

3-1-2003

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## Recommended Citation

S. G. Boyd, *Considering a Market in Human Organs*, 4 N.C. J.L. & TECH. 417 (2003).

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## Comment: Considering a Market in Human Organs

*S. Gregory Boyd, M.D.*<sup>1</sup>

### I. Introduction

In 1963, Nobel Prize winning geneticist Joshua Lederberg predicted that medical advances would impose “intolerable economic pressures on transplant sources.”<sup>2</sup> His prophetic statement has become more undeniably true as current altruistic methods for organ donation have failed to meet organ demand for more than thirty years.<sup>3</sup> As a result of these failed organ procurement methods, along with moral and legal barriers to other procurement methods, thousands of people die each year from the organ supply failure.<sup>4</sup> The lost lives and recent technological advances surrounding organ transplantation are leading to a reconsideration of alternatives to altruistic donation as the most effective means of organ procurement.<sup>5</sup>

Advancing medical technology is a central consideration in the discussion because human ingenuity has created immeasurable lifesaving value in organs that was not previously possible.<sup>6</sup> This technology-driven value increase has contributed to a developing tension between societal and individual rights over human organs and other valuable bodily derivatives.<sup>7</sup> At the center of this tension

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<sup>2</sup> RUSSEL SCOTT, *THE BODY AS PROPERTY* 182 (1981).

<sup>3</sup> Curtis E. Harris & Stephen P. Alcorn, *To Solve a Deadly Shortage: Economic Incentives for Human Organ Donation*, 16 *ISSUES IN L. & MED.* 213, 227 (2001) [hereinafter Harris I].

<sup>4</sup> *Id.*

<sup>5</sup> *Id.* at 213–15.

<sup>6</sup> *See id.*

<sup>7</sup> *See id.* at 224–32.

is the battle to create some form of market for human organs.<sup>8</sup> Throughout this paper, "market" will be used in its broadest sense, exchanging some form of valuable consideration for a human organ.<sup>9</sup> Creating or not creating such a market will necessarily involve judgments about what weight should be given to the claims of society and those of the individual over organs as property.<sup>10</sup> This article discusses the possibility of creating an organ market that respects individual autonomy, prevents exploitation, acknowledges the sanctity of human life, and increases the supply of human organs. Such a market may save thousands of lives each year.<sup>11</sup>

This paper surveys the medical, legal, and policy considerations that surround a market in human organs.<sup>12</sup> Each of these areas is important for a complete discussion and understanding of the topic.<sup>13</sup> The paper begins by discussing the organ shortage problem and proceeds to discuss the medical technology driving the moral choice toward a market in human organs. There also is a discussion of the relevant case law and statutory law surrounding the body as property. Finally, the paper concludes with a policy level discussion of organ markets.

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<sup>8</sup> *Id.* The word "market" is used generally to refer to some system of exchange that will render a benefit to the organ donor. This benefit does not have to be a monetary benefit and does not have to be given directly during life. *Id.* Many possible types of markets are discussed later in this article.

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

<sup>11</sup> *See id.* at 227–33. This article acknowledges that transplant is a heroic medical effort, made in the last stages of many diseases. An economic analysis of lifesaving procedures and preventive methods would probably indicate that healthcare dollars may be more effectively spent in early discovery and treatment of diseases such as hepatitis and diabetes so that patients would not advance far enough to need a transplant cure.

<sup>12</sup> *Id.*

<sup>13</sup> *See* Gloria J. Banks, *Legal & Ethical Safeguards: Protection of Society's Most Vulnerable Participants in a Commercialized Organ Transplantation System*, 21 AM. J.L. & MED. 45, 45–111 (1995).

## A. The Problem

As of January 18, 2003, there were eighty thousand people waiting for an organ donation; a name is added to that list every thirteen minutes.<sup>14</sup> Twelve Americans die every day waiting for a vital organ.<sup>15</sup> These deaths are particularly troubling because the medical technology necessary to save those lives exists and is rapidly advancing.<sup>16</sup> The consensus of the organ transplant community is that the organ supply shortage is a major concern, if not the greatest obstacle, to saving lives through transplantation.<sup>17</sup>

Donating an organ posthumously, or while living, is a difficult choice for many.<sup>18</sup> The decision to donate an organ has complex religious, medical, and financial considerations.<sup>19</sup> Given

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<sup>14</sup> United Network for Organ Sharing, *2002 Annual Report of the U.S. Organ Procurement and Transplantation Network and the Scientific Registry of Transplant Recipients: Transplant Data 1992–2001*, Organ Procurement and Transplantation Network, at <http://www.optn.org/data/annualReport.asp> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology) [hereinafter Report]; United Network for Organ Sharing, *Newsroom Fact Sheets*, at <http://www.unos.org/inTheNews/factSheets.asp> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology) [hereinafter UNOS Fact Sheet].

<sup>15</sup> Harris I, *supra* note 3, at 213.

<sup>16</sup> DAVID PRICE, LEGAL AND ETHICAL ASPECTS OF ORGAN TRANSPLANTATION 23 (2000); LINDA S. SHER & LEONARD MAKOWKA, INTRA-ABDOMINAL ORGAN TRANSPLANTATION 2000 8 (1994); David M. Harlan and Allan D. Kirk, *The Future of Organ and Tissue Transplantation: Can T-Cell Costimulatory Pathway Modifiers Revolutionize the Prevention of Graft Rejection?*, 282 JAMA 1076, 1076 (1999); Laura A. Siminoff & Matthew Leonard, *Financial Incentives: Alternatives to the Altruistic Model of Organ Donation*, 9 J. TRANSPLANT COORDINATION 250, 250 (1999).

<sup>17</sup> Frederick L. Grover et al., *The Past, Present, and Future of Lung Transplantation*, 173 AM. J. SURGERY 524, 532 (1997); Markus Weber et al., *Organ Transplantation in the Twenty-First Century*, 25 UROLOGIC CLINICS N. AM. 51, 58 (1998).

<sup>18</sup> ARTHUR L. CAPLAN & DANIEL H. COELHO, THE ETHICS OF ORGAN TRANSPLANTS 41–47 (1998); ROBERT M. VEATCH, TRANSPLANTATION ETHICS 1–20 (2000).

<sup>19</sup> *Id.*

the weight of the decision, it is easy to sympathize with the vast majority of people who decide not to donate their organs.<sup>20</sup>

The organ shortage is not a new problem.<sup>21</sup> A shortage has existed as long as there has been successful transplant technology, and this shortage has increased every year.<sup>22</sup> The medical profession has tried to work around the organ shortage for decades.<sup>23</sup> The transplant community has attempted to use artificial organs, animal organs, and wholly new organs engineered from basic materials.<sup>24</sup> These methods have met with limited success, with some new solutions, such as growing new organs *in vitro*, still lingering in the realm of science fiction.<sup>25</sup> Human organ donation and transplantation remain the most successful and viable methods for the majority of people needing organs.<sup>26</sup>

## II. The Medicine of Transplantation

### A. History of Human Organ Transplantation

Human organ transplantation is a relatively new technology.<sup>27</sup> Although surgery is thousands of years old, it has

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<sup>20</sup> *Id.* There were only 134,000 donors recorded by UNOS between 1988 and 2002. Organ Procurement and Transplantation Network, *National Data* (Statistics based on data as of March 6, 2003.), at <http://www.optn.org/latestData/step2.asp> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology). This number is particularly low when compared with the total population of the country. The number, however large, must also be considered against the background that only certain types of deaths, such as stroke and motor vehicle accidents qualify as organ donors.

<sup>21</sup> Siminoff & Leonard, *supra* note 16, at 252.

<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

<sup>24</sup> Weber et al., *supra* note 17, at 55–58.

<sup>25</sup> Paul S. Malchesky, *Artificial Organs and Vanishing Boundaries*, 25 *ARTIFICIAL ORGANS* 75, 75–79 (2001).

<sup>26</sup> *TRANSPLANTATION SURGERY* 17–18 (Nadey S. Hakim & Gabriel M. Danovitch eds., 2001) [hereinafter Hakim I]. Organs and tissues that can be donated include: heart, kidneys, lungs, pancreas, liver, intestines, corneas, skin, tendons, bone, and heart valves. UNOS Fact Sheet, *supra* note 14.

<sup>27</sup> Weber et al., *supra* note 17, at 51.

only been within the past fifty years that the medical community has been able to transplant an organ from one human to another with any measure of success.<sup>28</sup> By comparison, the modern computer pre-dates the first human transplant by more than a decade, as does atomic weaponry, the Porsche, and antibiotics.<sup>29</sup> The first kidney was transplanted in 1951, the first lung in 1963, the first intestine in 1964, the first liver in 1965, the first pancreas in 1966, and the first heart in 1967.<sup>30</sup>

Transplant technology is rapidly advancing because of its youth as a medical discipline and the accelerated pace of scientific discovery in our age.<sup>31</sup> As a society, policy decisions and value judgments were made about the appropriate boundaries of transplant technology near its inception, judgments that no longer hold true given technological advancement.<sup>32</sup> Several contemporaneous factors informed those original policy decisions and value judgments. For example, the wait for donor organs initially was not as long as it is today, the need was not as great, and the life saving power of transplantation was more mythic than real.<sup>33</sup> In the early days of transplantation, some religious and

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<sup>28</sup> *Id.* It should also be noted that only within the past thirty years has organ transplantation been considered safe and widely used. There are religious, historical, and mythic examples of human transplantation, however, that date back many centuries. For example, Cosmas and Damian, Christian Arab saints martyred in 300 A.D., were reputed to have replaced the diseased leg of a sexton with that of a Moor who had died several days earlier. Physicians in ancient India could repair mutilated noses using other tissues from the donor. This process was improved upon during the sixteenth century in Europe and used by the plastic surgeon Gaspare Tagliacozzi, among others. Hakim I, *supra* note 26, at 1.

<sup>29</sup> THE TIMETABLES OF HISTORY 519–529 (Bernard Grun ed., Simon & Shuster 3rd ed. 1991) (1946).

<sup>30</sup> INTRODUCTION TO ORGAN TRANSPLANTATION 4–10 (Nadey S. Hakim ed.) (1997) [hereinafter Hakim II]; David E. R. Sutherland, *Lessons Learned From More Than 1,000 Pancreas Transplants at a Single Institution*, 233 ANNALS SURGERY 463, 464 (2001); PRICE, *supra* note 16, at 3; Grover et al., *supra* note 17, at 523.

<sup>31</sup> See Weber, *supra* note 17, at 51–58.

<sup>32</sup> Harris I, *supra* note 3, at 227–28. These policy decisions and value judgments include a broad prohibition against valuable consideration in exchange for organs, thus prohibiting virtually any type of organ market. *Id.*

<sup>33</sup> *Id.*

ethnic communities resisted the idea of human organ transplantation in any form.<sup>34</sup> Currently, however, most people have accepted transplantation as an important life saving technology and organ donation as an important societal goal.<sup>35</sup> The remaining questions revolve around what type of procurement and distribution methods should be encouraged and the related property claims of society, and of the individual, implicit in these procurement and distribution methods.

This is a pivotal point in the history of transplantation. People must now reconsider many of the moral and legal aspects of organ transplantation due to the increasing demand for organs coupled with an unmatched supply. The need for donors, with scientific advances and measures of transplant success, is growing daily.<sup>36</sup> Technologically advanced societies are nearing the point, if they have not already passed it, where legislative judgments prohibiting a market in human organs have restricted the organ supply to such a degree that the current restrictive position appears less ethically defensible, if not morally culpable, as thousands die each year.

## B. Current State of Transplantation

Transplantation is safer and more successful than ever before.<sup>37</sup> One-year survival rates for most organ transplants are

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<sup>34</sup> VEATCH, *supra* note 18, at 19–20. The religions that have opposed organ transplant include Shintoism, Buddhism, Hinduism, and some Native American religions. Generally, these religions are suspicious of the value of a technology that merely extends humans' biological existence in this world. *Id.*

<sup>35</sup> PRICE, *supra* note 16, at 23; SHER & MAKOWKA *supra* note 16, at 8. Currently, all major world religions support the idea of organ transplantation in some form as a benevolent, life saving measure. See TransWeb.org, *Does My Religion Approve of Organ Donation?*, at [http://www.transweb.org/qa/qa\\_don/religion.htm](http://www.transweb.org/qa/qa_don/religion.htm) (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>36</sup> See Harris I, *supra* note 3, at 213–15; see also Weber et al., *supra* note 17, at 51.

<sup>37</sup> This is not to say that transplantation is entirely safe. Adult-to-adult right lobe liver transplants, among the most dangerous of common transplants, have a 0.2 percent mortality rate, 14 percent of donors have “serious complications,” and 8.5 percent of donors require re-hospitalization. Robert S. Brown et al., *A*

nearing ninety percent and five-year survival rates are now greater than seventy percent.<sup>38</sup> Transplanting organs and living with a transplanted organ now border on being medically routine given the current success of transplantation, but this was not always so.<sup>39</sup> Technical successes with organ transplantation have been largely attributable to technological advances in equipment, advances in surgical technique, and, primarily, the immunological benefits realized by anti-rejection drug regimens.<sup>40</sup>

First, transplant technology has advanced rapidly with the assistance of some key equipment developments. The first piece of equipment that proved essential for advances in transplant technology was the heart-lung machine.<sup>41</sup> First used in 1953, it allows surgeons to artificially pump and oxygenate blood during a surgical procedure.<sup>42</sup> The ability to pump and oxygenate blood is particularly important where the transplanted organ is either the heart or lungs.<sup>43</sup> This machine is also, in part, the intellectual ancestor of both the modern Left Ventricular Assist Device ("LVAD") and the internal artificial heart.<sup>44</sup> Second, the equipment developed by anesthesiology for monitoring transplant patients and delivering drugs has greatly improved in the last fifty years.<sup>45</sup> Anesthesiologists are now able to maintain patients in

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*Survey of Liver Transplantation from Living Adult Donors in the United States*, 348 NEW ENG. J. MED. 818, 818–25 (2003). This can be compared with kidney transplantation, which is safer and more widely practiced. Kidney transplantation has fewer complications and a donor mortality rate of 0.03 percent. Owen Surman, *The Ethics of Partial-Liver Donation*, 346 NEW ENG. J. MED. 1038, 1038 (2002).

<sup>38</sup> See Grover et al., *supra* note 17, at 523; see also, Weber et al., *supra* note 17, at 51; James C. Spann & Clifford Van Meter, *Cardiac Transplantation*, 78 CARDIOTHORACIC VASCULAR SURGERY 679, 679 (1998).

<sup>39</sup> PRICE, *supra* note 16, at 23; SHER & MAKOWKA, *supra* note 16, at 8.

<sup>40</sup> See Weber et al., *supra* note 17, at 51–58.

<sup>41</sup> See W. BRUCE FYE, AMERICAN CARDIOLOGY THE HISTORY OF A SPECIALTY AND ITS COLLEGE 167–68 (1996).

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> D. Glenn Pennington et al., *Cardiac Assist Devices*, 78 CARDIOTHORACIC VASCULAR SURGERY 691, 691–92 (1998).

