this procedure (at least as it is presently available). The only question that remains then is whether partaking in the IVF as presently available is morally sound. In my view, the answer to that question must be “yes,” for reasons I discussed in Part IV. Because the creation of the surplus embryos under present scientific capabilities is inevitable, and because resorting to these capabilities is morally permissible, the “creation” objection must fall.

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328. See Sally Wadyka, *For Women Worried About Fertility, Egg Bank Is a New Option*, N.Y. TIMES, Sept. 21, 2004, at F5 (“[E]gg freezing has yet to become widespread because, while sperm and embryos freeze fairly easily, eggs are much more fragile.”).

329. *Id.* (“The joke is that anyone can freeze eggs, *but can you thaw them*, fertilize them and actually make babies from them?”) (emphasis added) (quoting Dr. Michael Tucker, scientific director at Georgia Reproductive Specialists)).

330. See *Procedure Allows Women to Freeze Eggs to Preserve Future Fertility*, EUREKALERT, Jan. 27, 2006, available at [http://www.eurekaalert.org/pub\\_releases/2006-01/yu-paw012706.php](http://www.eurekaalert.org/pub_releases/2006-01/yu-paw012706.php) (reporting success rate of two to three births per 100 frozen eggs, compared to eight to nine births per 100 fresh eggs).

331. *Id.*

332. See *supra* note 252 and accompanying text.

333. See Wadyka, *supra* note 328 (“Researchers report pregnancy success rates of about 20 percent, but all the studies are based on very small numbers and the technology, most experts agree, is still in its infancy. Only about 100 babies worldwide are known to have been born using frozen eggs, the majority of them in Italy, where the procedure has been available since 1994.”).

*C. The “Snowflake”<sup>334</sup> and Adoption Objection*

The next objection to my approach was most famously enunciated by President George W. Bush<sup>335</sup> when he vetoed<sup>336</sup> the Stem Cell Research Enhancement Act.<sup>337</sup> While surrounded by eighteen children who were born after the frozen embryos were donated and adopted by non-biological parents, the President gave the following statement: “Each of these children was adopted while still an embryo and has been blessed with the chance to grow—to grow up in a loving family. These boys and girls are not spare parts.”<sup>338</sup> The implication of the President’s speech is that rather than authorize destruction of the embryos, the parents ought to put them up for adoption and give the embryos a chance “to grow up in a loving family.” Despite the superficial appeal of the argument, it does not hold water.

At its core, the broadly construed adoption objection is incompatible with the notion that embryos are human beings entitled to dignity and respect. Because the embryos are human, they are entitled, no less than born children, to have medical decisions made on their behalf by those who are closest to them, that is, their family. Simply asking the family to summarily abandon the embryos to the care of unknown individuals ignores the inter-human relationship between the embryo and its biological parents. It is asking the family to abandon its responsibility to make legitimate medical decisions for the embryo and instead to pass along that decision to strangers. To be sure, just like parents of a born baby, parents of an embryo may wish to put it up for adoption. There is nothing morally wrong or suspect with such a choice. But the choice is not suspect only when it is truly a *choice* made by the family taking into account the best interests of the embryo with reference to the family’s moral, ethical, cultural, and religious beliefs. Once the embryo adoption is no longer a choice, but the only option available to the parents of the embryo, the family’s views on what is best for the child cease to play a role in the decision. If the family cannot make a choice to simply discontinue further extraordinary medical intervention into the embryo’s life,<sup>339</sup> and must either keep it alive indefinitely or give it up for adoption, it is *then* that the embryos become “spare parts,” for those families who may wish to try their luck with implantation.

Furthermore, given the fact that live birth success rate is under eight percent per frozen embryo, the biological parents of the embryos cannot be morally required to gamble the life of their child on a very small chance of survival. They may justifiably

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334. The term “snowflake baby” refers to a baby successfully born from an adopted frozen embryo. See Elissa K. Zirinsky, *Adoption’s New Frontier: ‘Snowflake’ Babies Adopted for Personal, Political Reasons* CBS NEWS, July 28, 2005, <http://www.cbsnews.com/stories/2005/07/28/national/main712541.shtml>.

