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Interim Results of a National Test of the Rapid Assessment of Hospital Procurement Barriers in Donation (RAPiD)

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Abstract

Organ donation remains a major public health challenge with over 114 000 people on the waitlist in the United States. Among other factors, extant research highlights the need to improve the identification and timely referral of potential donors by hospital health-care providers (HCPs) to organ procurement organizations (OPOs). We implemented a national test of the Rapid Assessment of hospital Procurement barriers in Donation (RAPiD) to identify assets and barriers to the organ donation and patient referral processes; assess hospital–OPO relationships and offer tailored recommendations for improving these processes. Having partnered with seven OPOs, data were collected at 70 hospitals with high donor potential in the form of direct observations and interviews with 2358 HCPs. We found that donation attitudes and knowledge among HCPs were high, but use of standard referral criteria was lacking. Significant differences were found in the donation-related attitudes, knowledge and behaviors of physicians and emergency department staff as compared to other staff in intensive care units with high organ donor potential. Also, while OPO staff were generally viewed positively, they were often perceived as outsiders rather than members of healthcare teams. Recommendations for improving the referral and donation processes are discussed.

Keywords

Education; organ donation; quality assessment; qualitative research

Introduction

Despite legislative efforts, public–private partnerships, such as the Organ Donation Breakthrough Collaborative, and work by advocacy organizations like the National Kidney Foundation organ donation continues to be a major public health challenge. The need for life-saving organ transplants is unrelenting with over 114 000 candidates on the national waitlist (1). With thousands more Americans suffering from chronic and/or end-stage organ failure, these numbers are unlikely to decrease in the future (1). After the substantial gains made between 2003 and 2007, largely associated with the Collaborative’s work, donation rates have plateaued at approximately 8000 donors per year during the last 5 years (1,2). As such, the Collaborative’s efforts are not currently meeting the rising demand for donors. These discouraging statistics signify a need to more finely assess the organization of the donation process in hospitals as a first step towards increasing donation rates.

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The Spanish Model has often been cited as one of the most effective systems of organ procurement. Although many have attributed Spain's deceased organ donor rate to presumed consent laws, the family and their wishes about organ donation are still ascertained before donation proceeds (3). Moreover, the Spanish model is particularly effective because it takes advantage of the Spanish health care system. In Spain, each procurement hospital is mandated to retain a transplant coordinator who is specially trained and focuses on organ donation on a part-time basis. Thus, even hospitals with low-medium donor potential have coordinators on staff to assist healthcare providers (HCPs) in the care of potential donors. Spanish hospitals are also monetarily rewarded for successful procurement. The Model increased organ recovery in Spain from 14 to 32 organ donors per million people in 2010 (4) by increasing hospital accountability for donation. The United States has a donor rate of 26.3 per million people (5). The successes of the Collaborative and the Spanish focus on hospital accountability highlight the important role that hospital policies and procedures have for the success of any organ procurement system. It should be noted that, according to recently reported donation rates for US OPOs, approximately 15 OPOs exceeded the donation rates of Spain (6).

Given organizational differences in US and Spanish healthcare systems, the Spanish Model cannot be easily implemented in American hospitals. However, other means exist for improving the organ donation referral and request processes in the United States. While current literature underscore factors that positively affect consent, such as joining state donor registries and communicating a donor predesignation to family (7,8), the timely identification and referral of potential donors to organ procurement organizations (OPOs) remain critical prerequisites to catalyzing and ensuring the use of best practices in the request process. Time-sensitive patient identification and referral are also indicative of the ability of the hospital and OPO to collaborate on the organ donation and retrieval process (9–11). HCPs must work effectively with OPO staff for organ donation to take place. Research shows that strong OPO–hospital collaboration yields better donation outcomes (8,12–16). Additionally, hospitals must cultivate a positive donation climate (17), which includes the attitudes, knowledge and behaviors of HCP to optimize donation processes and outcomes (11,18–26). As demonstrated by the Collaborative, providing the evidence base to pinpoint the quality of these partnerships is critical to improving organ donation efforts (27). Therefore, the approach presented in this article is guided by literature on behavior change within healthcare organizations using “practice-enabling” or reinforcing methods (28,29), which emphasize that change occurs reliably when barriers are addressed, gaps demonstrated and resources deployed to help HCPs perform desired behaviors and activities.

Accordingly, we developed the Rapid Assessment of Hospital Procurement Barriers in Donation (RAPiD) to understand and address OPO–hospital performance on a sustained basis (30,31). The RAPiD is a continuous quality improvement tool that generates empirical data about the quality of the OPO–hospital relationship and the milieu within which organ donation activities are performed. Specifically, the RAPiD uses qualitative methods to identify and correct deficiencies in the identification and referral of donor-eligible patients, providing a holistic portrait of hospitals' organ donation cultures. A pilot test of the RAPiD within the catchment area of one Midwestern OPO demonstrated promising results (30). Building on this work, the current project tests the RAPiD in a national sample to examine the RAPiD's effectiveness at increasing donation referral and consent rates. Here, we describe the implementation and results of the first phase of the ongoing national, multisite, randomized controlled trial of the RAPiD.

