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Righting the Shortage
An Ethical Reformation of the United States Kidney Transplant System

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Transplant organs are one of the best examples of a limited healthcare resource requiring formulated criteria to govern allocation procedures. The importance of different allocation criteria is reflected in ethical principles and guidelines that are used in deciding how best to utilize this scarce resource. Current United States kidney allocation systems are characteristically justice centered, prioritizing waiting time over other criteria. Recent proposals have suggested that utility-centered systems provide a more efficient means of utilizing available kidneys (1). This paper first examined the current system, and followed with a proposal of alternative criteria that are generally deemed ethically relevant and an examination of those that are not. This paper then looked at options to procure more kidneys, finishing with an ethically minded review of the current Organ Procurement and Transplantation Network (OPTN) proposal for a revised allocation system. Though this paper makes no proposals for incorporation, in exploring these changes, it is obvious that there are changes that the system can incorporate without crossing ethical boundaries.

II. Introduction

In 1962, Seattle’s Swedish Hospital began to offer kidney dialysis to outpatients. Due to the novelty of the technology and its limited production, the use of the machines could only be extended to 17 patients. An admissions committee, of sorts, was formed to determine which 17 patients would have access to this life saving treatment. Participation on the committee was voluntary and was made up mainly of laypeople: a minister, a lawyer, a housewife, a labor leader, a state government official, a banker, and a surgeon.

SURGEON: How do the rest of you feel about Number Three—the small businessman with three children? I am impressed that his doctor took special pains to mention that this man is active in church work. This is an indication to me of character and moral strength....

LAWYER: It would also help him endure a lingering death...

MINISTER: Perhaps one man is more active in church work than another because he belongs to a more active church.
While today these comments seem outdated, and perhaps even morally repugnant, this so-called Seattle “God Committee” and their decision-making criteria demonstrate a reality of any transplant system: faced with no allocation criteria, it is hardly surprising that the committee turned toward an inclusion of socially relevant worthiness. Thus, as we consider a reformation of today’s kidney allocation system, outlining criteria that should and should not be used is of utmost importance.

One of the most impressive medical advances in the last 50 years is the development of organ transplantation procedures. Such procedures allow people with otherwise fatal and degenerative diseases the ability to lead healthier and longer lives (3). Particularly with regards to renal failure, kidney transplantation presents a treatment option far better than daily dialysis alternatives. Though despite this incredible, life-saving medical advancement, only 15,000 of the nearly 100,000 Americans in need of a kidney transplant receive one in a given year. Nearly 5,000 die each year waiting on the transplant list (4). While some of this shortage is due to a natural lack of appropriate donors, much is also due to ineffective utilization of those available. This paper begins with an overview of the current state of the kidney transplant system and will first consider the ethical issues that confound the allocation of transplant kidneys, noting criteria that are generally deemed ethical for consideration and those which are not (5). Second, this paper will explore options to procure more kidneys, focusing on those that are most often deemed ethically relevant to American society. In the last section, I will summarize and comment on the current Organ Procurement and Transplantation Network (OPTN) proposal for a revised kidney allocation system (1).

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A. The Current System

An exploration of the current state of the kidney allocation system is needed to be able to understand how it evolved and where it might be headed. While the number of kidneys available for transplant has incrementally increased in past years, it is not keeping pace with the number of patients consistently waiting for a transplant opportunity (4). As the UNOS waiting list for kidney transplant approaches its 100,000th member, the shortages of this system beg realization and regard. The perfect scenario would allow for donations to whoever was in need, but the reality of shortage and scarcity...
begs a new outlook. At the very least, the US is not at liberty to underutilize this resource. Unlike the abundance often seen in the United States healthcare system, kidneys are scarce.

The current OPTN system uses an allocation process to determine which of the candidates on the waiting list will be offered which organs. For comparison purposes, kidneys and other organs are allocated under a number of slightly different protocols (5). Livers, for instance, are allocated based on the likelihood of a candidate dying while on the waiting list – thus higher risk candidates receive transplant before lower risk ones. Lungs are allocated in a similar fashion leading to an overall minimization of death to those on the waiting list. Kidney allocation systems follow an alternative method – based almost exclusively on the length of time a candidate has been waiting, with a small consideration of the biological realities of transplantation (6). This discrepancy as compared to other systems is in large part due to the availability of renal dialysis. While kidney transplants may be lifestyle transforming, they are not emergently lifesaving in the manner of livers, hearts and lungs. Tissue typing and an emphasis on “matching” donor to recipient was initially a more heavily weighted criterion, but with the advent of transplantation technology, particularly immunosuppressant treatments, perfect donor to recipient matching has become far less important (5). Thus the current system has reverted to allocation based on waiting times, necessarily ignoring other patient factors, such as projected years of survival, that may make for a more successful transplant.

