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NATIONAL ORGAN TRANSPLANT ACT'S BAN ON BONE MARROW DONATION COMPENSATION: LEGAL COMPENSATION TO CREATE A LIFE, BUT NOT TO SAVE A LIFE

MARY G. VITALE

INTRODUCTION

In December 2008, Kumud Majumder received devastating news that most parents would consider to be their worst nightmare: his eleven-year-old son’s leukemia had relapsed.1 Arya Majumder was diagnosed in 2006 with acute lymphoblastic leukemia (“ALL”), a particularly aggressive cancer of the white blood cells that predominantly affects children.2 This deadly disease causes a person’s bone marrow to make abnormal, unformed cells called blasts.3 Blasts typically transform into

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1 Senior Staff Member, St. John’s Law Review; J.D. Candidate, 2012, St. John’s University School of Law; B.S., Boston University, 2009. I would like to thank Professor Rosa Castello for all her hard work, dedication, and guidance during this note-writing process. Thank you, also, to Adam Rafsky for being a great Notes and Comments Editor, to my family and friends for all their support, and to my wonderful fiance, Mark, for always inspiring me to do my best. This Note is dedicated in loving memory of my dear friend, Nolan Morales, and all those who have been lost to leukemia.

A previous draft of this Note was selected for First Prize in the Epstein, Becker, & Green, P.C. Health Law Writing Competition.

2 See Complaint for Declaratory and Injunctive Relief at 8, Flynn v. Holder, No. CV0907772, 2009 WL 3495055 (C.D. Cal. Oct. 26, 2009) [hereinafter Plaintiffs’ Complaint]. Kumud Majumder is one of the plaintiffs in a class action lawsuit against Eric Holder in his official capacity as Attorney General challenging the constitutionality of the National Organ Transplant Act as discussed infra in Part I.B.

3 See Acute Lymphoblastic Leukemia (ALL), NAT’L MARROW DONOR PROGRAM, http://www.marrow.org/PATIENT/Undrstnd_Disease_Treat/Lrn_about_Disease/ALL/index.html (last visited Jan. 28, 2012) [hereinafter NAT’L MARROW DONOR PROGRAM]. ALL is the most common leukemia in children, however, it can also appear in adults. Approximately 4,000 new cases of ALL are reported in the United States every year. See id.

See id.
lymphocytes, which are white blood cells that the body uses to fight infections.\textsuperscript{4} However, because the blasts are abnormal, they cannot develop properly to fight infections.\textsuperscript{5} Typically, as in Arya’s case, ALL is initially treated with chemotherapy or radiation therapy.\textsuperscript{6}

In Arya’s case, while previous treatment with chemotherapy in 2006 worked, in 2008 Arya’s health had rapidly declined\textsuperscript{7} and he needed an immediate bone marrow transplant if he had any hope of surviving.\textsuperscript{8} A bone marrow transplant is considered an ALL patient’s best chance of survival, especially when the cancer has relapsed and chemotherapy is not likely to provide long-term remission.\textsuperscript{9}

With no suitable match in sight, Kumud desperately accepted marrow cells from a “next best match,” unrelated donor, or a partial match donor, in an attempt to save his son’s life.\textsuperscript{10} This donation resulted in an undesirable match, known as a rejection,\textsuperscript{11} meaning Arya’s body identified the transplant tissue

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\textsuperscript{4} Id.

\textsuperscript{5} Id. These abnormal cells duplicate extremely quickly and prevent essential, normal red blood cells from growing. See id.

\textsuperscript{6} Id.

\textsuperscript{7} See Plaintiffs’ Complaint, supra note 1. Arya “began to lose his eyesight and the cancer invaded his brain and testicles.” Id.

\textsuperscript{8} See id.

\textsuperscript{9} See ALL Transplant Outcomes, NAT’L MARROW DONOR PROGRAM, http://www.marrow.org/PATIENT/Undrstd_Disease_Treat/Lrn_about_Disease/ALL/ALL_Transplant_Outcomes/index.html (last visited Jan. 28, 2012) (showing the approximate survival rates for ALL patients at various stages of remission who received bone marrow transplants between 1998 and 2006); see also Maurizio Arico et al., Outcome of Treatment in Children with Philadelphia Chromosome-Positive Acute Lymphoblastic Leukemia, 342 NEW ENG. J. MED. 998, 998 (2000) (discussing how bone marrow transplantation is superior over intensive chemotherapy alone in prolonging initial complete remissions).

\textsuperscript{10} See Plaintiffs’ Complaint, supra note 1.

\textsuperscript{11} See id. at 9.
as a foreign invader and destroyed it. Thus, Arya’s parents were forced to continue their search for a donor who was a closer match.

During this time, Kumud joined several other parents of children with cancer as plaintiffs in a class action lawsuit against the Department of Justice. The plaintiffs of this lawsuit, *Flynn v. Holder*, argued that they ought to be legally allowed to offer compensation to prospective bone marrow donors to encourage more donors to come forward to increase their chances of finding a suitable match to save the lives of their dying children. The lawsuit was dismissed by the District Court of California, but was reversed and remanded by the Ninth Circuit of the United States Court of Appeals. Unfortunately, Kumud’s son did not live long enough to see this legal battle unfold. A suitable bone marrow donor was not found in time and Arya Majumder passed away from leukemia in April 2010 at the age of twelve.

Arya’s heartbreaking story is one that is unfortunately repeated every day, year after year in this country. In 2011 more than 130,000 Americans were diagnosed with a very serious blood disease, and their best chances for survival will be a bone

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12 This “rejection” is also known as graft-versus-host disease (“GVHD”). It occurs when there are significant discrepancies between the bone marrow tissue type of the donor and that of the host, or recipient, during a bone marrow transplant. These cells may identify the host’s tissues as foreign and reject them. This commonly occurs when patients receive bone marrow cells from only partially matched donors. See Mark F. Anderson, *Encouraging Bone Marrow Transplants from Unrelated Donors: Some Proposed Solutions to a Pressing Social Problem*, 54 U. Pitt. L. Rev. 477, 482-83 (1993) (discussing the importance of finding a close match between a donor and a recipient to avoid rejection during bone marrow transplants); see also Richard J. O’Reilly, *Allogenic Bone Marrow Transplantation: Current Status and Future Directions*, 62 Blood 941, 942-44 (1983).

13 See Plaintiffs’ Complaint, supra note 1, at 9. “[T]he only way to avoid GVHD is to assure a close match between donor and recipient.” Anderson, supra note 12, at 483. Finding a close bone marrow tissue match means that certain proteins found on the surface of white blood cells and other tissues of the body called Human Leukocyte Antigens must be the same for the donor and the patient. See id. at 482 n.14.

14 See Plaintiffs’ Complaint, supra note 1, at 4.

15 See generally id.

16 See generally *Flynn v. Holder*, 665 F.3d 1048, (9th Cir. 2011); Civil Mins., Flynn v. Holder, No. 2:09-CV-07772-VBF-AJWX (C.D. Cal. Mar. 12, 2010) (tentative ruling regarding Defendant’s Motion to Dismiss). For a more in depth discussion of this pending lawsuit see infra Part I.C.

