Contract Development In A Matching Market: The Case of Kidney Exchange

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I

INTRODUCTION

Markets arise in unexpected places. Take, for example, the case of kidney donation. Although the common conception of kidney donation is one of gift exchange, modern kidney donation is better characterized as a market. Kidney exchange is not, however, a commodity market, in which price determines who gets what. Rather, kidney exchange is a matching market in which money does not change hands and market participants care with whom they transact—in other words, they must be matched, through either individual search or intermediary involvement.

Given that kidney exchange is a matching market, one might also expect to observe the widespread use of an instrument common to markets—formal contract. Although markets can

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and do flourish under all conditions, including in the absence of third-party contract enforcement, markets in which exchange requires significant present investment in the expectation of future return are more likely to emerge and persist when institutions exist to protect property and contractual rights. Yet formal contract so far has played only a limited role in kidney exchange.

This article discusses a new development in kidney exchange, the Advanced Donation Program (ADP), that permits a living kidney donor to donate a kidney in advance for the later benefit of a designated beneficiary who may or may not be in renal failure at the time of the donation. Referred to by some as a kidney "gift certificate," "layaway plan," or "voucher,"[1] ADP builds on the matching market principles that are fundamental to modern-day kidney exchange. But ADP, because of the advanced nature of the donations, pushes the market analogy even further, relying—for the first time—on a present investment (in the form of a healthy kidney) by donors who have an expectation of future return (in the form of a compatible kidney for a friend or loved one), leaving those donors potentially vulnerable to nonperformance.

[1] Enrique Rivero, *'Gift certificate' enables kidney donation when convenient and transplant when needed*, UCLA NEWSROOM, (July 11, 2016), http://newsroom.ucla.edu/releases/gift-certificate-enables-kidney-donation-when-convenient-and-transplant-when-needed.

ADP also incorporates—again, for the first time in the transplant setting—the use of formal contracts regarding those performances, by including a contractual agreement in the form of consents to donate and receive a transplant. In another setting, the use of formal contracts would hardly be notable, given the temporal separation of obligations. However, the transplant community has historically viewed formal contracts in the transplant setting with hostility, and that traditional hostility remains evident in current ADP practice.[2] This article demonstrates that the use of formal ADP contracts is likely inadvertent, and that these contracts are inadequate to tackle the complex, nonsimultaneous exchange of kidneys in which patients donate a kidney before their intended recipients have been matched with a potential donor. As currently structured, therefore, ADP poses risks to both transplant centers and registries, as market makers, and to donors, as counterparties who have made an initial investment in anticipation of future performance.

At the big picture level, then, ADP is a useful case study offering insights on both market and contract development. It provides an unusual window into the evolution of the exchange of a

[2] See infra notes XX and accompanying text (discussing this traditional and ongoing hostility).

single good—a kidney for transplantation—from gift, to simple barter, to exchange with a temporal separation of obligations that relies solely on trust and reputational constraints for enforcement, to a complex matching market in which the parties rely, at least in part, on formal contract to define and clarify their obligations to each other.

At the small picture level, this article argues that ADP is a positive development, providing greater flexibility and the possibility of better matches for individual patients. Further, ADP could, if it reaches the full potential envisioned by many transplant professionals, increase the number of living kidney donors at a time of great shortage.[3] In order to achieve that, however, ADP, as a system built on a foundation of trust and selflessness, cannot sustain too many instances of miscommunication and false hope. This article therefore offers some preliminary suggestions to improve ADP so as to maximize its potential to increase transplants, while also protecting donors, recipients, registries, and kidney swaps and chains more generally**.**

Part II analyzes kidney exchange as a matching market, tracing the development of kidney donation from a gift model, in the case of deceased kidney donation; to barter, in the case

[3] Rivero, *supra* note 1 (noting that the program could increase altruistic donations by removing the fear that someone who donates now will not have a spare kidney for a loved one who might need one down the road).

of simultaneous kidney exchange; to exchange characterized by the temporal separation of counterparty obligations, in the case of Non-simultaneous Extended Altruistic Donor (NEAD) chains; culminating in ADP. Part III discusses the role of contracts in various types of markets, highlighting the notable absence of formal contract in kidney exchange, even as that exchange has matured from a relatively simple system of simultaneous barter to a more complex system of intertemporal exchange. It also discusses the traditional hostility of the transplant community to formal contracts, arguing that ADP presents a rare opportunity for contract expansion in the kidney exchange setting. Part IV details specific mechanisms for improving ADP. Part V concludes.

II
KIDNEY EXCHANGE AS A MATCHING MARKET

A. Commodity Markets Versus Matching Markets

A market is a mechanism by which goods or services are exchanged. Often, money is paid in exchange for such goods and services. Despite the important role money plays in markets, however, it is not the essence of a market. As stated by Nobel Laureate Alvin E. Roth: "[u]ntil recently, economists often passed quickly over matching and focused primarily on commodity

markets, in which price alone determines who gets what . . . The price does all the work, bringing the two of you together at the price at which supply equals demand."[4]

So what is a matching market, and how is it different from a commodity market? In some markets, the goods and services being exchanged are indivisible and heterogeneous, which often leads to thin markets, in that it is harder to find the right exchange counterparty.[5] For example, in a stock exchange, the buyer of a stock does not necessarily care from whom she is buying the stock, but if she is looking for an apartment, not just any apartment will do. In the apartment case, market participants must be appropriately matched, either through a centralized matching mechanism or through individual search efforts, before trading can commence.[6]

Some well-known matching markets, developed using the principles of game theory and market design, include school admission systems (such as the centralized matching systems in

[4] ALVIN E. ROTH, WHO GETS WHAT — AND WHY: THE NEW ECONOMICS OF MATCHMAKING AND MARKET DESIGN 5 (2015).

[5] ALVIN E. ROTH, WHAT HAVE WE LEARNED FROM MARKET DESIGN? Economic Journal, 118 (March), 2008, 285–310.

[6] ECONOMIC SCIENCES PRIZE COMMITTEE OF THE ROYAL SWEDISH ACADEMY OF SCIENCES, SCIENTIFIC BACKGROUND ON THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL 2012: STABLE ALLOCATIONS AND THE PRACTICE OF MARKET DESIGN 8 (2012).

New York City and Boston)[7] and the National Resident Matching Program, by which all medical students get their first jobs as residents.[8] Although money is used in these markets (for example, the application fees for school admission and the salary and bonuses in job hunting), it does not by itself determine who gets what. This is in contrast to a commodity market, such as a stock exchange, in which price alone determines who gets what.

B. The Human Organ Matching Market

Because buying or selling a human organ for transplantation is illegal in the United States,[9] price plays no role in kidney allocation even though a compatible donor kidney is a

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[7] Atila Abdulkadiroğlu, Parag A. Pathak & Alvin E. Roth, *Strategy-proofness versus Efficiency in Matching with Indifferences: Redesigning the NYC High School Match*, 99 AM. ECON. REV. 1954, 1957–59 (2009). *See also* Peter Dizikes, *Game theory, in the real world*, (May 1, 2012) (explaining how economists have used algorithms to build matching systems to assign students to schools in cities around the country) http://news.mit.edu/2012/profile-pathak-0501; Susan Adams, *Un-Freakonomics*, (July 22, 2010, 10:20 A.M.) (discussing Alvin Roth's accomplishments applying game theory to modern problems like matching students with schools in NYC and matching incompatible kidney donation pairs with lone donors). http://www.forbes.com/forbes/2010/0809/opinions-harvard-alvin-roth-freakonomics-ideas-opinions.html.

[8] Alvin E. Roth, *The Origins, History, and Design of the Resident Match*, 289 J. AM. MED. ASS'N 909, 910–11 (2003).