B. A New System

It is well accepted that a change in how kidneys are allocated is both necessary and imminent (7). There are many criteria that may be worth accounting for. However, the eventual effects of the implementation of different allocation criteria must be carefully considered. Throughout the short history of kidney transplantation, allocation criteria have varied to include a wide range of options, some ethically appropriate, some ethically questionable, and some nearly universally condemned. Criteria such as ability to pay, family involvement, social worth, mental acuity, criminal record, and patients’ past behaviors have all been considered in different cases, at different times and in different transplant networks and centers (5). Though most of the aforementioned criteria are not formally used
today, vast discrepancies in allocation procedures still exist amongst modern transplant centers. As perhaps just another example of the fragmented American healthcare system, kidney allocation has proved to vary regionally in numerous ways. Though the United Nations for Organ Sharing – USA (UNOS-USA) officially produces policies and criteria, many transplant centers deviate from these standards (5; 9).

The main goal of UNOS in making allocation standards and decisions is that the implemented criteria be “fair, socially acceptable and humane” (5; 2). While the individual criteria utilized by transplant centers may encompass those principles, the non-standardization of policy across centers raises issues of fairness. Different value is assigned to different criteria, leading to wide variation and lack of system coherence. Center differences aside, the question becomes one of maximization. The current system, at least inherently, favors a maximization of the number of people treated – fairness being determined primarily by time on the waiting list and less so on the severity of condition. UNOS employs criteria whereby points are assigned according to several criteria: quality of HLA matching\(^1\), level of panel reactive antibodies\(^2\), time on the waiting list and in certain cases, medical urgency (8). Once blood type\(^3\) and HLA-antigens are matched the kidney will go to the sickest person who has been waiting the longest within a defined geographical area, with some room to determine the best option combining those criteria. UNOS assigns one point to the candidate who has been waiting the longest, and fractions of 0.5 points to other candidates depending on their waiting time (8). And so the system seeks to fairly allocate kidneys on the basis of waiting time and location.

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\(^1\) HLA antigens refer to six principle pieces of protein on the surfaces of cells in the body. These are primarily responsible for potential rejections of donor organs. Donor kidneys must match on at least 3 of 6 to be considered as an option, but 6/6 matching allows for much more successful post-transplant survival and more positive outcomes for the recipient. A very small number of kidneys are matched 6/6 – “full house.”

\(^2\) A panel reactive antibody blood test is routinely preformed prior to transplantation. This laboratory test measures the levels of PRAs that are in the blood. The percentage score given to each patient (0%-99%) gives the proportion of the population that the patient is likely to react via pre-made antibodies. These antibodies target the HLA protein. Because HLAs are expressed on most cells in the body, high PRA levels correspond to an increased chance of organ transplantation rejection.

\(^3\) Blood type matching in tissue donation follows the rules of blood type matching in blood donation, taking into account ABO expressed antigens.
Waiting-list-time allocation structures seem inherently fair in large part due to society’s exposure to lines and waits. To oversimplify this point, it seems perfectly fair that the person who arrived at the bank first see a teller first, and the person who ordered first get their food first. Furthermore, even as first-graders, we have a serious aversion to people who try to “cut” in line. Such socialization comes into play as we consider the preferential access and treatment that may be available to those with monetary means. Thus it is no surprise that the default “fairest” system is one that prioritizes people who have simply been waiting the longest. Such systems are commonly referred to as “justice-based” and are used to determine many bioethical guidelines. However the justice-based system of waiting lists applied to kidney transplants has lead to a serious underutilization of a precious resource. Many kidneys with a high potential longevity are allocated to candidates with much shorter expected years of life. This relationship results in “unrealized graft years and unnecessarily high re-transplant rates” (1; 4).