335. President George W. Bush, Remarks on Stem Cell Research Policy, Address in the East Room (July 19, 2006), available at <http://georgewbush-whitehouse.archives.gov/news/releases/2006/07/20060719-3.html> [hereinafter Bush Remarks].

336. President George W. Bush, Message to the House of Representatives, (July 19, 2006), available at <http://georgewbush-whitehouse.archives.gov/news/releases/2006/07/20060719-5.html>.

337. H.R. 810, 109th Cong. (2005).

338. Bush Remarks, *supra* note 335.

339. Family does not have the right to discontinue *ordinary* medical interventions.

decide not to avail themselves of this opportunity and let their offspring expire with dignity. It would be strange to hear suggestions that parents give up for adoption their children who may be stricken with cancer or other near-fatal disease so that the new adoptive family could try the low-success treatments that the parents view as not being in the best interest of the child.<sup>340</sup>

A rejoinder to this argument is that, unlike a child with cancer who may feel pain and suffer through treatment that is unlikely to be successful, in the case of the embryo the downside is minimal (i.e., no suffering) while the potential payoff is great (i.e., a live birth and a full life). Accordingly, the argument goes, the implantation cannot be rejected because it does not place any real burdens on the embryo. I do not think that this argument is meritorious, despite having a correct factual predicate. It is true that eight-cell embryos do not feel pain.<sup>341</sup> However, I am skeptical that the presence or absence of pain makes any difference when analyzing whether or not low-success treatment could be refused.

An analogy to a born individual will illustrate why this is so. Imagine an individual who is in a coma and is maintained on life support. A patient in a coma does not feel pain.<sup>342</sup> That he does not feel pain, however, does not suggest that all sorts of invasive medical procedures can be tried on him in hope (however slim) that one of the procedures will work and bring him out of a coma. The person in a coma deserves to be treated with human dignity and not simply as a mannequin on which doctors can practice their procedures, especially if it is ninety-two percent likely that the procedure will kill the patient, and only eight percent likely that it will cure him. The patient (or those acting on his behalf) may morally choose to let nature take its course instead, and to let death occur without further poking and prodding. The embryo's rights are the same. It too is entitled to be allowed to die with dignity and not be subject to procedures that are unlikely to succeed.

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340. The same response holds, *a fortiori*, to the suggestion that parents ought to allow other individuals or organizations to pay to maintain their embryos in storage (even without transferring the embryo into a willing female recipient). Much like it would be unthinkable for parents to allow third parties (even ones with the best of intentions) to take control over a child in a persistent vegetative state and keep him alive on artificial life support despite the considered wishes of the parents, so too, it should be unthinkable to ask the parents of the embryo to allow well-meaning third parties to keep the child alive and on life support despite parental wishes.

341. Even most ardent pro-life activists concede that the earliest possible stage at which a fetus might feel pain is at six to seven weeks. *See, e.g.*, 152 CONG. REC. H8762, H8766 (daily ed. Dec. 6, 2006) (statement of Rep. Smith) (“Aspects of pain architecture begin as early as six to seven weeks, mature and are identified by their anatomy, their physiology, and the coordination of responses so that by 20–22 weeks of gestation, the evidence reveals a developed system of pain perception and response.” (quoting Dr. Jean Wright, Emory Univ. Sch. of Med.)). Other studies put the pain threshold at about twenty-eight weeks. *See* Susan J. Lee, Henry J. Peter Ralston, Eleanor A. Drey, John Colin Partridge & Mark A. Rosen, *Fetal Pain: A Systematic Multidisciplinary Review of Evidence*, 294 J. AM. MED. ASS’N 947, 949–50 (2005). No matter which side is correct in this debate, it is undisputed that a two- to eight-cell (or even a 100-cell) embryo is incapable of feeling pain. Recall that embryos are generally stored at two- to eight-cell stage. *See* Robertson, *supra* note 99, at 443.