17 Brief of Appellants at 4 n.3, Flynn v. Holder, 665 F.3d 1048 (9th Cir. 2011) (No. 10-55643), 2010 WL 5854339.

18 See id.
marrow transplant. Currently, there are 7,500 patients actively searching for bone marrow donors. Approximately 1,000 of these patients, like Arya Majumder, will die while waiting for a bone marrow transplant. Only 30% of cancer patients will find an acceptable donor within their own families. Thus, the majority of these patients are forced to search outside their families for a suitable bone marrow donor—an overwhelmingly difficult task when the odds of finding a match are approximately one in 20,000 to one in 50,000. As a result, 60% of patients in need of a bone marrow transplant are not receiving one, and the process of finding suitable matches is further frustrated by the fact that only 2% of the American population is on the national registry for bone marrow matches. The importance of bone marrow transplants cannot be overstated. A cancer patient who receives a transplant can have

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20 See id.
21 See id.
22 See id.; see also Claudio Anasetti, The Role of the Immunogenetics Laboratory in Marrow Transplantation, 115 ARCHIVES PATHOLOGY & LABORATORY MED. 228, 292 (1991) (estimating even a less than thirty percent chance of patients finding a suitable donor within their immediate family); Anderson, supra note 12, at 484.
23 See Bone Marrow Donation, LIVING DONORS ONLINE!, http://www.livingdonorsonline.org/marrow/marrow4.htm (last visited Feb. 8, 2012) (further emphasizing that close matches are essential to a successful transplant to avoid rejection or GVHD); see also Anderson, supra note 12, at 484 (stating the chances of any two unrelated people having an acceptable match for all three pairs of relevant Human Leukocyte Antigens are between one in 100 and one in 1,000,000 depending on how frequently their antigens occur in the general population).
24 See Anderson, supra note 12, at 487.
25 See Resources, supra note 19. The National Bone Marrow Program was started by the federal government in 1986 and created a computer file of volunteer donors whose tissues could be matched with patients in need of bone marrow transplants. See Anderson, supra note 12, at 485; Who We Are—About the National Bone Marrow Program and Be the Match, NAT'L MARROW DONOR PROGRAM, http://www.marrow.org/ABOUT/Who_We_Are/index.html (last visited Feb. 8, 2012). Although the creation of a national registry was an important step that has made a substantial difference for many cancer patients and their families, it is nowhere near an aggressive enough approach to ensure that all patients in need receive an acceptable bone marrow transplant.
a survival rate as high as 90%;\textsuperscript{26} without a transplant, death is almost a certainty because bone marrow transplants are generally used as a patient's last resort.\textsuperscript{27}

Incentives are desperately needed to encourage more donors to come forward as the current altruistic-based system of bone marrow donation is just not working. Allowing modest compensation for bone marrow donations is the most efficient way to increase donations, as observed in the areas of blood and gamete—sperm and egg—donation,\textsuperscript{28} and to ensure that patients receive this life-saving treatment. Generous compensation persuades thousands of men and women every year to donate eggs and sperm to infertile couples hoping to conceive a child.\textsuperscript{29} However, similar compensation incentives for bone marrow donors to save the lives of cancer patients are illegal in the United States and punishable by up to five years


\textsuperscript{27} Anderson, supra note 12, at 481.

\textsuperscript{28} When the commercial blood market in 1971 was at its height, a pint of blood sold anywhere from $5 to $30, depending on local conditions. See 1 NAT'L HEART & LUNG INST., DEPT OF HEALTH, EDUC., & WELFARE, NHLI'S BLOOD RESOURCE STUDIES: SUPPLY AND USE OF THE NATION'S BLOOD RESOURCE 197 (1972). While today only a small percentage of blood donors are paid for their services, this change came about because of a sudden increase in hepatitis in patients transfused with blood from paid donors who were predominantly from poor areas. Since modern medicine now has the technology to screen against such diseases, this problem is no longer an issue and it is extremely likely that a greater emphasis would be placed back on paid blood donations if today's voluntary system stopped providing enough blood or blood products to meet the current need. See Anderson, supra note 12, at 492; Sarah Terman, Comment, Marketing Motherhood: Rights and Responsibilities of Egg Donors in Assisted Reproductive Technology Agreements, 3 NW. J.L. & SOC. POL'Y 167, 167 (2008) (discussing how financial incentives have produced substantial increases in egg donation over the past decade).

\textsuperscript{29} See Terman, supra note 29; see also CRTS. FOR DISEASE CONTROL AND PREVENTION, U.S. DEPT OF HEALTH & HUMAN SERVS., 2007 ASSISTED REPRODUCTIVE TECHNOLOGY SUCCESS RATES: NATIONAL SUMMARY AND FERTILITY CLINIC REPORTS 91 (2009) (revealing that over 15,000 embryos created from donor eggs were used for assisted reproductive procedures). This statistic only refers to actual embryos successfully created using donor eggs; the additional number of donated eggs collected in unsuccessful embryo creation, as well as donated eggs collected for research purposes, are not included in this report.
in prison. In 1984, Congress passed The National Organ Transplant Act ("NOTA"), 42 U.S.C. § 274e, banning compensation for the donation and receipt of human organs. This Note argues that this piece of legislation is sorely outdated and the continued ban on bone marrow donation compensation no longer serves NOTA's stated purposes. Congress must amend NOTA to remove bone marrow from the list of human organs prohibited from being donated for valuable consideration. This amendment will not offend the original purposes of the statute's enactment and will save the lives of thousands of cancer patients.

Part I of this Note briefly discusses the background of NOTA and several recent scientific and legal developments in the field of bone marrow donation. Part II sets forth the policy and legal arguments for why the continued ban on bone marrow compensation is illogical, outdated, and possibly even unconstitutional. As this Note argues, bone marrow donation differs substantially from the donation of the other organs included in NOTA's phrasing. In light of recent advances in biomedical technology since the passage of the statute in 1984, making the continued inclusion of bone marrow in NOTA's definition arbitrary and unnecessary to achieve the statute's stated purposes. This Note further argues that it is illogical for Congress to ban compensation for bone marrow cell donation but allow compensation for other renewable cells, such as eggs, sperm, and blood. Part III discusses the benefits and potential problems of three possible solutions to deal with remaining ethical issues that would exist if Congress were to legalize bone marrow compensation, and concludes that government regulation and procurement is the optimal solution.

I. CONGRESS'S STATED PURPOSE FOR NOTA AND RECENT DEVELOPMENTS IN THE FIELD OF BONE MARROW DONATION

A. Legislative Background of NOTA

The National Organ Transplant Act of 1984 provides that

It shall be unlawful for any person to knowingly acquire, receive, or otherwise transfer any human organ for valuable

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31 See id.
32 See id. at § 274e(c)(1).
33 See infra Part II.B.
consideration for use in human transplantation if the transfer affects interstate commerce. . . . The term "human organ" means the human (including fetal) kidney, liver, heart, lung, pancreas, bone marrow, cornea, eye, bone, and skin or any subpart thereof and any other human organ (or any subpart thereof, including that derived from a fetus) specified by the Secretary of Health and Human Services by regulation.34

NOTA was passed with substantial bilateral support and little debate,35 primarily in response to moral and ethical concerns surrounding the advancements in medical technology made during the 1980s regarding organ transplants.36 Congress maintained that the stated purposes of NOTA were (1) to prevent the commercialized, permanent disfigurement of the human body, (2) to prevent the human body from being treated as a commodity,37 and (3) to prevent the unjust exploitation of the poor who may be willing to put their health at risk by selling their organs.38 Moral and ethical concerns over creating a for-profit market for solid human organs remain prominent in academia and in the American court system today.39

However, Congress specifically excluded renewable cells, such as blood and semen, from the prohibitions described in NOTA.40 During its discussion of the statute and subsequent

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34 42 U.S.C. § 274e.
36 See 98 CONG. REC. S14,796–97 (1983) (statements of Sen. Kennedy and Sen. Heinz) (discussing the moral and ethical concern that a for-profit market in solid organs would lead to "black-market trafficking in human flesh").
37 See S. REP. NO. 98–382, at 7 (1984) ("The committee believes that human body parts should not be viewed as commodities."); Carlson, supra note 36.
39 See Guo Qi Wang v. Holder, 583 F.3d 86, 90–91 & n.3 (2d Cir. 2009) (citing how a "scheme to . . . sell organs on a black market" is a serious nonpolitical crime because of the "general condemnation of this type of behavior by the world community"); see also Kenneth Baum, Golden Eggs: Towards the Rational Regulation of Oocyte Donation, 2001 BYU L. REV. 107, 134 (discussing the argument that allowing a for-profit market of human organs would belittle the human existence and that the human body is something to be cherished).
40 H.R. REP. NO. 98–1127, at 16 (1984) (Conf. Rep.) ("The term 'human organ' is not intended to include replenishable tissues such as blood or sperm."); see also J. Brad Reich & Dawn Swink, You Can't Put the Genie Back in the Bottle: Potential Rights and Obligations of Egg Donors in the Cyberprocreation Era, 20 ALB. L.J. SCI.
legislative history, Congress explicitly chose not to include these cells because they can be replenished and because their donation "does not compromise the health of the donor."\footnote{41}

B. Recent Scientific Developments

Since the passage of NOTA in 1984, there have been several substantial advances in biomedical technology. One of these advances that relates directly to bone marrow is the introduction of the peripheral blood stem cells apheresis ("PBSC") method for retrieving bone marrow cells from donors.\footnote{42} PBSC donation was developed during the early 1990s, after NOTA was drafted.\footnote{43} In order to extract bone marrow using the PBSC method, a donor receives injections of a drug called filgrastim, which moves more stem, or blood-forming, cells out of the marrow and into the bloodstream.\footnote{44} The donor's blood is then removed through a needle in one arm and passed through a machine that separates out the blood-forming cells that are needed to treat the recipient.\footnote{45} The remaining blood is returned to the donor


\footnote{43} See Martin Körbling & Emil J. Freireich, Twenty-Five Years of Peripheral Blood Stem Cell Transplantation, 117 BLOOD 6411, 6413 (2011) (discussing the development of peripheral blood stem cell transplantation technology).