[9] *See* National Organ Transplantation Act 42 U.S.C. § 274e(a) (2012) ("It shall be unlawful for 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.").

valuable resource. Thus, even though a market in which human organs are bought and sold might mitigate the mismatch between kidney demand and supply, human organ allocation is a matching market.[10] As detailed in the remainder of this section, the market for matching donors and recipients works differently for the allocation of deceased donor kidneys than it does for living donor kidneys.

1. Deceased Donor Kidneys

In the case of deceased donor kidneys, a kidney failure patient registers with the United Network for Organ Sharing (UNOS), which is responsible for maintaining the waiting list and matching registered deceased donor kidneys to patients on the waiting list.[12] In doing so, UNOS serves as the market maker—deciding who gets what and when based on carefully defined criteria.

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[10] *See* Gary S. Becker and Julio J. Elias, *Cash for Kidneys: The Case for a Market for Organs*, (Jan. 18, 2014, 4:58 P.M.) (outlining the full scope of this mismatch and arguing for the commoditization of the organ market), http://www.wsj.com/news/articles/SB10001424052702304149404579322560004817176?mod=WSJ_hpp_MIDDLENexttoWhatsNewsFifth.

[12] *See generally* UNITED NETWORK FOR ORGAN SHARING, https://www.unos.org (A private non-profit organization that administers deceased donor kidney procurement and allocation under a contract with the Organ Procurement and Transplantation Network, a governmental organization).

Today, more than 120,000 patients await kidney transplants.[13] The waiting time for a patient on the deceased donation list ranges from a few months to more than a decade.[14] An individual's priority for transplantation depends on a variety of criteria, as determined by policies of the Organ Procurement and Transplantation Network (OPTN).[15] Those criteria include: the patient's tissue and blood type, time spent on the waiting list, the difficulty of matching the patient, and Estimated Post Transplant Survival.[16] To be matched, the patient requires an immunologically compatible donor, as determined by the blood types and recipient antibodies against the human leukocyte antigens (HLA) of the donor.[17]

2. Living Donor Kidneys

[13] https://www.kidney.org/news/newsroom/factsheets/Organ-Donation-and-Transplantation-Stats.

[14] According to data from OPTN, the median waiting time for patients with Panel Reactive Antibody (measuring compatibility with a randomly chosen donor, with zero indicating a patient's immune system can accept any blood type compatible donor's kidney) lower than ten is 1,381 days, and that for the patients with Panel Reactive Antibody higher than eighty is 4,149 days. http://optn.transplant.hrsa.gov/converge/latestData/rptStrat.asp.

[15] *See OPTN Policies*, ORGAN PROCUREMENT AND TRANSPLANTATION NETWORK, (Sept. 1, 2016) https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf#nameddest=Policy_08.

[16] *Id.*

[17] http://repository.ul.hirosaki-u.ac.jp/dspace/bitstream/10129/4865/1/HirosakiMedJ_64_S45.pdf ref 1 or ref 2.

An appealing alternative to waiting for a kidney donation from a deceased donor is to find a healthy living donor. Most commonly, patients receiving a living donor kidney do not go through UNOS.[18] Instead, patients and their potential donors present themselves to transplant centers, which then serve as the market maker that facilitates the donation.[19] Because living donor transplantation is also subject to immunological compatibility constraints, many willing donors are incompatible with their prospective recipient—typically a loved one.[20]

As a response to this challenge, economists and medical professionals developed Kidney Paired Donation (KPD) as a way to facilitate swaps between incompatible donor–patient pairs so that they can still have access to living kidney donation.[21] Incompatible living donor–patient pairs swap with other pairs so that the donors who cannot donate to their intended recipients can

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[18] UNOS, Living Donation: Information You Need to Know. https://www.unos.org/wp-content/uploads/unos/Living_Donation.pdf

[19] *Id*.

[20] G. Opelz. Impact of HLA compatibility on survival of kidney transplants from unrelated live donors. Transplantation 64, 1473-1475, 1997.

[21] *See* Dorry L. Segev et al., *Kidney Paired Donation and Optimizing the Use of Live Donor Organs*, 293 J. AM. MED. ASS'N 1883, 1883–84 (2005) (evaluating the impact of an improved matching scheme on the quality and number of transplants); Alvin E. Roth, Tayfun Sönmez & M. Utku Ünver, *A Kidney Exchange Clearinghouse in New England*, 95 AM. ECON. REV. 376, 376 (2005) (explaining the gains and constraints of implementing a kidney matching program with incompatible patient-donor pairs).

donate to a different recipient in the exchange pool.[22] In turn, her original intended recipient will receive a kidney from another donor, whose intended recipient is also receiving a transplant.[23] A simple exchange between two pairs is illustrated in Figure 1. To facilitate these exchanges, KPD registries manage pools of potential donors and their intended recipients and use matching algorithms to find immunologically compatible exchange opportunities.[24]

The matching algorithms are typically designed to maximize the number of patients matched to compatible donors and to minimize differences in waiting times among patients.[25] To that end, the KPD registries assign greater priority to hard-to-match donor–patient pairs, whose waiting time can otherwise be dramatically longer. This might also increase the number of transplants facilitated by the matching system, if done right.[26] These matching algorithms have been evolving, just as the matching policies adopted by the UNOS national program for

[22] Roth, et. al. supra note 21.

[23] *Id.;* Segev*, et. al.* supra note 21.

[24] *Id.*

[25] Segev, et al. supra note 21.

traditional deceased donation are evolving. For example, some registries have given increasing priority to patients that are immunologically difficult to match.[27]

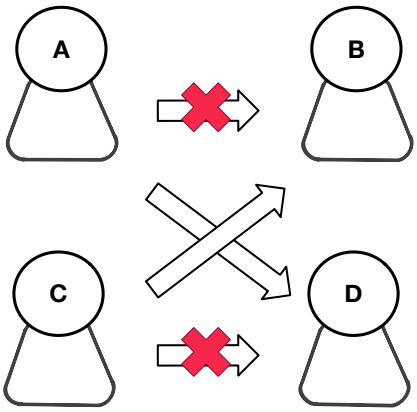

Figure 1. Illustration of an exchange between two incompatible donor-patient pairs (A–B, and C–D): A intended to donate to B, C intended to donate to D, but unfortunately neither of them are compatible (indicated by the red cross); noticing that A is compatible with D, and C is compatible with B, the transplant center arranges a two-way exchange between the two pairs, in which both B and D receive a kidney transplant.

Algorithm matching is only part of the challenge of paired donation, however. Because prospective donors can back out of a planned transplant, KPD leads to a potential reneging problem in which a donor has already donated her kidney as part of a planned exchange, but the

[26] Wenhao Liu, Matching Lives – Reducing the Waiting Time in Kidney Paired Donation (2016) (unpublished Ph.D. thesis, Stanford University) (on file with Stanford University Libraries). https://purl.stanford.edu/qy259pp1617

[27] See, for example, the matching algorithm description of the Alliance for Paired Donation, (http://paireddonation.org/about-us/algorithm/), in which a higher priority score is assigned to patients with higher Panel Reactive Antibody (PRA) levels, a commonly used measure for the difficulty of finding an immunological match for a given patient – a higher PRA level indicates a harder to match patient. See also NKR Quarterly Reports (2nd Quarter 2016) Page 7 and 9 on pool composition and PRA (http://www.kidneyregistry.org/pages/p384/NKR_QuarterlyReport2ndQuarter16.php).

donor originally matched with her intended recipient backs out of the transplant. Such donor reneging is rare, but not unheard of.[28] As a result, KPD practice initially favored simultaneous surgeries for all involved in the exchange, to avoid the possibility of donor reneging.[29]

An important innovation in KPD was the development of NEAD chains. These chains are initiated by a non-directed donor, who donates a kidney to a patient with an incompatible potential donor without expectation that a loved one receive a kidney in return, as illustrated by Figure 2.[30] The incompatible donor can then donate to another incompatible pair, continuing the chain. Most often, the final donor of a chain donates a kidney to a patient on the kidney waitlist. The structure of NEAD chains removes the need for simultaneity, enabling patients to receive a kidney transplant before their paired donor donates, adding flexibility to KPD practice and permitting more transplants. If there is a significant time gap between a recipient's transplant and

[28] Wenhao Liu, Eric Treat, Jeffrey L. Veale, John Milner, and Marc L. Melcher. Identifying Opportunities to Increase the Throughput of Kidney Paired Donation. Transplantation: July 2015, Volume 99, Issue 7, 1410–1415 (reporting two cases of donor reneging (Figure 2) during NKR's practice between March 1, 2011, and April 23, 2013, when a total of 3,180 match offers were generated).