342. Lawrence K. Altman, *The Doctor’s World; When the Mind Dies but the Brain Lives on*, N.Y. TIMES, Nov. 17, 1987, at C3.

I am, however, constrained to concede that if the science becomes sufficiently advanced to ensure high success rates in implanting and bringing cryopreserved embryos to term, the parents would have no moral authority to forgo employing such treatment. The right to forgo extraordinary and burdensome treatment is not a right to deny a painless and highly successful treatment simply because the parents may not want the child around.<sup>343</sup> It may well be true that the parents would be distressed in putting up their embryo for adoption,<sup>344</sup> but that is not a relevant consideration in deciding whether they can decline to treat their child. Just as parents adhering to the Jehovah's Witness faith cannot decline blood transfusions to their children,<sup>345</sup> no matter the level of distress such transfusion may cause them, so too the parents of an embryo cannot deny him a real (as opposed to highly speculative and ephemeral) opportunity to live a full life, even if such life is distressing to the parents.<sup>346</sup>

Additionally, I have argued that it is a fact that currently the process of thawing, implanting, and carrying the embryo to term is unlikely to succeed, and not any potential suffering on the part of the embryo, that gives the parents the right to decline treatment.<sup>347</sup> Under that paradigm, it is not the pain or the suffering of the child that serves as the basis for declining treatment, but the recognition that as a human being endowed with individual dignity, it cannot be required to risk death while undergoing a low-probability-of-success procedure instead of being allowed to peacefully expire. Thus, while the lack of pain may counsel towards proceeding with thawing and implantation, the low rate of success, in and of itself, may counsel towards not proceeding with the process.<sup>348</sup> If, however, a situation arises where the process becomes likely to succeed, then nothing, other than the parents' disinclination to put up the embryo for adoption, weighs in favor of declining implantation. Given that the decision to withdraw or withhold care is legitimate only if made by reference to the best interest of the patient, mere parental unwillingness to have another child born to them is not a legitimate consideration in deciding whether to decline treatment, just like mere parental unwillingness to remain parents is insufficient to withhold effective antibiotic treatment from a child suffering from pneumonia.

It should be further observed that even if the thawing and implantation process were to become much more certain, it would not necessarily solve the problem of surplus

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343. Cf. Thomson, *supra* note 265, at 66 ("A woman may be utterly devastated by the thought of a child, a bit of herself, put out for adoption and never seen or heard of again. She may therefore want not merely that the child be detached from her, but more, that it die. . . . All the same, I agree that the desire for the child's death is not one which anybody may gratify, should it turn out to be possible to detach the child alive.").

344. *See id.*

345. *See supra* note 236 and accompanying text.

346. Of course, "if the science becomes sufficiently advanced to ensure high success rates in implanting and bringing cryopreserved embryos to term," *supra* text accompanying note 343, the entire problem of surplus embryos will dissipate. Since the low rate of success is the reason surplus embryos are made in the first place, *see supra* Part II.B, having a high rate of success would allow for effective IVF treatment without surplus embryos. Cf. *supra* Part III.B.

347. *See supra* notes 338–40 and accompanying text.

348. Which of those two considerations ought to weigh more is a decision to be made by family, with reference to the best interest of the embryo, and taking into account the family's moral, religious, and ethical beliefs.



embryos. There are currently roughly 400,000 frozen embryos being kept in a variety of labs across the United States.<sup>349</sup> At the same time, Nightlight Christian Adoptions—the pre-eminent embryo adoption network<sup>350</sup>—has completed only 2410 embryo adoptions in ten years.<sup>351</sup> Even if one could assume an unlikely 100-fold increase in embryo adoptions with the increased public awareness, and proliferation of embryo adoption agencies, there would still be only 200,000 embryos put up for adoption, thus leaving an additional 200,000 in the storage tank. Moreover, every year, additional embryos are created and are frozen. For instance, in 2004, almost 82,475 successful oocyte retrievals were accomplished.<sup>352</sup> Recalling that, on average, eight to fifteen oocytes are harvested per retrieval cycle,<sup>353</sup> of which roughly seventy percent will fertilize,<sup>354</sup> we can calculate that in 2004 alone between 462,000 and 866,000 embryos were created. Subtracting from that number about 2.5 to 3.3 embryos that are usually transferred per transfer procedure<sup>355</sup> (of which there were 76,533),<sup>356</sup> we are still left with the possibility of between 209,000 and 675,000 embryos being created and not implanted yearly. Of course, not all of these embryos that are created are stored and thus not all are available for either research or adoption. Nonetheless, the numbers show that it is highly unlikely that even a widespread embryo adoption program could be successful in placing all of the frozen embryos for adoption. Much like creation of surplus embryos is an inevitable consequence of IVF treatment,<sup>357</sup> so too is the retention of these embryos in storage, despite availability of adoption programs.