Materials and Methods

OPO and hospital samples

Seven OPOs representing geographically diverse regions of the United States (i.e. South, Southwest, Midwest, East and Southeast) agreed to collaborate. At the study's outset, the OPOs collectively served 366 counties and a population of almost 47 million; four OPOs reported crude donation rates (calculated as the number of donors per 100 eligible deaths) above the national average of 66.4 (6,32). All identified hospitals with high donor potential, that is, a yearly average of five or more eligible donors, for inclusion in the study. A total of 99 A (10 or more eligible donors per year) and B (5–9 eligible donors per year) hospitals, representing 14.9% of the OPOs' donor service area, were invited to participate, and 70 (70.1%) agreed. The preassessments were staggered by OPO and hospital availability and took place from June 2009 to March 2011; most were conducted from November 2009 to June 2010. Table 1 displays the characteristics of the samples of invited and participating hospitals by OPO.

Data collection

The specific data collection procedures used in the RAPiD are described in detail elsewhere (29,30). In brief, data collection involved on-site evaluations of hospital units seeing the most potential donors (e.g. intensive care units [ICUs], critical care units [CCUs] and emergency departments [EDs]). Evaluations were facilitated by key contacts (e.g. administrators, charge nurses), who ensured entry and orientation to the units to be assessed. Data collection entailed direct observation of units to assess the donation environment, such as "Donate Life" posters, notices of early referral criteria and other donation-related items and semistructured, intercept interviews with hospital administrators and HCPs (see Ref. 29 for RAPiD areas of inquiry). In some instances, small focus groups were held rather than individual interviews. Hospital staff were interviewed to the point of redundancy or saturation (33). On average, 33.7 people were interviewed at each hospital. Before each interview, a short overview of the study was provided to the HCP and verbal informed consent for participation obtained. With permission, the interaction was digitally audio recorded for analysis, but no identifiers were collected (i.e. names). The study (R01DK081118) was reviewed and approved by the Virginia Commonwealth University Institutional Review Board (approval #HM11773), as well as by hospital-level review boards when requested.

Data analysis

After extensive training in the data analysis procedures, 17 assessors and 5 additional members of the research team coded the interviews and observational data. A codebook, developed based on the pilot study and an accompanying manual guided the coding process along three overarching themes—HCP knowledge, attitudes and behaviors regarding donor-eligible patient identification and referral. Specifically, interviews were coded for HCPs' knowledge of the organ donation process, early referral criteria and the hospital's organ donation policy; attitudes towards organ donation and early referral, placing referrals, patient versus donation advocacy and perceptions of the relationship with the regional OPO and frequency of contact with the OPO, use of referral criteria, timeliness of referrals, profiling families for receptivity to the concept of donation and determination of donor eligibility. A total of 242 (10.3%) interviews were double coded for reliability. Inter-coder reliability, as measured via percent agreement, ranged from 62.5% to 100% with an overall reliability of 90.1%. Disagreements were resolved through discussion to consensus.

Frequency counts, with corresponding percentages, were used to characterize the coded variables. Subgroup analyses were performed using the Chi-square test statistic to identify

differences in attitudes, knowledge and behaviors of HCPs by unit (i.e. ICU/CCU, ED and other) and interviewee role (i.e. MD, RN and other). When significance was found, the z-test statistic was calculated to identify the specific categories having statistically significant differences; the Bonferroni method was used to adjust the p value given the multiple statistical tests performed. A p value of 0.05 or less was used to determine statistical significance. Statistical analyses were performed using IBM SPSS 20.

Results

HCP sample

We completed interviews with 2358 HCPs, including 1890 nurses (80.2%), 342 physicians (14.5%) and 126 (5.3%) other hospital staff (e.g. 24 social workers [1.0%], 59 chaplains [2.5%] and 43 hospital administrators [1.8%]), in 209 ICUs/CCUs and EDs. We interviewed a range of 153–554 HCPs in each OPO's catchment area and an average of 27 nurses, 4.9 physicians and 1.8 other HCPs, at each hospital. Table 2 displays the sample by interviewee role and OPO. Hospital evaluations ranged from 1 to 9 days; 0.75–16.5 h were spent in each unit depending on its size.

HCP attitudes, knowledge and behaviors regarding donor-eligible patient referral

The analysis focused on three factors—HCPs' attitudes, knowledge and behaviors—that can positively or negatively affect the early referral of potential organ donors. In concert, these factors provide a rich view of organ donation and the referral processes in the hospitals assessed. The results are presented below by theme and subgroup analysis.