While the current system may not be efficient, it is generally considered ethically sound. However, there are a few basic issues that are often raised with its structure. Because kidneys are allocated within a fairly narrow geographical area, one must be enrolled in the donor program for that area through the transplant hospital. In order to be considered as a recipient candidate in the area, a complete medical work-up at the hospital in that region is necessary. Insurance typically only covers (if at all) a single evaluation at one catchment area (4). However with enough money, an individual can conceivably enroll in numerous geographical areas at numerous catchment transplant clinics – thus significantly increasing his or her chances at finding a donor kidney in one of these transplant networks. Thus it is a system that directly rewards those who are wealthy enough to game it. Take Steve Jobs as an example of this system (though a liver and not a kidney transplant patient). Waiting times for an organ transplant vary considerably in different parts of the country, so those with means are free to travel to a city or state with short waiting times. Jobs did this at multiple centers, waiting for
a call from one, and quickly flying cross-country to receive his transplant. While this may seem unfair, it is not against any UNOS rules (9).

With the exception of a possible advantage to those who are fortunate enough to multi-system enroll, the current organ allocation system is rarely deemed unethical in the principles it is based upon. The system’s downfall comes more in the underutilization of a resource as limited as the kidney. Underutilization in this situation refers jointly to kidneys that are transplanted and rejected within a year after transplantation⁵. Furthermore, underutilization refers to kidneys from (in the extreme case) young healthy donors that are placed inside notably older or sicker recipients. Presumably, a kidney from a young healthy car accident victim could be transplanted into a younger patient giving them 40 years of extended life. But when that kidney goes into a 95-year-old, long-term dialysis patient, its life-years from transplant value⁶ declines considerably (10). In creating a system based on “fair” principles of waiting time, we have also managed to create a system that is almost unethical in its vast underutilization of resources and therefore in the number of lives that are lost due to its inadequacy.

III. Criteria for Allocation: Ethical

There are a number of criteria that are raised as possible additions to the kidney transplant allocation system. While many of them would assist in the shortage, they must be ethical and fair in practice to be potentially implementable. Some, while ostensibly useful for allocation, are unethical in their use. The possible consequences of each and every criteria must be considered before they become part of the system as a whole.

A. Survival Models

⁴ Arguments suggesting that the rich contribute more to society and thus deserve better access are not ethically relevant due in large part to their employment of ethically irrelevant criteria of social worth.
⁵ One year of survival post-transplant is the generally used metric of determining a “successful” transplant.
⁶ The particulars of the “life years from transplant” system will be discussed further in part one of the paper. Furthermore, LYFT is just one example of a group of similar algorithms designed to compute this metric
Recent proposals for a reformation of this system focus away from models based on waiting time fairness and toward those that emphasize a maximization of years of life saved. Such systems focus in large part on metrics like life years from transplant (LYFT) (10,11). The LYFT system is a measure of the “extra years of life that a candidate can expect to achieve with a kidney transplant as compared to never receiving a transplant at all” (10). This is one example of a specific algorithm designed to calculate years of life from transplant, though it illustrates the larger goal of some of the more broad aspects of the system. LYFT is defined as “the difference, in years, between two potential future lifetimes, one without a kidney transplant, and the other with one.” Ability to survive on dialysis is also accounted for (10:1523). This so called “survival model” and others like it utilize different criteria. The LYFT system proposes a utilization of its metric to allocate most kidneys to those with high LYFT scores and fewer to those whose scores are considerably lower (10,11). Though such mathematical systems seem fair in many regards, a simple maximization of years of life raises a number of ethical questions.

B. Age Criteria

Like many ethical dilemmas, the issues with a simple maximization of life years come in the imaginable grey-area scenarios. Take for instance the following case of two patients waiting for transplant.

_Ally is a 20-year old college sophomore with chronic kidney failure. With a transplant she is expected to live to age 86, the average life expectancy for a woman in America today. Ally, therefore, has a “life years from transplant” of 66 years._

_Now take Marie. Marie is a 33 year-old mother of 4. Like Ally, she desperately needs a kidney and is projected to live a full and healthy life if a transplant is successfully obtained. Being 13 years older than Ally, Mari has a “life years from transplant” of 53 years._

While it is unlikely that Ally and Marie would have the exact same HLA antigens or blood type, and therefore be equally viable candidates for the exact same kidney, one can imagine scenarios
of this type that reward candidates in their 20’s while penalizing older recipients especially those in their 40’s and early 50’s who are often very viable candidates.