Thus, in order for the “snowflake” objection to be valid, not only would the process of bringing frozen embryos to term have to become significantly more successful, there would need to be a sufficient number of families willing to adopt these embryos. Failure of either prong makes adoption of the embryos an unviable alternative. Consider the situation where a child is on life support, and can be cured relatively easily, but the actual treatment (for instance antibiotics) is not available and is not

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349. D.I. Hoffman, Gail L. Zellman, C. Christine Fair, Jacob F. Mayer, Joyce G. Zeitz, William E. Gibbons & Thomas G. Turner, *Cryopreserved Embryos in the United States and Their Availability for Research*, 79 FERTILITY & STERILITY 1063 (2003); RAND LAW & HEALTH INITIATIVE, HOW MANY FROZEN EMBRYOS ARE AVAILABLE FOR RESEARCH? (2003), available at [http://www.rand.org/pubs/research\\_briefs/RB9038/RB9038.pdf](http://www.rand.org/pubs/research_briefs/RB9038/RB9038.pdf).

350. Janet I. Tu, “Embryo Adoption” Gives New Life to Some Couples’ Hopes for a Child, SEATTLE TIMES, Nov. 20, 2008, at A1 (“Indeed, Nightlight Christian Adoptions, which runs one of the largest ‘embryo adoption’ services in the country, says its program has resulted in 194 births over the last decade.”).

351. See Nightlight Christian Adoptions, Snowflakes Frozen Embryo Adoptions, Frequently Asked Questions, [http://www.nightlight.org/programs\\_SnowflakesFrozenEmbryoPlacingFaqs.html](http://www.nightlight.org/programs_SnowflakesFrozenEmbryoPlacingFaqs.html).

These numbers include some donor families from foreign countries. Thus, the number of embryos adopted from American storage banks is less than 0.5% of the overall number of embryos stored. This calculation does not even take into account the fact that these 2000 adoptions occurred over the course of ten years.

352. CDC REPORT, *supra* note 90, at 17.

353. ART: STEP-BY-STEP, *supra* note 73.

354. *Id.*

355. CDC REPORT, *supra* note 90, at 81.

356. *Id.* at 17 fig.5.

357. See *supra* Part VI.D.

likely to become available. The unavailability of the treatment is, for all practical purposes, the same as its nonexistence. The parents can then choose to withdraw life-supporting means because in reality no accessible treatment exists to cure their child. The same logic applies to an embryo in a cryopreservation tank. Even if the parents of the embryo knew with a 100% certainty that he could be successfully brought to term, in the absence of a woman willing to undertake the pregnancy, no *realistic* possibility of success exists, and the parents cannot be required to keep the embryo alive.

At present, neither of the two prongs is satisfied. It is also unlikely (given the numbers previously cited) that at least the “availability” prong will ever be satisfied. For these reasons, at least at present, the “snowflake” objection must be dismissed.

#### *D. The “Reprogramming” and “Biopsy” Objections*

In Part II.C.2, I discussed two potential new methods of creating embryonic stem cell lines—methods that may obviate the need for the destruction of the embryo.<sup>358</sup> Is it not reasonable to then ask that the researchers postpone their scientific inquiry until that time? Sure, some discoveries may be delayed, but is human life (or in this case, multiple human lives) not worth a delay of several months or even years? The argument is tempting but, like others before it, ultimately does not create a significant barrier to the presently outlined approach.