[29] Roth *et al*., *supra* note 21 .

[30] *See* Michael A. Rees et al., *A Nonsimultaneous, Extended, Altruistic-Donor Chain*, 360 NEW ENG. J. MED. 1096, 1096 (2009) (exploring the success of a chain of 10 kidney transplantations initiated by a single altruistic donor).

her paired donor's donation, the donor is referred to as a bridge donor.[31] Theoretically, the longer the time between the recipient's transplantation and the bridge donor's donation, the greater the risk that the bridge donor will renege on her promise to donate a kidney to the next recipient in the chain.

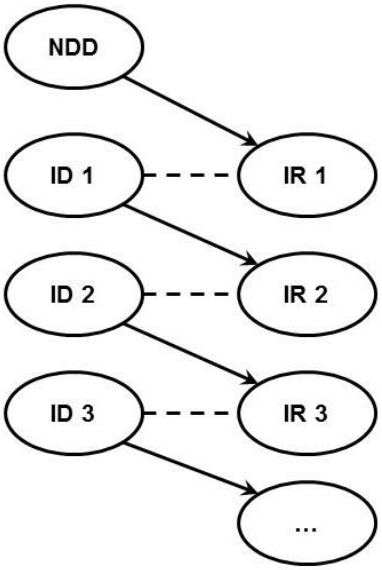

Figure 2. An illustration of a KPD chain. The non-directed donor donates to an Intended Donor (ID) within a donor-patient pair, and then her original ID donates to the ID of the second pair, so on and so forth. Hence the donation of a non-directed donor can trigger a chain of transplants.

If one of the potential donors in the chain does not honor her promise to donate, no direct and specific harm is done to any specific individual participant, because no donor has donated

[31] Rees et al., *supra* note 30.

without her intended recipient receiving a transplant.[32] However, the NEAD chain will not reach its full length, and potential transplants will not be performed. Moreover, as with any bargained-for exchange, if reneging were to become too common, confidence in the NEAD system could become compromised.

Although UNOS was initially reluctant to participate in these living donor kidney exchanges, several non-profit registries have developed to match donors and patients and to facilitate transplants. The National Kidney Registry (NKR), established in 2008, has been the most successful registry, having facilitated nearly 2000 living donor transplants as of April 14, 2016.[33] Part of NKR's success can be attributed to its innovative approaches to overcoming logistical obstacles.[34]

3. The Advanced Donation Program

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[32] Liu et al., *supra* note 28.

[33] NATIONAL KIDNEY REGISTRY, http://www.kidneyregistry.org/.

[34] *See* L.A. Baxter-Lowe, M. Cecka, M. Kamoun, J. Sinacore & M. L. Melcher, *Center-defined Unacceptable HLA Antigens Facilitates Transplants for Sensitized Patients in a Multi-Center Kidney Exchange Program*, 14 AM. J. TRANSPLANTATION 1592, 1595–97 (2014) (investigating the potential of multi-center kidney paired donation to overcome problems with cross-match criteria); F.K. Butt et al., *Asynchronous, Out-of-Sequence, Transcontinental Chain Kidney Transplantation: A Novel Concept*, 9 AM. J. TRANSPLANTATION 2180, 2181–84 (2009) (describing the first asynchronous, out-of-sequence transplant chain, which enabled more people to benefit from a single altruistic donation).

As noted in the previous section, donor reneging in NEAD chains may impede their efficiency by preventing them from reaching their full potential, but it does not harm any particular participant directly. A new KPD arrangement, the Advanced Donation Program (ADP), however, does present a danger of harming specific individual participants. Although ADP is still in its infancy, it is already being offered by at least nine transplant centers throughout the United States under the umbrella of NKR.[35]

Recall that the intended recipient in a NEAD chain is transplanted before or simultaneously with her paired donor's donation, reducing the possibility that the pair gives a kidney without receiving one in return. In practice, however, donors often have their own time constraints that interfere with this ideal. For example, patients or donors may have rigid time constraints, due to employment or other commitments, such that enforcing the convention of each patient receiving a transplant no later than the donor's donation prevents them from participating in KPD.[36] In response, NKR implemented ADP. In ADP, when a donor has a

[35] *See* Rivero, *supra* note 1.
[36] S. M. Flechner et al., *The Incorporation of an Advanced Donation Program Into Kidney Paired Exchange: Initial Experience of the National Kidney Registry*, 15 AM. J. TRANSPLANTATION 2712, 2173 (2015) (discussing factors requiring advanced donation including a donor having a specific window of availability to donate).

compatible recipient in the KPD database and her intended recipient cannot be presently matched, the donor can choose to donate in advance.[37] This advanced donation entitles the intended recipient to a "prioritized opportunity to receive a kidney as part of a swap within the NKR," but does not guarantee that her intended recipient will receive a transplant from the exchange anytime soon, if ever.[38] In contrast to the scenario in which a bridge donor may renege in standard NEAD chains, the risk in ADP is that NKR is unable to provide a compatible kidney to the intended recipient. Both the donor and recipient participating in ADP explicitly acknowledge this possibility in separate consent forms, attached hereto as Appendix A & B.[39]

A Canadian case very similar to ADP serves as evidence that the risk of a patient experiencing a long waiting time or not receiving a kidney transplant is not merely hypothetical. Estella Jamieson and her son-in-law, Jeff Pike, participated in the Living Kidney Donor Paired

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[37] Id.

[38] Id.

[39] NATIONAL KIDNEY REGISTRY, https://www.kidneyregistry.org/docs/adp_consent_form_intended_donor.pdf; NATIONAL KIDNEY REGISTRY, https://www.kidneyregistry.org/docs/adp_consent_form_intended_recipient.pdf; *see also* Flechner, *supra* note 31, at 2715 ("The ADP informed consent documents highlight the particular considerations that each donor and recipient are required to understand and affirm. Perhaps the most important consideration is that a time frame for identification of a suitable donor for the paired recipient cannot be predicted, and that due to logistical and medical concerns a future transplant through the ADP may never occur.").

Exchange Program in Canada after Jeff developed renal failure and needed a kidney transplant.[40] Before the day of the surgeries, Jeff developed shingles and became unfit for the transplant procedure, so his transplant surgery was cancelled.[41] Based on the promise that Jeff would receive top priority if she went through with her donation as scheduled, Estella decided to proceed.[42] Yet months later, and long after Jeff's health allowed him to go through surgery, Jeff was still not transplanted and the pair, reportedly unable to get a satisfactory explanation from the exchange program, aired their complaints publicly.[43] Part IV revisits this case and argues that the current structure of ADP does not adequately handle such contingencies and risks.

III

CONTRACTS AND MARKETS

So far, parts I and II have described matching markets, as distinct from commodity markets, and have detailed the ways in which kidney donation constitutes a matching market. An important aspect of markets—whether commodity or matching—is the element of contract.

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[40] *See* Rosa Marchitelli, *Organ exchange program slow to deliver on promise to man in need of a kidney, family says*, CBC NEWS (Oct. 12, 2015, last updated 6:07 AM), http://www.cbc.ca/news/health/kidney-exchange-chain-breakdown-1.3263749; *see also* LIVING DONOR PAIRED EXCHANGE REGISTRY, https://www.blood.ca/sites/default/files/english_ldpe_brochure_general.pdf (outlining the details of the Living Donor Exchange Registry).