Attitudes—Attitudes toward organ donation were overwhelmingly positive, with only 1% of HCPs interviewed expressing negative views on donation (see Table 3). Although a majority viewed organ donation as part of standard end-of-life care (65.4%), a sizeable minority perceived a conflict between donation and patient care. In addition, most HCPs (54.7%) did not believe that donation advocacy precluded patient advocacy. Consistent with these findings, a large majority (82.4%) believed that the OPO should be involved in end-of-life decision-making and only a small minority (8%) viewed the presence of the OPO as a last resort or an indication of failure. Most interviewees also reported a sense of urgency with regard to donor-eligible patient referral (57.2%). However, attitudes toward OPOs varied. Despite a majority of HCPs (56.4%) reporting OPO staff to be helpful and supportive, OPO staff were nonetheless perceived as outsiders (62.6%); few equated OPO staff with “vultures” (2.4%) or “bullies” (2.4%). Overall, 80.8% reported a good, working relationship between the OPO and the hospital, 10.3% a strained relationship and 1.7% described the relationship as poor.

Knowledge—Knowledge of the donation process and, specifically, the criteria for referral was also high (Table 4). Most HCPs (88.3%) exhibited some understanding of the donation process as involving the identification of potential donors, the timely referral of those patients to a regional OPO, and the family approach. Many respondents (74.5%) also had partial knowledge of the clinical triggers for referral, including a Glasgow Coma Score of 5 or 4 (depending on the region), consideration of withdrawal of care and indications that the patient will progress to brain death (8). However, only 21.9% were conversant with all the triggers. Additionally, a majority (71.3%) of HCPs knew that donors could be 50 years of age or older and have many medical presentations, such as Hepatitis C. A small minority (10.7%), however, thought only young and healthy patients became donors. Over three-quarters of respondents (79.3%) successfully explained the difference between brain death and coma while 16.2% could not make the distinction and 4.4% feared misdiagnosis when attempting to differentiate between the two conditions. Finally, about one-fifth of

respondents (20.8%) did not know how or where to access their hospital's policy on organ donation, and over half (60.1%) could not adequately explain the policy's contents.

Behaviors—HCPs varied in terms of their referral behaviors. About 60% (60.9%) of the HCPs interviewed reported routine or occasional use of the standard clinical triggers for referral while a large minority (39.1%) rarely or never used them (Table 5). Approximately the same proportion (38%) neither placed nor suggested the placement of referral calls, although 76.3% affirmed that they did not need anyone's permission to do so. It should be noted that it is unclear whether HCPs neglected their duty to place referrals or were simply never provided an opportunity to do so. Alternately, HCPs who reported making no referrals may have been part of a team for which this responsibility was tasked to another HCP. Additionally, 10.2% of HCPs screened the families of potential donors for receptivity to organ donation before placing a referral call and 3.8% determined patients' eligibility as potential organ donors without consulting the OPO.

Subgroup analyses—Significant differences across the three factors were found between HCPs working in an ED as compared to those working in an ICU or CCU, or other units sampled (the "other" category was used to classify interviewees who do not work in a specific unit, such as chaplains and social workers). Fewer respondents in the ED were familiar with the organ donation process (19.9% vs. 52% in ICUs), understood the criteria for donation or patient referral (8.6% vs. 23.9%), communicated a sense of urgency for seizing on every opportunity for organ donation (38.7% vs. 60.1%), knew of or where to obtain hospital's organ donation policy (46.1% vs. 62.8%), or knew the OPO's contact information (63.9% vs. 83.6%). Moreover, fewer HCPs in the ED, compared to those in ICUs, perceived OPO staff to be helpful, supportive members of the hospital team (46.2% vs. 58.4%), reported using referral criteria (13.5% vs. 45.4%), placing calls (31.8% vs. 57.1%), or allowing the OPO to determine patient eligibility (9.4% vs. 13.6%). Conversely, more ED staff reported screening families for receptivity to the concept of organ donation than did HCPs in the ICUs (15.2% vs. 9.1%).

Significant differences were also found by interviewee role, with physicians (MDs) exhibiting markedly less favorable attitudes toward and less knowledge of the identification and referral processes than other respondents. Specifically, although MDs were more likely to understand the need for donors than other interviewees (94.8% vs. 85.4% nurses and 85.1% other interviewees), they were less likely to perceive of donation as part of standard end-of-life care (86.5% vs. 93.2% nurses and 96.6% others) and to communicate a sense of urgency for donation (50.8% vs. 57.2% nurses and 75.5% others). In addition, physicians exhibited a more limited understanding of the organ donation (32.2% vs. 48.6% nurses and 52.4% others) and referral (12.4% vs. 23.4% nurses and 25.8% others) processes. Regarding hospitals' organ donation policies, MDs were less aware of their existence (57.4% vs. 82.5% nurses and 76.9% others), less knowledgeable about the policies' content (24.5% vs. 42.4% nurses and 44.9% others) and less familiar with where to obtain the policies (29.2% vs. 64.7% nurses and 68.7% others). Physicians also reported less frequent contact with the OPO (30.4% vs. 43.6% nurses and 53.3% others) and were less likely to use the hospital's specified referral criteria (19.2% vs. 44.8% nurses and 25.7% others) or place referral calls (26.6% vs. 58.4% nurses and 27.4% others).