There are two fundamental reasons why this objection does not persuade. First, as with the “consent” and “snowflake” objections, practical reasons stand in the way. Even assuming that either of these approaches will be successful and consistent in obtaining pluripotent cells, which can then be cultured into stem lines, neither method does anything to solve the problem of (both extant and newly created) surplus embryos. In fact, the very point of both approaches is to keep the embryo intact and alive. At the same time, thousands of embryos are being created in IVF labs on a yearly basis, and hundreds of thousands are already being stored. The presence or absence of these new methods does not change the parents’ decision whether to continue providing life-sustaining care to the embryo. Indeed, separation of the decision to withdraw medical intervention and the decision to donate organs is essential for ethical decision making.<sup>359</sup> Thus, parents may legitimately choose to terminate further life-supporting interventions even if there is not a need for the embryonic cells. Consequently, the number of embryos currently slated to die should not decrease even if the biopsy method proves to be a success. It then follows, that if the parents can make a morally acceptable decision to withdraw life-sustaining means from their offspring, they can—*independently* of that initial decision—choose to offer the offspring’s now dead body to science. It may be that the science may have no need for that body, in which case it should be disposed of with all due care and dignity, but this lack of need does not affect the morality of the decision to donate.

In essence, this objection is a non sequitur. Under the approach proposed in this Article, the embryos are not destroyed *in order to* extract their cells. The extraction of the cells occurs *after* the *independent* and morally legitimate decision to withdraw treatment has been made. Thus, to the extent that the objection is an argument against

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358. See *supra* text accompanying notes 123–33.

359. See *supra* text accompanying note 278; see also *supra* Part IV.B.

destroying embryos solely for the purposes of conducting research, it simply misses the point.<sup>360</sup>

Second, the biopsy (though not the “reprogramming”) approach is problematic on its own terms. Although current studies do not report any adverse outcomes with respect to children born from post-embryonic biopsies, it is too early in the history of this technique to make conclusions about its long-term safety.<sup>361</sup> The procedure may well carry some long-term risks. It also carries short-term risks, including the risk of embryonic death due to the possibility of error during the cell-extraction process.<sup>362</sup> With respect to the embryos meant for implantation, the risk may be justified by the assurance that the resultant child is genetically healthy and will not suffer from debilitating genetic illnesses throughout his life.<sup>363</sup> Thus, because the procedure is (arguably) beneficial to the child, parental consent to the procedure is valid as being (again, at least arguably) in the best interest of the child.

On the other hand, when it comes to embryos that are biopsied strictly in order to obtain materials for scientific study, those embryos are not deriving any benefit from the procedure. Parents who consent to such a procedure cannot be said to be acting in the best interest of the child, because the child has no direct interest in the scientific experiment.<sup>364</sup> A biopsy of the embryo for the purposes of research is akin to organ

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360. The same response can be given to the “dead embryo” approach, proposed by some as a substitute to research on healthy embryos. See ALTERNATIVE SOURCES, *supra* note 120, at 8–23. Even if the research is limited to the “dead embryos,” parents will still retain the moral right to withdraw life-sustaining interventions from their healthy but frozen embryos. Thus, those embryos will still be dying and the parents will consequently retain the moral authority to donate the organs of their dead embryos. The availability of an alternate method in no way diminishes the morality of the parental decision to withdraw life-supporting interventions or the morality of a subsequent and independent decision to donate the deceased embryo’s cells.

361. See *supra* text accompanying note 133–34.

362. See ALTERNATIVE SOURCES, *supra* note 120, at 27 (noting that the biopsy procedure is only “usually” not fatal, and therefore implying that some risk of death is present).

363. It is arguable whether such a consideration constitutes a “benefit” to the child. To the extent that embryos are considered morally on par with born babies, they have the same right to human dignity as those that are born, whether or not the embryos are genetically abnormal. If embryos are indeed fully human, it is just as impermissible to kill an embryo with Down’s syndrome as it would be impermissible to kill a similarly afflicted born child. Nonetheless, at least with respect to the embryos who are biopsied in order to discover their genetic abnormalities, an argument (however unconvincing) can be made that the biopsy is done for the embryo’s own benefit.

