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Stability of Organ Donor Designations on Driver's Licenses

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Abstract

Background—Little is known about the stability of decisions that people make to be organ donors. We sought to determine the rate of stability of organ donor designations on driver's licenses.

Methods—With the use of a cross-sectional study design, we reviewed the health records of 2500 randomly selected primary-care patients at a large urban safety-net medical system to obtain their demographic and medical characteristics. We also examined the two most recent unique driver's licenses, state identification cards, or learner's permits that were scanned into electronic health records as part of the patient registration process. We obtained organ donor designations from these documents for each patient.

Results—Of all patients, 1174 (47%) had two driver's licenses, identification cards, or permits in their electronic medical records. The two documents were issued an average of 3.5 years apart. Overall, 114 (10%) patients had differing organ donor designations on their two documents. Among the 502 patients who were designated as organ donors on the first document, 32 (6%) were not designated as organ donors on the second document. Among the 672 patients who were not designated as organ donors on the first document, 82 (12%) were designated as organ donors on the second document. There was little relationship between stability of organ donor designations and patient demographic and medical characteristics.

Conclusions—About 1 of every 10 patients changed their organ donor designation, but stability was not associated with any demographic or medical factors. Further work is needed to understand why individuals change their organ donor designation.

Many aspects of organ donation have been extensively studied [1–4]. However, little is known about the stability of decisions that people make to be organ donors, for example, how often individuals change their organ donor designations. Furthermore, past studies on

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willingness to donate have relied on asking respondents if they were willing to donate or were designated as organ donors on driver's licenses [1–3,5–8]. By not directly checking respondents' licenses to verify donation designation, these studies may be susceptible to social desirability bias or the tendency of individuals to answer questions in a manner that will be viewed favorably by others. Social desirability bias may confound research results by creating false relationships or obscuring relationships among variables [9–11]. We sought to overcome this limitation by examining driver's licenses or similar documents, which record actual donation designations. We were able to examine these because they are scanned into patients' electronic health records at each clinical encounter at a large urban safety-net medical system. Knowing more accurately the stability of donor preferences may help inform future efforts to increase organ donation.

METHODS

This study was conducted at an urban safety-net medical system in northeast Ohio that includes a large tertiary care hospital and more than a dozen community centers located in both poor and wealthy communities. We randomly selected 2500 active patients from the electronic health record. Active patients were defined as those who saw their primary care physician at least twice in the preceding 2 years. Only patients over the age of 18 years were eligible for this study.

From electronic health records, we obtained patient demographic characteristics including age, sex, race, ethnicity, language, marital status, employment status, health insurance, and zip code. We also determined the presence of specific common comorbid conditions based on relevant ICD-9 codes, including hypertension, chronic obstructive pulmonary disease, diabetes, cancer, cerebrovascular accident, chronic kidney disease, congestive heart failure, connective tissue disease, peripheral vascular disease, myocardial infarction, peptic ulcer disease, AIDS, and liver disease. Because we did not have data on individual income, we used census data to obtain the median household income of each patient's zip code.

From January 2016 to March 2016, 2 researchers independently examined the 2 most recent unique driver's licenses, state identification cards, or learner's permits to determine each patient's organ donor designation at 2 different times. A third researcher resolved any discrepancies between the 2 researchers. This study was approved by the Institutional Review Board of MetroHealth Medical Center, Cleveland, Ohio (approval No. 685, protocol No. 13-00548).

We used descriptive statistics (percentages, means, and standard deviations) to describe the characteristics of the patients. We used the χ^2 test to determine the univariate relationship between change in organ donor designation and several predictor variables, including demographic characteristics and medical characteristics. We used logistic regression to determine the multivariate relationship between change in organ donor designation and all predictor variables. All statistical analyses were performed using JMP Pro 11.0 (SAS Institute, Cary, NC, United States).