[41] Marchitelli, *supra* note 40.

[42] *Id.*

[43] *Id.*

Though markets can exist even in the absence of enforceable contract rights—indeed, black markets often persist even in the face of legal bans on the market—exchange that requires significant present investment in the expectation of future return is facilitated by a legal regime of contract and such markets are less common and less robust in regimes lacking institutions that protect property and contract rights.[44] This part discusses the role of formal contract (or, more accurately, its notable absence) in kidney exchange arguing that, as kidney exchange has become more complex, with performances and obligations extending across time, the possibilities for contract have similarly grown and may be underutilized.

At the same time, there are substantial barriers to the expansion of contract as a response to the risk of nonperformance in kidney exchange. As will be shown, contracts are currently employed only reluctantly—indeed, most likely, inadvertently—and contain few firm commitments or obligations. Moreover, transplant professionals have traditionally been

[44] *See, e.g.*, Douglas C. North, *Institutions*, 5 J. ECON. PERSPS. 97, 101 (1991) (explaining how institutions help structure of the economy and thus influence the direction of economic change); *See* Rafael La Porta et al., *Law and Finance*, 106 J. POL. ECON. 1113 (1998) (explaining how third party enforcement of contracts facilitates the emergence of sophisticated capital markets).

suspicious of contracts in kidney exchange and are distrustful of inviting lawyers and the legal system into the doctor–patient relationship.[46]

Despite this, ADP may present a rare opportunity for an expansion of the use of contract in the kidney exchange setting. Accordingly, part IV suggests a variety of contractual and noncontractual mechanisms to protect patients and the integrity of ADP. Those suggestions include a more careful and detailed disclosure of the risk that a kidney may not be found for the intended recipient or may be found only after great delay, as well as greater transparency regarding priorities and algorithms.

A. Simultaneous Versus Intertemporal Exchange

The recognition that kidney exchange is a matching market carries important implications for the instruments of market design. As previously noted, kidney exchange began as KPD, a relatively straightforward, simultaneous, barter-type exchange. As with all simultaneous exchange, formal contract plays only a limited role in traditional KPD. This is because contract law is primarily about enforcing promises. When exchange is simultaneous there is thus little

[46] See infra notes XX and accompanying text (discussing this in more detail).

need for contract law, and other legal mechanisms, such as tort and criminal law, are usually sufficient to address the parties' needs.[47] Perhaps not surprisingly then, formal contracts are not seen among traditional KPD donors, intended recipients, and market makers (the individual coordinating transplant centers).

Rather, contract law is primarily concerned with an exchange of goods or services that extends through time.[48] Such intertemporal exchange requires one or more parties to rely on and adhere to promises of future performance, and contract is the usual mechanism by which the law ensures that those promises are kept.[49]

In contrast to traditional KPD, NEAD chains possess this element of intertemporal exchange and, as a result, donor reneging is a known risk in NEAD chains.[50] One thus might expect contracts to play an important role in NEAD chain organization. However, significant enforcement hurdles inhibit the use of formal contracts to address the risk of donor reneging that

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[47] *See* ERIC A. POSNER, CONTRACT LAW AND THEORY 18–19 (2011) (explaining why parties enter into contracts).
[48] *Id.*
[49] *Id.*
[50] *See supra* notes 28–30 and accompanying text (discussing NEAD chains and donor reneging risk).

arises from non-simultaneous performance in NEAD chains.[51] Moreover, a contract purporting to require a reluctant donor to nonetheless part with her kidney is perceived as contrary to the ethical mandate that organ donation should be the purely voluntary act of a willing and informed donor.[52] This would even be the case when a potential NEAD chain donor has procured a matching kidney for her paired recipient by promising to donate her kidney as part of the chain and then fails to do so.[53]

As a result, the concept of contract lurks in the background of NEAD chain organization, without ever materializing. Patients inquire whether they will be required to sign a contract and are assured that they will not. Transplant professionals consider the possibility of formal contract, only to dismiss it as overly legalistic or detrimental to the doctor–patient relationship.[54] Others simply assume that the National Organ Transplant Act (NOTA)[55] renders NEAD chain contracts

[51] Kieran Healy & Kimberly D. Krawiec, *Custom, Contract, and Kidney Exchange*, 62 DUKE L. J. 645, 663–67 (2012).

[52] *Id.* at 659 (noting that, though no court would literally force an unwilling NEAD chain participant to donate her kidney through specific performance, even monetary damages could be perceived as coercive of unwilling patients).

[53] *Id.* at 663.

[54] Id.

[55] National Organ Transplant Act, 42 U.S.C. § 274e (2012).

illegal.[56] In the end, therefore, it is moral commitment, social solidarity, and the screening practices of transplant professionals that control NEAD chain bridge-donor reneging—not the use of formal contracts.[57]

B. ADP And Contract

ADP participants sign separate consent forms in which the donor agrees to donate her kidney in exchange for her intended recipient's (IR) "prioritized opportunity to receive a kidney as part of a swap."[58] This raises two preliminary questions: first, does this consent form a contract? And second, if so, what is it a contract for?

The first question can be answered in the affirmative. The consent form is an example of the type of low-powered enforcement contract common in many relationships that rely primarily on trust and informal sanctions, rather than primarily on formal contract enforcement, to ensure performance. As for the second question, consistent with the case law and literature on

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[56] Healy & Krawiec, *supra* note 49 at 662. (suggesting that contract law does not necessarily conflict with NOTA's prohibition of purchasing organs).
[57] *Id.* at 649.
[58] NATIONAL KIDNEY REGISTRY, https://www.kidneyregistry.org/docs/adp_consent_form_intended_donor.pdf; NATIONAL KIDNEY REGISTRY, https://www.kidneyregistry.org/docs/adp_consent_form_intended_recipient.pdf; *See infra* Appendices A and B. Although NKR drafted the ADP consents, they are administered by transplant professionals at individual transplant centers.

low-powered enforcement, the contract likely protects only against bad faith behavior on the part of NKR—for example, a complete failure to provide the IR with any priority.

1. ADP And Low-Powered Enforcement

Although the ADP consent forms promise the IR a "prioritized opportunity," that phrase is not defined, and the forms explicitly provide that there is no guarantee that the IR will receive a kidney.[59] At some level, this imprecision makes sense. The ease with which any IR can be matched may vary dramatically across patients and through time, depending on the IR blood type, degree of immunological compatibility with the general population, and age.[60] Moreover, any number of unforeseen events could prevent a match to the IR or render matching more difficult than assumed at the time of contracting.[61] Those unforeseen events could be recipient-dependent, that is, something could occur that makes it difficult to match the IR. For example, an IR might become too ill to receive a transplant or be too difficult to match because of immunologic

[59] National Kidney Registry, Advanced Donation Program, Consent Form, Intended Donor and Intended Recipient, Appendix. See also supra notes 37-39 and accompanying text.

[60] *Supra* notes 14-16 and accompanying text.

[61] Wenhao Liu, Eric Treat, Jeffrey L. Veale, John Milner & Marc L. Melcher, *Identifying Opportunities to Increase the Throughput of Kidney Paired Donation*, 99 TRANSPLANTATION 1410, 1411–15 (2015) (discussing causes of stopped match offers that lead to delays in kidney exchange).

obstacles. These immunological obstacles can change over time, and by their nature, registries such as NKR have greater numbers of difficult-to-match patients.[62] The unforeseen events that prevent matching could also be registry dependent, meaning that something could occur that renders NKR incapable of matching patients with donors. For example, NKR might dissolve, or a national program could take over the entire KPD process.