<sup>45</sup> See Hakim I, *supra* note 26, at 355–71. There are also pre-, intra-, and post-operative anesthesia management protocols specific to each type of organ



more physiologically controlled states for longer than was previously possible.<sup>46</sup>

In the realm of surgical technique, there is no substitute for practice. In the early 1900's, Nobel Prize winner Alexis Carrel recognized the importance of blood vessel anastomosis<sup>47</sup> when transplanting major vascularized organs in animals.<sup>48</sup> His methods, including using fine needles and thread, careful dissection, controlling bleeding at both ends of a blood vessel, exact identification of vessel layers, and sewing vessels together in a way that everts<sup>49</sup> the intima,<sup>50</sup> have been used with few modifications since 1902.<sup>51</sup>

Carrel was also a pioneer in organ preservation.<sup>52</sup> He was one of the first to develop a physiologically balanced solution to maintain the viability of organs much longer than was previously possible.<sup>53</sup> Carrel began by using a room temperature solution.<sup>54</sup> It was not until the 1960's that Geoffrey Collins substantially improved on Carrel's work by cooling the solution and changing its composition to essentially what is still in use today.<sup>55</sup> Specifically for lung transplants, Frank Veith discovered in 1979 that reattaching a lung using a shorter donor bronchial length leads to better healing.<sup>56</sup> This technical modification has been called

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transplant that have improved over the years. The protocols depend upon a specialized knowledge of organ failure for each type of organ replaced and play a significant role in the successful outcome of transplantations. *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> Anastomosis is the splicing of two hollow tubular structures together. In the instance above it is used to describe the operative union of blood vessels.

STEDMAN'S MEDICAL DICTIONARY 72 (Marjory Spraycar ed., 26th ed. 1995).

<sup>48</sup> Hakim II, *supra* note 30, at 3.

<sup>49</sup> Eversion is the process of turning outward, as with an eyelid or a foot. As used here, it means to turn the vessel layer outward during the surgical process. STEDMAN'S MEDICAL DICTIONARY, *supra* note 47, at 606.

<sup>50</sup> The intima is the inner most layer of a blood vessel. ROBBINS PATHOLOGIC BASIS OF DISEASE 494 (Ramzi S. Cotran et. al. eds., 6th ed. 1999).

<sup>51</sup> Hakim II, *supra* note 30, at 3.

<sup>52</sup> Hakim I, *supra* note 26, at 13.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> Grover et al., *supra* note 17, at 523.

"the single most important detail" for successful bronchial anastomosis.<sup>57</sup>

The greatest advances in organ transplantation, however, have probably resulted from immunologic manipulation using anti-rejection drug regimens.<sup>58</sup> Advances in anti-rejection drug regimens have proven difficult, and the benefits resulting from new developments in this area cannot be overstated.<sup>59</sup> The primary problem in the area is gaining a functional understanding of the human immune system and using that understanding to develop pharmaceuticals.<sup>60</sup> To be effective, pharmaceuticals must manipulate the hypothesized immune mechanisms in a way that prolongs organ survival.<sup>61</sup> Without immunological intervention, an organ recipient's body will not tolerate the organ and will reject it, a process termed graft rejection.<sup>62</sup>

Graft rejection can be hyper acute, acute, or chronic.<sup>63</sup> Hyper acute rejection occurs within minutes or hours of transplantation.<sup>64</sup> It may even occur as early as the completion of the procedure.<sup>65</sup> Often the transplanted organ appears pale or

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<sup>57</sup> *Id.*; See *supra* text accompanying note 47 (defining anastomosis).

<sup>58</sup> See Weber et al., *supra* note 17, at 51–52.

<sup>59</sup> One of the greatest early advances in the understanding of transplant rejection can be attributed to Sir Peter Brian Medawar, the zoologist and Nobel Prize winner. His work described what he called "actively acquired immunity" during the 1940's. This, along with his later work using steroids and describing tolerance, has encouraged modern scientists to believe that the seemingly impossible obstacle of host rejection may one day be overcome. See Hakim II, *supra* note 30, at 1–19.

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> See Weber et al., *supra* note 17, at 51–52.

<sup>63</sup> *Id.*

<sup>64</sup> ROBBINS PATHOLOGIC BASIS OF DISEASE, *supra* note 50, at 207–08. Hyper-acute rejection is the type of rejection that occurred in the recent and tragic gross error by Duke University Medical Center when its doctors transplanted young Jessica Santillan with a heart-lung organ set of the wrong blood type. Jessica had type O blood, and the donor had type A blood. These major immunological differences cannot be overcome, and such an error is almost invariably fatal. Jerry Adler, *A Tragic Error*, NEWSWEEK, (Mar. 2003), available at <http://www.msnbc.com/news/876221.asp> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>65</sup> ROBBINS PATHOLOGIC BASIS OF DISEASE, *supra* note 50, at 207–08.

mottled and does not regain function after the procedure.<sup>66</sup> The incidence of hyper acute rejection has been reduced as immunologic matching technology has improved, subsequently causing better fits between the donor and recipient immune systems.<sup>67</sup>

Acute rejection may occur within days of the transplant or may appear months or years later.<sup>68</sup> It is characterized as a slower process than hyper acute rejection, usually manifested by organ failure with inflamed, deteriorating blood vessels within the transplanted organ.<sup>69</sup> Acute rejection episodes have essentially been conquered through the use of modern combination immunosuppressive treatments, as discussed below.<sup>70</sup>

Chronic graft rejection occurs through mechanisms that are not yet fully understood.<sup>71</sup> It is the greatest obstacle to stable long-term transplantation cures because it has no effective treatment.<sup>72</sup> Not all organ recipients encounter chronic graft rejection, but of those organs that fail after the first year, the majority fail because of chronic graft rejection.<sup>73</sup> It occurs over many months or years and affects the body of the organ itself as well as the blood vessels running through the organ.<sup>74</sup> These chronic changes ultimately result in complete organ failure.<sup>75</sup>

A hope for overcoming chronic rejection, and the goal of immunologic manipulation, is to induce tolerance.<sup>76</sup> Tolerance is an immunologic state in which the graft is tolerated by the recipient's immune system.<sup>77</sup> Importantly, if immune tolerance is achieved, then transplanted organs have a greatly improved chance

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<sup>66</sup> *Id.*

<sup>67</sup> *See id.* at 204–10.

<sup>68</sup> *Id.* at 209.

<sup>69</sup> *Id.*

<sup>70</sup> *See* Weber et al., *supra* note 17, at 51–52.

<sup>71</sup> ROBBINS PATHOLOGIC BASIS OF DISEASE, *supra* note 50, at 209–10.

<sup>72</sup> *See* Weber et al., *supra* note 17, at 51–52.

<sup>73</sup> *Id.*

<sup>74</sup> ROBBINS PATHOLOGIC BASIS OF DISEASE, *supra* note 50, at 209–10.

<sup>75</sup> *Id.*

<sup>76</sup> *See* Weber et al., *supra* note 17, at 58.

<sup>77</sup> STEDMAN'S MEDICAL DICTIONARY, *supra* note 47, at 1819; *see* Weber et al., *supra* note 17, at 52–54.

of success.<sup>78</sup> Current pharmacologic methods alone rarely induce a true state of tolerance, but they may induce such a state when combined with coming advances and new transplant discoveries.<sup>79</sup>

Pharmacological advances, including the development of anti-rejection drug regimens, have been the largest factor contributing to the general success of organ transplants.<sup>80</sup> The first agent used in humans was 6-mercaptopurine.<sup>81</sup> Use of this new anti-rejection regimen produced a great improvement over pre-anti-rejection drug outcomes but was not nearly as effective as later-developed regimens.<sup>82</sup> In the late 1970's, a drug named cyclosporine was introduced into the clinical community.<sup>83</sup> Cyclosporine has proven to be the most successful and commonly used agent for transplants in the past twenty years.<sup>84</sup>

Thomas Starzl is perhaps most responsible for the widespread use and extensive understanding of cyclosporine.<sup>85</sup> He demonstrated the dramatic improvement possible in renal and hepatic allografts<sup>86</sup> with some of the most extensive studies of the drug.<sup>87</sup> As a testament to the drug's effectiveness, pre-cyclosporine, one-year organ transplant survival rates were less than forty percent.<sup>88</sup> Post-cyclosporine, one-year organ transplant survival rates are now eighty percent, with an incredible seventy percent five-year survival rate.<sup>89</sup> The future promises higher success and survival rates using newer drugs, including mycophenolate mofetil tacrolimus and rapamycin.<sup>90</sup> These drugs

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<sup>78</sup> See Weber et al., *supra* note 17, at 58.

<sup>79</sup> See *id.* at 51-58.

<sup>80</sup> See *id.* at 51-52.

<sup>81</sup> Hakim II, *supra* note 30, at 5.

<sup>82</sup> *Id.*

<sup>83</sup> Hakim I, *supra* note 26, at 4-5.

<sup>84</sup> Weber et al., *supra* note 17, at 51.

<sup>85</sup> See Hakim I, *supra* note 26, at 5-6.

<sup>86</sup> An allograft is a graft that is transplanted between genetically non-identical individuals that are from the same species. STEDMAN'S MEDICAL DICTIONARY, *supra* note 47, at 50.

<sup>87</sup> SHER & MAKOWKA, *supra* note 16, at 2; Weber et al., *supra* note 17, at 51.

<sup>88</sup> SHER & MAKOWKA, *supra* note 16, at 2; Weber et al., *supra* note 17, at 51.

<sup>89</sup> SHER & MAKOWKA, *supra* note 16, at 2; Weber et al., *supra* note 17, at 51.

<sup>90</sup> Weber et al., *supra* note 17, at 52.

have been developed with improved immunological understanding of and experience with anti-rejection regimes.<sup>91</sup>

Considering all the technological advances in transplant medicine, equipment, drugs, and surgical techniques, the largest obstacle currently facing transplantation is the growing organ supply shortage.<sup>92</sup> This problem of organ shortage cannot be solved through better surgical techniques, equipment, or pharmaceuticals. It is a problem requiring a political solution, away from the hospital and the research bench.

### C. Future of Transplantation

It is essential to note that organ supply and donor shortages are driving the development of most of the emerging techniques discussed below. If there were an available supply of organs equal to the demand, then virtually all of the technologies discussed below would drop in importance. Nearly all of these emerging techniques are an attempt to make poor immunological matches accepted longer, or create an additional supply of new organs. In effect, they are all attempting to substitute or compensate for a scarce supply of human organs.

The future of organ transplantation is promising given current avenues of inquiry. Avenues of research include two major areas: (1) technology to create new sources of donor organs; and (2) technology to fight graft rejection.<sup>93</sup>

#### 1. New Sources of Donor Organs

A major effort to increase the supply of organs is through xenotransplantation. Xenotransplantation is a medical advance

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<sup>91</sup> *Id.*

<sup>92</sup> See Grover et al., *supra* note 17, at 532; see also Weber et al., *supra* note 17, at 58.

<sup>93</sup> See generally FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT (Julia M. Polak et. al. eds., 2002). It is interesting to note that one of the pioneers of xenotransplantation was the Russian-born Parisian Serge Voronoff made infamous in the early part of the twentieth century by transplanting monkey testicles into men, believing this would stave off age-related mental and physical deterioration. Hakim I, *supra* note 26, at 1.

that would allow physicians to use animal organs to replace failing human organs for transplant purposes.<sup>94</sup> The problems with this approach include increased graft rejection, possible cross-species disease transfer, and moral objections by some groups.<sup>95</sup>

Unaltered animal organs are so different from human organs that hyper acute rejection usually occurs when animal organs are used for transplants.<sup>96</sup> In an effort to overcome this problem, transgenic animals have been developed.<sup>97</sup> Transgenic animals are genetically altered animals that express special proteins due to their genetic alteration that allow them to be more compatible with human immune systems.<sup>98</sup> Mechanistically, they express proteins that interrupt the immunologic graft rejection cascade, which is a series of biochemical reactions, by blocking or accelerating the decay of important protein factors necessary for the rejection

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<sup>94</sup> FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 217–30; Weber et al., *supra* note 17, at 55–56.

<sup>95</sup> Among the groups that are alarmed by xenotransplantation are animal rights activists who believe that it is unethical to take an animal's life and organs so that a human might live. Other groups worried include those that fear the possibility of animal to human (cross-species) disease transmission. One of the first and most publicized transplants was that of Baby Fae in 1984. The baby was born with a fatal heart condition on October 12, 1984. A baboon heart was transplanted into the baby because compatible infant hearts are almost never available. Baby Fae lived until November 15, 1984, and the final cause of death remains in dispute because initial testing did not show cellular evidence of rejection. See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 217–30; see also VEATCH, *supra* note 18, at 259–71.

<sup>96</sup> Weber et al., *supra* note 17, at 55–56.

<sup>97</sup> See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 217–30; SHER & MAKOWKA, *supra* note 16, at 7; Weber et al., *supra* note 17, at 57–58. The most commonly discussed transgenic species is the pig. Pigs are superior to primates because they are more variable in size, are readily available, have very few human pathogens, are easily genetically engineered, and have frequent litters. Additionally, the phylogenetic distance between humans and pigs amplified by the long established agricultural use of pigs make them far less susceptible to the ethical problems encountered when engineering primates for transplantation. See Hakim I, *supra* note 26, at 428–30.

<sup>98</sup> See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 217–230; SHER & MAKOWKA, *supra* note 16, at 7; Weber et al., *supra* note 17, at 57–58.

reaction.<sup>99</sup> Transgenic animals should eventually be able to allow organ recipients to completely resist the graft rejection process and develop a type of tolerance toward the new organ.<sup>100</sup> However, the theoretical advances described above are still far from reality.<sup>101</sup>

Given the difficulty involved in xenografts, researchers have also considered using artificial devices to replace human organs.<sup>102</sup>

Artificial organs have replaced human organs on a limited basis.<sup>103</sup> Surgeons have successfully transplanted artificial hearts and kidneys.<sup>104</sup> Artificial livers, artificial muscles, as well as an artificial pancreas capable of slowly releasing insulin, are currently being developed.<sup>105</sup> The artificial heart and related devices have proven to be the most successful of all artificial organs.<sup>106</sup> One type of heart-related artificial device is the Left Ventricular Assist Device ("LVAD").<sup>107</sup> This device is mechanical, with a significant portion of the device placed outside the body.<sup>108</sup> It assists the heart's most powerful chamber, the left ventricle, by helping pump oxygenated blood to the body.<sup>109</sup> Devices like the LVAD are often called "bridging devices" because they allow patients with failing hearts to extend the amount of time that they can wait for a transplantable organ.<sup>110</sup> One of the greatest artificial organ

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<sup>99</sup> See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 217–230; SHER & MAKOWKA, *supra* note 16, at 7; Weber et al., *supra* note 17, at 57–58.

<sup>100</sup> See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 217–230; SHER & MAKOWKA, *supra* note 16, at 7; Weber et al., *supra* note 17, at 57–58.

<sup>101</sup> See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 217–230; SHER & MAKOWKA, *supra* note 16, at 7; Weber et al., *supra* note 17, at 57–58.

<sup>102</sup> See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 141–42.

<sup>103</sup> *Id.*

<sup>104</sup> See *id.* at 141–66.

<sup>105</sup> See PRICE, *supra* note 16, at 7.

<sup>106</sup> Pennington et al., *supra* note 44, at 691–95 (1998); see also Spann & Van Meter, *supra* note 38, at 679–82.

<sup>107</sup> Spann & Van Meter, *supra* note 38, at 679–82.