\footnote{44} See Donation FAQs, supra note 43; see also Stem Cell Transplant (Peripheral Blood, Bone Marrow, and Cord Blood Transplants), AM. CANCER SOC', http://www.cancer.org/Treatment/TreatmentTypes/TreatmentTypesandSideEffects/TreatmentTypes/BoneMarrowandPeripheralBloodStemCellTransplant/stem-cell-transplant-donor-experience (last visited Feb. 9, 2012) [hereinafter Stem Cell Transplant].

\footnote{45} See Donation FAQs, supra note 43; see also Jonathan L. Powell et al., Pediatric Hematopoietic Stem Cell Transplantation, MEDSCAPE REFERENCE, http://emedicine.medscape.com/article/991032-overview (last updated Sept. 11, 2009); Stem Cell Transplant, supra note 45.
through the other arm. This process is called asphersis and is extremely similar to donating blood or plasma, which notably is not prohibited under the language of NOTA.

The PBSC donation method is a remarkable breakthrough in biomedical technology and provides many benefits to both the donor and the recipient. The donor is not required to undergo anesthesia or multiple marrow aspiration. Furthermore, the entire process of PBSC only takes approximately two to four hours, and the risk of a serious side effect is less than one percent, the same remarkably low risk of serious side effects seen in blood donors. As for the recipient, the use of PBSC results in faster engraftment, which may be associated with a better clinical outcome. Studies have also shown that the PBSC method allows for doctors to harvest more stem cells during one collection than the traditional aspiration method. Additionally, PBSC has an extremely low rate of infectious complications in recipients. Because of these benefits, PBSC is now almost always the preferred method of extracting bone marrow stem cells.

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46 See Donation FAQs, supra note 43; see also Stem Cell Transplant, supra note 45.
47 See Donation FAQs, supra note 43; see also Stem Cell Transplant, supra note 45.
48 See supra notes 41-43 and accompanying text; see also Anderson, supra note 12, at 491 (noting how blood and blood products are excluded from NOTA).
49 See Watanabe et al., supra note 43, at 168.
50 See id. The more traditional, aspiration method of bone marrow extraction required doctors to sedate donors with anesthesia and then draw out the bone marrow with a long syringe from the back of the donor's pelvic bone. See Donation FAQs, supra note 43; see also infra Part II.A.1.
51 See Stem Cell Transplant, supra note 45.
52 See Donation FAQs, supra note 43.
54 This means that the donor's bone marrow tissue is accepted by the recipient's bone marrow tissue quicker.
55 See Watanabe et al., supra note 43, at 168.
56 See id. at 167.
57 See id. at 167-68; see also Jeffrey L. Winters, Complications of Donor Apheresis, 21 J. CLINICAL APERATURESIS 132, 132 (2006) (discussing the extremely low risk accompanying bone marrow donation).
58 See Watanabe et al., supra note 43; see also Resources, supra note 19 (data compiled by the Institute of Justice) (stating that the PBSC method is now used in over seventy percent of marrow donations); Hematopoietic Cell Sources Tailored to the Patient, NAT'L MARROW DONOR PROGRAM, http://www.marrow.org/
C. Recent Legal Developments

On October 26, 2009, the Institute of Justice filed a lawsuit on behalf of several cancer patients and MoreMarrowDonors.org against Eric Holder in federal district court alleging that NOTA violates the Equal Protection Clause and the Due Process Clause of the United States Constitution. The plaintiffs argued that NOTA is unconstitutional because it arbitrarily includes bone marrow on its list of prohibited organs while excluding similar renewable cells and that the inclusion of bone marrow is not rationally related to achieve the government’s purpose when it enacted NOTA. MoreMarrowDonors.org, a plaintiff in the case, proposed to provide a $3,000 scholarship to individuals found to be a bone marrow match for a patient in need and whom would subsequently donate their bone marrow cells to that patient. The plaintiffs argued that it was absurd that this program is currently illegal under NOTA. On March 12, 2010, the District Court of California dismissed this case, Flynn v. Holder, for failure to state a claim. The trial court maintained that the plaintiffs could not bring an “as applied” equal protection claim against the government and that the government’s purposes for enacting NOTA were sufficiently legitimate to support the statute.

PHYSICIAN/Adv_in_Auto_Allo_Tx/Hematopoietic_Cell_Sources_Tai/index.html (last visited Feb. 9, 2012) (showing via chart that between 2002 and 2006 PBSC donation was used in over 70% of marrow donations for patients over the age of twenty, compared to only 40% of the time between 1997 and 2001).

59 See Plaintiffs’ Complaint, supra note 1, at 2–3; see also John Wagner & Jeff Rowes, Op-Ed., Give These Donors A Bone, N.Y. TIMES, Jan. 8, 2010, at A27; Sherry F. Colb, Suit Challenges Federal Ban on Compensation for Bone Marrow Donors, FINDLAW (Nov. 9, 2009), http://writ.news.findlaw.com/colb/20091109.html.

60 See generally Plaintiffs’ Complaint, supra note 1; Wagner & Rowes, supra note 60; Colb, supra note 60.

61 See Plaintiffs’ Complaint, supra note 1, at 27; Saving Lives: Challenging the Federal Ban on Compensating Bone Marrow Donors, INST. FOR JUST. (Oct. 2009), http://ij.org/about/2899 [hereinafter Saving Lives].

62 See Plaintiffs’ Complaint, supra note 1, at 33–34.


64 See id.
The Plaintiffs appealed and on December 1, 2011 the United States Court of Appeals for the Ninth Circuit reversed and remanded the district court's ruling. The Ninth Circuit held that the restrictions in NOTA did not prohibit compensation for bone marrow cells that were donated through PBSC. The court considered such donations to be scientifically "blood donations" because only the cells found outside the bones flowing through the veins were being harvested for donation. Thus, in the court's view, bone marrow donated through the PBSC method was not within the purview of NOTA. This ruling is already being hailed as a victory by the Institute of Justice and cancer advocates across the nation. However, not only is the court's ruling limited to the states of the Ninth Circuit, the court also did not address the core constitutional question: whether NOTA's ban on bone marrow donation compensation as it exists in today's world violates the Equal Protection Clause. While the Ninth Circuit's ruling provides some comfort for cancer patients and their loved ones, an amendment of NOTA is still desperately needed, as the court's ruling only provides relief for a small number of states limited to MoreMarrows.org's scholarship program.