364. The child may have an interest as a member of the human race in advancement of science, but that interest is too attenuated to qualify as the child’s own. Some have argued that it is in a child’s interest to donate organs to a sibling because a sibling may be “dependent upon [other siblings], emotionally and psychologically, and that his well-being would be jeopardized more severely by the loss of his brother than by the removal of” an organ. *Strunk v. Strunk*, 445 S.W.2d 145, 146 (Ky. 1969); see also *Hart v. Brown*, 289 A.2d 386 (Conn. Super. Ct. 1972) (holding that parents may consent to intratwin kidney donation); *Little v. Little*, 576 S.W.2d 493, 500 (Tex. App. 1979) (authorizing a transplant from a minor incompetent donor after concluding that the donor “will receive substantial psychological benefits” from the donation). *But see Curran v. Bosze*, 566 N.E.2d 1319 (Ill. 1990) (refusing to authorize testing for bone marrow compatibility from a minor half sibling of the afflicted patient); *In re Richardson*, 284 So. 2d 185 (La. Ct. App. 1973) (holding that kidney donation by a minor to a sibling is not in

donations by minors—a practice that is universally viewed as too fraught with moral hazard to be acceptable.<sup>365</sup> Even such a simple and low-risk procedure as blood donation cannot be performed on an incompetent minor except in a very narrow set of circumstances.<sup>366</sup> Since it is not permissible for parents to consent to organ donations (or even blood transfusions) from live minors, it is equally impermissible to consent to donations from live embryos. In this way, the biopsy method actually violates minor's autonomy and bodily integrity, and it is this method that treats the embryo as a source for spare parts.

#### VII. DIFFERENTIATING STEM CELL RESEARCH FROM ELECTIVE ABORTION

One of the purposes of this Article is to explain how an otherwise pro-life individual (or organization) can rationally and with intellectual honesty support embryonic stem cell research, which involves destruction of embryos to the same extent that abortion does. It is therefore important to discuss whether the arguments made herein could be used with equal force to defend the morality of elective abortion. If in fact these arguments could be so used, it is an indication that the proposed ethical paradigm fails, at least from the pro-life perspective. If, on the other hand, the arguments cannot be so used, then the approach is sound, at least insofar as the anti-abortion ethical argument is concerned. For reasons explained below, I submit that the adoption of the model I propose does not apply to elective abortion, and therefore allows for maintenance of opposition to abortion in tandem with support for embryonic stem cell research.

The fundamental difference between elective abortion and destruction of frozen embryos rests on the distinction between ordinary and extraordinary medical care. As I have demonstrated, keeping embryos in the frozen state of suspended animation amounts to extraordinary medical intervention of unknown duration. The conditions to which cryogenically preserved embryos are subjected do not approximate anything in nature. Conversely, there is nothing more natural (at least in terms of pure biology) than pregnancy. Thus, while withdrawing an embryo from a cryogenic tank amounts simply to discontinuation of extraordinary life-sustaining interventions, abortion is a discontinuation of ordinary and normal biological processes.

Second, cryogenically preserved embryos are stored in the storage tanks for an indefinite period of time. The possibility that they will ever be born is remote because no one can tell when or even if these embryos will ever be implanted. By contrast,

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minor's best interest and therefore prohibited). However, even courts that have held that the transplant from minors is permitted have limited the applicability of their holdings to intra-family transplantation where the donee is readily identifiable and related to the donor. *See Little*, 576 S.W.2d at 500 (“Nothing in this opinion is to be construed as being applicable to a situation where the proposed donee is not a parent or sibling of the incompetent.”). No court has approved transplantation from minors or incompetents where the donee was unknown. *See AM. MED. ASS'N, THE USE OF MINORS AS ORGAN AND TISSUE DONORS* 9 (1993), available at [http://www.ama-assn.org/ama1/pub/upload/mm/369/ceja\\_3i93.pdf](http://www.ama-assn.org/ama1/pub/upload/mm/369/ceja_3i93.pdf) [hereinafter *AMA, MINORS AS DONORS*] (requiring that, in cases of minors donating organs, recipient be a close relative or that a relationship of “psychological closeness” be established).