There are generally three possible approaches a court might take when presented with the type of contractual imprecision posed by the promise of "a prioritizted opportunity" in ADP: (1) conclude that the promise is too indefinite to form a legally binding obligation, (2) conclude that a contract is formed, but that it is breached only through bad faith behavior, such as a complete failure to attempt to provide priority to the IR, or (3) conclude that a contract is formed and apply "high powered enforcement," by attempting to divine the parties' intent and gap filling the meaning of "prioritized opportunity."[63]

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[62] Itai Ashlagi and Alvin E. Roth, New Challenges in Multihospital Kidney Exchange. American Economic Review: Papers & Proceedings 2012, 102(3): 354–359. (discussing how some transplant centers arrange exchanges internally, which tend to involve more easy-to-match pairs, and hence selectively register hard-to-match pairs to kidney registries.)

[63] Ronald J. Gilson, Charles F. Sabel & Robert F. Scott, *Braiding: The Interactions of Formal And Informal Contracting In Theory, Practice, And Doctrine*, 110 COLUM. L. REV. 1377, 1418 (2010) (discussing the options available to the court in *Eli Lilly v. Emisphere*, 408 F. Supp. 2d 668 (S.D. Ind. 2006)).

For both doctrinal and policy reasons, we believe that option two—finding a contract that can be breached only by bad faith—is both the proper and most likely outcome. The level of imprecision employed in ADP is not uncommon in instances where uncertainty about future outcomes makes specifying possible future states—and the obligations of the parties in each of those future states—impractical. Nonetheless, NKR has made a promise to the donor—one on which the donor has relied, to her detriment.

In such cases, courts have sometimes applied what has been referred to as "low-powered enforcement.[65]" Low--powered enforcement imposes sanctions for "red-faced" violations of the agreement to provide a prioritized opportunity, but does not impose sanctions for a failure to reach particular outcomes.[66] In other words, in the unlikely event that NKR were to make no attempt to match the IR with a compatible recipient on a prioritized basis then a court could conclude that NKR violated its promise to provide the IR with a prioritized opportunity. But a court would not, in a low-powered enforcement environment, attempt to direct any particular

[65] *Id.* at 1427.

[66] *Id.* at 1417.

resolution—by, for example, concluding that the IR should have been transplanted with any particular kidney.

For a number of reasons, it seems unlikely that a court would conclude that NKR has made no enforceable promise whatsoever to the donor (option one). The donor has relinquished an important and valuable item—a healthy kidney—and undertaken some health risk and physical discomfort. Further, she has suffered lost time and inconvenience, all in expectation of a future return—the possibility of a matching donor for her IR. In addition, NKR is the contract drafter, a repeat player, and the more experienced and informed party. As such, any ambiguity in the contract terms would traditionally be construed against NKR.[67]

At the same time, any attempt by courts to gap fill the contract by finding a specific obligation on the part of NKR to deliver a transplantable kidney to the IR would be dangerous. As already noted, a number of contingencies outside of the control of NKR could prevent any specific match or transplant.[68] Moreover, uncertainty regarding court interpretations of liability

[67] Charles L. Knapp, Nathan M. Crystal, & Harry G. Prince, Problems in Contract Law 382-83 (7th Ed., 2012) (quoting Edwin W. Patterson, The Legal Interpretation and Construction of Contracts, 64 Colum. L. Rev. 833, 853-55 (1964)).

[68] *See* supra notes 59-62and accompanying text.

could impede the development of ADP and similar advanced donation programs, and could chill future attempts at transplant innovation. Given the current kidney shortage, this is a substantial social cost. Though this approach is unwise, it cannot be ruled out entirely. Not all courts have exercised restraint when interpreting imprecise promises such as those contained in the ADP consent forms,[69] and this possibility poses a legal risk to NKR and potential reputational risk to participating transplant centers and personnel, a concern to which we return in the following part II.B.2.

2. Contract Resistance in Transplantation

As should be evident from the foregoing discussion, the contractual protections currently contained in ADP consent forms impose few firm obligations and provide only limited protection to donors and intended recipients. Moreover, their incompleteness carries legal risk to NKR and potential reputational risk to ADP participating transplant centers and personnel. Given this risk, why do ADP participants not insist on more detailed contractual language? Why is NKR itself not incentivized to provide it?

[69] Gilson, Sabel & Scott, *supra* note 63 at 1422–42 (criticizing cases in which courts have not followed the low-powered enforcement approach).

As already noted, formal contracts are largely absent from NEAD chains, despite the known risk of donor reneging. Of course, transplantation is not the only setting in which researchers have noted a reluctance to rely on formal contract. In his seminal study of Wisconsin businesses, Stewart Macaulay found that "businessmen often prefer to rely on "a man's word" in a brief letter, a handshake, or "common honesty and decency"—even when the transaction involves exposure to serious risks."[71] One lawyer interviewed by Macaulay as part of the project complained that he was "sick of being told, 'We can trust Old Max,' when the problem is not one of honesty but of reaching an agreement that both sides understand."[72]

Many of Macaulay's subjects viewed formal contract as a hurdle to closing a sale and detrimental to customer relations.[73] Suing a customer was, at best, a last resort and lawyers were thought to only get in the way:

> [I]f something comes up, you get the other man on the telephone and deal with the problem. You don't read legalistic contract clauses at each other if you ever want to do business again. One doesn't run to lawyers if he wants to stay in business because one must behave decently.[74]

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[71] Stewart Macaulay, *Non-Contractual Relations in Business: A Preliminary Study*, 28 AM. SOC. REV. 55, 58 (1963).
[72] *Id.* at 58-59.
[73] Id.
[74] *Id.* at 61.

Although the settings in which transplant professionals and Wisconsin businessmen operate are very different, there are many similarities in their attitudes toward formal contracts (and lawyers). One group of transplant professionals explained the issue in language notably similar to that documented by Macaulay:

> We maintain that the basic principle of organ donation is based upon selfless generosity and faith in the human spirit, rather than contractual obligations. We would discourage future participants from becoming mired in legal arguments and lengthy debates that would only cause interminable delays.[75]

This rejection of NEAD chain contracts arose in connection with concerns over donor reneging and, as already discussed, contracts in that setting face a variety of enforceability hurdles and ethical concerns.[76] The conclusion that other mechanisms are more suitable than contractual remedies for controlling NEAD chain donor reneging is thus an understandable (though not inevitable) conclusion.[77]

In ADP, however, it is the ***donor*** who performs first and faces the risk of nonperformance by NKR. Many of the objections to NEAD chain contracts—which center around the possible

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[75] F.K. Butt et al., *supra* note 34 at 2183.

[76] *See* Healy & Krawiec, *supra* note 51 and accompanying text (discussing those hurdles); *see also supra* notes 28–30 and accompanying text (discussing the risk of donor reneging in NEAD chains).

[77] *Id.*

coercive and negative public policy effects of binding donors through contractual obligations—are not implicated by ADP, nor are the same enforceability barriers present.

Yet resistance to formal contracting remains. In fact, our conversations and experiences with those involved with ADP suggests a resistance to even recognizing the current ADP consent forms as containing contractual obligations. A recent exchange in the American Journal of Transplantation introducing the concept of ADP provides just one example. The concept authors, in discussing ADP, never acknowledge the contractual nature of the ADP consent forms, despite our suggestion that the consents impose a contractual obligation.[81] Once again, there are clear similarities with Macaulay's interviews, notwithstanding the time gap (1963) and different setting (Wisconsin businesses):

> Often businessmen do not feel they have 'a contract'—rather they have 'an order.' They speak of 'cancelling the order' rather than 'breaching our contract.' When I began practice I referred to the order cancellations as breaches of contract, but my clients objected since they do not think of cancellation as wrong . . . Lawyers are often surprised by this attitude.[82]

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[81] *See* Flechner et al., *supra* note 36 (introducing the concept of ADP); Liu, Krawiec & Melcher, *supra* note 28 (raising concerns with the current structure of ADP, including the vague contractual language); S.M. Flechner et al., *"Do the Right Thing. It Will Gratify Some People and Astonish the Rest."—M. Twain*, 16 AM. J. TRANSPLANTATION 1039 (2016) (responding to Liu et. al but not addressing the contractual point).