Hospital report cards and recommendations

The assessments culminated with the generation of report cards that summarized each individual hospital's performance with an overall rating. Of the 70 participating hospitals, none were given a rating of *excellent*; however, 12 (17.1%) were rated *very good*, 15 (21.4%) *good*, 29 (41.4%) *fair* and 14 (20.0%) a *poor*. The ratings were based on the

enumerated assets and barriers to the successful implementation of organ donation processes within each hospital. Assets facilitated the organ donation process while barriers, which were classed as minor, major or fatal flaws, impeded donation activities.

In addition, the report cards contained recommendations to address listed barriers; Table 6 enumerates the top 10 most recommended hospital development activities. Initiatives targeting knowledge deficits, educational in-services and garnering support among HCPs appeared most frequently (81.4%). Another common suggestion was to increase OPO presence in hospitals beyond moments when donation is imminent (34.3%) and strengthen the OPO–hospital relationship. It was also recommended that residents and nurses be empowered to make referrals once a clinical trigger is present without seeking prior directives.

Discussion

The relationship between a hospital and OPO has inherent tensions. The ability of OPO staff to save the lives of people on the national waitlist through organ donation is largely dependent on the death of donor-eligible patients, who are typically admitted to hospitals because of acute, traumatic and devastating injuries, often incurred through motor vehicle or cerebrovascular accidents. The purpose of hospitals is, of course, to provide life-saving interventions for these same individuals. Whereas HCPs' efforts to identify and refer potential donors in a timely manner are life saving, the hospital–OPO dynamic can be strained, as the individuals caring for donor patients are the same persons on which the system relies for referrals. Thus, special efforts are required for mutually productive relationships that ensure the successful conduct of donation-related activities.

Our results suggest that these relationships need maintenance and/or repair. Just over half (56.4%) of the HCPs interviewed found OPO staff to be helpful or supportive, and only 8% considered them part of the hospital team. While legal and regulatory statutes mandate the involvement of OPO staff during consent for donation and subsequent maintenance of donor-eligible patients, nearly two-thirds of respondents considered OPO staff “outsiders” while some characterized them as “bullies” or “vultures”. Our recommendation of greater OPO presence offers prime opportunities for “teaching moments” by OPO staff during which they could informally correct knowledge gaps, dispel donation myths and build or strengthen relationships with HCPs. Furthermore, restructuring the relationship so that HCPs recognize and are comfortable with OPO staff as members of the healthcare team would assist in this process. Without active engagement and genuine cooperation on the part of both OPO staff and HCPs, the HCP–OPO relationship will continue to be the single most considerable barrier to the organ donation process.

Given the deficits in knowledge and behaviors among ED and physician staff, a recommendation for additional educational in-services was made. As the front lines in the care of traumatically injured patients, ED staff are ideally placed for the timely identification and referral of potential organ donors. Thus, the referral process could be improved by providing HCPs in the ED continuing medical education in clinical triggers for referral (8) and incorporating the triggers into standard ED protocols. Moreover, ED staff should be made aware of their role in the donation process and of the importance of early OPO contact with the families of potential donors. Timely referrals provide OPO request staff with the opportunity to establish rapport with families, provide much needed emotional support, and build a relationship of trust (34–36).

Physicians are well positioned to positively impact organ donation activities for a number of reasons. Physicians occupy positions of authority in the hospital setting, with the potential to

influence hospitals' organ donation cultures and initiate referral behaviors. As our findings demonstrate, many nurses (23.7%) await physician approval or directive before making referrals, frequently leading to late or missed referrals. Physicians also set the tone for donation activities by suggesting or sanctioning referrals by nursing staff without prior permission. We recommended that hospitals and units empower nurses to make referrals on their own accord. In addition, physicians, particularly intensivists, are instrumental in managing potential donors (37). Indeed, consent is more likely when HCPs make positive statements about donation to family decision makers (38); physicians expressing unfavorable attitudes toward and/or knowing little about donation may undermine the process. When adequately informed and trained, however, they become ambassadors for organ donation.

Similarly, HCPs must be guided by the assumption that eligible patients and their families want to donate. We found evidence of profiling families for their receptivity to organ donation, particularly among ED staff and physicians. Not only does required request legislation stipulate that donation be presented as an option (39), past research clearly demonstrates that many families find comfort in knowing that their loved one was able to save others' lives (40–42). For patients who have designated themselves as posthumous organ donors, timely referrals uphold individual autonomy by assuring donation wishes are fulfilled. Since HCPs are only likely to accurately assess families' initial responsiveness to donation half the time (43), HCPs should assume that all families are open to donation, avoid stereotypes about one's desire to donate and consider that further discussion is frequently warranted even if someone does not initially seem open to donation. One study found that 20.3% of families that initially refused donation and 65.8% of families who were undecided at first, eventually consented when reapproached (44). Another study observed that 17% of families, who initially viewed donation unfavorably, actually donated following a second approach by an in-house coordinator (45).