<sup>108</sup> *Id.*

<sup>109</sup> *Id.*

<sup>110</sup> See PRICE, *supra* note 16, at 7.

accomplishments to date was the installation of the Jarvik 2000 artificial heart into a ten-year old boy in Oxford, England, in 1998,<sup>111</sup> which allowed him to survive for five days while a donor heart was found and successfully transplanted.<sup>112</sup>

A device that is planned to do more than merely assist the heart is the Total Artificial Heart ("TAH").<sup>113</sup> In July 2001, surgeons placed the first entirely implantable TAH.<sup>114</sup> Despite advances in artificial organs, including artificial hearts, however, they remain expensive and less effective than natural tissue.<sup>115</sup>

Another approach suggested to overcome the organ shortage is tissue engineering,<sup>116</sup> which can be thought of as a bridge between the artificial and the natural.<sup>117</sup> In some instances, the engineered tissue contains both biological and non-biological components.<sup>118</sup> Ideally, tissue engineering would mimic as closely as possible the human body's own construction of tissues and organs.<sup>119</sup> Cells naturally form into a scaffolding, or matrix.<sup>120</sup>

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<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

<sup>113</sup> Abiomed is the company responsible for the first totally implantable artificial heart. Its newest hearts have no moving parts and are about the size of a grapefruit, made of titanium and plastic, and weigh only two pounds. The heart is also so quiet that people present in the same room report being unable to hear its pumping. Furthermore, it is entirely implanted inside the body with an external coil from a battery pack worn around the waste that provides power through the skin. There is also an internal power supply that lasts thirty minutes in case of emergencies. Other advances that exist for artificial hearts include electromagnetic fields supporting internal rotors and car chargers, so that artificial hearts can be recharged while one drives. CHFpatients.com, *Artificial Hearts*, at [http://www.chfpatients.com/implants/artificial\\_hearts.htm](http://www.chfpatients.com/implants/artificial_hearts.htm) (updated May 6, 2002) (on file with the North Carolina Journal of Law & Technology); See also Emily Denham Morris, *The Organ Trail: Express Versus Presumed Consent as Paths to Blaze in Solving a Critical Shortage*, 90 KY. L.J. 1125, 1125 (2002).

<sup>114</sup> CHFpatients.com, *supra* note 113.

<sup>115</sup> See Pennington et al., *supra* note 44, at 679–82.

<sup>116</sup> See FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 51–71.

<sup>117</sup> *Id.*

<sup>118</sup> *Id.*

<sup>119</sup> *Id.*

<sup>120</sup> *Id.*



Then, more cells grow over this matrix into tissues and organs.<sup>121</sup> The goal of tissue engineering is to recreate the natural biological process in the laboratory.<sup>122</sup> Researchers are currently attempting to use stem cells or other undifferentiated cells on natural and artificial matrixes with the goal of creating tissues and, eventually, organs.<sup>123</sup> Although researchers are currently able to form small sections of bone, skin, and simple organs, this approach has met with only limited success.<sup>124</sup>

Finally, organ preservation methods are also currently the subject of much research and are considered an effective way to increase the donor pool by increasing the time an organ can travel to a recipient.<sup>125</sup> For example, kidneys are currently able to survive outside the body for forty-eight hours, while a heart is viable for about six hours.<sup>126</sup> Each organ type also has specific handling instructions and types of solutions used to extend its "shelf life."<sup>127</sup> New work with lower temperature preservation methods and new chemical solutions should extend the time organs are available for donation.<sup>128</sup> This will have the effect of extending the geographic area where organ donors may be located, potentially increasing the number of organs for transplantation.<sup>129</sup>

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<sup>121</sup> *Id.*

<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*

<sup>125</sup> See SHER & MAKOWKA, *supra* note 16, at 10–30; see also FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 27–46. This does not directly increase the donor pool by providing more organs, but it has the effect of increasing the donor pool by increasing the range that organs can travel to a recipient. Some organs that would previously go unused are now able to be matched with recipients at distances that were not previously achievable. The result is that as organ preservation techniques improve, more organs are used and more patients receive organs. This technology can be viewed as having an "effective" increase on the donor organ pool. See *id.*

<sup>126</sup> SHER & MAKOWKA, *supra* note 16, at 10–30; FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 27.

<sup>127</sup> See Hakim I, *supra* note 26, at 265–95.

<sup>128</sup> See SHER & MAKOWKA, *supra* note 16, at 10–30; see also FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 27–46.

<sup>129</sup> *Id.*

## 2. Pharmaceutical Alternatives for Fighting Graft Rejection

Researchers are also actively investigating alternatives to pharmaceutical mechanisms to manipulate the immune system, halt rejection, and induce tolerance.<sup>130</sup> To date, these methods have been less successful than pharmaceutical manipulation, but they maintain their importance because they are areas with great potential benefit for organ transplantation.<sup>131</sup> Additionally, this research is driven by the organ shortage and societal pressures to match organs with donors that are far less than immunologically ideal, including the very immunologically non-ideal organs provided by xenotransplantation.<sup>132</sup> These alternatives generally center on the manipulation of genes and gene products.<sup>133</sup>

The first alternative to pharmaceutical manipulation is direct gene therapy.<sup>134</sup> The idea behind gene therapy is locating a gene that causes cells to produce a protein of interest and, then, finding a way to incorporate that gene into a target cell that would benefit from expressing that protein.<sup>135</sup> This approach could be used to alter the immune response to foreign organs and, perhaps, to halt the rejection process.<sup>136</sup> The goal of gene therapy is to introduce genes into the recipient's immune system that fool it into believing that the transplanted organ is not foreign tissue.<sup>137</sup> As an alternative, genes may also be introduced into the donor organ that

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<sup>130</sup> Weber et al., *supra* note 17, at 51–58. This refers to the methods discussed in this section of the paper as pharmaceutical “alternatives” because they are being researched as a way to control the immune system that does not directly involve the administration of drugs. In practice, however, they will almost certainly be employed with pharmaceutical regimens during actual clinical practice, at least at the early stages of their development. *Id.*

<sup>131</sup> *Id.*

<sup>132</sup> *Id.*

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> *Id.*

<sup>136</sup> *Id.*

<sup>137</sup> *Id.*

produce factors blocking or accelerating the destruction of important signaling factors known as cytokines.<sup>138</sup>

As another alternative to pharmaceutical manipulation, it may also be possible to blend the donor and recipient immune systems through methods such as the transplantation of bone marrow along with the donor organ.<sup>139</sup> Bone marrow produces and trains some of the immune cells so that they do not recognize the foreign identity of an organ.<sup>140</sup> Ideally, the donor and recipient immune systems can find a way to function together in harmony, sparing the donor organ.<sup>141</sup> This blending of immune systems is called chimerism and, if successful, will be an important step toward achieving tolerance.<sup>142</sup>

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<sup>138</sup> Cytokines are intercellular signaling molecules that are essential to the immune system. Science has only discovered a fraction of these communication molecules that are important to the rejection process. Future research is aimed at discovering more of these molecules, their function, and ways to manipulate them to induce tolerance and halt rejection. Blocking important cytokines and accelerating their destruction is a similar theoretical mechanism to some of those employed in transgenic animals.

A related technology involves the use of a type of molecule called a monoclonal antibody. Monoclonal antibodies are specifically engineered proteins that are constructed to attack one target specifically. If injected into a person with a donated organ, these monoclonal antibodies could be engineered to destroy cytokines and other factors important to the rejection process. Blocking cytokines by any mechanism and using monoclonal antibodies to affect rejection are all methods that are still in initial experimental stages. See SHER & MAKOWKA, *supra* note 16, at 4–5.

<sup>139</sup> Bimalangshu Dey et al., *Outcomes of Recipients of Both Bone Marrow and Solid Organ Transplants*, 77 MEDICINE 355, 355–66 (1998); Thomas E. Starzl et al., *Chimerism and Xenotransplantation*, 79 SURGICAL CLINICS N. AM. 191, 191–201 (1999).

<sup>140</sup> Dey et al., *supra* note 139, at 355–66; Starzl et al., *supra* note 139, at 191–201.

<sup>141</sup> Dey et al., *supra* note 139, at 355–66; Starzl et al., *supra* note 139, at 191–201.

<sup>142</sup> *Id.* The word chimerism comes from the mythological beast of Lycia, the Chimera. It was part lion, goat, and dragon. In addition, the beast spawned the Sphinx and the Nemean Lion. It was eventually slain by Bellerophon and has found its way into both English and medical terminology as a reference to something patched together from incongruous sources. MICHAEL MACRONE, BY JOVE! BRUSH UP YOUR MYTHOLOGY 148–49 (1992).

Importantly, none of the organ substitute technologies, even working in concert with pharmacological regimes, have advanced far enough to extend life even a year without a transplant.<sup>143</sup> Many of the organ substitute advances above are not yet developed to the extent that they are widely used on humans, putting them squarely in the realm of science fiction.<sup>144</sup> The hope of overcoming the donor shortage embodied in the quest for organ substitutes and pharmacological advances above could be realized in the present by the implementation of an organ market. However, there are multiple legal and public policy considerations surrounding the sale of organs.

### **III. The Law and Public Policy of Human Organ Sale for Transplantation**

The law and public policy surrounding transplantation is an area of great volume and complexity.<sup>145</sup> This section will survey some of the most influential law and organizational policies pertaining to the sale of human organs. On the whole, this section will demonstrate a historical resistance to the notion of a market in organs, with some recent shifts toward more accepting attitudes as medical technology advances and as organ demand grows.

#### **A. The Body as Property: Development of a Property Interest Through Case Law**

The general notion of the body as property has long been debated.<sup>146</sup> Property interests in living persons have a long and controversial history in the United States and were definitively decided through a Civil War and a Constitutional amendment.<sup>147</sup>

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<sup>143</sup> See Weber et al., *supra* note 17, at 51–58. See generally FUTURE STRATEGIES FOR TISSUE AND ORGAN REPLACEMENT, *supra* note 93, at 91.

<sup>144</sup> *Id.*

<sup>145</sup> See generally Walter Block, et al., *Human Organ Transplantation: Economic & Legal Issues*, 3 QUINNIPAC HEALTH L.J. 87, 87–109 (2001); see also PRICE, *supra* note 16, at 1–20.

<sup>146</sup> See Block et al., *supra* note 145, at 87–109; PRICE, *supra* note 16, at 1–20.

<sup>147</sup> U.S. CONST. amend. XIII. This amendment can be viewed as an affirmation of individual property rights and each person's bodily autonomy.

At common law, there was no property interest in a corpse.<sup>148</sup> The clergy had ecclesiastical courts with exclusive jurisdiction over disputes concerning corpses and where the corpses would be interred.<sup>149</sup> In the seventeenth century, Lord Edward Coke, the English judge and legal scholar, considered the property status of the cadaver implicit in his etymological derivation of the word cadaver, *caro data vermibus*, flesh given to worms, and, therefore, the property of no one.<sup>150</sup> This interpretation satisfied Lord Coke and influenced hundreds of years of common law.<sup>151</sup> This influence prevented the body, or anything derived from it, from being treated as a good or being legally recognized as any other type of property.<sup>152</sup> This interpretation remained sufficient until the nineteenth century.<sup>153</sup>

The 1856 case of *In re Beekman Street* exposed Coke's poor Latin scholarship, and the shift toward acknowledging some property rights in the body began.<sup>154</sup> *In Re Beekman Street* involved widening a well-known New York City street and removing many corpses from a graveyard.<sup>155</sup> When the daughter of one of the men buried in the graveyard sought property-related damages, the referee in the case, Samuel B. Ruggles, launched an attack on Coke's Latin explanation of cadaver and declared that the true derivation came from *cadere*, which meant "to fall."<sup>156</sup> Ruggles' interpretation has been recognized as the correct

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<sup>148</sup> SCOTT, *supra* note 2, at 186; R. Alta Charo, *Skin and Bones: Post-Mortem Markets in Human Tissue*, 26 NOVA L. REV. 421, 425–26 (2002); See 3 Edward Coke, *INSTITUTES OF THE LAWS OF ENGLAND* 203 (1644); *Renihan v. Wright*, 25 N.E. 822, 824 (Ind. 1890) (discussing the early English common law position that there was no property right in a corpse and that any dispute over the interment of a corpse must be resolved through ecclesiastical courts).

<sup>149</sup> *Renihan*, 25 N.E. at 824. (discussing the early English common law position that there was no property right in a corpse and that any dispute over the interment of a corpse must be resolved through ecclesiastical courts).

<sup>150</sup> SCOTT, *supra* note 2, at 186.

<sup>151</sup> *Id.*

<sup>152</sup> *Id.*

<sup>153</sup> See *id.* at 186–87.

<sup>154</sup> *Id.* at 187.

<sup>155</sup> *Id.*

<sup>156</sup> SCOTT, *supra* note 2, at 186.

derivation, and the case marked the legal beginning of a shift toward recognizing more robust property rights in one's body.<sup>157</sup>

Francis Carey continued the development of a legal theory describing the body as property in an 1885 law review article in which he noted that, due to medical advances and the need for human bodies as dissection material, the human corpse had become "a thing of value, a subject of political economies, perhaps to be bought, sold, and exchanged, and subject to the rules of supply and demand."<sup>158</sup> Carey prophetically noted the excitement experienced by lawyers as "the human corpse rises to a dignity and importance in the commercial world which it may not have possessed in its lifetime," is "second only to that caused by death itself."<sup>159</sup> Further the lawyer "pricks up his ears and holds the reins of his lawful control over the heretofore useless hulk with firmer grasp" in the hopes that someday the body will be "appraised and executor's commissions calculated upon it!"<sup>160</sup> Somberly he concludes with visionary clarity, "the whole foundation of law and custom is shaken," and it falls upon us to answer the serious question of how it will be rebuilt.<sup>161</sup>

The twentieth and twenty-first centuries have contained urgings toward body property rights in some respects while

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<sup>157</sup> *Id.*; As Ruggles noted, cadaver is derived from "cadere" meaning "to fall," as in the fallen ruins of a city. See O.H. PEPPER, MEDICAL ETYMOLOGY 19 (1949); WILLIAM S. HAUBRICH, MEDICAL MEANINGS 34 (1997).

<sup>158</sup> Francis King Carey, *The Disposition of the Body After Death*, 19 AM. L. REV. 251, 252 (1885).

A great many years ago: — before American jurisprudence had torn the wigs and gowns from the wrinkled head and shaking shoulders of the common law, and before common sense had suggested any doubt as to the certainty of the resurrection of the human body in its original flesh and blood every man approached the gateway which is called death, under the complete dominion of the three learned professions. The doctor of medicine was master of his mortal body, the doctor of law clung to his almighty dollar (whatever shape it might then have taken), and the doctor of theology tyrannized his immortal soul. *Id.* at 251.

<sup>159</sup> Carey, *supra* note 158, at 251.