RESULTS

Of the 2500 randomly selected patients, 937 (37%) had only 1 license, card, or permit; 377 (15%) had no documentation; and 12 (0.6%) had only illegible documentation. The remaining 1174 (47%) patients had 2 licenses, cards, or permits documenting organ donor designation in their medical records. The 2 documents were issued an average of 3.5 years (standard deviation, 1.3 years) apart. Compared with the 1174 patients with 2 documents, the 1326 patients without 2 documents were more likely to be male (50% vs 37%), less likely to be black (29% vs 39%) or Hispanic (2% vs 6%), more likely to speak a language other than English or Spanish (8% vs 4%), more likely to be uninsured (13% vs 4%), more likely to have more medical conditions (0.5 vs 0.9), and more likely to have a higher income (\$42,700 vs \$39,000). The 2 groups were similar in marital status and employment status.

The demographic and medical characteristics of patients with a donation designation are listed in Table 1. A majority of patients were female, spoke English, were not married, were unemployed, and had private insurance.

Among the entire sample of 1174 patients, 114 (10%) had differing organ donor designations on their 2 documents. Among the 502 patients who were designated as organ donors on the first document, 32 (6%) were not designated as organ donors on the second document. Among the 672 patients who were not designated as organ donors on the first document, 82 (12%) were designated as organ donors on the second document. There was little relationship between stability of organ donor designations and patient demographic and medical characteristics. For example, 11% of patients 18 to 34 years of age changed their organ donor designation, 10% of patients 35 to 54 years of age changed their organ donor designation, and 7% of patients 55 years of age changed their organ donor designation ($P = .12$; Table 2). No patient characteristics were associated with stability of organ donor designation on multivariate analyses (results not shown).

DISCUSSION

We found that about 1 in 10 of the patients at a large urban safety-net medical system changed their donor designation from driver's license, state identification card, or learner's permit to the next. We also found no demographic or medical characteristics to be associated with donor stability. The strengths of this study include a large and diverse sample of patients, the direct verification of donor designation rather than relying on self-reported measures of willingness to donate, and objective measures of patient characteristics.

Although there has been no previous work done on stability of organ donor designation, many previous studies have looked at the stability of advance directives, which are another important area of end-of-life decision-making and encompass organ donation [3,12]. Advance directives provide patients the opportunity to express their wishes regarding life-sustaining treatments (via a living will), their choice for a surrogate decision maker (via a durable power of attorney for health care), or both [13,14]. A systematic review of studies on advance directives found that stability ranged from 63% to 89% over periods ranging from 1 to 36 months [15]. In comparison, we found the rate of stability for donor

designations to be 90% over an average of 3.5 years. Moreover, studies on advance directives generally found no relationship between stability of advance directives and patient characteristics such as age, sex, or race [16–21]. We also found no relationship between stability of donor designations and demographic or medical characteristics.

Several limitations must be considered in interpreting our study results. First, the modest number of patients who changed their organ donor designation may have limited our ability to find significant associations with patient demographic and medical characteristics. Second, all study subjects were individuals receiving care from a single health system so the results may not generalize to patients in other health systems or to the general public. Third, we did not have direct measures of certain variables of interest such as income and education.

Our findings raise several important questions. First, why do individuals change their organ donor designations? It is possible that clerks at motor vehicle bureaus may not consistently ask patrons whether they would like to consent to organ donation. In a study of donation consent obtained within Ohio bureaus of motor vehicles, 9% of participants were not asked about donation [22]. Second, what can be learned from individuals who change their organ donor designation that might help promote donation efforts? Third, do individuals who change their organ donor designation discuss these decisions with their families? This is important because organ procurement organization staff are often reluctant to go against the wishes of families even when signed organ donor designations are available [23–25]. Further research is needed to understand these questions. In the meantime, we recommend that individuals discuss any changes in their organ donor designation with their families.