Although this study has generated considerable insight about HCPs' attitudes, knowledge and behaviors, the donation climate of hospitals, and areas of potential improvement, two limitations are noteworthy. First, actual referral behaviors of HCPs could not be triangulated with reported behaviors. Due to the nature of the RAP methodology and the relative rarity of organ donation, observing actual behaviors would have exceeded the scope and time allotted for the assessments. Direct observation would likely interfere with patient care and necessitate that assessors be on-site or available at all times because potential donors are admitted unpredictably and infrequently. Second, the proportion of participating pediatric hospitals (6.8%) was below national estimates (46). Future research should examine the organ donation practices and protocols in pediatric hospitals exclusively, since this topic is rarely studied (47–49).

Conclusion

Although the Organ Donation Breakthrough Collaborative promulgated best practices for organ donation nearly eight years ago, many areas of improvement are still unresolved. In particular, two overarching principles are still germane: (1) "tailor or adapt the organ donation process to complementary strengths of OPO and individual hospitals" and (2) "integrate OPO staff into the fabric of high potential hospitals" (50). In an attempt to address the sustainability of the Collaborative's gains and locate areas in need of improvement, the RAPiD has been designed as a qualitative assessment tool for identifying and recommending remediation of barriers to the successful implementation of organ donation processes. For example, one recommendation focused on the need for strong, positive OPO–hospital relationships. Other recommendations mirrored those of the Collaborative (50), that is, offering evidence-based, educational in-services to improve knowledge of referral criteria

and garner support for organ donation activities among HCPs. This study suggests that continual quality improvement and stronger incorporation of the donor process into the fabric of hospitals may be necessary for noticeably improved performance to supply the nation's need for transplantable organs. Future reports will correlate HCPs attitudes, knowledge and behaviors with donation outcomes (i.e. referral and consent rates) to determine the true impact of hospital environments on OPO performance. Such efforts will advance the valuable gains made by the Breakthrough Collaborative.

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Abbreviations

ED	emergency department
HCP	healthcare provider
ICU	intensive care unit
OPO	organ procurement organization
RAPiD	Rapid Assessment of hospital Procurement barriers in Donation

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Table 1

Characteristics of hospital sample by OPO

Hospital characteristic	Organ procurement organization (OPO)							Total
	1	2	3	4	5	6	7	
Crude donation rate ¹	62.1	69.0	70.8	48.1	68.1	65.9	76.4	
Total hospitals participating	8 (11.4)	7 (10.0)	9 (12.9)	18 (25.7)	11 (15.7)	13 (18.6)	4 (5.7)	70 (100)
Level I trauma	7 (20.6)	3 (8.8)	6 (17.6)	9 (26.5)	3 (8.8)	4 (11.8)	2 (5.9)	34 (100)
Pediatric	0 (0.0)	1 (20.0)	2 (40.0)	0 (0.0)	1 (20.0)	1 (20.0)	0 (0.0)	5 (100)
Units assessed	31 (14.8)	33 (15.8)	16 (7.7)	59 (28.2)	11 (5.3)	47 (22.5)	12 (5.7)	209 (100)
ED	3 (9.4)	7 (21.8)	0 (0.0)	3 (9.4)	4 (12.5)	11 (34.4)	4 (12.5)	32 (100)
ICU/CCU	25 (15.4)	24 (14.8)	13 (8.1)	54 (33.3)	5 (3.1)	34 (21.0)	7 (4.3)	162 (100)
Other	3 (20.0)	2 (13.3)	3 (20.0)	2 (13.3)	2 (13.3)	2 (13.3)	1 (6.8)	15 (100)

DSA = donor service area; ED = emergency department; ICU = intensive care unit; CCU = critical care unit. Values expressed as count (%).

¹Crude donation rate is calculated as the number of donors per 100 eligible deaths.

Table 2

Interviewees by role and OPO

Role	Organ procurement organization (OPO)						
	1	2	3	4	5	6	7
Nurses	137 (89.5)	381 (86.4)	110 (72.8)	391 (70.6)	363 (83.8)	373 (80.7)	135 (82.3)
Physicians	3 (2.0)	33 (7.5)	13 (8.6)	141 (25.4)	59 (13.6)	70 (15.2)	23 (14.0)
Other	13 (8.5)	27 (6.1)	28 (18.6)	22 (4.0)	11 (2.6)	19 (4.1)	6 (3.7)
Total	153 (100)	441 (100)	151 (100)	554 (100)	433 (100)	462 (100)	164 (100)

Values expressed as count (%).