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65 See generally Brief of Appellants, Flynn v. Holder, 665 F.3d 1048 (9th Cir. 2011) (No. 10-55643), 2010 WL 5854339.
66 See Flynn v. Holder, 665 F.3d 1048, 1059 (9th Cir. 2011). Attorney General Eric Holder has since requested a rehearing en banc in this matter. See Appellee's Petition for Rehearing and Rehearing En Banc at 1, Flynn v. Holder, 665 F.3d 1048 (9th Cir. 2011) (No. 10-55643), 2012 WL 523381.
67 See id.
68 Id. at 1057 ("Such donations of cells drawn from blood flowing through the veins may sometimes anachronistically be called 'bone marrow donations,' but none of the soft, fatty marrow is donated, just cells found outside the marrow, outside the bones, flowing through the veins.").
69 See id. at 1059.
70 Cancer Patients Win Bone Marrow Legal Fight Against U.S. Attorney General, INST. OF JUST. (December 1, 2011), http://www.ij.org/about/4200.
71 While the Ninth Circuit found that the traditional aspiration method of bone marrow donation did not violate Equal Protection, the court deemed it unnecessary to address "any constitutional question" on the subject of PBSC donation. Flynn, 665 F.3d at 1057.
II. POLICY AND LEGAL ARGUMENTS FOR THE AMENDMENT OF NOTA

A. The Inclusion of Bone Marrow in NOTA Is Inconsistent with the Statute's Stated Purposes and Intent

Hardly anything in American society is as it was twenty-six years ago. This fact is overwhelmingly true in both the fields of biomedical technology and Congressional legislation. However, Congress has not given proper consideration to these scientific changes in regards to several statutes, such as NOTA. Congress must now amend NOTA to properly reflect these developments in order to better serve the statute's original purposes and to better promote the values of justice in today's climate.

This section maintains that the development of the PBSC method has eradicated many of the ethical concerns Congress may have had regarding compensation for bone marrow donors. It further argues that, even without this development, the inclusion of bone marrow in NOTA's definition is unequivocally arbitrary because bone marrow is a renewable cell and, as such, should be excluded from NOTA's ban along with the already excluded blood, plasma, and gametes.

1. Development of the PBSC Method Renders NOTA's Inclusion of Bone Marrow Irrelevant to the Statute's Purpose

Biomedical technology has increased so rapidly over the past decade that medical techniques and procedures doctors used just a few years ago have become obsolete and outdated. Since the enactment of NOTA in 1984, scientists, researchers, and doctors have made astounding technological advancements in the way diseases are diagnosed and treated. However, Congress has not made a single amendment to NOTA, one of the most important pieces of legislation regulating modern medicine, since the statute's enactment in 1984. It is crucial for Congress to advance along with biomedical technology and take notice that

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72 See Donation FAQs, supra note 43 (explaining how bone marrow cells are completely replenished within four to six weeks using either the PBSC method or the traditional bone marrow aspiration method); Colb, supra note 60.
73 See supra Part I.B.
several of its ethical concerns regarding NOTA are no longer applicable in the medical community twenty-six years after it passed this statute.

The development of the PBSC method for bone marrow extraction has had a profound effect on the way doctors perform bone marrow transplant procedures. This new method for extracting bone marrow is a far less invasive and painful procedure than the traditional aspiration method of extracting bone marrow that was commonly used during such procedures in 1984. During the traditional aspiration method, the doctor would put the donor under anesthesia while making small incisions in the back of the donor's pelvic bone. The doctor would then insert a long syringe through these incisions over the rear of the pelvic bone to draw out the marrow. While the traditional aspiration method is also arguably minimally invasive, it still carries higher risks than PBSC donation because of the use of anesthesia.

Not only does the PBSC method cause patients less pain and discomfort, it also carries an extremely low chance of serious side effects and is considered by many doctors to have a very high success rate. Thus, bone marrow donation today does not cause the donor permanent disfigurement and certainly does not jeopardize the health and safety of the donor. Arguably, the biggest sacrifice marrow donors must make during these procedures is their time and the minimal discomfort they may experience during injections and extraction. Congress even shared this opinion when it expressly stated it would not include plasma and other blood products in NOTA's list of prohibited organs because the donation procedures used in plasma and blood donation did "not compromise the health of the donor." As several scholars and researchers have noted, procedures used for both traditional bone marrow donation and PBSC donation

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75 See supra Part I.B.
76 See Watanabe et al., supra note 43, at 168.
77 See Donation FAQs, supra note 43.
78 See id.
79 NOTA's legislative history shows that even Congress noted the difference between the traditional method of bone marrow donation and other types of invasive solid-organ donation. See 98 CONG. REC. H6236 (1984).
80 See id.; see also Watanabe et al., supra note 43, at 168.
81 See supra notes 45–51 and accompanying text.
practically mirror the methods used in blood and plasma donation.\textsuperscript{83} The Ninth Circuit of the United States Court of Appeals unanimously agreed with this assessment in its recent ruling in \textit{Flynn v. Holder}.\textsuperscript{84}

One of Congress's main purposes for drafting and enacting NOTA in 1984 was to prevent the commercialized, permanent disfigurement of the human body.\textsuperscript{85} It is difficult to argue that this purpose is not a rational and just governmental concern. The health and safety of an organ donor should never be compromised, and Congress correctly guarded this concern by prohibiting financial incentives that might cause donors to put their health in jeopardy. However, the inclusion of bone marrow in NOTA's list of prohibited organs for valuable consideration does not accomplish this goal. The development of the PBSC method for extracting bone marrow makes NOTA's inclusion of bone marrow unnecessary to address the statute’s concerns. Thus, whatever reasons Congress may have had for including bone marrow no longer exist.

Congress can still protect its interest of preventing commercialized and permanent disfigurement of the human body by continuing to ban compensation for donation of the other organs listed in NOTA—kidneys, livers, hearts, lungs—because the donation procedures used in those extractions involve major, invasive surgical procedures that carry a much higher risk for the donor and the recipient.\textsuperscript{86} These organ donation procedures do involve permanent disfigurement and permanent loss to the patient and are thus properly included in NOTA.\textsuperscript{87} Bone marrow donation, on the other hand, does not involve permanent disfigurement or a high risk of harm to the donor. Therefore, Congress ought to amend NOTA and legalize compensation for bone marrow transplants.

\begin{itemize}
\item \textsuperscript{83} See supra note 48 and accompanying text.
\item \textsuperscript{84} 665 F.3d 1048, 1052, 1057–59 (9th Cir. 2011).
\item \textsuperscript{85} See S. REP. NO. 98–382, at 16–17.
\item \textsuperscript{86} Compare Arthur J. Matas et al., \textit{Morbidity and Mortality After Living Kidney Donation, 1999-2001: Survey of United States Transplant Centers}, 3 AM. J. TRANSPLANTATION 830, 833 (2003) (citing that between 10% and 16.5% percent of kidney donors experience complications), with Donation FAQs, supra note 43 (citing that serious complications or side effects occurred in less than 1% of bone marrow donors).
\item \textsuperscript{87} See Anderson, supra note 12, at 478.
\end{itemize}
2. Bone Marrow Is a Renewable Cell

Under NOTA, donors are freely allowed to receive compensation for donating renewable cells, including blood cells and sperm cells. Because of this, there currently exists capital markets for several renewable cells, including gametes, blood, and hair. Congress maintained that these renewable cells ought to be excluded from NOTA's prohibition because their donation would not cause the donor to suffer a severe, permanent loss because such cells would replenish themselves in weeks or even days after the donation was made. Thus, Congress made a distinction between solid organ donations, such as kidney donations, and replenishable cell donations, indicating that Congress did not believe banning compensation for renewable cells was necessary to achieve NOTA's purpose of preventing the human body from being treated as a commodity because blood or gamete donors would not suffer a permanent loss of an organ.

Bone marrow donation is unquestionably more similar to blood or sperm donation than to kidney or liver donation because bone marrow cells are also renewable cells. Congressional committee hearings before the enactment of NOTA document that even several members of the House Committee on Science and Technology understood that bone marrow cells are

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90 See H.R. REP. NO. 98–575, pt. 1, at 8 (1983) (indicating that Congress's concerns over donor health were limited to instances in which the donor suffered a permanent loss, such as a kidney).