<sup>160</sup> *Id.*

<sup>161</sup> *Id.*

maintaining explicit exclusions of property rights in others.<sup>162</sup> Modern medical advances have “altered the value of the human body, from merely a source of labor, or food for worms, to a highly prized biological commodity.”<sup>163</sup>

The 1978 case of *McFall v. Shimp*<sup>164</sup> is particularly useful for considering: (1) English legal principles against property rights in our own bodies reaching into modern times; (2) how medical advances create new applications of these principles and new value in the human body; and (3) the modern trend protecting bodily autonomy against state compulsion.<sup>165</sup>

In *McFall*, the plaintiff, Robert McFall “suffer[ed] from a rare bone marrow disease.”<sup>166</sup> His prognosis was poor, and his chances of survival were slim unless he found a bone marrow donor.<sup>167</sup> His cousin, David Shimp, was a possible match given that they were closely related.<sup>168</sup> Shimp, however, did not want to undergo the tests necessary to verify that he was a match.<sup>169</sup> McFall sought a court order forcing his cousin to submit to the transplant tests.<sup>170</sup> McFall’s argument centered on a seven-hundred-year old English law that requires a person to give up their bodily security to save another if it is the only means available.<sup>171</sup> The court ruled against McFall’s request, denying the

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<sup>162</sup> See Charo, *supra* note 148, at 425–50. This has taken shape by forming markets in blood and reproductive cells, but continuing to outlaw slavery or selling the tissues of others without their consent. *Id.* This shift toward autonomy is also implicit in such other decisions as *Schloendorff*, where Cardozo writes, “Every human being of adult years and sound mind has a right to determine what shall be done with his own body . . .” *Schloendorff v. Soc’y of N.Y. Hosp.*, 105 N.E. 92, 93 (N.Y. 1914).

<sup>163</sup> Michael H. Scarmon, *Brotherton v. Cleveland. Property Rights in the Human Body--Are the Goods Oft Interred with Their Bones*, 37 S.D. L. REV. 429, 429 (1992).

<sup>164</sup> 10 Pa. D. & C.3d 90, 90–92 (C.P. Alleghany County 1978).

<sup>165</sup> The third element in this list is particularly relevant later as a consideration against policies of presumed consent as a way to increase organ supply.

<sup>166</sup> See *McFall*, 10 Pa. D. & C.3d at 90.

<sup>167</sup> *Id.*

<sup>168</sup> *Id.*

<sup>169</sup> *Id.* at 90–91.

<sup>170</sup> *Id.* at 90–92.

<sup>171</sup> *Id.* at 90.

state power over Shimp's organs.<sup>172</sup> The court held that a decision to submit to tests or a transplant rested with Shimp, not with the state.<sup>173</sup> Moreover, the court stated that ruling in favor of McFall "would change every concept and principle upon which our society is founded," and in a society "which respects the rights of one individual, to sink its teeth into the jugular vein or neck of one of its members and suck from it sustenance for another member, is revolting to our hard-wrought concepts of jurisprudence."<sup>174</sup>

Several other modern cases are worthy of description due to their tension between some recognition of the body as personal property versus a state interest in organs.<sup>175</sup> The tension results from a policy under which the state "presumes consent" to certain procedures after a person has died.<sup>176</sup> These procedures may include recovering some organs or tissues, performing an autopsy, or conducting other tests that may be considered a violation of the next-of-kin's property interest in the corpse.<sup>177</sup> Two of the most important of these cases defining a property interest in a relative's organs are *Brotherton v. Cleveland*<sup>178</sup> and the follow-up case of *Whaley v. Tuscola*.<sup>179</sup>

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<sup>172</sup> *Id.* at 92.

<sup>173</sup> *Id.* at 91–92.

<sup>174</sup> *Id.* at 91–92.

<sup>175</sup> The cases in this section are similar to *McFall* because they are related to both establishing a property interest in body parts and also maintaining autonomy concerning that interest in cases where the state would attempt to claim a superior interest in the organs and tissues.

<sup>176</sup> This presumed consent is related to presumed consent for organ donation discussed later in the article. Both types of presumed consent are instances of the state asserting a superior interest in a corpse, often in the name of efficiency. See Morris, *supra* note 113, at 1125–50.

<sup>177</sup> See *id.*

<sup>178</sup> *Brotherton v. Cleveland*, 923 F.2d 477, 482 (6th Cir. 1991) (holding that a widow had rights in her husband's corpse that rose to the level of a "legitimate claim of entitlement," which implied that his corneas could not be removed without her consent).

<sup>179</sup> *Whaley v. Tuscola*, 58 F.3d 1111, 1117 (6th Cir. 1995) (holding that procedural due process rights of the decedent's next of kin were violated when the decedent's eyeballs were removed without the authorization of the next of kin).



In *Brotherton*, the Sixth Circuit ruled that Ohio state law recognized a widow's property interest in her deceased husband's body when his corneas were removed pursuant to state law.<sup>180</sup> The court held that the removal of the husband's corneas without due process for the widow violated her constitutional rights.<sup>181</sup> The court noted that to make a successful due process claim under 42 U.S.C. § 1983, a plaintiff must show: (1) deprivation, (2) of property, (3) under color of state law.<sup>182</sup> The court, finding that the deprivation and color of state law requirements were easily met, determined the central issue to be whether Mrs. Brotherton had a property interest in her husband's corneas.<sup>183</sup> The court interpreted Ohio state law to provide the next of kin some sort of interest in the decedent's body.<sup>184</sup> According to the court, this interest qualified as a property interest for purposes of the Due Process Clause.<sup>185</sup> Using the above reasoning, the court declared that the state procedures that caused the corneas to be removed without the widow's consent were unconstitutional and deprived Brotherton of procedural due process.<sup>186</sup> It is important to note that *Brotherton* was by no means the final decision concerning consent and property rights in bodies.<sup>187</sup>

Four years after *Brotherton*, the Sixth Circuit decided a similar case concerning an almost identical fact pattern under Michigan law and came to the same conclusion.<sup>188</sup> In *Whaley v. Tuscola*, the court noted that Michigan law expressly states that a family may take possession of a decedent's body for burial.<sup>189</sup>

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<sup>180</sup> *Brotherton*, 923 F.2d at 482.

<sup>181</sup> *Id.*

<sup>182</sup> *Id.* at 479.

<sup>183</sup> *Id.*

<sup>184</sup> *Id.* at 480-82.

<sup>185</sup> *Id.*

<sup>186</sup> *Id.* In this case, the due process clause violation was argued as procedural. There are arguments, however, for both a procedural and a substantive due process right in a person's own body. Eric S. Jaffe, "She's Got Bette Davis[s'] Eyes": Assessing the Nonconsensual Removal of Cadaver Organs Under the Takings and Due Process Clauses, 90 COLUM. L. REV. 528, 543-68 (1990).

<sup>187</sup> See *Whaley v. Tuscola*, 58 F.3d 1111 (6th Cir. 1995).

<sup>188</sup> *Id.*

<sup>189</sup> *Id.* at 1115.

Furthermore, taking possession of the body for burial implied some sort of possessory right in the body that conflicted with the government sanctioning the nonconsensual removal of tissue.<sup>190</sup> The court declared that there was a due process violation on the facts and went on to say that, in this “case and *Brotherton*, the state cause of action for damaging a corpse explicitly acknowledges the next of kin’s right to possess and prevent the mutilation of the dead body.”<sup>191</sup> This right of protection and control is very similar to what courts otherwise consider to be a property interest, even if they are hesitant to use such explicit language.<sup>192</sup>

Cases such as *Brotherton* and *Whaley* seem to recognize that taking tissues under a limited presumed consent law for organ donations would probably be a violation of the Due Process Clause.<sup>193</sup> Other courts, however, have come to different conclusions when considering similar facts.<sup>194</sup> For example, deciding the same question five years before the *Brotherton* decision, the Florida Supreme Court held that the removal of corneas without the consent of the next of kin is permissible.<sup>195</sup> The Florida court noted that corneal removal is a small intrusion on the body when compared to the large invasion of an autopsy.<sup>196</sup> The court found “no taking of private property by state action for a non-public purpose in violation of . . . the Florida Constitution.”<sup>197</sup> In addition, the court rejected the idea of substantial property rights in the corpse by describing them as:

a somewhat dubious “property right” to the body, usually in the next of kin, which did not exist while the decedent was living, cannot be conveyed, can be used only for the one purpose of burial, and not only has no pecuniary value but is a source of liability for funeral expenses. It seems reasonably

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<sup>190</sup> *Id.* at 1116–17.

<sup>191</sup> *Id.* at 1117.

<sup>192</sup> See Morris, *supra* note 113, at 1125–50.

<sup>193</sup> See *id.* at 1145.

<sup>194</sup> See *State v. Powell*, 497 So. 2d 1188, 1191 (Fla. 1986).

<sup>195</sup> *Id.* at 1193–94.

<sup>196</sup> *Id.*

<sup>197</sup> *Id.* at 1192.

obvious that such "property" is something evolved out of thin air to meet the occasion, and that it is in reality the personal feelings of the survivors which are being protected, under a fiction likely to deceive no one but a lawyer.<sup>198</sup>

In yet another pre-*Brotherton* case, the Fifth Circuit ruled that there existed no liberty or property interest in the bodies of deceased children based on 42 U.S.C. § 1983.<sup>199</sup> The gruesome facts surrounding that case, *Arnaud v. Odom*, involve a coroner who performed a grisly experiment on the corpses of two babies who had died of Sudden Infant Death Syndrome.<sup>200</sup> Before performing the requisite autopsy, he dropped each baby on its head to examine the damage such a fall would do to an infant's head.<sup>201</sup> The coroner did this to gain evidence to clear his name from a previous lawsuit.<sup>202</sup> The court decided that even though Louisiana recognized a "quasi-property" interest in a corpse, this did not create a property interest as required to activate the Due Process Clause of the Constitution.<sup>203</sup> Thus, both procedural and substantive due process arguments were considered and rejected.<sup>204</sup>

In *Brotheron*, *Whaley*, *Powell*, and *Arnaud*, the courts considered state law when determining whether a property right in bodies existed for procedural due process purposes.<sup>205</sup> This will be important to the subject of body property rights as a whole and organ markets because the success of challenges to these ideas could revolve around state law.<sup>206</sup> In addition, states that recognize

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<sup>198</sup> *Id.*

<sup>199</sup> *Arnaud v. Odom*, 870 F.2d 304, 309 (5th Cir. 1989).

<sup>200</sup> *Id.* at 306.

<sup>201</sup> *Id.*

<sup>202</sup> *Id.*

<sup>203</sup> *Id.* at 309.

<sup>204</sup> *Id.* at 304-09.

<sup>205</sup> See *Brotherton v. Cleveland*, 923 F.2d 477, 477-82 (6th Cir. 1991); *Whaley v. Tuscola*, 58 F.3d 1111, 1111-17 (6th Cir. 1995); *State v. Powell*, 497 So. 2d 1188, 1188-91 (Fla. 1986); *Arnaud v. Odom*, 870 F.2d 304, 304-09 (5th Cir. 1989).

<sup>206</sup> See Jaffe, *supra* note 186, at 543-68. This article explicitly discusses the possibility of both procedural and substantive due process violations for presumed consent law. It also considers the importance of state law in determinations of procedural due process. *Id.*; see also *Newman v.*

property rights in organs are essentially relinquishing state control by modifying the older common law position that body parts do not merit individual property rights.<sup>207</sup> States that have recognized property rights or quasi-property rights, such as in *Brotherton* or *Whaley*, would be more likely to support some form of organ market.<sup>208</sup> More recent cases do not rely as much on a state law procedural due process theory to develop property rights.

The current state of body property rights and tissue control has recently and famously, or infamously, been explored in the cases of *Moore v. Regents of University of California*<sup>209</sup> and *Hecht v. Superior Court*.<sup>210</sup> As with the case law before them, these cases struggle with and differ over the extent of property rights allowed in tissues.<sup>211</sup> Also similar to previous case law, and foreshadowing this article's focus on a market in human organs, both cases confront whether the individual or society is ultimately able to assert a superior claim over this material.<sup>212</sup>

In *Moore*, the nation's attention was captured as the facts of the case presented the California Supreme Court with the profound questions central to a market in human organs: whether people own their body parts when the parts are in, or attached to, their bodies and whether people continue to own them once the parts are removed from their bodies.<sup>213</sup> In 1976, doctors diagnosed John Moore, the plaintiff, with hairy cell leukemia, a disease that, ironically, had the potential to create significant commercial and scientific value in inventions derived from his blood products.<sup>214</sup>

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Sathyavaglswaran 287 F.3d 786, 795–99 (9th Cir. App. 2002) (holding that procedural due process property rights were violated by a presumed consent law that authorized cornea harvesting).

<sup>207</sup> See Jaffe, *supra* note 186, at 543–68.

<sup>208</sup> *Id.*

<sup>209</sup> 793 P.2d 479 (Cal. 1990).

<sup>210</sup> 20 Cal. Rptr. 2d 275 (Ct. App. 1993).

<sup>211</sup> See Charles M. Jordan & Casey J. Price, *First Moore, Then Hecht: Isn't it Time We Recognize a Property Interest in Tissues, Cells, and Gametes?*, 37 Real Prop. Prob. & Tr. J. 151, 151–90 (2002).

<sup>212</sup> *Id.*

<sup>213</sup> See *Moore*, 793 P.2d at 487–89.

<sup>214</sup> See *id.* at 480–81. This potential, however, had never been exploited before with the success that it would be by the creation of the Mo-cell line. *Id.* at 481–89.

Following the diagnosis, and on the advice of his doctors, Moore consented to the removal of his spleen as the best-known treatment for the disease.<sup>215</sup> Without Moore's knowledge, doctors and researchers at the University of California at Los Angeles ("UCLA") then developed a valuable cell line from the cells removed from Moore's spleen.<sup>216</sup> Without Moore's complete understanding, these same doctors monitored Moore for seven years, extracting tissue samples for testing and development related to the developing cell line.<sup>217</sup>

Upon learning of these events, Moore filed a lawsuit in 1984 against the doctors, the Regents of the University of California, and three other defendants claiming numerous causes of action.<sup>218</sup> He alleged that doctors at UCLA were aware of the enormous value found in his cells, intentionally chose not to inform him of it, and used his body parts over an extended period of time to create a very valuable cell line from Moore's T-lymphocytes.<sup>219</sup> The doctors then patented the cell line derived from Moore's cells, the "Mo-cell line," which had a value of three billion dollars at the time of the trial.<sup>220</sup> Given the great value of the cell line and the fact that his cells were a necessary component in the production of the cell line, Moore alleged a cause of action against the doctors for conversion<sup>221</sup> of his cells.<sup>222</sup> Specifically, Moore claimed the following: (1) that he continued to own his cells after they were removed from his body; (2) that he had a right to direct their use or nonuse; and (3) that he had never consented to

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<sup>215</sup> Moore v. Regents of Univ. of Cal., 793 P.2d 479, 481 (Cal. 1990).

<sup>216</sup> See *id.* at 481-82.

<sup>217</sup> See *id.* at 481.

<sup>218</sup> See *id.* at 480-82.

<sup>219</sup> See *id.* at 481-82. T-lymphocytes are an important type of immune cell that are found in the lymph nodes, thymus, and spleen. Coincidentally, they are also very important in the graft rejection reactions that are so crucial to the survival of transplanted organs. See ROBBINS PATHOLOGIC BASIS OF DISEASE, *supra* note 50, at 209-10.

<sup>220</sup> See Moore, 793 P.2d 479 at 482.

<sup>221</sup> "An unauthorized assumption and exercise of the right of ownership over goods or personal chattels belonging to another, to the alteration of their condition or the exclusion of the owner's rights." BLACK'S LAW DICTIONARY 332 (6th ed. 1990).