Though age discrepancies provide the most obvious quantitative measurement of deservedness, it is important to consider what we are trying to maximize when choosing age as a criterion. Is the sheer number of years that a kidney will give its patient the right way of measuring its utility (12)? Another criterion that is proposed as being perhaps of greater utility is a measure in the change of quality of life. Scarce resources should be distributed to maximize benefit to patients; benefit will reasonably be maximized when treatment is provided to the individuals that will most likely experience the greatest improvement in quality of life” (13). However, while such measures may seem inherently ethical, they are problematized by their individually qualitative, immeasurable nature. There is, quite simply, no way to separate an individual’s subjective values from a measure of quality of life or improved functional status. It is worth noting that scales\(^7\) do exist for the purpose of measuring criteria related to quality of life. While these scales may be useful to understanding individual perceptions of a condition, they provide much less utility from the standpoint of comparing patients, two of whom may rank their life as a 7, a number which may mean very different things for each. Thus, criteria like life quality which cannot be measured, are really only useful if vast discrepancies exist between patients.

III. Criteria for Allocation: Non-Ethical

While an exploration of criteria that may be ethically relevant is useful, it, as shown, does not lead to any very obviously beneficial changes in the current system. Most of the criteria that may be ethically relevant are not practically considerable in their subjective and qualitative nature. Perhaps just as useful to exploring system alternatives, is a look at those criteria that do not seem ethically sound and the reasons behind an aversion to their inclusion in a reformed system. This paper will

\(^7\) Index of Psychological Affect, Index of Overall Life Satisfaction, Index of Well-Being; all provide general delineations for factors included in life quality assessments.
examine those criteria in an effort to understand the assumptions made in categorizing them as non-relevant.

**A. Ability to Pay**

While “ability to pay” presents a more logistically oriented criterion, it is still not widely considered ethically permissible to consider means of payment as a criterion for distribution. The argument against payment generally stems from concerns about coercion, in that those who were most severely economically disadvantaged would feel pressure to donate organs in an effort to “right” their situation. That said, a functional system is one that must be financially plausible and transplantations are some of the most expensive medical procedures and treatments available today. In medicine, particularly in the American system, ability to pay is generally seen as an unfortunate necessity, not a positive ethical principle (5, 7). Ability to pay thus enters into the picture as the point of access for scarce resources, though as far as simple allocation, this is not a criterion that ought to be taken into account. Particularly as it concerns lifesaving resources, market values and principles cannot accurately apply (14). People are often forced to make decisions, based on income, of the things that they value as worth spending money on. However, with lifesaving resources, such valuation decisions are not possible, and the disparity that exists amongst income and class is often seen as detrimental to ideals about who deserves healthcare and access to technology. Therefore the market model ought not to apply as a fair criterion or means of allocation.

**B. Social Worth**

As raised with the earlier discussion of the Seattle God Committee, social worth is an example of a criterion that has been utilized in the past as a means to allocate organs. Utilization of social worth takes on more numerous forms than that which is explained above, and is most often employed as a way to justify denial of care to the elderly members of society who “no longer make a positive

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8 Current cost of kidney transplant: ~$100,000 (4).
9 Page one: introduction
contribution to the social good (15-16). Age-based rationing will be further elaborated in a discussion of the new OPTN proposal. Simply from a position of social worth, the elderly are often targets of a system that employs consideration of social good. However, arguments can also be made in favor of those who have put so much into society that they are entitled to get something back. This would be “the older the wiser” line of reasoning. In this way, the elderly would have a greater claim to scarce resources, as they are the ones that have invested the most in modern society. Yet, this sort of thinking ultimately prejudices anyone who is deemed to have not yet contributed adequately to society: the young, the handicapped, the mentally ill, prisoners. Even those who work good jobs are subject to potential discrimination as those holding jobs deemed more “socially good” (doctors, teachers) would be far more likely to receive a kidney.

Consideration of criteria of social worth presents a good opportunity to note an important factor of any allocation system. If we deem a certain criterion ethically relevant, and therefore desire to utilize it in making decisions about allocation, there must be a system that is in place to evaluate whatever the criterion is. If, for instance, social worth were a criterion worth evaluating, there would have to be a system in place to quantify it. Thus even when a criterion seems ethically acceptable, the ethical implications of evaluating it must be considered. For instance, far more ethically unsound principles are introduced into the criterion of social worth when the improbability of measuring it appropriately is considered. Committee members, if that were the system of measurement, would have to judge what social worth meant, what jobs were best, whether religious devotions played a role, whether family played a role – all this to ultimately differentiate between candidates receiving a scarce resource that for many represents the difference between life and death.