91 See id.

92 See Russell Scott, The Terrible Imbalance: Human Organs and Tissues for Therapy—A Review of Demand and Supply, 9 J. CONTEMPORARY HEALTH L. & POL'Y 139, 156 (1993) (distinguishing blood and bone marrow-which are vital, regenerative tissue—from other organs on that basis); Colb, supra note 60 (discussing how renewable cells do not cause a donor permanent loss and how it is arbitrary for Congress to treat bone marrow—a proven renewable cell—differently from other renewable cells, such as blood and gametes); Donation FAQs, supra note 43 (explaining how bone marrow cells are completely replenished within four to six weeks using either the PBSC method or the traditional bone marrow aspiration method).
renewable, and yet Congress inexplicably still included bone marrow in the statute. A bone marrow donor loses only approximately ten percent of their bone marrow cells during a single collection. This percent of bone marrow, or blood-forming cells, is completely regenerated by the donor within four to six weeks of donation. This regeneration happens whether the marrow is extracted using the traditional bone marrow aspiration donation method or the PBSC method. Thus, marrow donors do not experience any type of permanent disfigurement or loss that kidney or liver donors experience because bone marrow cells, like blood and sperm, are regenerative.

It is completely arbitrary and irrational for Congress to ban bone marrow donation compensation while simultaneously allowing for compensation to donors who donate blood or plasma. Furthermore, because bone marrow cells are renewable, their inclusion in NOTA's list of organs banned for compensation does not serve the government interests of preventing the human body from being treated as a commodity and from preventing permanent loss to the donor.

B. The Underlying Constitutional Issue: NOTA Violates Equal Protection

In addition to NOTA being outdated and illogical, its inclusion of bone marrow has underlying constitutional issues as well. The inclusion of bone marrow in NOTA's list of organs banned from donation compensation violates the Equal Protection Clause because its inclusion is not rationally related to achieve Congress's stated statutory purposes.

The Supreme Court has held that the Equal Protection Clause of the Fifth Amendment of the United States Constitution requires the federal government to provide equal protection of its laws to all citizens. Equal protection cases arise when the

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94 See Anderson, supra note 12, at 482 n.13.
95 See id.; see also Donation FAQs, supra note 43.
96 See Donation FAQs, supra note 43.
97 See sources cited supra note 93.
98 See Carlson, supra note 36.
99 See Bolling v. Sharpe, 347 U.S. 497, 500 (1954) (holding that equal protection applied as much to the federal government through the Fifth Amendment as it did to
government has enacted a legislative classification that discriminates against a particular group of citizens by denying them certain rights or privileges that another group of citizens is legally allowed to have. All equal protection cases pose the same basic question: Is the government's legislative classification justified by a sufficient and legitimate purpose?

When dealing with a non-suspect class, courts are required to apply rational basis review to determine if a government classification can withstand an equal protection challenge. Because the Supreme Court strictly limited suspect classes to those classifications involving race or ethnicity, rational basis review, or minimal scrutiny, is generally thought of as the "default level" of equal protection review.

In turning to the constitutionality of NOTA, rational basis review is the appropriate level of scrutiny because a classification involving cancer patients is not rooted in race, ethnicity, lawful resident alienage, or gender. Under rational basis review, a

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the states through the Fourteenth Amendment); see also ERWIN CHEMERINSKY, CONSTITUTIONAL LAW: PRINCIPLES AND POLICIES 684–85 (4th ed. 2011); CALVIN MASSEY, AMERICAN CONSTITUTIONAL LAW: POWERS AND LIBERTIES 608 (3d ed. 2009).

100 See CHEMERINSKY, supra note 100, at 686 (describing that a classification may be a facially discriminative law or a facially neutral law that has a discriminatory impact).

101 See id. at 685.

102 A group of citizens classified by some characteristic other than race, ethnicity, alienage, or gender.

103 See MASSEY, supra note 100, at 608–09; see also Romer v. Evans, 517 U.S. 620, 631 (1996); CHEMERINSKY, supra note 100, at 687–88.

104 See Romer, 517 U.S. at 631; Mass. Bd. of Ret. v. Murgia, 427 U.S. 307, 313 (1976); see also MASSEY, supra note 100, at 640. The Supreme Court also applies intermediate scrutiny to equal protection challenges involving "quasi-suspect classes," such as gender or illegitimate birth. See id. at 609; see also Miss. Univ. for Women v. Hogan, 458 U.S. 718, 724 (1982) (holding that a gender classification fails unless it is substantially related to a sufficiently important government interest); Matthews v. Lucas, 427 U.S. 495, 518–19 (1976) (noting that illegitimacy of one's birth is beyond one's control and that classifications involving illegitimacy should be subject to a somewhat heightened review).

105 See MASSEY, supra note 100.

106 Rational basis review was applied by the District Court for the Central District of California to the plaintiffs' similar claims of equal protection violations under NOTA in Flynn v. Holder. See generally Civil Mins., Flynn v. Holder, No. 2:09-CV-07772-VBF-AJWX (C.D. Cal. Mar. 12, 2010) (tentative ruling regarding Defendant's Motion to Dismiss). Additionally, the plaintiffs in Flynn did not object to rational basis review because they recognized that the statutory classification at issue was not a suspect class. See Brief of Appellants at 15, Flynn v. Holder, 665 F.3d 1048 (9th Cir. 2011) (No. 10-55643), 2010 WL 5854339.
plaintiff challenging the validity of a legislative classification must prove either that the government classification does not rationally advance a legitimate state purpose; or the actual government purpose itself is not legitimate. Here, as previously noted, it is difficult to argue that the government’s objectives behind NOTA are not legitimate. Congress’s objectives to prevent the permanent commercialized disfigurement of the human body, to prevent the human body from being treated as a commodity, and to prevent the unjust exploitation of the poor willing to put their health at risk by selling their organs are all just and legitimate government concerns. This Note does not advocate that the inclusion of bone marrow in NOTA violates the Equal Protection Clause because the government’s objectives behind the statute are not legitimate; rather it advocates that

107 See Massey, supra note 100, at 608–09; see also Quinn v. Millsap, 491 U.S. 95, 108 (1989) (invalidating a Missouri state law requirement that any citizen who was appointed to any governmental board must own real property and holding that a citizen’s ability to grasp politics was not rationally related to their ability to own property); U.S. Dep’t of Agric. v. Moreno, 413 U.S. 528, 534 (1973) (holding that excluding households that contained unrelated residents from participating in a government food stamp program was not rationally related to the government purpose of alleviating hunger and strengthening the agricultural economy); In re Levenson, 587 F.3d 925, 932 (9th Cir. 2009) (holding that a California state law that denied benefits to same-sex couples was not rationally related to the state’s purpose of encouraging traditional heterosexual marriages and thus violated equal protection).

108 See Massey, supra note 100, at 609, 628 (noting how discriminating against a minority group is not a legitimate governmental objective); see also Romer, 517 U.S. at 634 (Justice Kennedy explained that there was no legitimate purpose in singling out a particular group and precluding it from using the political process).


110 See sources cited supra note 39.

111 The Honorable Valerie Baker Fairbank also noted the importance and legitimacy of these state interests in her opinion in Flynn v. Holder. See generally Civil Mins., Flynn v. Holder, 2:09-CV-07772-VBF AJW (C.D. Cal. Mar. 12, 2010) (tentative ruling regarding Defendant’s Motion to Dismiss).
NOTA is overinclusive, and the inclusion of bone marrow in the statute is not rationally related to achieve Congress's stated objectives.

NOTA violates the Equal Protection Clause in three distinct ways. First, the recently developed method of PBSC to extract bone marrow tissue from donors does not cause the body permanent disfigurement like the invasive and major surgical procedures required to remove kidneys or livers. Therefore, compensation would not entice bone marrow donors to undergo any medical procedure that would cause permanent disfigurement. Donors would merely be compensated for the time they spend donating their bone marrow tissues, similar to the way blood donors are legally compensated.

The Supreme Court has even acknowledged that recent societal or scientific developments may affect the subsequent constitutional validity of a legislative classification that may have been valid when first enacted. In Abie State Bank v. Weaver, Chief Justice Hughes said, "[A] ... regulation, although valid when made, may become, by reason of later events, arbitrary and confiscatory in operation." This appears to be the case with bone marrow's inclusion in NOTA. Although it may have been constitutionally valid for Congress to include bone marrow tissue in NOTA in 1984 because the traditional aspiration method of extracting bone marrow caused the donor an intense amount of pain, the development of the PBSC method now makes it constitutionally invalid because this concern no longer exists.