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References

1. Baughn D, Rodrigue JR, Cornell DL. Intention to register as organ donors: a survey of adolescents. *Prog Transplant*. 2006; 16:260–7. [PubMed: 17007163]
2. Boulware LE, Ratner LE, Sosa JA, et al. Determinants of willingness to donate living related and cadaveric organs: identifying opportunities for intervention. *Transplantation*. 2002; 73:1683–91. [PubMed: 12042662]
3. Thornton JD, Curtis JR, Allen MD. Completion of advanced care directives is associated with willingness to donate. *JAMA*. 2006; 98:897–904.
4. Rodrigue JR, Fleishman A, Fitzpatrick S, Boger M. Organ donation knowledge, willingness, and beliefs of motor vehicle clerks. *Transplantation*. 2014; 98:1025–8. [PubMed: 25222015]
5. Wakefield CE, Reid J, Homewood J. Religious and ethnic influences on willingness to donate organs and donor behavior: an Australian perspective. *Prog Transplant*. 2011; 21:161–8. [PubMed: 21736247]
6. Wakefield CE, Watts KJ, Homewood J, et al. Attitudes toward organ donation and donor behavior: a review of the international literature. *Prog Transplant*. 2010; 20:380–91. [PubMed: 21265292]
7. Siminoff LA, Burant CJ, Ibrahim SA. Racial disparities in preferences and perceptions regarding organ donation. *J Gen Intern Med*. 2006; 21:995–1000. [PubMed: 16918748]
8. Thornton JD, Wong KA, Cardenas V, et al. Ethnic and gender differences in willingness among high school students to donate organs. *J Adolesc Health*. 2006; 39:266–74. [PubMed: 16857540]

9. Paulhus DL, Reid DB. Enhancement and denial in socially desirable responding. *J Pers Soc Psychol.* 1991; 60:307–17.
10. Krumpal I. Determinants of social desirability bias in sensitive surveys: a literature review. *Qual Quant.* 2013; 47:2025–47.
11. Persoskie A, Leyva B, Ferrer RA. Mode effects in assessing cancer worry and risk perceptions: is social desirability bias at play? *Med Decis Making.* 2014; 34:583–9. [PubMed: 24718657]
12. Thornton JD, Sullivan C, Albert JM, et al. Effects of a video on organ donation consent among primary care patients: a randomized controlled trial. *J Gen Intern Med.* 2016; 31:832–9. [PubMed: 26921161]
13. Silveira MJ, Kim SYH, Langa KM. Advance directives and outcomes of surrogate decision making before death. *N Engl J Med.* 2010; 362:1211–8. [PubMed: 20357283]
14. Committee on Approaching Death: Addressing Key End of Life Issues, Institute of Medicine. *Dying in America: Improving Quality and Honoring Individual Preferences Near the End of Life.* Washington (DC): National Academies Press (US); 2015. <http://dx.doi.org/10.17226/18748>
15. Auriemma CL, Nguyen CA, Bronheim R, et al. Stability of end-of-life preferences: a systematic review of the evidence. *JAMA Intern Med.* 2014; 174:1085–92. [PubMed: 24861560]
16. Barrio-Cantalejo IM, Simón-Lorda P, Molina-Ruiz A, et al. Stability over time in the preferences of older persons for life-sustaining treatment. *J Bioeth Inq.* 2013; 10:103–14. [PubMed: 23288442]
17. Ganzini L, Lee MA, Heintz RT, et al. The effect of depression treatment on elderly patients' preferences for life-sustaining medical therapy. *Am J Psychiatry.* 1994; 151:1631–6. [PubMed: 7943452]
18. McParland E, Likourezos A, Chichin E, et al. Stability of preferences regarding life-sustaining treatment: a two-year prospective study of nursing home residents. *Mt Sinai J Med.* 2003; 70:85–92. [PubMed: 12634900]
19. Wittink MN, Morales KH, Meoni LA, et al. Stability of preferences for end-of-life treatment after 3 years of follow-up: the Johns Hopkins Precursors Study. *Arch Intern Med.* 2008; 168:2125–30. [PubMed: 18955642]
20. Carmel S, Mutran EJ. Stability of elderly persons' expressed preferences regarding the use of life-sustaining treatments. *Soc Sci Med.* 1999; 49:303–11. [PubMed: 10414816]
21. Danis M, Garrett J, Harris R, Patrick DL. Stability of choices about life-sustaining treatments. *Ann Intern Med.* 1994; 120:567–73. [PubMed: 8116994]
22. Thornton JD, Alejandro-Rodriguez M, Leon JB, et al. Effect of an iPod video intervention on consent to donate organs: a randomized trial. *Ann Intern Med.* 2012; 156:483–90. [PubMed: 22473435]
23. Christmas AB, Burris GW, Bogart TA, Sing RF. Organ donation: family members not honoring patient wishes. *J Trauma.* 2008; 65:1095–7. [PubMed: 19001980]
24. Christmas AB, Mallico EJ, Burris GW, et al. A paradigm shift in the approach to families for organ donation: honoring patients' wishes versus request for permission in patients with Department of Motor Vehicles donor designations. *J Trauma.* 2008; 65:1507–9. [PubMed: 19077650]
25. Shaw D. We should not let families stop organ donation from their dead relatives. *BMJ.* 2012; 345:e5275. [PubMed: 22872697]