C. Perceived Obstacles to Treatment

Another criterion that represents a category not so ethically defined, is the question of considering perceived obstacles to treatment (5,8). Such obstacles may severely disadvantage a patient toward a successful transplant, but are not obviously medical in nature. “These include those who lack education, patients with transportation problems, those without supportive family environments or
significant language barriers” (5,8). Such obstacles, while in many cases surmountable, do present very real reasons why transplants might be more likely to fail. We will consider the following type of scenario:

*Amanda is a 28-year-old teacher in Connecticut. She has a wonderful family living close by, with a grandmother who frequently brings her dinner and a mother who calls every day to check in. Amanda’s father often stops by, bringing along her younger sister and brother.*

*Barbara lives in the next town over. She is also an elementary school teacher, but has no family at all. She hates her job and her co-workers. Her father and mother split when she was young, she has lost touch with both and has no other family members or close friends that she stays in touch with.*

*Barbara and Amanda are both in line for kidney transplants at their local transplant clinic. A donor comes up. Amanda and Barbara both have 4 HLA antigens matching with the donor and a corresponding AB+ blood type. For all medical purposes, they are an equal match. However Amanda’s supportive family environment makes it much more likely that her transplant will be a successful one. She has people to take her to appointments and support her in times of pain. Barbara, lacking that, is much less likely to be able to follow the regimen of drugs and appointments that necessarily follows every transplant.*

So who gets the kidney? Should a decision be based entirely on waiting time? If Barbara were the one on the waiting list longer, does she ultimately deserve the kidney? Amanda’s supportive family is very likely to contribute to the transplant success, and in an effort to maximize transplant utility, each individual donation ought to have a maximal chance of succeeding. Supportive communities, while of great importance, are not ultimately measureable criteria. Maximizing candidates with supportive family environments, when medical criteria are equal, may indeed lead to more successful transplant outcomes. But in doing so, a system utilizing such criteria would involve the valuation of non-medical, non-quantifiable factors. Preference of recipients with supportive families and communities quickly turns into a discussion of social worth.

The ethics of this scenario and others like it lie more in the determination of what constitutes a supportive family. Allowing for the use of criteria that are so subjective and so qualitative, inherently
allows for an unethical determination of allocation criteria. Thus, supportive environment is yet another example of a criterion that might have ethically sound components, but cannot be deemed useable without a legitimate and fair way to define it.

D. Past Use of Resources

As a final criterion that is ethically unsound, the past use of resources is often brought up as an argument for the fairness of allocation systems. Should a patient who has already had access to a scare resource (i.e. already had a kidney transplant), be disadvantaged on a waiting list as compared to those who have not yet been recipients? Such a criterion relies on an inherent idea of equality. Yet, “equality does not impose an ethical requirement that all patients receive the same amount of care” (5,9). Rather, equality speaks more to the fair judgment of patients based on current condition and current needs. Some argue that giving more patients access to resources is the fairest means of allocation, but absent any medical necessity, this is an ethically invalid argument. If a recipient rejects a donor kidney, why should he or she be disadvantaged in consideration of receiving one in the future? Obviously if there is a medical reason causing the failure of the transplant, that is relevant in determination of future use of the resource, but absent any medical necessity, kidneys should be allocated based on criteria that would normally be used, without consideration of past access to treatment where medically non-relevant.

IV. Maximizing Resource Quantity and Quality

The benefits of organ transplantation cannot, and will not, be maximized until the shortage that we are experiencing is either righted or improved. Many of the criteria in the discussion above will help with the shortage in making transplantation more efficient. If we can more successfully match and allocate kidneys, repeat transplants and unnecessary rejections can be more completely avoided.

Furthermore exacerbating the problem of “not enough kidneys” is the increasing number of people who have transplantation as a treatment option. New antirejection, immunosuppression technology, and the generally aging population are all contributing to longer and longer waiting lists of
candidates with a donor supply that is not rising equally (7). Thus, in addition to considering new allocation measures, it is perhaps equally, if not more important, to consider proposed strategies of organ procurement and the ethical and non-ethical components of these. While the establishment of an “organ market” is sometimes raised as a potential strategy, this paper will not consider any sort of United States organ market. Numerous other plausible strategies exist that would help with the shortage, and the establishment of a free market for kidneys is both highly unlikely and fraught with ethical issues. While an argument in its favor can certainly be made, it is out of the scope of “possible solutions” that this paper seeks to propose. It is important to realize that none of the four solutions proposed below would eliminate the shortage, or even come close to it. Rather all represent possible ways to increase supply (7; 17). Additionally, the proposals are not mutually exclusive, meaning it is entirely plausible that one or all of them could be instituted, thus maximizing their potential to procure an extended number of organs for transplantation.