[82] Macaulay, *supra* note 71 at 61.

To reiterate, there are justifiable reasons for this cautious approach toward formal contracting in the transplant setting—a complex and malleable system with many competing interests. Allocation strategies and prioritizations for different patients frequently are modified as utility and fairness are balanced.[83] Moreover, courts have little experience with or expertise in transplantation, which could prompt concern about their ability to understand and evaluate these factors when, *ex post*, a transplant (or, in this case, a planned transplant) has not gone as expected.

At the same time, the traditional objections to the use of formal contracts are not present in ADP. First, in ADP it is the registry that poses a risk of reneging, not the patient. Second, impediments to enforcement (to the extent that they exist) appear no greater or different in kind in ADP than in other contexts in which unforeseen events may frustrate the parties' original plans. Finally, there are no concerns about binding unwilling donors to commitments that they may later regret—instead, it is NKR who is being held to its promises to the patient.

[83] See supra notes 26-27 and accompanying text (discussing these changing algorithms).

It seems likely that the transplant community, conditioned to traditional objections to the use of formal contractual obligations in kidney exchange, has failed to appreciate, at this early stage of ADP development, that those objections are simply inapplicable to ADP. Moreover, transplant professionals involved in ADP, as already noted, do not appear to recognize that the registry is already committed through contract, but in a manner sufficiently vague as to carry risks that a court will find obligations in the contractual language not intended by NKR.[86]

This lack of precision, in turn, imposes a risk on transplant centers and professionals involved in ADP. Frustrated patients, who may not understand the risks inherent in ADP, may—if the recipient is unable to be matched within a certain timeframe—turn to the transplant center, surgeons, and other personnel with whom she has already communicated and who performed the IR's transplant, rather than seeking out the transplant registry, with whom she has had no prior direct dealings. If so, then any misunderstandings among patients about the risk that an IR will not receive a transplant under ADP and the obligations owed to her by NKR carry the possibility of reputational damage to individual transplant centers and professionals. Accordingly,

[86] See supra note XX and accompanying text.

it is in the interests of patients, NKR, and participating transplant centers to seek more clarity in the ADP contract and to develop more detailed, standardized disclosures apprising patients of the risks inherent in ADP.

As Macaulay noted so many years ago, the law is not the only—or even, necessarily, the most important—mechanism constraining the behavior of parties to exchange.[87] Among Wisconsin businessmen, other considerations, including the reputational constraints on repeat players and an overriding norm that "one does not welsh on a deal" helped to ensure that defaults remained relatively rare events.[88] Despite the similarities already noted between that setting and the transplant setting, there are also differences that suggest a more careful consideration of the benefits of formal contract in ADP is warranted. Like the Wisconsin businessmen studied by Macaulay, NKR is a repeat player in transplantation and relies on its reputation for care and trustworthiness in order to ensure patients, transplant centers, and the transplant community at

[87] *See* Macaulay, *supra* note 71 at 62–63 (explaining that in many situations, contracts are not needed because there are many effective non-legal sanctions that can effectively resolve a problem); *see also* Barak D. Richman, *How Communities Create Economic Advantage: Jewish Diamond Merchants in New York*, 31 LAW & SOCIAL INQUIRY 383-420 (2006); Lisa Bernstein, *Opting Out of the Legal System: Extralegal Contractual Relations in the Diamond Industry*, 21 JOURNAL OF LEGAL STUDIES 115 (1992).

[88] Macaulay, supra note 71 at 62-63.

large that it is a safe partner with which to transact. Thus, we do not expect NKR to undertake its obligations to ADP patients lightly. Aside from its commitment to help transplant patients, rather than harm them, its reputation is a valuable asset and one it seeks to protect.

Unlike the Wisconsin businessmen studied by Macaulay, however, ADP patients are not repeat players with an understanding of industry customs and practices. They are not represented by counsel, are highly motivated to complete the transaction, and are likely to be unsophisticated, at least in the details of transplantation and kidney matching. In other words, unlike the environment documented by Macaulay, in which problems are avoided without resort to formal contractual language and legal sanctions because "usually there is little room for honest misunderstandings or good faith differences of opinion about the nature and quality of . . . performance," there is quite a bit of room for ADP patients to misunderstand the risks of advanced donation and the various contingencies that may prevent matching the IR as planned.[92] In addition, Macaulay was careful to note that "when defaults occur they are not likely to be disastrous because of techniques of risk avoidance or risk spreading."[93] Such risk mitigation

[92] *See* Macaulay, *supra* note 71 at 62, 65–66.
[93] *Id.* at 63.

techniques are not available to ADP patients: a failure to transplant the IR as intended could be disastrous. Thus, as part IV argues, consent forms should endeavor to clarify the priority due to the IR as concretely as possible, more appropriately warn donors of the potential risks of advanced donation, and provide greater transparency.

IV
MAKING ADP BETTER

Part III noted that the ADP consent forms likely constitute a contract, though one subject to only low-powered enforcement. Moreover, as we discuss below, the priority process and other aspects of ADP lack transparency and are not clearly disclosed to patients in the current consent forms. Finally, the forms do not address a number of possible contingencies, leaving the door open to future misunderstandings.

These are problems for reasons that go beyond the possible harm to a patient who has undertaken the irreversible act of kidney donation for the future benefit of a loved one. One of the main goals of introducing ADP was to increase participation in living kidney donation and

help patients in need.[95] And kidney exchange, as a system built on a foundation of trust and selflessness, cannot sustain too many instances of miscommunication and false hope. It is therefore important that participants share a common understanding about the arrangements. This includes clarifying the variability of waiting times, the priority that the IR receives relative to other recipients, and the actions to be taken in contingency situations. This part provides suggestions for improvement and points out challenges and nuances involved in the practice.

The likelihood that the IR is able to receive a kidney depends on the difficulty of finding a match within the KPD pool and the degree of prioritization that the matching algorithms give to the IR.[96] As previously detailed, the odds of matching an IR can vary dramatically and depend primarily on her blood type and the number of antibodies she has against potential donors. The consent forms should acknowledge this variation and perhaps even broadly quantify it. For example, NKR could provide information on what percentage of donors currently available in the registry match the IR. This would provide a sense of how difficult it will be to

[95] *See* Rivero, *supra* note 1.
[96] See supra notes 59-62 and accompanying text.

find a future match. In addition, NKR could summarize the amount of time IRs within ADP have historically waited for a kidney.

This information snapshot is insufficient, however, because the probability of finding a match changes over time based on the composition of the pool and changes in the IR's immunological status. Introducing certain intermediate assurances could address the changing nature of the donor pool, build trust, and improve communication between the registries and the participants. Therefore, data on match likelihood and waiting times should be updated periodically. Such updating should not be an onerous burden to NKR. Currently, UNOS imposes a similar reporting obligation on transplant centers, by requiring them to update everyone on their deceased donor waiting list (which is currently much larger than the ADP participant list) through a biannual letter reporting the latest patient and graft one-year survival outcomes.[99]

Though the variability of ADP waiting time can be explained to a great extent by factors also commonly seen in KPD, the prioritization given to IRs is unique to ADP. Given that a

[99] *See OPTN Policies*, *supra* note 15. Technically, transplant centers are required to report when a patient dies and when a graft stops working. UNOS then determines the patient and graft survival outcomes. The SRTR publishes the letter summarizing center based outcomes. See the following for details: Lisa B. VanWagner and Anton I. Skaro, Program-specific Reports: Implications and Impact on Program Behavior. Curr Opin Organ Transplant. 2013 Apr; 18(2): 10.1097/MOT.0b013e32835f07f8.

prioritized opportunity is promised to the ID in exchange for her advanced donation, the failure of the forms to define "prioritized opportunity" is a startling omission that presents two issues for the participants.