Table 1

Demographic and Medical Characteristics of Patients (n = 1174)

Age, years	46.0 (16.0)
Sex	
Female	743 (63%)
Male	431 (37%)
Race	
White	511 (44%)
Black	461 (39%)
Other	202 (17%)
Ethnicity	
Hispanic	70 (6%)
Non-Hispanic	1104 (94%)
Language	
English	1077 (92%)
Spanish	54 (5%)
Other	43 (4%)
Marital status	
Married	315 (27%)
Not married	859 (73%)
Employment status	
Employed	455 (39%)
Unemployed	719 (61%)
Insurance	
Private	604 (51%)
Government	520 (44%)
None	50 (4%)
Annual household income, \$1000	40.0 (17.8)
Total medical conditions	0.9 (1.2)

Numbers indicate mean (standard deviation) for continuous variables and n (percentage) for categorical variables.

Table 2

Percentage of Patients Whose First and Second Donor Designation Differed

	Entire Sample (n = 1174)	P Value	Second Donor Designation Differed From First (%)				P Value	Not Donor at First Designation (n = 672)	P Value
			Organ Donor at First Designation	32 (6%)	–	82 (12%)			
All patients	114 (10%)	–							–
Age, years		.12					.21		.05
18–34	39 (11%)		15 (9%)			24 (13%)			
35–54	48 (10%)		11 (5%)			37 (15%)			
55	27 (7%)		6 (5%)			21 (8%)			
Sex		.86					.52		.35
Female	73 (10%)		20 (6%)			53 (13%)			
Male	41 (10%)		12 (7%)			29 (11%)			
Race		.50					.15		.73
White	44 (9%)		13 (5%)			31 (14%)			
Black	50 (11%)		13 (10%)			37 (11%)			
Other	20 (10%)		6 (7%)			14 (12%)			
Ethnicity		.44					.60		.46
Hispanic	5 (7%)		1 (4%)			4 (9%)			
Non-Hispanic	109 (10%)		31 (7%)			78 (12%)			
Language		.45					.59		.08
English	107 (10%)		29 (6%)			78 (13%)			
Spanish	5 (9%)		2 (9%)			3 (9%)			
Other language	2 (5%)		1 (17%)			1 (3%)			
Marital status		.56					.06		.48
Married	28 (9%)		5 (3%)			23 (14%)			
Not married	86 (10%)		27 (8%)			59 (12%)			
Employment		.52					.31		.51
Employed	41 (9%)		13 (5%)			28 (13%)			
Unemployed	73 (10%)		19 (7%)			54 (12%)			
Insurance		.31					.14		.56
Private	51 (8%)		15 (5%)			36 (12%)			

	Second Donor Designation Different From First (%)					
	Entire Sample (n = 1174)	P Value	Organ Donor at First Designation (n = 502)	P Value	Not Donor at First Designation (n = 672)	P Value
Government	57 (11%)		16 (10%)		41 (12%)	
None	6 (12%)		1 (4%)		5 (19%)	
Income, \$		.24		.33		.10
<30,000	34 (9%)		11 (9%)		23 (9%)	
30,000–44,999	50 (12%)		12 (7%)		38 (15%)	
45,000	30 (8%)		9 (5%)		21 (12%)	
Number of medical conditions		.86		.86		.61
0	55 (9%)		18 (6%)		37 (13%)	
1	32 (11%)		8 (7%)		24 (13%)	
2	27 (9%)		6 (7%)		21 (10%)	

Numbers indicate n (percentage).