A. Presumed consent

Presumed consent is often offered as a simple solution to aid, nationwide, in abetting the organ shortage experienced today. Such systems are often called “opt out” systems, in contrast to the current “opt-in” system of organ donation that exists in the US. US citizens must actively indicate that they wish to be considered for organ donation should circumstances arise. Yet, many potential donors in support of organ donation never get around to those requisite enrollment steps. The process of enrolling is generally done as part of licensing at the Registry of Motor Vehicles, and typically requires no more than a checked box and signature (18). Such consent often still requires the patient’s family to confirm desire after death. Opt-in systems typically have very poor rates of “opting in” as active consent is required. Opt-out systems are found in countries such as Spain, Brazil and Singapore (19). These systems assume the presence of consent until a clear incidence of retraction. In these countries, an individual must actively opt-out of being a presumed organ donor, requiring said individual to do nothing if he or she wants to be considered as a donor upon death (18; 20). While
these systems have not solved the shortages in their countries of implementation, they are widely regarded as having contributed to a greater overall supply (18).

Ethically, presumed consent systems raise the question of “whether the practice, in putting the onus on individuals to indicate their unwillingness, demonstrates sufficient respect for persons and their rights of self-determination” (7). Critics worry, in large part, about incidents of a false positive, where the assumed donor did not know about the system and was opposed to organ donation. Those who support this system point to the overall good done from this assumption based system, and the number of lives that are saved. To supporters, this far outweighs theoretical violations of autonomy. Were the system sufficiently publicized and were the opting out procedures sufficiently clear, there is no obvious violation of personal autonomy.

Other concerns that are raised and that are important to address include the involvement of the family in this system. It stands without question that an ethical opt-out system should not bypass the consent of the family when available. While bypassing the family’s wishes may lead to a more efficient system, opt-out systems become far more ethically grey if the family’s rights are diminished (18;19). Undoubtedly, however, organs are lost and wasted in waiting for the administrative mess that is waiting for the family’s consent, yet such wishes have to be respected and given the option to be heard and understood. It is entirely possible to have a functioning opt-out system that still includes the wishes of the family. Spain, for example, has one of the highest organ procurement rates in the world and functions on opt-out with family approval (19). It is of tremendous importance to balance the desires of the family with those of the deceased, though still crucial that this be done coherently so as to allow for organs to be utilized if the decision is made to proceed in this way. Interestingly, laws exist under the HOTA (Human Organ Transplant Act) that prohibit contact with the family regarding organ donation until after the patient is declared brain dead (7; 17). This mainly functions to protect families against misunderstanding or coercion.

**B. Donation after Controlled Cardiac Death**
Organ transplantation, since the inception of the modern system, has been importantly governed by rules strictly related to what type of patient is considered dead. These “dead donor rules” are in place to preserve a respect towards life and protect vulnerable patients at the end. These rules also include such stipulations as the maintenance of a separation between the medical teams that certify death and those who ultimately procure the organs (7, p360). These dead-donor rules were, for much time, commonly accepted and understood without issue. However the emergence of “controlled cardiac-death”\(^{10}\) has raised issues in its use as a method to expand the pool of potential donors. These are patients whose death comes about through a termination of life support and in a controlled manner meant to increase their successful organ donation prospects. American Medical Association protocol involves a waiting time of at least 2 and fewer than 5 minutes to ensure that circulatory and respiratory non-function is irreversible\(^{11}\) (7). “A shorter duration reflects judgment in favor of an improvement in quality and quantity of organs procured over an increased certainty of death” (7, 361).

Donation by Controlled Cardiac Death, DCCD, as it is usually referred, has potential not as much in increasing the supply of organs as it does in increasing the quality of the organs that are procured. If the majority of donated organs can be maximized in quality, transplants are far more likely to be successful, thus reducing underutilization where it refers to rejection. However it is this value of DCCD that has the most numerous ethical implications. Recent technology has allowed for medical interventions designed solely to increase the viability of the organs to be transplanted. Patients on life-support, who have planned for DCCD, are now often given vasodilators and anticoagulants just before the withdrawal of life support in the final stages of sickness (23). Both medical interventions keep organs receiving blood supply for extended periods of time, allowing for minimized damage to the

\(^{10}\) Controlled cardiac death involves the discontinuation of life support in the operating room so that organs can be harvested immediately following cardiac death. Also considered for patients who suffer unexpected cardiac death but reach medical care quickly (22).