<sup>222</sup> See Moore, 793 P.2d at 482.

their use by the UCLA doctors in the development of the cell line.<sup>223</sup>

At the lower appellate court level, the California Court of Appeals held that Moore had sufficiently shown the tort of conversion and that he possessed a property interest in his body and its parts.<sup>224</sup> The court held that a "patient must have the ultimate power to control what becomes of his or her tissues".<sup>225</sup> The court further stated, "[t]o hold otherwise would open the door to a massive invasion of human privacy and dignity in the name of medical progress."<sup>226</sup> The Supreme Court of California, however, did not endorse the lower court's reasoning.<sup>227</sup> In fact, the court held that Moore had "abandoned" his cells and summarily rejected Moore's conversion claim.<sup>228</sup> The court also held that it would not "force the round pegs of 'privacy' and 'dignity' into the square hole of 'property' in order to protect the patient, since the fiduciary-duty and informed-consent theories<sup>229</sup> protect these interests directly by requiring full disclosure."<sup>230</sup>

Perhaps more reasonably, the California Supreme Court also refused Moore's demand for a property interest in the patent created from his cells.<sup>231</sup> The court explained that the potential cell line "is both factually and legally distinct from the cells taken from

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<sup>223</sup> See *id.* at 487.

<sup>224</sup> See generally *Moore v. Regents of Univ. of Cal.*, 249 Cal. Rptr. 494 (Ct. App. 1988).

<sup>225</sup> See *id.* at 508.

<sup>226</sup> *Id.* This case concluded that Moore must at least have some form of property interest in the tissues taken from his own body. *Id.*

<sup>227</sup> See *Moore*, 793 P.2d at 482-89.

<sup>228</sup> See *id.* at 488-89. It is interesting that the court uses the language of abandonment yet simultaneously does not recognize an explicit property right in the cells.

<sup>229</sup> Informed consent is "voluntary consent given by a person ... for participation in a study ... after being informed of the purpose, methods, procedures, benefits, and risks." *STEDMAN'S MEDICAL DICTIONARY*, *supra* note 47, at 871.

<sup>230</sup> *Moore*, 793 P.2d at 491. The *Moore* court explained the policy rationale of its holding and said, "Liability based upon existing disclosure obligations, rather than an unprecedented extension of the conversion theory, protects patients' rights of privacy and autonomy without unnecessarily hindering research." *Id.* at 494.

<sup>231</sup> See *id.* at 489.

Moore's body."<sup>232</sup> After assessing the nature of the Mo-cell line, the *Moore* court determined that researchers could patent human cell lines because the long-term growth of human tissues and cells is so difficult that it is often considered an art.<sup>233</sup> The court concluded that, with the UCLA doctors' creative efforts, the Mo-cell line and the products derived from it, became the property of the University Regents, not of Moore.<sup>234</sup>

The *Moore* opinion suggests a holding concerned with promoting the research efforts of scientists, particularly those in the promising field of biotechnology.<sup>235</sup> The desire to foster growth in biotechnology resulted in careful language designed to avoid granting property rights in cells that may result in dampening economic incentives for biological research.<sup>236</sup> The court also noted that at the time of the litigation there were 350 biotechnology companies in the United States, and approximately twenty five to thirty percent of those companies were developing products that required access to human cells.<sup>237</sup> The court also feared that every cell sample used by a researcher would be like a ticket purchased to a "litigation lottery."<sup>238</sup> The court was concerned that recognizing a property interest in cells would necessitate some sort of tracking system even more elaborate than those currently in place for every cell removed from someone, even those removed for therapeutic purposes.<sup>239</sup> Obviously, if this end came about, this type of system would greatly increase the cost of biotechnological research and completely discourage some

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<sup>232</sup> *Id.* at 492.

<sup>233</sup> *Id.* at 493.

<sup>234</sup> *See id.* at 492-93.

<sup>235</sup> One could also imagine a decision granting Moore a property right in his cells that could have still found them "abandoned" or altered so much by the scientist's creativity so that they were no longer his by the time they became part of the Mo-cell line. The current decision allows Moore a type of victory through the fiduciary duty mechanism. It did not take any more steps than were necessary to reach that result, always careful to avoid treading on any ground that could harm the booming biotechnology and medical industries.

<sup>236</sup> *See Moore*, 793 P.2d at 494-95.

<sup>237</sup> *Id.*

<sup>238</sup> *Id.* at 496.

<sup>239</sup> *See id.* at 524.

research efforts.<sup>240</sup>

Considering all of the above, the court decided against recognizing a cause of action for the conversion of Moore's cells.<sup>241</sup> As a result, the *Moore* court refused to recognize a property interest in tissues or cells that had been removed from one's body for therapeutic purposes and chose, instead, to rely on the doctrine of informed consent to protect patients from unscrupulous doctors.<sup>242</sup>

The *Moore* reasoning is accepted as the current state of the law concerning property rights in tissues extracted for research purposes.<sup>243</sup> Because the *Moore* court relied on informed consent as a way of avoiding the issue of property rights in tissue generally,<sup>244</sup> scholars have argued that the court did not reach a true decision regarding property rights in tissues and that the court's property interest dicta should be limited to surreptitiously extracted research tissues.<sup>245</sup>

*Hecht v. Superior Court*<sup>246</sup> is important to this article because the case arose after *Moore*, making it one of the most recent cases to wrestle with the idea of the body as property.<sup>247</sup> The case began as an action by the decedent's live-in girlfriend,

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<sup>240</sup> *Id.*

<sup>241</sup> *See id.* at 497.

<sup>242</sup> *See id.* at 491–95.

<sup>243</sup> *See Jordan & Price, supra* note 211, at 164.

<sup>244</sup> *See Moore*, 793 P.2d at 488–95.

<sup>245</sup> *See Banks, supra* note 13, at 65. *But see Jordan & Price, supra* note 211, at 164. The interpretation of such an important case, dealing with fundamental issues and with such terrific consequences, is almost certain to be in contention for some time to come even if the Supreme Court eventually makes a decision on the issue.

<sup>246</sup> *Hecht* is actually a collection of three cases. *Hecht v. Superior Court*, 16 Cal. App. 4th 836, 843–48 (Ct. App. 1993); *Kane v. Superior Court*, 37 Cal. App. 4th 1577 (Ct. App. 1995); *Hecht v. Superior Court*, 59 Cal. Rptr. 2d 222 (Ct. App. 1996). The 1996 *Hecht* case was ordered not to be published and, therefore, has no other reference than the one listed above. It was ordered deleted by the California Supreme Court on January 15, 1997. "An order of the Supreme Court directing depublishing of an opinion in the Official Reports shall not be deemed an expression of opinion of the Supreme Court of the correctness of the result reached by the decision or of any of the law set forth in the opinion." CAL. CT. R. 979.

<sup>247</sup> *See Jordan & Price, supra* note 211, at 177.



Deborah Hecht.<sup>248</sup> Hecht lived with the decedent, William Kane, for approximately five years.<sup>249</sup> Kane froze fifteen vials of sperm and bequeathed this sperm to Hecht.<sup>250</sup> Kane later committed suicide after losing \$20,000 in Las Vegas.<sup>251</sup> Hecht commenced an

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<sup>248</sup> See *Hecht*, 16 Cal.App. 4th at 839–40.

<sup>249</sup> See *id.*

<sup>250</sup> See *id.* at 840. Kane's intentions were indisputable and backed by several sources. The will read "I bequeath all right, title, and interest that I may have in any specimens of my sperm stored with any sperm bank or similar facility for storage to Deborah Ellen Hecht." *Id.* In addition, the Statement of Wishes section of the will provided, "It being my intention that samples of my sperm will be stored at a sperm bank for the use of Deborah Ellen Hecht, should she so desire, it is my wish that, should [Hecht] become impregnated with my sperm, before or after my death," she may ignore earlier will provisions for the disposition of certain diplomas and mementoes if she instead prefers to preserve them for Kane and Hecht's future children. *Id.* Finally, Kane also had a contract with the sperm bank that read, "I, William Everett Kane, . . . authorize the [sperm bank] to release my semen specimens (vials) to Deborah Ellen Hecht. I am also authorizing specimens to be released to recipient's physician Dr. Kathryn Moyer." *Id.*

<sup>251</sup> His will also contained a letter to his children, born and unborn, explaining the circumstances surrounding his death:

I address this to my children, because, although I have only two, Everett and Katy, it may be that Deborah will decide--as I hope she will--to have a child by me after my death. I've been assiduously generating frozen sperm samples for that eventuality. If she does, then this letter is for my posthumous offspring, as well, with the thought that I have loved you in my dreams, even though I never got to see you born. If you are receiving this letter, it means that I am dead--whether by my own hand or that of another makes very little difference. I feel that my time has come; and I wanted to leave you with something more than a dead enigma that was your father. . . . I am inordinately proud of who I have been--what I made of me. I'm so proud of that that I would rather take my own life now than be ground into a mediocre existence by my enemies--who, because of my mistakes and bravado have gained the power to finish me. . . . So why am I checking out now? Basically, betrayal, over and over again, has made me tired. I've picked up some heavyweight enemies along the way--ranging from the Kellys of the world, to crazies with guns, to insurance companies, to the lawyers that have sucked me dry. . . . I don't want to die as a tired, perhaps defeated and bitter old man. I'd rather end it like I have lived it--on my time,

action in order to recover Kane's sperm.<sup>252</sup> Kane's two adult children sought to prevent her from obtaining the fifteen vials of sperm that Kane had deposited in an account at a Los Angeles sperm bank.<sup>253</sup>

In *Hecht*, the most important issue to be decided was whether the sperm vials were the property of Kane's estate and, by extension, whether he could have a property interest in those vials and direct their distribution.<sup>254</sup> The court approached the issue by first determining the definition of property and then examining whether sperm met the definition.<sup>255</sup> The court distinguished the instant case's facts from those of *Moore* by noting that there was an explicit contract with the sperm bank describing Kane's expectation of control and his intent of disposal.<sup>256</sup> The court was specifically concerned with Kane's intent because the court desired the vials be distributed according to that intent.<sup>257</sup> The court itself summarized the evidence that indicated Kane's intent.<sup>258</sup> It also determined that Kane had "an interest in the nature of ownership" in the vials stored with the sperm bank.<sup>259</sup> Finally, the court reasoned that once gametes<sup>260</sup> are dealt with as a form of property, the analysis then hinges on whether the owner has demonstrated sufficient intent to dispose of the individual's gametes.<sup>261</sup> Given

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when and where I will, and while my life is still an object of self-sculpture--a personal creation with which I am still proud. In truth, death for me is not the opposite of life; it is a form of life's punctuation.

See *Hecht*, 16 Cal.App. 4th at 841.

<sup>252</sup> See *id.*

<sup>253</sup> See *id.*

<sup>254</sup> See *Jordan & Price*, *supra* note 211, at 177.

<sup>255</sup> See *Hecht*, 16 Cal.App. 4th at 845-50.

<sup>256</sup> See *id.* at 846 n.4. In fact, Moore never had any hope of seeing his spleen again. As far as he was informed, it was not only useless to him, but had to be removed as part of the treatment for his disease. *Id.*

<sup>257</sup> See *Hecht Hecht*, 16 Cal.App. 4th at 839-40.

<sup>258</sup> *Id.* This evidence included the contract Kane had with the sperm bank, the explicit provisions in his will and the Statement of Wishes in his will. *Id.*

<sup>259</sup> See *Hecht Hecht*, 16 Cal.App. 4th at 846.

<sup>260</sup> Gametes are reproductive cells, or sperm and egg cells for humans.

STEDMAN'S MEDICAL DICTIONARY, *supra* note 47, at 701.

<sup>261</sup> See *id.* at 839-46.

the great amount of evidence in favor of Kane's intent to leave Hecht his sperm, the court first granted an injunction against destroying the vials and, in later hearings, granted Hecht possession of all the vials.<sup>262</sup>

*Hecht* is central to the thesis of this article because it explicitly recognizes property rights in human cells and, perhaps, represents a modest case law shift in favor of recognizing these rights generally.<sup>263</sup> In addition, *Hecht* is the only case to date expressly focusing on whether gametes may be bequeathed and inherited, acts which are intimately tied with our traditional notions of property distribution.<sup>264</sup> Finally, *Hecht* is also a case that, like *Moore*, arose as a direct result of advances in medical technology that are forcing a reconsideration of legal doctrines.<sup>265</sup> Courts and leading medical organizations consider these legal doctrines, and they will arguably help shape future legal decisions.<sup>266</sup>

Everything about transplantation is a commercial transaction.<sup>267</sup> The hospital, the physician, and the staff all make a living from transplantation and other life saving procedures.<sup>268</sup> Given the case law and current tissue selling practices in support of property rights in bodies, one may ask what is preventing organ sales? The answer explored below is a combination of organizational policy declarations and statutory provisions.

## B. Organizations

Organizations involved in transplantation are important as collections of experts that lawmakers may look to when making decisions about transplantation.<sup>269</sup> Therefore, the policies and

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<sup>262</sup> See *id.* at 861.

<sup>263</sup> See *Hecht*, 16 Cal.App. 4th at 849.

<sup>264</sup> See *id.* at 848–49.

<sup>265</sup> *Id.*

<sup>266</sup> Live Organ Donor Consensus Group, *Consensus Statement on the Live Organ Donor*, 284 JAMA 2919, 2919–26 (2000) [hereinafter *Consensus Statement*].

<sup>267</sup> Roger W. Evans & Daniel J. Kitzmann, *An Economic Analysis of Kidney Transplantation*, 78 Renal Transplantation 149, 149–71 (1998).

<sup>268</sup> *Id.*

<sup>269</sup> See *Consensus Statement*, *supra* note 266, at 2919–26.

opinions of the world's leading medical and transplantation organizations may be viewed as an enlightened barometer indicating the future of law in this area.<sup>270</sup>

Initially, nearly every national and international organization adopted a blanket policy against the sale of organs.<sup>271</sup> In addition, most nations have had laws against the sale of organs dating from the birth of transplantation in the 1960's and 70's.<sup>272</sup> Not all laws, however, have been against the sale of organs for transplantation, and there are some governments and organizations that support some form of organ market or sale.<sup>273</sup>

The Transplantation Society is a thirty-five-year-old international transplantation organization that is the "principal international forum for basic and clinical transplantation science throughout the world."<sup>274</sup> The Society's position on the sale of organs has been essentially the same since it first undertook to study the issue in the early 1980's: "Organs and tissues should be freely given without commercial consideration or commercial profit."<sup>275</sup>

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<sup>270</sup> See *id.* at 2919–26.

<sup>271</sup> See PRICE, *supra* note 16, at 376.