First, the lack of clarity makes it difficult to verify and enforce the efforts on the part of the KPD registry—in this case, NKR. How will participants know whether, and what sort, of efforts NKR has made to facilitate the IR's transplant? Second, it adds one more layer of uncertainty on top of an already complex process, making it more challenging for a patient to understand her waiting time and for the registries to manage the patients' expectations. Misunderstandings of this sort can lead to negative consequences, such as those illustrated by the Pike incident in Canada, even when transplant centers have made every effort to procure a transplantable kidney.[103]

Clarifying the phrase "prioritized opportunity" is not simple, however. Any promise of a definitive timeline is unrealistic, for reasons already discussed.[104] The matching algorithms of any KPD program—ADP or other—typically assign some kind of priority weight to each

[103] *See supra* note 40 and accompanying text (discussing the Pike incident).
[104] *See supra* notes 36–38 and accompanying text (discussing the uncertainties in the ADP timeline).

patient,[105] and higher weights are usually assigned to harder-to-match patients to promote equality in the system.[106] So a seemingly obvious clarification might be to assign some pre-specified priority weights to IRs participating in ADP in the matching algorithm.

The challenge with this approach is that the KPD matching algorithms evolve over time based on the evolving characteristics of the KPD pool,[107] an evolution which is difficult, if not impossible, to predict and which is outside of the control of any KPD registry or center. The weights in matching algorithms are often adjusted, and in many cases the weights are not well documented.[108] Therefore, the specification of priorities for ADP participants is not straightforward. Perhaps, however, the consent process could inform the IR and ID of their

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[105] *See* ALLIANCE FOR PAIRED KIDNEY DONATION, http://paireddonation.org/about-us/algorithm/ (explaining how it, one of the major KPD registries in the United States, publishes its matching algorithm on its website which details the numerical weights assigned to the patients based various medical and economic criteria).

[106] *Medical Board Policies*, NAT'L KIDNEY REG., http://www.kidneyregistry.org/transplant_center.php#policies ("[M]atch offers shall be selected to facilitate the most possible transplants except when difficult to match pairs can be matched. Pair matching difficulty shall be measured by the pair match power (PMPc) score.").

[107] *Compare Susan* L. Saidman et al., *Increasing the Opportunity of Live Kidney Donation by Matching for Two- and Three-Way Exchanges*, 81 TRANSPLANTATION 773 (2006) (tracing the early years of KPD, when matching algorithms were designed based on the belief that there are not many highly sensitized patients (patients with sensitive immune system that are likely to reject organ graft), *with* Itai Ashlagi et al., *NEAD Chains in Transplantation*, 11 AM. J. TRANSPLANTATION 2780 (2011) (outlining how new algorithms are designed in response to new data indicating that KPD pools involve a large number of highly sensitive patients).

[108] Id.

priority relative to other patients, such as previous donors requiring a transplant, highly sensitized patients[109], and the patients whose scheduled transplants were cancelled due to a donor renege.

This challenge is further amplified when there is greater temporal separation between the ID's donation and the IR's transplant. To illustrate, in one case, a son wanted to donate for his mother but was constrained by military leave.[110] ADP allowed him to donate and recover prior to redeployment, and his mother was successfully transplanted 5 months later.[111] In cases such as this, where only a short delay is expected between the ID's donation and the IR's expected transplant date, there is less cause to worry about changing algorithms or deterioration of the recipient's health.

In contrast, some ADP IDs might participate in the program in order to gain future advantage for their IRs, who do not need an immediate transplant, but will likely need one later. Or, the program may eventually appeal to altruistic donors who want to donate their kidney to a

[109] "Highly sensitized" patients are those with high PRA levels. See supra note 14 and accompanying text.

[110] Flechner et al., *supra* note 36.

[111] Id.

stranger, but only in exchange for the assurance that, should a loved one ever face renal failure, transplantation is not thwarted by this lost kidney because the registry has guaranteed priority to a designated beneficiary. Indeed, it is precisely this type of donor that provides the greatest hope of increasing the number of living donors and relieving the current organ shortage.[113] But cases like these entail long anticipated waiting times. Managing expectations and clearly communicating risks to the patient are crucial because so many variables can change in the interim.

At least two Advanced Donors already fall into this long wait category. Howard Boardman, a sixty-six year old retired judge, wanted to help his grandson, Quinn, who was born with a single defective kidney.[114] Although Quinn would need a kidney transplant at some point, Mr. Boardman would be too old to donate when that day arrived. Boardman started a kidney chain by donating to a stranger in 2014, in exchange for a priority "voucher" that his grandson could use when he ultimately needed a transplant.[115] That date could be years down the road, as

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[113] *See* Rivero, *supra* note 1 (providing an example of an individual who donated a kidney to a stranger in exchange for assurance that his grandson would get a kidney in the future).
[114] Erika Edwards, *Will "kidney coupons" revolutionize transplants?*, WWLP.COM (July 11, 2016, last updated 8:56 A.M.), http://wwlp.com/2016/07/11/will-kidney-coupons-revolutionize-transplants/.
[115] Id.

Boardman recognized: "I've left a legacy for my grandson," he said, "I may not even be here when he realizes it . . . ."[116]

In another case, a teenage girl had a functioning transplanted kidney.[117] But transplanted kidneys from deceased donors last, on average, for only eight to twelve years, and transplanted kidneys from living donors last, on average, for only twelve to twenty years,[118] meaning that she would eventually need another transplant. Moreover, because of the prior transplant, she would be sensitized and thus more difficult to match.[119] Her father donated a kidney under ADP, in exchange for a "gift certificate" granting her priority should she need a second transplant.[120]

The grandfather to grandson example could be even more complicated if multiple grandchildren were at risk of renal failure. NKR allows for up to five potential IR's to be listed,

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[116] Rivero, *supra* note 1.
[117] Id.

[118] *The Benefits of Transplant versus Dialysis*, BETH ISRAEL DEACONESS MED. CTR., http://www.bidmc.org/Centers-and-Departments/Departments/Transplant-Institute/Kidney/The-Benefits-of-Transplant-versus-Dialysis.aspx (last visited Oct. 2, 2016).

[119] *See Highly Sensitized Transplants*, CEDARS-SINAI, https://www.cedars-sinai.edu/Patients/Programs-and-Services/Comprehensive-Transplant-Center/Kidney-and-Pancreas/Conditions-and-Treatments/Highly-Sensitized-Transplants.aspx (last visited Oct. 2, 2016) (explaining why some individuals with prior transplants are harder to match).

[120] Rivero, *supra* note 1.

stating that, "the first appropriate candidate for transplant will get the ADP kidney."[121] However, the "first appropriate candidate for transplant" will not always be clear and the factors that will be used in reaching a determination as to who is the first "appropriate candidate" are not defined. To illustrate, consider a situation in which multiple beneficiaries have chronic renal insufficiency (as could be the case if, for example, the kidney problem were genetic). Determining the most appropriate candidate may involve multiple considerations including the progression and severity of the disease and the age, diagnosis, and overall health condition of the candidates. For example, what if one beneficiary is more sick, and thus arguably the "most appropriate" candidate, but is middle aged? The other beneficiary may be able to last on dialysis longer, but is younger, thus giving the transplanted kidney a longer useful life. There is currently no indication in the ADP consent forms of how the "appropriate candidate" issue would be resolved or who has the authority to resolve it.