Table 3

Attitudes towards organ donation and early referral

Item	Overall count (%)	Unit			Interviewee role		
		ED	ICU/CCU	Other	Nurse	Physician	Other
Overall donation attitudes							
Prodonation	1111 (99.0)	176 (98.3)	876 (99.3)	59 (96.7)	862 (98.9)	158 (99.4)	91 (100.0)
Antidonation	11 (1.0)	3 (1.7)	6 (0.7)	2 (3.3)	10 (1.1)	1 (0.6)	0 (0.0)
Urgent sense about timely referrals							
Sense of urgency	1256 (57.2)	135 (38.7) ¹	1050 (60.1)	1 (71.0)	1014 (57.2) ²	161 (50.8)	81 (75.7)
No sense of urgency	940 (42.8)	214 (61.3) ¹	697 (39.9)	29 (29.0)	758 (42.8) ²	156 (49.2)	26 (24.3)
Disposition about early referrals							
Standard care	1542 (92.4)	187 (88.6) ³	1275 (93.3)	80 (88.9)	1258 (93.2) ⁴	199 (86.5)	85 (96.6)
Conflict of interest	126 (7.6)	24 (11.4) ³	92 (6.7)	10 (11.1)	92 (6.8) ⁴	31 (13.5)	3 (3.4)
Belief that one has authority to refer							
Has authority	1501 (76.3)	194 (66.0) ¹	1238 (77.8)	69 (84.1)	1255 (75.9) ⁵	200 (81.6)	46 (66.7)
Needs permission	466 (23.7)	100 (34.0) ¹	353 (22.2)	13 (15.9)	398 (24.1) ⁵	45 (18.4)	23 (33.3)
Donation advocacy precludes patient care							
Patient advocacy	180 (12.2)	24 (11.8) ⁶	138 (11.6)	18 (24.0)	139 (12.0)	34 (15.2)	7 (8.2)
Donation advocacy	1290 (87.8)	179 (88.2) ⁶	1054 (88.4)	57 (76.0)	1022 (88.0)	190 (84.8)	78 (91.8)
Perception of OPO							
Vulture	57 (2.4)	8 (1.9)	43 (2.3)	6 (5.6)	45 (2.4)	6 (1.8)	6 (4.4)
Bully	116 (4.9)	17 (4.1)	92 (5.0)	7 (6.5)	91 (4.8)	16 (4.7)	9 (7.1)
Helpful/supportive	1329 (56.4)	190 (46.2) ¹	1074 (58.4)	65 (60.7)	1074 (56.8) ⁴	170 (49.7)	85 (67.5)
Member of team	187 (7.9)	13 (3.2) ¹	165 (9.0)	9 (8.4)	142 (7.5) ²	21 (6.1)	24 (19.0)
Outsider	1477 (62.6)	257 (62.5)	1157 (62.9)	63 (58.9)	1197 (63.3) ²	226 (66.1)	54 (42.9)

Counts may not sum to 2358 due to missing values.

¹ Significant difference between units: ED and ICU/CCU/Other.

² Significant difference between roles: MD/RN and other.

³ Significant difference between units: ED and ICU/CCU.

⁴ Significant difference between roles: MD and RN/Other.

⁵ Significant difference between roles: MD and other.

⁶ Significant difference between units: ED/ICU/CCU and other.