365. *See* Francis L. Delmonico & William E. Harmon, *The Use of Minor as Live Kidney Donor*, 2 *AM. J. TRANSPLANTATION* 333, 333 (2002) (“The Consensus Conference participants were generally opposed to live organ donation from a minor because it obviously strains the concept of voluntarism, the ethical underpinning of live donation.”).

366. *See* *AMA, MINORS AS DONORS*, *supra* note 364, at 3–4.

pregnancy has a definitive endpoint, known long before the actual birth of a child. The birth of a gestating child is much more definite and imminent than the birth of a cryogenically preserved embryo. Consequently, a gestating child cannot be compared to a born individual who is on artificial life support with little hope of recovery. At best, a gestating child is more akin to an individual who is on temporary life support following complicated surgery, but whose recovery is expected. Life support cannot be withdrawn from individuals in this category,<sup>367</sup> and so too it cannot be withdrawn from a gestating infant.<sup>368</sup>

The gestating fetuses also differ from cryogenically preserved embryos in another respect. Even if a frozen embryo were thawed and implantation attempted, the chances of live birth would still be under eight percent.<sup>369</sup> With a gestating child the numbers are much different. The earliest time surgical abortion can take place is at the fourth week of pregnancy.<sup>370</sup> By the fourth week, however, the embryo is fully implanted with a developed and attached placenta.<sup>371</sup> Thus, the potential problems with implantation are no longer an issue. Taking CDC numbers for IVF treatment as a benchmark, we can see that an embryo that gets implanted and results in a successful pregnancy has an eighty-two percent chance of being born.<sup>372</sup> That is an over tenfold increase over cryogenically preserved embryos' odds of being born. Thus, while the extraordinarily low chances of success for the birth of a frozen embryo allow parents of that embryo to forgo the treatment, the extraordinarily high chances of success for the birth of a gestating fetus do not allow for termination of pregnancy via induced abortion.

Finally, the decision to abort differs from the decision to discontinue the cryogenic process for embryos because of the considerations that go into each decision. In the former case, the decision is made because the mother, for whatever reason, is unwilling to carry the pregnancy to term. In deciding to abort, the primary considerations that go into the decision involve her own well-being. The decision is not focused on the best interest of the gestating child. Because of this, the decision to abort cannot be viewed as made under the "best interest" standard.<sup>373</sup> Even if the decision not to carry the

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367. See *In re Quinlan*, 355 A.2d 647, 667–68 (N.J. 1976) ("For those possibly curable, such devices are of great value, and, as ordinary medical procedures, *are essential*. Consequently, . . . *they are necessary because of the ethic of medical practice*. But . . . , one would have to think that the use of the same respirator or like support could be considered 'ordinary' in the context of the possibly curable patient but 'extraordinary' in the context of the forced sustaining by cardio-respiratory processes of an irreversibly doomed patient." (emphases added)).

368. I express no view on whether, normatively, this is a correct moral approach. However, *if* one believes that an embryo (or a gestating child) is fully human, such an approach is to be expected.

369. See *supra* note 252 and accompanying text.

370. In fact, only forty percent of abortion providers in the United States offer abortions so early in pregnancy. THE GUTTMACHER INST., FACTS ON INDUCED ABORTION IN THE UNITED STATES (2008), *available at* [http://www.guttmacher.org/pubs/fb\\_induced\\_abortion.pdf](http://www.guttmacher.org/pubs/fb_induced_abortion.pdf).

371. See PRENATAL FORM AND FUNCTION—THE MAKING OF AN EARTH SUIT: UNIT 2 (2009), [http://www.ehd.org/dev\\_article\\_unit2.php](http://www.ehd.org/dev_article_unit2.php).