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112 A law is generally considered "overinclusive" if it applies to those who need not be included in a classification in order for the government to achieve its legitimate purpose. CHEMERINSKY, supra note 100, at 690. NOTA fits this definition because, while its prohibition of buying and selling solid organs is necessary to protect the purpose of preventing permanent commercialized disfigurement of the human body, the prohibition of compensation for bone marrow donation is not necessary to achieve this purpose. If a court deems a law overinclusive, it does not automatically invalidate the law. Id. However, the law may still be invalidated if the court finds the overinclusive classification is not rationally related to the legitimate government purpose. See id.

113 See supra Part II.A.1.

114 See supra note 48 and accompanying text.


116 Id.

117 See supra Part I.B
Second, because bone marrow cells are easily donated and readily replenished,\textsuperscript{118} unlike the removal of a patient’s kidneys or liver, Congress’s inclusion of bone marrow in NOTA’s definition is not rationally related to the legitimate government interest of preventing the human body from being treated as a commodity\textsuperscript{119}, under the minimal scrutiny equal protection review. Donors do not experience a permanent loss when donating bone marrow, and their bodies are not being treated like “commodities.”\textsuperscript{120} Thus, banning compensation for bone marrow cells is not rationally related to the second stated purpose of NOTA.

Third, NOTA’s inclusion of bone marrow on its list of organs banned from compensation is unconstitutionally arbitrary. The Supreme Court has held that statutes that classify in an arbitrary way fail minimal scrutiny.\textsuperscript{121} Under NOTA, Congress is arbitrarily treating similar things dissimilarly in both definition and purpose. The statute explicitly allows compensation for blood, gametes, and other renewable cells,\textsuperscript{122} while it simultaneously bans compensation for bone marrow cells,\textsuperscript{123} even though such cells are also renewable.\textsuperscript{124} Furthermore, it allows for valuable consideration for certain medical donation procedures for these renewable cells—blood donation through standard needle draws and plasma donation through needle apheresis; yet, it continues to ban valuable consideration for bone marrow cell donation that uses a near identical donation method, PBSC.\textsuperscript{125} Thus, NOTA is arbitrarily treating similar things dissimilarly through its statutory classification.\textsuperscript{126}

\textsuperscript{118} See supra Part II.A.2.
\textsuperscript{119} See sources cited supra note 110.
\textsuperscript{120} See supra Part II.A.2.
\textsuperscript{121} See Ry. Express Agency, Inc. v. New York, 336 U.S. 106, 112 (1949); see also CHEMERINSKY, supra note 100, at 703; MASSEY, supra note 100, at 629.
\textsuperscript{122} See supra notes 41–42 and accompanying text.
\textsuperscript{124} See Donation FAQs, supra note 43.
\textsuperscript{125} See supra note 48 and accompanying text.
\textsuperscript{126} Although these three Equal Protection arguments have merit, the Supreme Court has a history of extremely strong deference to the government under rational basis review. See CHEMERINSKY, supra note 100, at 694–95. In fact, since 1970, plaintiffs have won only eighteen out of the 117 Equal Protection cases that the Supreme Court has decided under rational basis review. Brief of Appellants at 23, 25, Flynn v. Holder, 665 F.3d 1048 (9th Cir. 2011) (No. 10–55643), 2010 WL 5854339. Because of this steep uphill climb that plaintiffs in minimal scrutiny equal protection cases must overcome, it is unfortunately unlikely that the battle for the
C. Comparing Bone Marrow Donation with Oocyte Donation

Removing bone marrow from NOTA’s definition will substantially increase bone marrow donations in this country and will have the potential to save the lives of hundreds of cancer patients. Furthermore, as discussed above, inclusion of bone marrow in NOTA does not effectively serve the stated congressional purposes of preventing the commercialized, permanent disfigurement of the human body\footnote{See 98 CONG. REC. S14,796–97 (1983) (statements of Sen. Kennedy and Sen. Heinz).} and preventing the human body from being treated as a commodity.\footnote{See sources cited supra note 110.} Conversely, these same government interests would not be offended if NOTA was amended to exclude bone marrow cells. However, the explicit third stated purpose of NOTA must also be considered if Congress were to amend NOTA: preventing the unjust exploitation of needy donors who may consider compromising their health to receive compensation.\footnote{See sources cited supra note 39.} Legalizing an open, unregulated market for a human cell or organ can lead to unethical consequences. This reality could not be more apparent than in the current unregulated market of oocyte—egg cell—donation. Although not given an explicit exception to NOTA’s ban like its gamete counterpart,\footnote{Congress’s lack of specifically mentioning egg cells in NOTA’s legislative history is most likely because oocyte donation was not as prevalent in 1984 as it is now. See Terman, supra note 29, at 170 (noting how NOTA is consistently interpreted as insufficiently overbroad to cover the sale of human gametes).} compensation for oocyte donation is currently legal under NOTA,\footnote{See EMILY JACKSON, REGULATING REPRODUCTION 165–66 (2001) (human eggs do not regenerate after birth, unlike human sperm, which are constantly renewed within the body). However, women produce hundreds of thousands of egg cells during their lifetime so including them in “renewable cells” is arguably an accurate comparison. Baum, supra note 40, at 127 (citing how the average woman has approximately 400,000 pre-oocytes, cells capable of becoming oocytes, in her ovaries at puberty, which in reality makes her supply of oocytes unlimited).} even though egg cells are technically speaking not renewable cells.\footnote{See Terman, supra note 29, at 170 (noting how NOTA is consistently interpreted as insufficiently overbroad to cover the sale of human gametes).}
Like bone marrow, astounding medical advances have been made in the last decade in the field of assisted reproduction technology ("ART"). Various procedures used in ART, especially those using third party donated eggs, have been extremely successful and are not only changing the face of modern medicine, but society's approach to procreation in this country as well. Because of this success, egg donors are in greater demand now than ever before, and many women are jumping at the chance to donate because of the generous compensation packages that come with donation, compensation packages that are freely permissible under NOTA.

However, such ART advances have also raised several ethical concerns surrounding oocyte donation. In 1999, a childless couple began searching for their perfect egg donor. The couple took ads out in several ivy league university newspapers searching for a donor who was intelligent, athletic,

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133 Assisted reproduction technology ("ART") is an umbrella term for various medical technologies used for creating human conception through means other than coital reproduction, sexual intercourse between a man and a woman. See Reich & Swink, supra note 41, at 7.

134 Such procedures include in vitro fertilization and early egg retrieval. In vitro fertilization involves fertilizing an egg with sperm outside the woman's body. A woman must undergo fertility treatments to stimulate egg production before the eggs can be removed from her body. Once the eggs are removed, they can be fertilized by sperm in the lab and the fertilized eggs are then implanted into a woman, either the intended mother or a surrogate. See id. at 9 n.23 (quoting Sandy Varnado, Comment, Who's Your Daddy?: A Legitimate Question Given Louisiana's Lack of Legislation Governing Assisted Reproductive Technology, 66 LA. L. REV. 609, 616 (2006)). Early egg retrieval is a new advancement in the world of ART where a woman's immature eggs may be collected from her ovaries and then allowed to mature in a laboratory setting before being frozen for other ART procedures in the future. See Reich & Swink, supra note 41, at 13.

135 In 2006, ART doctors and researchers celebrated the astounding milestone of the three millionth baby born from in vitro fertilization since the first ART baby was born in the United Kingdom in 1978. See Three Million Babies Born Using Assisted Reproductive Technologies, MED. NEWS TODAY (June 25, 2006, 9:00 AM), http://www.medicalnewstoday.com/articles/45720.php (also estimating the use of one million cycles per year, producing 200,000 babies a year worldwide). Additionally, the number of ART cycles performed in the United States more than doubled in the last decade, from 64,681 cycles in 1996 to 138,198 in 2006. See Reich & Swink, supra note 41, at 11.