<sup>272</sup> See *id.*

<sup>273</sup> See *id.* at 369–72. These include both the state of Pennsylvania and the American Medical Association. To a lesser extent, they also include countries, such as India, Pakistan, the Philippines, and Iraq, that have had a healthy black market organ trade without enforcing existing laws against the sale of organs. Each of these is discussed in more detail later. *Id.*

<sup>274</sup> Transplantation Society, *Overview*, at <http://www.transplantation-soc.org/> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>275</sup> Transplantation Society, *Position of the Transplantation Society on Paid Organ Donation*, (quoting from the June 1995 issue of the Society Bulletin) at <http://www.transplantation-soc.org/policy/policy.html> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology). Benedict Cosimi, Councilor and Chairman of the Ethics Committee for the Transplantation Society recognizes in the Transplantation Society's policy statement that the success of transplantation is the driving force behind the demand for a market in human organs:

The dramatic success of organ replacement over the past three decades has resulted in referral of progressively increasing numbers of patients to compete for the limited number of allografts available for transplantation. The inadequate supply

The World Health Organization ("WHO"), founded in 1948 by the United Nations, also opposes organ sales.<sup>276</sup> On May 15, 1989, the WHO adopted resolution WHA42.5, which prevents the purchase and sale of human organs.<sup>277</sup> Importantly, the WHO has

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of suitable donors has rapidly become the major obstacle to further extension of this life-saving therapy to patients being maintained on dialysis or dying with end-stage disease of other vital organs. Among the potential solutions that have been offered to increase organ donation has been the suggestion that some economic incentive be provided either to the individual, in the case of a living kidney donor, or to the family or estate of a cadaver donor.

Recognizing the potential controversies that could arise from the commercialization or brokerage of transplantable organs, the Ethics Committee and the Council of the Transplantation Society first addressed this matter in the early 1980's. Their clear concern was that if the organ donation process were to be relegated to the laws of the market place, particularly when the less privileged might be exploited to improve the health of the more privileged, the established safeguards surrounding altruistic donation would likely be compromised. After considerable deliberation, specific guidelines for practice were agreed upon. The concluding resolution was that: "No transplant surgeon/team shall be involved directly or indirectly in the buying or selling of organs/tissues or in any transplant activity aimed at commercial gain to himself/herself or an associated hospital or institute."

See *supra* note 72 for allograft definition.

<sup>276</sup> World Health Organization, *About WHO*, at <http://www.who.int/about/en/> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>277</sup> World Health Organization, *World Health Assembly Resolutions and Decisions Sessions 1-55 (June 1948-May 2001)*, [http://policy.who.int/cgi-bin/om\\_isapi.dll?infobase=WHA&softpage=Browse\\_Frame\\_Pg42](http://policy.who.int/cgi-bin/om_isapi.dll?infobase=WHA&softpage=Browse_Frame_Pg42) (last updated Oct. 24, 2002) (on file with the North Carolina Journal of Law & Technology).

The relevant portion of the text of WHA42.5 is:

The Forty-second World Health Assembly,  
Concerned by the commercial trafficking in the organs of healthy donors, which exploits human distress and puts at increased risk the health of the donors;

Aware that commercial arrangements for organ transplants are nevertheless being undertaken and that to date there has been little success in preventing trafficking in human organs;

recognized that the success of transplantation technology, coupled with the organ shortage, has driven the development of a black market in international organ sales of non-related living donors.<sup>278</sup>

The American Medical Association ("AMA") opposes financial incentives generally, but it is interested in exploring the possibilities.<sup>279</sup> The AMA is generally against paying for an organ

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Anxious to prevent the exploitation of human distress, particularly in children and other vulnerable groups, and to further the recognition of the ethical principles which condemn the buying and selling of organs for purposes of transplantation;

1. CALLS UPON Member States to take appropriate measures to prevent the purchase and sale of human organs for transplantation;

2. RECOMMENDS that Member States introduce legislation to prohibit trafficking in organs where this cannot effectively be prevented by other measures;

3. URGES Member States, in close cooperation with professional health organizations and supervising health authorities, to discourage all practices which facilitate commercial trafficking in organs;

4. REQUESTS Member States to report as soon as possible to WHO on action taken with respect to this resolution;

5. REQUESTS the Director-General to report to the Forty-fourth World Health Assembly the measures taken by the governments of Member States in furtherance of this resolution.

*Id.*

<sup>278</sup> PRICE, *supra* note 16, at 368 (citing the World Health Organization. WHO, *Guiding Principles on Organ Transplantation*, 1991).

<sup>279</sup> American Medical Association, *H-370.000 Organ Donation and Transplantation*, [http://www.ama-assn.org/apps/pf\\_online/pf\\_online?f\\_n=browse&doc=policyfiles/H-370.000.HTM](http://www.ama-assn.org/apps/pf_online/pf_online?f_n=browse&doc=policyfiles/H-370.000.HTM) (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology). This link contains policy H-370.979:

Ethical Aspects of Future Contracts for Cadaveric Donors: The AMA has adopted the following guidelines for a pilot program of financial incentives for future contracts regarding organ donations: (1) There is enough evidence in favor of employing some form of financial incentive to justify the implementation of a pilot program. This program, as with any policy involving financial incentives to encourage organ donation, should have adequate regulatory safeguards to

from a living donor but would consider a "pilot program" that offered futures contracts<sup>280</sup> for cadaveric organ donations, provided that the payment was "moderate" and the "lowest amount that can reasonably be expected to encourage organ donation."<sup>281</sup>

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ensure that the health of donors and recipients is in no way jeopardized, and that the quality of the organ supply is not degraded. This pilot program should operate for a limited time, in a limited geographical region, and have the following safeguards. (2) Incentives should be limited to future contracts offered to prospective donors. By entering into a future contract, an adult would agree while still competent to donate his or her organs after death. In return, the appropriate state agency would agree to give some financial remuneration to the donor's family or estate after the organs have been retrieved and judged medically suitable for transplantation. Under a system of future contracts, several other conditions would apply: (a) No incentives should be allowed for organs procured from living donors. (b) It would be inappropriate to offer financial incentives for organ donation to anyone other than the person who would actually serve as the source of the organs. Only the potential donor, and not the potential donor's family or other third party, may be given the option of accepting financial incentives for the donation of his or her own organs. In addition, the potential donor must be a competent adult when the decision to donate is made, and the donor must not have committed suicide. (c) Any incentive should be of moderate value and should be the lowest amount that can reasonably be expected to encourage organ donation. By designating a state agency to administer the incentive, full control over the level of incentive can be maintained. (d) Payment of any incentive should occur only after the harvested organs have been judged medically suitable for transplantation. Suitability should continue to be determined in accordance with the procedures of the Organ Procurement and Transplantation Network. (e) Incentives should play no part in the allocation of donated organs among potential transplant recipients. The distribution of organs for transplantation should continue to be governed only by ethically appropriate criteria relating to medical need. (CEJA Rep. I-93-6)

<sup>280</sup> This type of contract is a contract in which a person becomes an organ donor during life, and some type of consideration is paid to their estate at death.

<sup>281</sup> The American Medical Association, H-370.979: *Financial Incentives for Organ Procurement*,

### C. Legislation

There is more state, national, and international legislation controlling the sale of organs than could possibly be covered in less than a book.<sup>282</sup> In the United States, however, two statutes essentially prevent organ sales and describe legal procurement and distribution methods.<sup>283</sup> One of these is a federal statute, and the other is a uniform statute, adopted by essentially every state.<sup>284</sup> This section will also explore one additional progressive statute in Pennsylvania, which allows a small gift payment to the donor's estate in exchange for donating organs.

#### 1. Uniform Anatomical Gift Act (UAGA) 1968/1987—Universal Adoption<sup>285</sup>

In an effort to facilitate the transplantation of hearts and kidneys, the National Conference of Commissioners on Uniform State Laws adopted the Uniform Anatomical Gift Act in 1968.<sup>286</sup> As time passed, however, certain inadequacies in the 1968 version became obvious, and the UAGA was revised in 1987.<sup>287</sup> In short, the UAGA allows anyone who is eighteen years or older to make

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[http://www.ama-assn.org/apps/pf\\_online/pf\\_online?f\\_n=browse&doc=policyfiles/HOD/H-370.979.HTM&s\\_t=&st\\_p=&nth=1&prev\\_pol=policyfiles/HOD/H-365.999.HTM&nxt\\_pol=policyfiles/HOD/H-370.972.HTM](http://www.ama-assn.org/apps/pf_online/pf_online?f_n=browse&doc=policyfiles/HOD/H-370.979.HTM&s_t=&st_p=&nth=1&prev_pol=policyfiles/HOD/H-365.999.HTM&nxt_pol=policyfiles/HOD/H-370.972.HTM) (last visited Mar. 22, 2003); see also American Medical Association, *supra* note 279 and accompanying text.

<sup>282</sup> See generally PRICE, *supra* note 16 (highlighting that prohibition against the sale of organs is so deeply held in Brazil that the Brazilian Constitution states that transplantation shall not be the subject of any commercial transaction. *Id.* at 376.)

<sup>283</sup> See Julia D. Mahoney, *The Market for Human Tissue*, 86 VA. L. REV. 163, 176–82 (2000).

<sup>284</sup> *Id.* Unif. Anatomical Gift Act § 2(a) (1987); National Organ Transplant Act, 42 U.S.C. §§ 273–274 (1984).

<sup>285</sup> See Jordan & Price, *supra* note 211, at 159 n35. (providing an entire statute list for every state).

<sup>286</sup> Jordan & Price, *supra* note 211, at 158.

<sup>287</sup> See PRICE, *supra* note 16, at 99–100.



or refuse to make an organ donation.<sup>288</sup> The UAGA spells out many procedures and guidelines that must be stringently adhered to by all parties involved in the removal and eventual use of the organ, regardless of whether the organ is ultimately used for research or transplantation purposes.<sup>289</sup> Importantly for this article, the UAGA also states that someone “may not knowingly, for valuable consideration, purchase or sell an organ for transplantation or therapy, if removal of the part is intended to occur after the death of the decedent.”<sup>290</sup> Additionally, the punishment for buying or selling organs under UAGA is up to a \$50,000 fine and five years in prison.<sup>291</sup> Also of note, the UAGA language does not permit sale if the organ is “intended to occur after the death of the decedent.”<sup>292</sup> This language arguably leaves open the possibility of a living donor market in organs, such as liver portions, kidneys, and lungs, which may be removed while the donor is still living.

The UAGA fails to address whether property rights exist in regenerating tissues, such as blood and sperm.<sup>293</sup> The UAGA does not prohibit the sale of such tissues, and such a market in them does exist.<sup>294</sup> As was demonstrated in the case law section of this article, property rights and the right of sale for these tissues currently are more respected by courts than they have been in the past.<sup>295</sup> Interestingly, when addressing the sale of regenerating body fluids, most states have statutorily characterized such fluids as a type of service, rather than as a sale of goods.<sup>296</sup> This legal fiction protects donors and suppliers from product liability should injuries, such as disease, result from the supplied blood or fluid.<sup>297</sup>

When considering a market in organs, it is crucial to note that the 1987 version of the UAGA, now adopted wholly or

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<sup>288</sup> Unif. Anatomical Gift Act § 2(a).

<sup>289</sup> *Id.* §§ 1-17.

<sup>290</sup> *Id.* § 10(a).

<sup>291</sup> *Id.* § 10(c).

<sup>292</sup> *Id.* § 10(a).

<sup>293</sup> Jordan & Price, *supra* note 211, at 159.

<sup>294</sup> *Id.*

<sup>295</sup> See *supra* notes 146-268 and accompanying text.

<sup>296</sup> SCOTT, *supra* note 2, at 180-81.

<sup>297</sup> *Id.*

partially by all fifty states and the District of Columbia,<sup>298</sup> is the primary statutory authority that recognizes property rights in the human body.<sup>299</sup> UAGA provisions treat the body and body parts as property of the individual for gift purposes.<sup>300</sup> The body's parts may be donated by the consent of the decedent before death and may also be devised in the decedent's will.<sup>301</sup>

## 2. National Organ Transplant Act

The National Organ Transplant Act ("NOTA") is the only federal law that regulates the procurement, distribution, and transplantation of human organs.<sup>302</sup> Passed by Congress in 1984, the NOTA provides regulatory guidance on organ procurement and donation.<sup>303</sup> In fact, the NOTA has been essential in the creation of the current national organ donation system, which was designed to meet the growing demand for organs.<sup>304</sup> Importantly, the Act created the Organ Procurement and Transplantation Network ("OPTN"), which is discussed in more detail in section IV(A) of this article.<sup>305</sup>

The NOTA specifically prohibits "any person to knowingly acquire, receive, or otherwise transfer any human organ for valuable consideration for use in human transplantation if the transfer affects interstate commerce."<sup>306</sup> As with the UAGA, the punishment for selling organs is five years in prison or a \$50,000 fine.<sup>307</sup> For market purposes, this federal law is more restrictive than the UAGA because it prohibits organ sale during life and death if the sale could be interpreted to affect interstate

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<sup>298</sup> See Jordan & Price, *supra* note 211, at 159 n35. (providing an entire statute list for every state).

<sup>299</sup> *Id.* at 159.

<sup>300</sup> Unif. Anatomical Gift Act § 2(a) (1987).

<sup>301</sup> *Id.*

<sup>302</sup> National Organ Transplant Act, 42 U.S.C §§ 273-274 (1984).

<sup>303</sup> *Id.*

<sup>304</sup> Jordan, *supra* note 211, at 157.

<sup>305</sup> 42 U.S.C. §§ 273-274.

<sup>306</sup> 42 U.S.C. § 274e(a).

<sup>307</sup> 42 U.S.C. § 274e(b).

commerce.<sup>308</sup> NOTA is essentially a broad prohibition on valuable consideration in exchange for human organs.<sup>309</sup>

There are two positive aspects to the NOTA for organ market purposes. First, the statute specifically defines the term "organ," and the statute does not interpret an organ to include blood, sperm, and ova.<sup>310</sup> Because of this definition, blood, sperm, and ova can be legally *sold* to donees or organizations for valuable consideration.<sup>311</sup> Second, and more importantly, the NOTA defines the term "valuable consideration" to exclude "the reasonable payments associated with the removal, transportation, implantation, processing, preservation, quality control, and storage of a human organ or the expenses of travel, housing, and lost wages incurred by the donor of a human organ in connection with the donation of the organ."<sup>312</sup> For market purposes, this may open up avenues for compensation that allow donors to be legally compensated broadly for organ donation, including transplant cost, travel, and lost wages.<sup>313</sup> Furthermore, this language may provide a modest beginning toward some allowable form of compensation.<sup>314</sup> A new law in Pennsylvania, for instance, may be using this broad compensation language allowable through NOTA to compensate donees.<sup>315</sup>

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<sup>308</sup> 42 U.S.C. § 274e.

<sup>309</sup> *Id.*

<sup>310</sup> *Id.*

<sup>311</sup> 42 U.S.C. § 274e(c)(2).

<sup>312</sup> 42 U.S.C. § 274e.

<sup>313</sup> Jordan & Price, *supra* note 211, at 158.

<sup>314</sup> *Id.*

<sup>315</sup> See 20 PA. CONS. STAT. ANN. §§ 8621-8622 (West 1994) (allowing some compensatory benefits to be paid by a trust for expenses resulting from donation).