\(^{11}\) Irreversible means autoresuscitation will not occur, a patient whose cardiac and respiratory functions are deemed “irreversible” will not experience autoresuscitation, but could still be revived with CPR or more drastic measures (22).
organs in the process of harvesting and transplanting them (24)\textsuperscript{12} Critics of this system point to the utilization of medical procedures that are not necessarily in the best interests of, and have no ability to help the donor. Supporters point to the vast increase in value to the potential recipient in the form of well-preserved organs and eventually a more successful transplantation procedure (25). Furthermore, supporters point to the minimal harm or risk experienced by the donor, thus interventions are justified on the basis of their ability to provide expanded positive outcomes to the transplant recipients without incurring negative utility for the donor (23)\textsuperscript{13}.

While anticoagulants and vasodilation medications may seem ethically acceptable in DCCD usage, one has to be cognizant of the precedent that such interventions are setting. These donors, even near death, are not simply organ farms. Especially when dealing with patients who are decided organ donors close to the withdrawing of life support the vulnerability of this population must be considered. Principles of “do no harm” are much more difficult to uphold when life support is imminently being withdrawn (23). One can imagine situations where it might be favorable to terminate life before the risk of infection gets too high or to minimize overall time on life support in the interest of successful transplants. Whatever medical interventions might come along that could increase recipient success, it is important that the patient, and their interests, are protected through personal consent, familial consent and full disclosure where possible.

\textbf{C. Extended Donor Criteria}

While interventions like donation by controlled cardiac death focus on the quality of the donor pool, other criteria focus more on an expansion of the pool overall. Given the vast need for organs and improving transplantation technology, particularly technology that allows for a suppressed immunorejection response, it is feasible that previously un-donatable kidneys will soon be more useable (4). As a result, the prospects of extended donor criteria are being considered both nationally

\textsuperscript{12} Patients with cardiac failure are generally hypotensive before the onset of cardiac death. This lack of oxygen damages eventual graft function. Additionally, anticoagulants decrease risk of thrombosis. Vasodilators enhance organ blood flow in anti-mortem stages directly preceding cardiac death (24).

\textsuperscript{13} Some suggestions for the possibility of increased pain and swelling have been suggested, though if death is imminent these concerns are questionably justifiable – though certainly in need of consideration (23).
and abroad. As of now, in the US system, organs are rejected as possible donor material for a variety of different medically relevant reasons. Organs from donors with hypertension or advanced age, for instance, are generally not considered transplantable. These organs are ultimately associated with poorer clinical outcomes and higher instances of necessary re-transplantation (7). Additionally, organ donation criteria are used to exclude donors with problematic behavioral or lifestyle risk factors. While hypertension may not seem particularly problematic, instances of disease transmission via donation have been recorded (7; 26). Particularly HIV, which has a lag time before detection, raises ethical concerns (26). Thus in attempts to increase donor supply, it is very necessary to take into consideration the potential harm that recipients might face from increased dialysis time or a sub-par kidney transplant. Though notably that harm must be balanced with the harm experienced from no transplant at all.

Risks aside, it is perfectly reasonable to envision a system whereby a potential transplant candidate can be fully informed of the risks associated with the donor kidney imminently available. Thus this candidate would have the opportunity to accept or reject the offered organ and maintain waitlist spot accordingly. Patients should not be penalized if choosing not to accept a “sub-par” organ, but still offered the option if relevant (4,7). Ethically, however, one final major consideration is raised with regards to an expanded criteria system. The issue of medical care for these recipients is of vital importance in consideration of society’s investment, but also in consideration of their own cost. If these expanded donor recipients ultimately require further hospitalization, they could incur significant financial burden if not covered by insurance, ultimately utilizing medical care that will cost both society and themselves. However, it is hard to say for sure that these costs would be more than the costs associated with dialysis or keeping the patients alive long enough to have another transplantation option.