Table 4

Knowledge of organ donation and early referral

Item	Overall count (%)	Unit			Interviewee role		
		ED	ICU/CCU	Other	Nurse	Physician	Other
Familiarity with donation process							
Familiar	1089 (46.4)	81 (19.9) ¹	953 (52.0)	55 (51.9)	913 (48.6) ³	110 (32.2)	66 (52.4)
Some familiarity	983 (41.9)	208 (51.1) ¹	742 (40.5)	33 (31.1)	770 (41.0) ⁴	167 (48.8)	46 (36.5)
Unfamiliar	274 (11.7)	118 (29.0) ²	138 (7.5)	18 (17.0)	195 (10.4) ⁴	65 (19.0)	14 (11.1)
Understands need for donors							
Unaware	287 (13.2)	39 (10.2)	238 (14.0)	10 (11.2)	253 (14.6) ³	17 (5.2)	17 (14.9)
Aware	1880 (86.8)	345 (89.8)	1465 (86.0)	79 (88.8)	1474 (85.4) ³	309 (94.8)	97 (85.1)
Familiarity with referral criteria							
Familiar	510 (21.9)	35 (8.6) ²	434 (23.9)	41 (39.0)	436 (23.4) ³	42 (12.4)	32 (25.8)
Some familiarity	1226 (52.6)	185 (45.5) ⁵	996 (54.8)	45 (42.9)	998 (53.5)	172 (50.7)	56 (45.2)
Unfamiliar	593 (25.5)	187 (45.9) ¹	387 (21.3)	19 (18.1)	432 (23.2) ⁴	125 (36.9)	36 (29.0)
Understanding of brain death							
Can differentiate from coma	1701 (79.3)	275 (73.7) ¹	1348 (80.2)	78 (85.7)	1357 (78.8) ⁶	275 (85.4)	69 (68.3)
Cannot differentiate from coma	348 (16.2)	87 (23.3) ²	256 (15.2)	5 (5.5)	296 (17.2) ³	32 (9.9)	20 (19.8)
Fear of misdiagnosis	95 (4.4)	11 (2.9) ⁵	76 (4.5)	8 (8.8)	68 (4.0) ⁷	15 (4.7)	12 (11.9)
Understanding of donor criteria							
Only young and healthy can donate	204 (10.7)	49 (15.2) ¹	153 (10.1)	2 (3.4)	151 (9.7) ³	49 (18.5)	4 (5.3)
Donor can be 50+	260 (13.7)	81 (25.1) ⁵	172 (11.3)	7 (11.9)	197 (12.6) ⁴	53 (20.0)	10 (13.3)
Donor can have many medical presentations	81 (4.3)	9 (2.8)	71 (4.7)	1 (1.7)	68 (4.4)	8 (3.0)	5 (6.7)
Donor can be 50+ and have many medical presentations	1357 (71.3)	184 (57.0) ¹	1124 (73.9)	49 (83.1)	1146 (73.4) ³	155 (58.5)	56 (74.7)
OPO contact information							
Knows how to obtain contact info	1860 (80.0)	257 (63.9) ¹	1520 (83.6)	83 (79.8)	1599 (85.6) ⁶	176 (52.7)	85 (69.1)
Does not know how to obtain contact info	95 (4.1)	39 (9.7) ¹	54 (3.0)	2 (1.9)	40 (2.1) ³	52 (15.6)	3 (2.4)
Does not need to know/does not contact Accessing hospital policy	369 (15.9)	106 (26.4) ⁵	244 (13.4)	19 (18.3)	228 (12.2)	106 (31.7)	35 (28.5)

Item	Overall count (%)	Unit			Interviewee role		
		ED	ICU/CCU	Other	Nurse	Physician	Other
Knows where and how to access	1280 (59.8)	179 (46.1) ¹	1040 (62.8)	61 (62.2)	1111 (64.7) ³	90 (29.2)	79 (68.7)
Knows how but not where	415 (19.4)	103 (26.5) ¹	299 (18.1)	13 (13.3)	327 (19.0)	68 (22.1)	20 (17.4)
Does not know how and where	446 (20.8)	106 (27.3) ⁵	316 (19.1)	24 (24.5)	280 (16.3) ³	150 (48.7)	16 (13.9)
Aware of hospital policy							
Aware of policy	1785 (78.5)	245 (61.1) ¹	1460 (82.4)	80 (79.2)	1504 (82.5) ³	191 (57.4)	90 (76.9)
Unaware of policy	488 (21.5)	156 (38.9) ¹	311 (17.6)	21 (20.8)	319 (17.5) ³	142 (42.6)	27 (23.1)
<i>Understanding of hospital policy</i>							
Understands policy	903 (39.9)	61 (15.4) ¹	793 (44.9)	49 (48.5)	769 (42.4) ³	81 (24.5)	53 (44.9)
Does not understand policy	1360 (60.1)	335 (84.6) ¹	973 (55.1)	52 (51.5)	1045 (57.6) ³	250 (75.5)	65 (55.1)

Counts may not sum to 2358 due to missing values.

¹ Significant difference between units: ED and ICU/CU/Other.

² Significant difference between all three units.

³ Significant difference between roles: MD and RN/Other.

⁴ Significant difference between roles: MD and RN.

⁵ Significant difference between units: ED and ICU/CCU.

⁶ Significant difference between all three roles.

⁷ Significant difference between roles: MD/RN and Other.