372. CDC REPORT, *supra* note 90, at 21.

373. This is true even if the mother considered potential hardships for the baby such as poverty, handicap, lack of loving family, etc. Since killing born individuals who may be poor or handicapped, or who lack a loving family is impermissible, so too it is impermissible to kill those not yet born, if one views them as fully human.

pregnancy to term is made after consideration of both the child's and the mother's best interests,<sup>374</sup> the possibility for conflict of interest still remains. Given the potential for a conflict of interest, the pregnant woman would not be permitted to decide what is in the best interest of the gestating child.<sup>375</sup>

In contrast, under the methodology proposed by this Article, the decision whether to terminate the cryogenic process is made solely with reference to the best interests of a frozen embryo. Although it is possible that in deciding whether to withdraw treatment the family may consider the cost of that treatment, it is unlikely that that consideration would play a significant role. Embryo storage costs about \$200–\$600 per year<sup>376</sup>—a rather modest amount, especially as compared to the cost of the initial fertility treatment.<sup>377</sup> Thus, the risk that the financial considerations will overwhelm “best interests of the embryo” considerations is quite small.<sup>378</sup>

For these reasons, abortion is inapposite to the decision allowing the frozen embryos to expire. One can, with intellectual honesty and philosophical consistency, adopt the approach proposed in this Article, while remaining opposed to elective abortion.

#### CONCLUSION

Biomedical research is opening new frontiers in treatment of disease, understanding physiological processes, and increasing knowledge. On the other hand, the advances in this field come with a host of ethical quandaries. While scientifically it is possible to do things unthinkable only a few decades or even years ago, the mere ability to accomplish these things does not answer the question whether it is morally permissible to accomplish them.

If taken too far, the exciting scientific frontiers of embryonic stem cell research may present moral problems. Yet, this research presents us, as humans, with incredible opportunities to better the lives of almost everyone. Thus, to the extent that such research is to be permitted, it should be done under stringent ethical guidelines.

Bans or other limitations on embryonic stem cell research do not accomplish their purported goal of saving embryos from destruction. Every year, thousands of embryos

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374. Again, the child's interests cannot be simply that his “quality of life” will be low. Rather, a circumstance where it really may be in the child's interest to terminate pregnancy is one where the gestating fetus exhibits a condition incompatible with life (e.g., anencephaly). Only then can it be plausibly argued that it is moral to forgo continuation of pregnancy, because the born child cannot survive on his own.

375. See *supra* notes 313–14 and accompanying text.

376. See, e.g., Advanced Fertility Ctr. of Chi., The Cost of IVF at the Advanced Fertility Center of Chi., <http://www.advancedfertility.com/ivfprice.htm>; Advanced Fertility Servs., Costs, <http://www.infertilityny.com/costs/index.html>; Fertility Ctr. of Cal., Sperm Bank Service Costs and Fees, <http://www.spermbankcalifornia.com/sperm-bank-cost.html>.

377. See *supra* note 324.

378. Additionally, the family is permitted to consider the financial burden on itself when deciding whether to continue with treatment. The family is allowed to take stock of financial issues if the chances of treatment's success are small. Because the chances of success are less than eight percent, see *supra* note 254, the consideration of financial outlays does not present a significant problem.

are created through the IVF protocols as part of infertility treatments. Many of these embryos end up being destroyed for a variety of reasons. The creation and destruction of these embryos can be ethical, provided that the guiding principle through the entire process remains the best interest of the embryo, thus recognizing the embryo's full humanity. The approach outlined by the present Article allows for a principled support of embryonic stem cell research while acknowledging the humanity of the embryo. This approach also permits for continuation and broadening of research, while prohibiting the indiscriminate creation and destruction of human life. Ultimately, Senator Hatch is correct. Supporting stem cell research is "the most pro-life position you can take."<sup>379</sup> But in order for the position to truly remain "pro-life," the principles presently laid out ought to govern.

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379. *News Hour: Political Science* (PBS television broadcast July 10, 2001), available at [http://www.pbs.org/newshour/bb/health/july-dec01/stem\\_cells\\_7-10.html](http://www.pbs.org/newshour/bb/health/july-dec01/stem_cells_7-10.html).