136 See Reich & Swink, supra note 41, at 11.

137 See id. at 65.

138 See 42 U.S.C. § 274e (2006 & Supp. I); Terman, supra note 29, at 169–70 (noting how NOTA is consistently interpreted as insufficiently overbroad to cover the sale of human gametes).

139 See supra notes 141–43 and accompanying text.
at least five feet and ten inches tall, had at least a 1,400 SAT score, and had no major family medical issues. While this story on its own was enough to stir the ethical consciousness of the general public, the enticement of the couple's offer created a full media frenzy, complete with newspaper articles, ethical debates, and television spotlights: the couple offered to compensate a willing donor who possessed these traits $50,000 for her services.

Not only has Congress not outlawed such outrageous compensation for egg donations, it has not passed a law to even regulate the oocyte donation market. Egg donation is currently a $38 million-a-year industry, and studies have shown that with the continued success of ART procedures and the continued demand for donor eggs in these procedures, this astronomical number is expected to substantially increase over the next few years. Generally egg donors are compensated between $1,000 and $5,000 for their services; however, because of the unregulated system, there have been reports as high as $150,000 in compensation for egg donation by "prized donors," such as

140 Baum, supra note 40, at 108 n.7; see also Irene Sege, A $50,000 Dilemma on Campus; Top Students Wrestle with Egg Donor Lure, BOSTON GLOBE, Mar. 6, 1999, at A1.

141 See Sege, supra note 141; see also Baum supra note 40, at 110 & n.15 (citing 48 Hours: The Baby Makers; Choosing What Kind of Baby To Have (CBS television broadcast Dec. 30, 1999); CBS this Morning: Egg Donor Sharise and Dr. Arthur Caplan Discuss the Issue of Charging for Human Egg Donations (CBS television broadcast Mar. 4, 1999); CNN Morning News: Internet Auctioning of Human Eggs May Become Big Business (CNN television broadcast Oct. 26, 1999); Face the Nation: Professor Susan Wolf, University of Minnesota, Discusses the Ethics of Asking for Specific Types of People To Donate Eggs to Infertile Couples (CBS television broadcast Mar. 7, 1999); Today: Infertile Couple Searching for Egg Donor Places Half-Page Notice in Ivy League Newspapers (NBC television broadcast Mar. 3, 1999)).


143 See Sobota, supra note 90, at 1240; see also Terman, supra note 29, at 169 (describing the oocyte market as a free market and a largely unregulated system). To date, the federal government has only passed general guidelines addressing gamete donor screening protocol, fertility clinic reporting requirements, and policies regarding insurance coverage. See Baum, supra note 40, at 123–24.

144 See Reich & Swink, supra note 41, at 12–13.

145 See Sobota, supra note 90, at 1240–41; Baum, supra note 40, at 108.
supermodels, professional athletes, or Rhodes Scholars.\textsuperscript{146} Because of this financial incentive, many young women experiencing financial difficulty jump at the opportunity to donate their eggs without fully understanding the risks or consequences of their actions.\textsuperscript{147} Furthermore, infertile couples and fertility clinics take full advantage of this reality. Couples commonly take out advertisements in college newspapers to target young college students who are in need of financial assistance.\textsuperscript{148} Fertility clinics similarly do the majority of their egg donor recruiting through college and community newspapers.\textsuperscript{149}

The current system of oocyte donation clearly offends one of Congress’s stated purposes for enacting NOTA: exploitation of needy donors who are so encouraged by such high payments that they may be willing to compromise their health to donate their eggs.\textsuperscript{150} Amending NOTA to allow legal compensation for bone marrow donation also has the potential to incite this ethical concern of encouraging donors to blindly donate bone marrow for large payment packages as well. However, as will be discussed in Part III, this concern will not be an issue if NOTA is amended

\textsuperscript{146} See Sobota, supra note 90, at 1240 n.111; see also Reich & Swink, supra note 41, at 11–12 (between compensation for their donor and other ART related expenses, a couple may on average spend over $100,000 just trying to conceive their perfect child). It should also be noted that unregulated compensation for egg donation creates another ethical concern that would not be present in legalized compensation for bone marrow donation: couples with the financial means to recruit donors with their specific desired traits have the power to genetically design or customize their version of a perfect child. See id. at 18–19. Perhaps the most egregious example of this recent trend of child customization is a website created by Playboy fashion photographer, Ron Harris, called ronsangels.com. The website allows couples to bid on egg cycles donated by up-and-coming supermodels that have been reported to go as high as $150,000. See Contents, RONS ANGELS, http://ronsangels.com/contents.html (last visited Feb. 9, 2012). Harris’ philosophy is that it should be easier for couples who are seeking egg donors with socially desirable characteristics, notably physical beauty, and that in reality, “all mothers want pretty babies.” Id. Along with such advertisements are endless erotic photos of naked models to show parents what they’re really paying for and how much it is all worth. See id.; see also Sobota, supra note 90, at 1240 n.111.

\textsuperscript{147} See Roni Caryn Rabin, As Demand for Donor Eggs Soars, High Prices Stir Ethical Concerns, N.Y. TIMES, May 15, 2007, at F6 (noting how there is a growing concern that women are so drawn by thousands of dollars in compensation that they may not be seriously assessing the risks and consequences that accompany egg donation).

\textsuperscript{148} See Baum, supra note 40, at 108–09.

\textsuperscript{149} See Terman, supra note 29.

\textsuperscript{150} See sources cited supra note 39.
correctly and bone marrow donation compensation is regulated properly to ensure financial incentive to increase donations, while still protecting against exploitation and other unethical practices.

III. POSSIBLE SOLUTIONS TO REMAINING ETHICAL CONCERNS

As noted above, the current system of bone marrow donation does not work. Approximately sixty percent of patients in need of a bone marrow transplant cannot find a suitable donor. Only two percent of the American population is on the national registry for bone marrow matches, making it next to impossible for a patient to ever find a life-saving bone marrow match. While the current altruism-based bone marrow donation system is theoretically ideal, practically, it is not adequately serving society's needs. Allowing financial incentives for bone marrow donors would increase the amount of donations, which in turn would increase the likelihood of finding more suitable matches and, thus, will create a better system of reliability and efficiency. This can only be accomplished through Congress's amendment of NOTA.

However, the simple removal of bone marrow from NOTA's list of prohibited organs cannot be the end of the conversation; NOTA must be amended in a way that allows for legal bone marrow compensation but that also properly regulates it to avoid the ethical controversies seen in the oocyte donation market. Preventing the exploitation of needy donors must be addressed if compensation for bone marrow were to become legal, as well as, other pressing issues, such as the process for which donors would be selected and matched and how much donors ought to be compensated. Proper regulation of bone marrow donation compensation must adequately address ethical concerns, while

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151 See Anderson, supra note 12, at 487.
152 See Resources, supra note 19 (data compiled by the Institute of Justice). The National Marrow Donor Program was started by the federal government in 1986 and created a computer file of volunteer donors whose tissues could be matched with patients in need of bone marrow transplants. See Anderson, supra note 12, at 485; NAT'L MARROW DONOR PROGRAM, http://www.marrow.org (last visited Feb. 9, 2012).
153 See Michele Goodwin, Empires of the Flesh: Tissue and Organ Taboos, 60 ALA. L. REV. 1219, 1244-45 (2009) (discussing the benefits that financial incentives and a market-based system would have on organ donation and procurement system). Financial incentives have substantially increased the number of third party egg donations, as well. See supra Part II.C.
still giving weight to the most efficient system of increasing bone marrow donation to save thousands of lives per year. This Note will examine three possible solutions for increasing bone marrow donation while addressing these pressing issues below.

A. An Open, Private, and Unregulated System of Negotiation

An open and unregulated system of negotiation for buying and selling bone marrow would undoubtedly increase the number of bone marrow donations more than any other solution discussed in this section. As we have seen in the oocyte system of donation, one of the main reasons egg donation is so popular and successful, besides the recent advancement of ART, is that donors are eager to come forward and receive generous compensation packages. Oocyte donation is currently private and unregulated, and thus, recipients can offer any payment price within their means, normally resulting in an overwhelming response from donors willing to donate their eggs.