Finally, whether the existence of formal contract is acknowledged officially or not, it is crucial to develop certain contingency plans for when circumstances prevent the participating

[121] National Kidney Registry, Advanced Donation Program, Informed Consent, Intended Donor, Appendix.

parties from proceeding according to plan. In ADP, the IDs typically donate before the IRs are matched. Hence some IRs might find themselves no longer eligible for transplant surgery (this could happen if the health condition of the IR deteriorates), after their IDs have already undergone donation surgery. The IR consent form states: "I understand that this is non-transferable, and non-assignable."[122] The ID consent form does not contain such language. It can be argued that if the IR becomes ineligible for transplant surgery and her ID has donated, the priority should be transferrable, in which case someone should have the authority to designate another IR. In any event, the restriction should at least be explicitly included in the ID consent form, as the ID is the party to whom NKR is contractually obligated. Similar concerns have been raised,[123] and NKR has adjusted its policy to allow an ADP donor to have up to five intended recipients, mediating this problem somewhat.[124] But more clarity is still needed on the nature of the authority to re-assign priority and the ownership—to the extent it exists—of such authority, in the event that no named beneficiary is able to utilize the ADP priority. For ADP

[122] National Kidney Registry, Advanced Donation Program, Informed Consent, Intended Recipient, Appendix.

[123] *Supra* note 26.

[124] *See Living Donors*, NAT'L KIDNEY REG., http://www.kidneyregistry.org/living_donors.php?cookie=1.

practice to evolve and benefit more people, much effort is needed to prescribe reasonable courses of action in cases where it becomes challenging for the participants to perform as intended.

V

CONCLUSION

Organ donation has long been regarded as a noble and selfless act. Yet years of organ shortage suggest that altruistic donation has, so far, been insufficient to meet demand. This motivates transplant professionals to innovate, both in medical science and in the organization of transplantation. KPD and its variation, ADP, stand out among such innovations. By participating in these new systems, instead of passively waiting for a match to be identified by UNOS, renal failure patients can now influence their fates for the better. But, as a natural byproduct, more people are involved, and more complicated incentives and more unpredictable outcomes are introduced.

Analyzing KPD and ADP systems as matching markets—as economists have done for many years in developing the matching algorithms—helps to highlight this inevitable complexity and uncertainty. ADP involves multiple parties whose promises of performance are often separated in time from actual performance. Yet medical professionals have resisted

(unsuccessfully, as we have detailed) the use of the most common market mechanism for aligning incentives under such conditions—a contract. Although a set of consent forms are used to communicate with the donors and recipients, those consent forms are vaguely worded, leaving much room for interpretation. Moreover, there is limited information in the consent forms covering contingency situations, making it challenging to manage participant expectation, and raising the question whether the consent forms are adequate in informing the parties involved.

Transplant professionals—like many non-lawyers—are not fond of the idea of adding complex legal documents into the transplantation process, fearing it will undermine the foundation of trust and selflessness on which the transplantation system is built, and might impede their abilities to adapt to the fast-changing practice in the future. In the case of ADP, however, this resistance inadvertently created a vague yet binding contract, despite efforts to "leave the lawyer out of the room." Although the most likely result of this contract is low-powered enforcement, there is always the possibility that a court will intervene more aggressively, interpreting vague terms in a manner that imposes specific obligations on the parties involved, including NKR.

As with many other innovations, kidney exchange has great potential in improving social welfare. At the same time, it is complex and vulnerable to miscommunication and mistrust. Therefore, clarity and appropriate prescriptive rules of behavior are needed. Though contract is only one mechanism for achieving that clarity, it is an important one under the circumstances. Moreover, it is a mechanism the transplant community has already inadvertently embraced. Having entered the realm of contract, a more careful drafting of that contract only makes sense.

Appendix

National Kidney Registry

Advanced Donation Program

Informed Consent
Intended Recipient

Version 1.7

Intended Recipient's Government Issued Photo Identification

The Program: The Advanced Donation Program "ADP" allows a medically and psychosocially acceptable Intended Donor "ID" to donate their kidney via human organ paired donation (more commonly referred to as a swap) before their Intended Recipient "IR" is scheduled to receive a transplant via a swap. Once the ID donation has occurred, the IR may be activated by their transplant center for matching within the NKR. The ADP program is unrelated to the U.S. deceased donor system and participation in the ADP program does not confer any wait time points for the IR in the deceased donor system. When an ADP Donor has multiple Intended Recipients, the first appropriate candidate for transplant will get the ADP kidney.

Your Situation: I understand that my ID would like to participate in the ADP and donate a kidney to another recipient through the NKR. This donation gives me a prioritized opportunity to receive a kidney as part of a swap, within the NKR.

Information Release: I consent to the disclosure of all my health, medical, and personal information to the NKR for the purpose of participating in the ADP. I authorize the NKR to disclose, disseminate and utilize my health, medical and personal information in conducting the ADP, and I waive any and all privacy law claims that I may or may not have, in the use of this information as part of the ADP.

My Obligation: I understand that I must keep a copy of this form and present it to my transplant center when I return to receive my kidney. Additionally, I am willing to undergo the identity verification process when I return to receive my kidney. I understand that this is non-transferable, and non-assignable.

Patients Risks: There is risk that I may not get transplanted through the ADP due to:

- A sensitization event (e.g. blood transfusion, pregnancy, etc.)
- A situation whereby I become medically unable to go to surgery
- NKR's inability to find an acceptable compatible donor
- NKR unexpectedly shutting down operations
- Having a blood type of "O" which can often delay a match offer for 1 - 2 years or more after activation
- Being sensitized with a cPRA of 90% or greater which can often delay a match offer for 1 - 2 years or more after activation
- Other unforeseen circumstances such as an act of nature

Intended Recipient Contact Information

Address:	
Primary Phone Number:	Email Address:
Secondary Phone Number:	Transplant Center:

Informed Consent Agreed to:

Name (Print):
Signature (Sign):
Today's Date:
SSN: DOB:

Intended Recipient Identification Information

Blood Type: A B O AB Gender: M F

Enter HLA Antigens Below:

A-1	A-2	B-1	B-2	DR-1	DR-2

Witnessed by:

Name (Print):	Signature (Sign):	Date:

Overnight original signed copy to: ***National Kidney Registry • 42 Fire Island Avenue • Babylon, NY 11702***

National Kidney Registry

Advanced Donation Program

Informed Consent
Intended Donor

Version 1.7

Intended Donor's Government Issued Photo Identification

The Program: The Advanced Donation Program "ADP" allows a medically and psychosocially acceptable Intended Donor "ID" to donate their kidney via human organ paired donation (more commonly referred to as a swap) before their Intended Recipient "IR" is scheduled to receive a transplant via a swap. Once the ID donation has occurred, the IR may be activated by their transplant center for matching within the NKR. The ADP program is unrelated to the U.S. deceased donor system and participation in the ADP program does not confer any wait time points for the IR in the deceased donor system. When an ADP Donor has multiple Intended Recipients, the first appropriate candidate for transplant will get the ADP kidney.

Your Situation: I would like to participate in the ADP and I am willing to donate a kidney to an NKR patient and understand that my donation would give my IR a prioritized opportunity to receive a kidney as part of a swap within the NKR.

Information Release: I consent to the disclosure of all my health, medical, and personal information to the NKR for the purpose of participating in the ADP. I authorize the NKR to disclose, disseminate and utilize my health, medical and personal information in conducting the ADP, and I waive any and all privacy law claims that I may or may not have, in the use of this information as part of the ADP.

Risks:

- I may not be able to find a match and donate my kidney through the ADP
- I may become unsuitable for donation at any time in the process
- My surgery may be delayed or cancelled at any time due to unforeseen events
- NKR unexpectedly shutting down operations
- There is no guarantee that my IR will be transplanted through the ADP

Intended Donor Contact Information

Address:	
Primary Phone Number:	Email Address:
Secondary Phone Number:	Donor Center:

Informed Consent Agreed to:

Name (Print):
Signature (Sign):
Today's Date:
SSN:
Donor Alias (Assigned by Center):

Intended Recipient Identification Information

Name:
DOB:
SSN:
Relationship to IR:
Intended Recipient Alias:

Witnessed by:

Name (Print):	Signature (Sign):	Date:

Overnight original signed copy to: ***National Kidney Registry • 42 Fire Island Avenue • Babylon, NY 11702***