### 3. Pennsylvania Act No. 102 of 1994—Organ Donation Awareness Trust Fund.<sup>316</sup>

In 1994, Pennsylvania passed Act 102, which created the Governor Robert P. Casey Memorial Organ and Tissue Donation Awareness Trust Fund.<sup>317</sup> This fund is supported through one-dollar voluntary donations on driver's licenses and vehicle registrations.<sup>318</sup> The fund provides up to \$3,000 per donor to help with the cost of "reasonable hospital and other medical expenses, funeral expenses and incidental expenses incurred by the donor or donor's family in connection with making a vital organ donation."<sup>319</sup> The money is paid directly to the hospital, funeral home, hotel, or other organization responsible for providing the service the donor requires for the transplant.<sup>320</sup> No part of the money goes directly to the "donor's family, next of kin or estate," and it is all for donation-related expenditures.<sup>321</sup>

Even though the Act became law in 1994, an actual program that paid expense benefits did not result until January 2002.<sup>322</sup> The trust fund has more than one million dollars, and three million Pennsylvanians have signed up to be organ donors.<sup>323</sup> Even by the end of 2000, when the fund was not yet paying expense benefits, 37.4% of Pennsylvania drivers had signed up to

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<sup>316</sup> *Id.* The fund was named after Robert Casey, the former Pennsylvania governor and a multiple organ transplant recipient. Pennsylvania State Representative Bill Robinson helped create the fund after he learned that the mother of a boy whose heart and liver were donated to Casey had no life insurance benefits and had to raise money to be able to afford to bury her son. Ovetta Wiggins, *Pa. Organ Donors Get a \$300 Boost*, PHIL. INQUIRER, May 27, 2002, available at <http://www.philly.com/mld/inquirer/3346239.htm>; Pennsylvania Department of Health, *Organ Donation Awareness*, at <http://www.health.state.pa.us/php/organ/organdon.htm>. (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>317</sup> PRICE, *supra* note 16, at 371.

<sup>318</sup> 20 PA. CONS. STAT. ANN. §§ 8621-8622 (West 1994).

<sup>319</sup> *Id.*

<sup>320</sup> *Id.* at § 8622(b)(1).

<sup>321</sup> *Id.*

<sup>322</sup> Wiggins, *supra* note 316.

<sup>323</sup> Harris I, *supra* note 3, at 227.

be organ donors.<sup>324</sup> The current version of the program only distributes a \$300 benefit.<sup>325</sup> In spite of the reduction from the \$3,000 authorized to the \$300 current payment, nineteen donors or donor families applied for the benefit in the first six months of operation between January and May.<sup>326</sup> Eighteen of the nineteen donor applicants were living, and one donor applicant was deceased.<sup>327</sup>

In the coming years, this pilot program will help answer many questions about compensated organ donation.<sup>328</sup> The program is an implicit recognition of property rights in body parts and an example of the state yielding to individual choice and compensation.<sup>329</sup> One could view the fund as a type of limited organ market. In this market, the state is compensating donors with a fixed price for donation. If successful, the program could pave the way for other organ market permutations.

The relevant terms having been defined, and the paper, having canvassed the current state of law and medicine, the discussion now focuses on the advantages and disadvantages of recognizing property rights and developing a market in organs in the face of competing individual and state claims over human bodies.

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<sup>324</sup> Pennsylvania Governor's Office Press Release from 12/21/00, at <http://www.health.state.pa.us/NR/2000/GovCasey.htm> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology). There was a 59% increase in organ donor registration between 1995 and 2001. The trust was part of a larger plan that included drivers license solicitations for organ donation. Michelle Start, *Many Drivers Steering Clear of State's Organ Donor Registration*, VALLEY NEWS DISPATCH (Tarentum, PA), April 30, 2001, available at <http://www.pnpa.com/keystone/2002/tarentum12.htm> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>325</sup> Wiggins, *supra* note 316.

<sup>326</sup> *Id.* Donor families apply for money for food or lodging and that money, up to \$300, is paid directly to the restaurant or hotel. The reduction from a \$3,000 to a \$300 benefit has been cursed by the law's original proponents as an "insult" to families and as being insubstantial to genuinely help donor families. *Id.*

<sup>327</sup> *Id.*

<sup>328</sup> See Harris I, *supra* note 3, at 227.

<sup>329</sup> *Id.*

#### IV. The Status Quo, Markets, Alternatives, and Criticisms of Each

##### A. Body Parts, Tissues, Fluids, and Other Derivatives for Sale

Hair has been sold for centuries for use by wigmakers.<sup>330</sup> Teeth have been sold and fixed into the jaws of patients since the Elizabethan era.<sup>331</sup> Blood is sold in the United States, Europe, and much of the world.<sup>332</sup> Sperm and eggs are now routinely sold.<sup>333</sup> Donors are “compensated” in language that thinly disguises the economic reality of the sale.<sup>334</sup> Placental tissue from live births may be sold to cosmetic companies, and fetal tissue from abortions can also be transferred for money.<sup>335</sup> Not surprisingly, there have also been calls for changing the completely altruistic volunteer market in human milk to a compensated market because of need.<sup>336</sup> Finally, whole bodies are exchanged for money to medical schools that have used them for centuries in anatomy classes.<sup>337</sup> A blurry line appears to have been drawn between tissues, which regenerate,

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<sup>330</sup> SCOTT, *supra* note 2, at 180–81.

<sup>331</sup> *Id.*

<sup>332</sup> *Id.* Blood as a market item in the United States is actually classified as a “service” rather than a “good” for liability reasons. As one might imagine, this legal fiction has contributed to some interesting cases, including that of Ms. Dorothy Garber, who was fortunate to have a very rare and valuable antibody present in her blood. In the 1970’s, the forty-two year old mother of three was paid \$25,000 cash, 1000 shares of stock, \$200 per week and the use of a company car by a biotechnology company interested in her blood. She was creatively not reporting this income, which led to a charge and conviction for criminal tax evasion. *United States v. Garber*, 589 F.2d 843, 843–51 (5th Cir. 1979).

<sup>333</sup> See Charo, *supra* note 148, at 433–35.

<sup>334</sup> *Id.* Sperm and egg donation can bring large sums of money to donors. Egg donation on a per harvest basis and sperm donation over a long donation period can generate sums well into the thousands of dollars. *Id.*

<sup>335</sup> Charo, *supra* note 148, at 423.

<sup>336</sup> Sarah Waldeck, *Encouraging a Market in Human Milk*, 11 COLUM. J.

GENDER & L. 361, 361–406 (2002).

<sup>337</sup> See Mahoney, *supra* note 283, at 169–70.

and organs, which do not regenerate.<sup>338</sup> It is useful to compare the active tissue trade against the more regulated system for organs.

The Department of Health and Human Services ("DHHS") oversees the OPTN.<sup>339</sup> The chosen OPTN is a private entity called the United Network for Organ Sharing ("UNOS").<sup>340</sup> UNOS coordinates the matching, procurement and distribution of organs for transplant using a national system.<sup>341</sup> Under the current system, Organ Procurement Organizations ("OPOs") are paid acquisition fees to recover organs from donors.<sup>342</sup> These OPOs are statutorily regulated, state or regional non-profit entities that supply organs to UNOS for coordinated matching of donors and recipients.<sup>343</sup> After matching, hospitals purchase organs from the OPOs.<sup>344</sup> The patient is responsible for paying the hospital for the procedure, the organ procurement cost, and the physicians, nurses, and other staff involved in the operation.<sup>345</sup> For example, the actuarial estimate for a kidney transplant in 1996 was \$81,900 with total five-year charges estimated at \$171,700.<sup>346</sup> Heart and lung transplants can cost substantially more with \$250,000 billed in the first year, and liver transplants are billed at more than \$300,000 in the first year.<sup>347</sup>

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<sup>338</sup> See *id.* at 180–92. There are many exceptions to this blurry rule, the most notable of which is that human eggs may be sold even though they are not regenerative. *Id.*

<sup>339</sup> UNOS ORGAN PROCUREMENT, PRESERVATION AND DISTRIBUTION IN TRANSPLANTATION 1–6 (Michael G. Phillips, ed., 2nd ed. 1996) [hereinafter UNOS ORGAN PROCUREMENT]. The DHHS is advised on organ donation by the Advisory Committee on Organ Transplantation, which maintains an informative website that includes their recommendations to the Secretary for Health and Human Services at <http://www.organdonor.gov/acot.html> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>340</sup> See UNOS ORGAN PROCUREMENT, *supra* note 339, at 1–6.

<sup>341</sup> *Id.*

<sup>342</sup> Mahoney, *supra* note 283, at 180.

<sup>343</sup> 42 U.S.C. § 274(b) (1984).

<sup>344</sup> Mahoney, *supra* note 283, at 180.

<sup>345</sup> Evans & Kitzmann, *supra* note 267, at 162.

<sup>346</sup> *Id.* at 149–71. Charges should be considered separately from cost. Charges represent what the hospital bills, and cost represents what hospital actually spends for the products and services. *Id.*

<sup>347</sup> INSTITUTE OF MEDICINE, ORGAN PROCUREMENT AND TRANSPLANTATION: ASSESSING CURRENT POLICIES AND THE POTENTIAL IMPACT OF THE DHHS

This system looks like a standard commercial stream with a supplier, middlemen, value added processing, and, finally, an expensive installation procedure.<sup>348</sup> There is money changing hands at every level in the system other than at the level of the primary supplier, the organ donor.<sup>349</sup> It is also clear that transplants are limited by the number of donors.<sup>350</sup> This supply-side limitation is one of the strongest arguments for using a market system to grant incentives to encourage more people to donate.<sup>351</sup>

Hospitals claim that the patient is not actually paying for the organ in a transplantation procedure.<sup>352</sup> The patient is paying merely for medical treatment, never for the organ.<sup>353</sup> Yet, the transplantation service would not exist without the organ.<sup>354</sup> Furthermore, one cannot acquire the organs without the service;<sup>355</sup> they are sold together as an indivisible package.<sup>356</sup> It may be analogous to eating at a restaurant where one does not pay for the food, yet food is carefully prepared and served.<sup>357</sup> The bill that ultimately comes is just for the "dining services."<sup>358</sup> Framed in this way, it requires a difficult suspension of disbelief for anyone to think that they are not paying for the organ.<sup>359</sup>

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FINAL RULE 126 (1999), *available at*

<http://books.nap.edu/books/030906578X/html> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology). This text includes a table that lists the first year charges for many common transplants, including heart (\$253,200), lung (\$265,900), kidney (\$116,100), pancreas (\$125,800), and liver (\$314,500). *Id.*

<sup>348</sup> See Mahoney, *supra* note 283, at 179–182.

<sup>349</sup> *Id.*

<sup>350</sup> *Id.*

<sup>351</sup> David Kasserman, *Markets for Organs: Myths and Misconceptions*, 18 J. CONTEMP. HEALTH L. & POL'Y 567, 568 (2002).

<sup>352</sup> Mahoney, *supra* note 283, at 169–70.

<sup>353</sup> *Id.*

<sup>354</sup> *Id.*

<sup>355</sup> *Id.*

<sup>356</sup> *Id.*

<sup>357</sup> *Id.*

<sup>358</sup> *Id.*

<sup>359</sup> *Id.*



## B. Market Concerns

There are valid concerns about using a market approach to increase the supply of organs.<sup>360</sup> One primary worry is that the altruistic system will die if a compensated organ market is implemented.<sup>361</sup> Another concern is that a market system will exploit and coerce the poor.<sup>362</sup> Critics are especially worried about how organ sales have gone particularly badly overseas and on the black market.<sup>363</sup> The wealthy may gain an inequitable access to organs in an organ market.<sup>364</sup> There may be an increase in diseased organs if compensation is offered.<sup>365</sup> Scholars also offer the presumed consent model as a way to bypass paying for organs and still allow for an increase in the organ supply.<sup>366</sup> Many of these concerns are difficult to deal with, and all are worthy of discussion, but some may be worries that are disproportionate to the real consequences, or concerns that are based on a misunderstanding of market possibilities.<sup>367</sup>

Some scholars have argued that the altruistic market is too important to the organ procurement effort and that it would be destroyed by a compensated organ market.<sup>368</sup> Proponents of the altruistic system value organs as items beyond price.<sup>369</sup> A response to this concern is that a compensated organ market and altruistic giving are not mutually exclusive.<sup>370</sup> These two procurement systems may exist side by side.<sup>371</sup> Items that can be sold can also be given.<sup>372</sup> It is also the case that people may view

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<sup>360</sup> Gregory S. Crespi, *Overcoming the Legal Obstacles to the Creation of a Futures Market in Bodily Organs*, 55 OHIO ST. L.J. 1, 20–24 (1994).

<sup>361</sup> *Id.*

<sup>362</sup> *Id.*

<sup>363</sup> Madhav Goyal et al., *Economic and Health Consequences of Selling a Kidney in India*, 288 JAMA 1589, 1589–92 (2002).

<sup>364</sup> See Crespi, *supra* note 360, at 20–24.

<sup>365</sup> *Id.*

<sup>366</sup> See Morris, *supra* note 113, at 1135–42.

<sup>367</sup> See Kasserman, *supra* note 351, at 567–80.

<sup>368</sup> See Crespi, *supra* note 360, at 20–24.

<sup>369</sup> *Id.*

<sup>370</sup> See *id.* at 20–28.

<sup>371</sup> *Id.*

<sup>372</sup> *Id.*

something given, that could have been sold, as a particularly valuable and noble gift.<sup>373</sup>

Scholars have claimed that selling organs would result in the poor literally sacrificing a pound of flesh, or exchanging resources they need for bodily integrity.<sup>374</sup> When considering market discrimination and the exploitation of the poor, one should first consider that the current organ system has been accused of discriminating against the poor and minority racial groups.<sup>375</sup> An advantage created by a market system would be an increased supply of organs.<sup>376</sup> An increased supply would almost certainly mean lowered costs, which would benefit all groups, especially the poor.<sup>377</sup> One could view continuation of the current system as an infringement on autonomy and a form of oppression of the poor.<sup>378</sup> Not only would current difficulties continue and prices remain high under the current system, but removing an avenue of organ sale or compensation removes an alternative method of income for people who may believe that the possible benefit received from donating an organ is worth the cost.<sup>379</sup> Prohibiting organ markets

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<sup>373</sup> *Id.*

<sup>374</sup> David J. Rothman, *Ethical and Social Consequences of Selling a Kidney*, 288 JAMA 1640, 1640–41 (2002).

<sup>375</sup> Ian Ayres et al., *Unequal Racial Access to Kidney Transplantation*, 46 VAND. L. REV. 805, 808–09 (1993). The concerns focus on the fact that whites donate ninety percent of the kidneys, and a disproportionate number of people on the kidney waiting list are black, due to their increased susceptibility for end stage renal disease. When this is combined with the fact that matching is often best done within the same racial groups because of hereditary factors, there is a mismatch between donors and need that increases wait times for minorities. *Id.* The death of football legend Walter Payton also provides a case study representing some of the tensions surrounding the current organ procurement and distribution program. His liver disease was treatable with transplantation, yet he died while on the waiting list. His case raises questions about the relative importance of race and wealth in the face of a donor shortage. Encouraging Organ and Tissue Donation, at <http://www.senate.gov/~durbin/Legislation/organ.htm> (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>376</sup> See Kasserman, *supra* note 351, at 567–69.

<sup>377</sup> See *id.* at 567–80.

<sup>378</sup> See Ayres et al., *supra* note 375, at 806–09.