However, we have also seen several ethical issues that accompany this unregulated and open system of donation, specifically the exploitation of needy young women who are so encouraged by such high payments that they are willing to compromise their health to donate their eggs. This practice directly contradicts NOTA's stated purpose of preventing the exploitation of the poor. If a similar legal, but unregulated system was put in place for bone marrow, this pattern of exploitation and abuse would likely also occur. Furthermore, the presence of exploitation would be even more pronounced in the case of bone marrow donation on the recipient side of the relationship. Because the likelihood of finding a close enough bone marrow match is so difficult, donors could charge as much as they wanted for their rare and coveted bone marrow and take advantage of desperate patients and their families. While an open and unregulated system would most likely be the best

154 See supra Part II.C.
155 See supra Part II.C.
156 See supra Part II.C.
157 See Becoming A Donor, LIVING DONORS ONLINE!, http://www.livingdonorsonline.org/marrow/marrow4.htm (last visited Feb. 9, 2012); see also Anderson, supra note 12, at 484 (stating that the chances of any two unrelated people having an acceptable match for all three pairs of relevant Human Leukocyte Antigens are between one in 100 and one in 1,000,000, depending on how frequently their antigens occur in the general population).
solution to bone marrow shortage, it would also be the solution that would promote the most unethical mistreatment and exploitation, a legitimate reason Congress had for passing NOTA in the first place.

B. Charity Organization Donation and the Use of Scholarships

Compensation for bone marrow donors could be legalized and Congress could assign the responsibility for overseeing this compensation to charity organizations that would give out fixed sums of money to eligible donors in the form of "scholarships." This is the exact type of solution the plaintiffs in Flynn v. Holder advocated for.\textsuperscript{158} The plaintiffs in Flynn moved for the courts to allow MoreMarrowDonors.org to award scholarships in the amount of $3,000 to donors who are sufficient marrow matches for patients and who subsequently donate their marrow to help those patients.\textsuperscript{159} While this method would eliminate several of the exploitation and disparity of wealth issues, it would also create several new problems. Such charity organizations could arbitrarily choose what donors to accept and unless regulated by statute, would be left to their own devices as to what procedures applicants must go through. Furthermore, since these scholarships are mainly funded through outside donations, this method is arguably the least likely to produce a significant increase in donations due to probable lack of funds.

Allowing bone marrow compensation to be handled exclusively through charity organizations would also be nearly impossible to realistically execute. Now that the Ninth Circuit has ruled that MoreMarrowDonors.org's plan to compensate bone marrow donation does not violate NOTA, does this mean all charity scholarships do not violate NOTA? Who is to say what procedures carried out by organizations are constitutional and which are not? How could the courts or Congress justify legally allowing compensation for bone marrow donation through charity organizations, but not through private payments or insurance coverage? Because these dilemmas have no bright-line or workable answers, this method is not the best solution.

\textsuperscript{158} See Plaintiffs' Complaint, supra note 1, at 49–50; Brief of Appellants at 8–9, Flynn v. Holder, 665 F.3d 1048 (9th Cir. 2011) (No. 10-55643), 2010 WL 5854339; Resources, supra note 19.

\textsuperscript{159} See Plaintiffs' Complaint, supra note 1, at 49–50; see also Saving Lives, supra note 62.
C. Government Regulation and Procurement

The federal government could amend legislation and, with the help of medical and economic experts, decide a set fixed sum of money to compensate bone marrow donors. Bone marrow recipients in need can then pay this regulated price to an impartial national registry or organization, such as the United Network for Organ Sharing ("UNOS") or the National Marrow Donor Program, that can then transfer this payment to the donor. This method mirrors the system of organ allocation and procurement that is already in place with organizations, such as UNOS. UNOS maintains an online database system, known as UNet, that enables organ transplant centers to register new patients in need of organ donations and to match those patients with eligible donors in the system.\(^{160}\) Using this existing system, UNOS, or a similar third party organization, could maintain a separate registry for payment to bone marrow donors found to be a suitable match for a cancer patient.

This method would prevent exploitation because all payments are set at a standard price and no private negotiation would occur between the patient and the donor. Donation could remain anonymous at the donor's or donee's request, as is already the policy of UNOS in regard to other forms of organ donation;\(^ {161}\) this would eliminate arbitrary selections. All donations and payments would also be efficiently handled by an organization that is already familiar with matching and handling organ donations; this would just add an additional step in the process.

Government regulation and procurement is the best solution for both increasing bone marrow donations and addressing ethical concerns.\(^ {162}\) This solution would adequately address

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\(^{161}\) See Living Donation: Information You Need To Know, UNITED NETWORK FOR ORGAN SHARING 1 (2009), available at http://unos.org/docs/Living_Donation.pdf.

\(^{162}\) While this method is arguably the best solution for both increasing bone marrow donations and addressing ethical concerns, it is still not a perfect one. Extensive legislative action would be needed on the part of Congress for this system to be set up. Additionally, while this method would help decrease wealth disparity issues, they would still exist, as only those patients able to pay the fixed rate would receive the donation. However, there has never existed a perfect statute or a perfect legislative solution. The flaws encountered in the "government regulation and procurement method" are necessary and acceptable pitfalls to achieve the overall
Congress's third stated purpose of NOTA, preventing the exploitation of poor donors, and would prevent such outrageous offers of compensation seen in the current oocyte donation market. Thus, if Congress amended NOTA properly—removing bone marrow from the list of organs banned for compensation and regulating compensation in a reasonable manner—Congress could still protect its three legitimate purposes for enacting NOTA and simultaneously increase bone marrow donations to save the lives of thousands of cancer patients.

CONCLUSION

The field of biomedical technology has substantially changed in the last twenty-six years. Several methods and treatment plans used in 1984 are unrecognizable to doctors today because of the numerous technological and scientific advancements that have been made over the last two decades. One of these significant advancements is the development of the PSBC method for extracting bone marrow during bone marrow transplants. The PBSC method has not only yielded higher results of treatment success, but has made the entire bone marrow donation process easier and less invasive for both donors and recipients.

However, this medical achievement has not been accompanied by an increase in bone marrow donations. Over 1,000 Americans die every year while waiting for a bone marrow transplant and only two percent of the American population is on the national registry for bone marrow matches. The simple fact is that the altruistic-based bone marrow donation system is not working, and further incentive is needed to encourage more bone marrow donors to come forward. As seen in the gamete donation system, the best incentive for these perspective donors is compensation.

Congress must amend NOTA and remove bone marrow from its list of organs prohibited from compensation. This amendment is long overdue and will continue to serve Congress's initial purposes for passing the statute, as well as save the lives of thousands of cancer patients. The amendment would protect Congress's first stated interest of preventing commercialized greater good of increasing bone marrow donations and saving the lives of thousands of cancer patients infected with blood diseases every year.
disfigurement of the human body because the PBSC method is a noninvasive, minimally painful procedure that does not leave the donor with permanent loss. The amendment would protect Congress’s second stated interest of preventing the human body from being treated as a commodity because bone marrow is a renewable cell and can be readily replenished, identical to sperm and blood cells that Congress expressly left off NOTA’s list of prohibited organs.

Along with this amendment to NOTA, Congress must pass legislative regulation to protect its third stated interest of preventing the exploitation of poor donors willing to put their health at risk for large compensation packages. Government regulation and procurement would ensure that compensation for bone marrow donation would be a set price and payments would be handled anonymously through a third party organization to protect against exploitation of the poor and prevent unethical, outrageous offers of payments, as seen in oocyte donation.

Congress’s proper amendment of NOTA would provide a beacon of hope for the 1,000 cancer patients a year who are desperately waiting to receive a life-saving bone marrow transplant. Legalized and properly regulated compensation for donors would substantially increase the number of bone marrow transplants performed every year. With legislative reform and continued advancements in the biomedical technology field, hope exists that one day no parent will have to suffer the devastating loss that Kumud Majumder suffered simply because a bone marrow match was not found in time to save his son’s life.