D. Financial Inducement

A more thorough discussion of finances is required not only in considering potential disincentives toward non-standard kidneys, but also in relation to potential disincentives toward living
donation. Around the world (7; 27), transplant programs are considering strategies to incentivize living donation of kidneys. Not only do living donor kidneys have a higher transplant success rate, but they also pose low mortality and morbidity statistics for donors (28). While some of these strategies border on the establishment of a free-market, others are more focused on reducing financial disincentives, which may include lost employment wages, childcare costs, or insurance deductibles. While the United States has notably shied away from any sort of financial inducement towards donation, there are ways of financially incentivizing donation that do not immediately equate with payment per organ. These are the systems that rely only on removal of financial disincentives without paying donors. However, there is an acknowledged slippery slope involved in this policy, as transplant commercialism is not a far step from simply increasing and increasing these funds. Accordingly, the United Nations of Organ Sharing (UNOS) cautions against financial incentive that enriches the lives of potential donors with regards to socio-economic status increase (28). The current recommendations through the World Health Organization (WHO), permit compensation for actual documented costs, making explicit note that this “will not constitute as payment as long as the reimbursement leaves donors neither better nor worse off medically and financially postoperatively” (7,29).

More specifically, general recommendations for financial inducement protocol compiled by the National Kidney Foundation include the following (30):

- Guarantee that all living donors, and those evaluated but not ultimately used, are reimbursed for documentable expenses.
- Guarantee access to healthcare, medical coverage and disability related to the transplant for living donors.
- Guarantee living donors life insurance for unlikely death related to the donation.
- Guarantee that living donors will get their jobs back post-donation.
- Guarantee non-discrimination against living donors when obtaining health insurance.
- Establishment of a specific health insurance billing code for post-donation medical care for living donors.

Such criteria, while not exhaustive, note typical impediments towards donation that are often perceived as disincentives for those who are interested. The ethical employment of these criteria relies heavily on financial incentives that simply reimburse without extra payment of interested donors. Crossing the line of overpayment calls into consideration where a market of organs might begin. Though many
arguments exist in favor of a free-market system, such a practice is not realistic for the United States at this time and is therefore not covered in a discussion of possible solutions for the current shortage.

The four factors mentioned above, presumed consent, DCCD, expanded donor criteria and financial inducement, represent realistic ways for the United States to expand availability and utility of the organ supply without crossing into ethically repugnant territory. Though each proposal has ethical considerations attached, none is unreasonable in terms of possibility for implementation in the current or proposed system. As noted earlier, the potential exists for the implementation of all four, simultaneously increasing supply, quality and utility and thus maximizing the benefits that each, individually, can offer to the system as a whole.

V. Conclusion

The ethics of organ transplantation can be viewed from common bioethical principles of justice and utility – both of which, individually, lead to very different allocation systems and parameters. Furthermore, issues surrounding the allocation system call into question the general issue of responsibility to those needing emergent medical care. The proposal made at the United States level incorporates ethical principles of justice and utility – a blend of common principles that will ultimately set precedence and impact other areas of medicine and bioethics.

In understanding this complex issue, it is necessary to consider not only the macro-scale system that is under review, but furthermore the effects that will be seen at the middle (local centers) and micro (individual) levels of care (4). In considering the ethical implications and standards set by this proposal, one must account for each of these levels. What might be ethically and reasonably applied at the macro scale could have negative consequences on a micro level. However, it is this intertwined relationship between the group and the individual that ultimately characterizes this issue and many others just like it that the healthcare system is facing today. What is best for the group might be detrimental to the individual and vice versa. A policy designed to match survival rates of donors and recipients might have an individually detrimental effect on the elderly. Simply, what is best for the group in raising overall transplant success may not be ideal at the individual level.
The hope for a new system is that it will address issues of quantity as well as quality of donations, while making the system more effective and streamlined. Presumed consent, the removal of financial disincentives, and a general awareness of the system’s structure will undoubtedly help address at the very least the underutilization that plagues the current options. While kidneys might remain a scarce resource, they will be utilized to the fullest, thereby reducing the waste seen in today’s system.

While the OPTN proposal currently under consideration may ultimately prove unsuccessful in solving the problem, its effort at an ethically-minded reform represents a move in the necessary direction. There are many ways to procure more kidneys, like a free market, that would ultimately lead to greater supply – yet supply increases alone do not lead to a fair, sustainable system. Rather the changes that are ultimately made must weight the benefits of increased life years and quality benefit to the group with the autonomy and rights of individuals; both donors and recipients.

It is undeniable that more can be done to utilize the kidney resource that we have, and ultimately any system should be actively changing to increase utilization and success. With the growth of relevant technology and predictive models of lifespan, much adaptation and assimilation of these measures will be both necessary and required of the system as a whole. Beginning the process of transformation and incorporating elements of age and survival matching will open doors for potential system flexibility in the future. Though kidney transplantations in the current system ultimately save many lives, underutilization also causes many deaths and represents a systematic flaw that must be addressed on both national and individual levels.
VII. Bibliography


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