<sup>379</sup> JOHN HARRIS, CLONES, GENES, AND IMMORTALITY 157–70 (1998) [hereinafter HARRIS II].

removes an opportunity for economic advancement that could be present under a market system.<sup>380</sup>

Consider the following example.<sup>381</sup> If a mother were to go into a burning building to save the life of her child, it would be considered an act of heroism.<sup>382</sup> The parent risks her own body, sometimes harming herself or forfeiting her own life to save the life of her child.<sup>383</sup> The sale of an organ can be considered in a similar light.<sup>384</sup> There are places in the world where some families have very few opportunities and very little property other than their bodies.<sup>385</sup> In the name of protecting the poor, society may actually be denying them the use of one of the few assets they have, their bodies and, by extension, their personal autonomy.<sup>386</sup> One could argue that society, by using governmental organizations usually controlled by the affluent, is helping to oppress the poor by claiming that there should be “other ways” or better social programs instead of allowing the volitional sale of organs.<sup>387</sup> It could be considered heroic for a parent to sell an organ so that a child may have an education and better opportunities than the parent had.<sup>388</sup> It would also certainly benefit the organ recipient, .

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<sup>380</sup> *See id.*

<sup>381</sup> *Id.* In this example, one could substitute any family member for the child benefiting from the analogous organ market. The author has chosen to use a child saved from a burning building because it is an example familiar to local news and freshman philosophy classes. An acknowledged weakness of this thought experiment is that the organ donor would ideally use the funds derived from an organ market for the good of her family and not for destructive or counterproductive aims. A donor using funds derived from an organ sale for good rather than ill is a hopeful assumption, but a realistic possibility with a compensated organ market. *Id.*

<sup>382</sup> HARRIS II, *supra* note 379, at 169.

<sup>383</sup> *See id.*

<sup>384</sup> *See id.*

<sup>385</sup> *See id.* at 142–70.

<sup>386</sup> *Id.*

<sup>387</sup> *Id.* A point closely related to the above discussion is that every person in society, including the poor, volitionally may take the risk of working in dangerous professions. Indeed, the poor hold many of the more dangerous manual labor positions in society. This type of calculated risk and individual autonomy in exchange for reward is the status quo, if not normally encouraged, and similar to the choices involved in selling organs. *See id.*

<sup>388</sup> HARRIS II, *supra* note 379, at 169.

the random victim of disease.<sup>389</sup> Using the burning building analogy, the parent is actually going into the building to save possibly both her child and a stranger in need.<sup>390</sup>

Society should also ponder current black market pricing and the terrible consequences resulting from these illegal organ sales, including the use of diseased organs.<sup>391</sup> The price paid on the black market for a good can generally be said to be one of the highest prices possible for that good.<sup>392</sup> Current stories of inflated organ prices, if they can be trusted at all, are not representative of what organ prices would be in a legal market.<sup>393</sup> Consider that in a black market there is a diminished supply of goods and additional risks because of illegality.<sup>394</sup> Both of these factors increase the market price of the goods. In a legal market, supply is increased, and there are only ordinary risks associated with selling the good.<sup>395</sup> Both of these factors would push the price for organs down.<sup>396</sup> Current economic estimates of organ prices in a legal market predict that they would be reasonable when compared with the cost of the transplant procedure.<sup>397</sup>

There are reports that the black market in human organs has resulted in the exploitation of the poor, including many terrible and

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<sup>389</sup> *Id.* at 142–70.

<sup>390</sup> *Id.* This thought experiment is supportive for both living and cadaveric market systems. In the former example, the parent analogously places herself at risk for her child and, in the latter example, the parent provides one final benefit to her child. *Id.*

<sup>391</sup> See Goyal et al., *supra* note 363, at 1589–92.

<sup>392</sup> Kasserman, *supra* note 351, at 573–75.

<sup>393</sup> *Id.*

<sup>394</sup> *Id.*

<sup>395</sup> *Id.*

<sup>396</sup> *Id.* Scholars continue to consider that now “zero cost” organs may appear to be the best possible consumption deal that the poor can have for organs. In contrast to the current “zero cost” market, a traditional market will likely increase supply, but add some cost to the organs and, by extension, to the transplantation procedure. A traditional market will also allow some form of compensation. This is arguably better for poor donors than no compensation. Additionally, a sufficient increased supply of legal organs should eradicate the black market in organs and the associated ills. See *id.*

<sup>397</sup> See *id.*

dishonest acts, and disease transmission.<sup>398</sup> It is important to note that many of these ills, like black market pricing, should not be extrapolated on to what would occur in a legal regulated market.<sup>399</sup> To illustrate this point, consider the United States during prohibition or during the period in which abortion was generally illegal.<sup>400</sup> There was certainly a time when dealing with alcohol<sup>401</sup> or having an abortion<sup>402</sup> was a dangerous prospect. Today, however, both exist under regulated systems.<sup>403</sup> There are some arguably negative consequences that have resulted from each practice.<sup>404</sup> Discussion continues on many levels debating the merits of each, but the general environment for drinking and medical abortions is much safer than it was during their periods of prohibition.<sup>405</sup> It would have been difficult, if not impossible, to imagine the current relative safety we enjoy under our legal system by citing examples based on practices during a period of prohibition.<sup>406</sup> Likewise, it is inappropriate to use the evils

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<sup>398</sup> See Goyal et al., *supra* note 363, at 1589–92. Disease transmission specifically is a concern that technology is alleviating through better screening methods. The compensated market in blood and plasma had early problems with disease transmission that are now virtually eliminated through improved testing procedures that are available. Crespi, *supra* note 360, at 18–24.

<sup>399</sup> Kasserman, *supra* note 351, at 568–80.

<sup>400</sup> Both of these examples are particularly fitting because they both involve personal autonomy and state control. In the case of abortion, there is also a strong medical technology tie, as well as a substantive due process element, that has also been considered with property rights in organs.

<sup>401</sup> Most people are familiar with Al Capone and the terrors that spawned during prohibition in the 1920's, including the St. Valentine's Day Massacre. Court TV, *Crime Library: St. Valentine's Day*, at [http://www.crimelibrary.com/gangsters\\_outlaws/mob\\_bosses/capone/day\\_8.html?sect=15](http://www.crimelibrary.com/gangsters_outlaws/mob_bosses/capone/day_8.html?sect=15) (last visited Mar. 22, 2003) (on file with the North Carolina Journal of Law & Technology).

<sup>402</sup> *Roe v. Wade*, 410 U.S. 113, 149 (1973) (describing the horrors of illegal abortions).

<sup>403</sup> Leonard Birdsong, *Drug Decriminalization and Felony Disenfranchisement the New Civil Rights Causes*, 2 BARRY L. REV. 73, 79 (2001). In fact, prohibition has been called our "dismal failed national experiment . . . ." *Id.*

<sup>404</sup> *Id.* at 79–80.

<sup>405</sup> *Id.*

<sup>406</sup> It is also arguable that prohibition itself may be partially responsible for the ills associated with black market activity. *Id.* at 79–81.

apparent in a black market for organs as indicative of the problems that may result from a legal market in organs.

Presumed consent is an often discussed market alternative for organ procurement.<sup>407</sup> Presumed consent is essentially a national policy, popular in Europe, that presumes that each person consents to the donation of their organs unless they indicate otherwise.<sup>408</sup> In contrast, one could consider the current United States system as one of presumed non-consent.<sup>409</sup> As discussed above, our country has traditionally believed that a person is not an organ donor unless she explicitly states as much.<sup>410</sup>

The difficulty many people have with presumed consent is a moral one.<sup>411</sup> Presumed consent implies a state or societal claim over the body of every person in the jurisdiction.<sup>412</sup> Many scholars find this implication difficult to deal with ethically.<sup>413</sup> As this article has discussed above, some courts have found this concept to be a violation of traditional notions of due process.<sup>414</sup> If presumed consent is rejected as a method to increase organ donation in the United States, some form of market may be considered to perform the same function.<sup>415</sup>

### C. Market Possibilities

Markets have been described as “an obvious and straightforward approach to solving the organ or any other shortage.”<sup>416</sup> Many people greatly underestimate the variety of forms a market in human organs could take and still be able to

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<sup>407</sup> See Morris, *supra* note 113, at 1135–39.

<sup>408</sup> *Id.*

<sup>409</sup> *Id.* at 1128–35.

<sup>410</sup> *Id.*

<sup>411</sup> See *id.* at 1139–47.

<sup>412</sup> *Id.*

<sup>413</sup> See Morris, *supra* note 113, at 1139–47.

<sup>414</sup> *Id.*; see also *supra* notes 165–208.

<sup>415</sup> See Kasserman, *supra* note 351, at 568–72.

<sup>416</sup> *Id.* at 568.

increase the organ supply.<sup>417</sup> The first important choice that could be made is between some form of living donor market and cadaveric donor market.<sup>418</sup> Generally speaking, people are more comfortable with a cadaveric market in organs because it removes the possibility of people selling an organ they may need later or the disability that might result from such a sale.<sup>419</sup> The cadaveric market is often called a futures market in organs because there may be some payment made to the person during life or at death for organs that will not be recovered until death.<sup>420</sup>

A second important variable in the organ market is to separate markets for procurement from markets for distribution.<sup>421</sup> A market for distribution where donees bid on organs to be distributed in an auction system is bothersome to many people because of the possibility that rich donees would receive a disproportionate share of organs.<sup>422</sup> It seems less worrisome to imagine hospitals, insurance companies, or OPOs bidding in a well-regulated or price-fixed system for organs.<sup>423</sup> The Pennsylvania system discussed above is a price-fixed cadaveric organ procurement market where the state is the only allowed bidder.<sup>424</sup> This type of market may be more desirable because the price paid on the procurement end of the market would attract more donors, while the distribution end of the market could be controlled so that organs would be distributed under an equitable system.<sup>425</sup>

A third important market consideration would be to whom, when, and in what form payment would be made for the organ.<sup>426</sup> The idea of giving a donor a check, cashable at the nearest liquor

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<sup>417</sup> *Id.* at 568–80. When mentioning a market in organs, many people immediately imagine some eBay-like auction where living people sell kidneys and lungs to the highest bidder. In fact, there are many more possibilities. *Id.*

<sup>418</sup> *See id.*

<sup>419</sup> *See id.*

<sup>420</sup> *See id.*

<sup>421</sup> *See id.* at 575–77.

<sup>422</sup> *See id.*

<sup>423</sup> *Id.*

<sup>424</sup> HARRIS I, *supra* note 3, at 227.

<sup>425</sup> *See* Kasserman, *supra* note 351, at 575–77.

<sup>426</sup> *Id.* at 568–80.

store, is terrifying to most people, and rightfully so.<sup>427</sup> Scholars have considered many alternatives to a cash-up-front method that are more palatable.<sup>428</sup> The alternatives include discounted insurance premiums, estate tax credits, payments to charities or religious groups, lost wage recovery, payments of funeral expenses, and associated family expenses directly related to the donation.<sup>429</sup> A related idea implicit in the above discussion is who pays for organs.<sup>430</sup> It is possible to include the cost of the organ in the standard hospital bill, so that the donee is not directly responsible for the payment.<sup>431</sup> Insurance premium discounts and estate tax relief do not cause direct cost; they are merely income not received by the purchasing organization.<sup>432</sup>

Finally, a market could help overcome what has been referred to as the "tyranny of the gift."<sup>433</sup> This is guilt that some transplant recipients feel after receiving this gift that is inherently one-sided.<sup>434</sup> The recipient is given a priceless second chance at life, and often wants to be able to give something back to the donor or the donor's family.<sup>435</sup> In some cases, the recipient may not feel they can ever fully continue their life independently because they feel that they are in a debt relationship that cannot be overcome.<sup>436</sup> A market may begin to allow for some sense of repayment between the donor and recipient.<sup>437</sup> Valuable consideration could help overcome the tyranny of the gift.<sup>438</sup>

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<sup>427</sup> *See id.*

<sup>428</sup> *See id.*

<sup>429</sup> *See id.*

<sup>430</sup> *See id.*

<sup>431</sup> *See id.*

<sup>432</sup> *See id.*

<sup>433</sup> RENEE C. FOX & JUDITH P. SWAZEY, SPARE PARTS: ORGAN REPLACEMENT IN AMERICAN SOCIETY, 39–42 (1992).

<sup>434</sup> *Id.*

<sup>435</sup> *Id.*

<sup>436</sup> *Id.*

<sup>437</sup> *See id.* at 64–72.

<sup>438</sup> *See id.*



## V. Conclusion

Considering the above, there can and should be an effective market option that is ethically palatable.<sup>439</sup> Legal and medical scholars do not find the current system and resulting deaths ethically acceptable.<sup>440</sup>

Any robust instantiation of an organ market would require amending the prohibition against valuable consideration in NOTA. Since amending NOTA is probably not a politically viable option, a first step toward an acceptable organ market could be a “practical market” or specifically a practical compensation system. This could be governmental or insurance company reimbursement for cadaveric organs following the Pennsylvania model. This could allow families of donors to be reimbursed for expenses related to organ donation including meals and funeral expenses. Compensation in any form would provide an incentive that does not exist in the current altruistic system. Ideally, this incentive would lead to greater donations. By limiting this proposed “practical market” to cadaveric donors the market would bypass health concerns about the consequences of living donations.

One could argue that property rights in body parts are being established, that organs have value, and that a market for these organs does exist in the United States.<sup>441</sup> The altruistic market is a procurement side market with the United States government as the only allowable bidder.<sup>442</sup> The bidder has set the price in the legal

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<sup>439</sup> HARRIS I, *supra* note 3, at 231–33. There are four central tenets of modern biomedical ethics. First is autonomy defined as respect for the individual to pursue his own needs, interests, desires, and independence. Second is beneficence or the result of actually doing good for patients. Third is nonmaleficence, which is the concept that healthcare providers should also not harm patients in their efforts to do good. Finally there is justice, which is the fair distribution of benefits and burdens of a policy or treatment. Scholars disagree about whether or not an organ market can be implemented with proper respect for and balancing of each concept. JAMES R. RODRIGUE, *BIOPSYCHOSOCIAL PERSPECTIVES ON TRANSPLANTATION* 44 (Kluwer Academic/Plenum Publishers New York) (2001).

<sup>440</sup> “[W]hat has been done thus far has arguably been worse than doing nothing.” Harris I, *supra* note 3, at 227.

<sup>441</sup> *Id.* at 213–31.

<sup>442</sup> Kasserman, *supra* note 351, at 568–80.

market to zero.<sup>443</sup> This is the lowest possible monetary incentive to compensate suppliers in the current market.<sup>444</sup> The unregulated black market thrives in the background while the legal, price fixed, and under-priced market fails to provide for legitimate market needs, resulting in the deaths of thousands and the suffering of tens of thousands.<sup>445</sup>

Advancing medical technology has created value in human organs and tissues.<sup>446</sup> The struggle for a market in human organs is one facet of individuals' claiming property rights in their own bodies.<sup>447</sup> Individuals are attempting to claim these rights in the face of old common law (e.g. Coke) and new statutory resistance (e.g., NOTA, UAGA).<sup>448</sup> Allowing individual autonomy to flourish with some form of compensated organ market holds great promise to prevent people from suffering and dying while waiting for organs and political action.<sup>449</sup>

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<sup>443</sup> *Id.*

<sup>444</sup> *Id.*

<sup>445</sup> *Id.*

<sup>446</sup> *See id.*

<sup>447</sup> *See* SCOTT, *supra* note 2, at 181–84.

<sup>448</sup> *See id.* at 179–97.

<sup>449</sup> Harris I, *supra* note 3, at 231–33. *See generally* Crespi, *supra* note 360 (discussing several types of organ markets).