Table 5

Referral-related behaviors

Item	Overall count (%)	Unit			Interviewee role		
		ED	ICU/CCU	Other	Nurse	Physician	Other
Contact with OPO							
Frequent	970 (42.2)	133 (33.8) ¹	791 (43.9)	46 (44.7)	804 (43.6) ³	101 (30.4)	65 (53.3)
Limited	467 (20.3)	48 (12.2) ¹	401 (22.3)	18 (17.5)	401 (21.8) ⁴	50 (15.1)	16 (13.1)
Rare	859 (37.4)	212 (53.9) ²	608 (33.8)	39 (37.9)	637 (34.6) ³	181 (54.5)	41 (33.6)
Support for organ donation							
In principle	369 (20.6)	128 (42.8) ²	223 (15.9)	18 (20.0)	241 (16.8) ⁶	93 (36.8)	35 (33.0)
In practice	1379 (76.9)	165 (55.2) ²	1149 (81.8)	65 (72.2)	1155 (80.5) ⁶	155 (61.3)	69 (65.1)
Does not support donation but fulfills related duties	46 (2.6)	6 (2.0) ⁵	33 (2.3)	7 (7.8)	39 (2.7)	5 (2.0)	2 (1.9)
Use of referral criteria							
Routine use	921 (40.1)	55 (13.5) ²	810 (45.4)	56 (54.9)	827 (44.8) ⁶	65 (19.2)	29 (25.7)
Occasional use	477 (20.8)	73 (17.9) ⁷	392 (21.9)	12 (11.8)	380 (20.6)	74 (21.9)	23 (20.4)
Rare use/never	897 (39.1)	279 (68.6) ²	584 (32.7)	34 (33.3)	637 (34.5) ⁶	199 (58.9)	61 (54.0)
Support for early referral							
Makes calls	1187 (52.2)	126 (31.8) ²	1014 (57.1)	47 (45.2)	1067 (58.4) ⁶	83 (26.6)	32 (27.4)
Suggests a call be made	224 (9.8)	38 (9.6) ⁵	166 (9.3)	20 (19.2)	164 (9.0)	42 (12.7)	18 (15.4)
Neither calls nor suggests	865 (38.0)	232 (58.6) ²	596 (33.6)	37 (35.6)	597 (32.7) ⁶	201 (60.7)	67 (57.3)
Use of profiling							
Screens families	192 (10.2)	41 (15.2) ¹	140 (9.1)	11 (14.3)	137 (8.9) ⁸	47 (18.4)	8 (9.0)
Does not profile	1689 (89.8)	228 (84.8) ¹	1395 (90.9)	66 (85.7)	1399 (91.1) ⁸	209 (81.6)	81 (91.0)
Determining patient eligibility							
HCP often/always determines	81 (3.8)	30 (8.5) ¹	47 (2.8)	4 (4.2)	53 (3.1) ⁸	24 (7.9)	4 (3.7)
HCP occasionally determines	166 (7.7)	34 (9.7)	127 (7.5)	5 (5.2)	124 (7.2) ⁹	41 (13.4)	1 (0.9)
HCP allows OPO to determine	274 (12.8)	33 (9.4)	231 (13.6)	10 (10.4)	214 (12.3)	39 (12.8)	21 (19.6)
OPO determines	1624 (75.7)	255 (72.4)	1292 (76.1)	77 (80.2)	1342 (77.4) ⁸	201 (65.9)	81 (75.7)

Counts may not sum to 2358 due to missing values.

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- ¹ Significant difference between units: ED and ICU/CCU.
- ² Significant difference between units: ED and ICU/CCU/Other.
- ³ Significant difference between roles: MD and RN/Other.
- ⁴ Significant difference between roles: MD and Other.
- ⁵ Significant difference between units: ED/ICU/CCU and Other.
- ⁶ Significant difference between roles: RN and MD/Other.
- ⁷ Significant difference between units: ICU/CCU and Other.
- ⁸ Significant difference between roles: MD and RN.
- ⁹ Significant difference between all three roles.

Table 6

Most commonly made recommendations for hospital development

Recommendation	Examples	Count (%)
Offer evidence-based, educational in-services to improve knowledge of referral criteria and garner support for organ donation activities among HCPs	Lunch-and-learns; credit for continuing medical education	57 (81.4)
OPO's contact information and the criteria for early referral of donor-eligible patients should be displayed and made easily accessible to hospital staff and healthcare providers.	Distribute reference cards; develop reference stickers for telephone stations; include information in patient chart template	41 (58.6)
OPO should have greater presence in hospital beyond moments when donation is imminent	Biweekly rounds; informal and unannounced visits	24 (34.3)
Provide statistics and donor stories regarding the numbers of patients referred in the units and the number converted to organ donors (i.e. benchmarking and data on unit progress).	Distribute letters about donor cases originating in units; include recent statistics in hospital newsletter	23 (32.9)
Standardize clinical triggers for early referral at all hospitals within OPO catchment area	Meet with invested HCPs and administrators to make triggers uniform; work with nursing education staff; lobby influential HCPs	18 (25.7)
Empower residents and nursing staff to place a referral call as soon as a clinical trigger is present	Prompt invested administrators and attending physicians to send memos; create and distribute promotional flyers and useful items (e.g. pens, note pads) with information	17 (24.3)
HCPs should be encouraged to be present/more involved during the donation approach with the family	Provide training to HCPs so they can participate in approach with OPO staff; use relationships with hospital donation committees to determine best approach	16 (22.9)
More group huddles should be implemented to consider family dynamics	Offer in-services to explain importance of huddles; involve HCPs during family approach	15 (21.4)
Leverage influential HCP to encourage others to be unit/hospital champions for organ donation	Establish periodic meetings with influential HCPs; invite influential HCPs to participate in hospital development events, for example, symposia, donor recognition events	13 (18.6)
Inform HCPs that they will not be reprimanded for referral "too early"	Coordinate with unit managers, nursing education, and attending physicians; provide education to emergency department staff; configure electronic charting system to prompt early referral to OPO	10 (14.3)