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ORIGINAL ARTICLE

Transplant administration—A survey of the roles and responsibilities of kidney and pancreas medical directors of US transplant centers

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American Society of Transplantation (AST) Kidney Pancreas Community of Practice and AST Medical Directors Task Force

Abstract

The current American Society of Transplantation (AST) accredited transplant fellowship programs in the United States provide no structured formal training in leadership and administration which is essential for successfully running a transplant program. We conducted a survey of medical directors of active adult kidney and kidney-pancreas transplant programs in the United States about their demographics, training pathways, and roles and responsibilities. The survey was emailed to 183 medical directors, and 123 (67.2%) completed the survey. A majority of respondents were older than 50 years (61%), males (80%), and holding that position for more than 10 years (47%). Only 51% of current medical directors had taken that position after completing a one-year transplant fellowship, and 58% took on the role with no prior administrative or leadership experience. The medical directors reported spending a median 50%–75% of time in clinical responsibilities, 25%–50% of time in administration, and 0%–25% time in research. The survey also captured various administrative roles of medical directors vis-à-vis other transplant leaders. The study, designed to be the starting point of an improvement initiative of the AST, provided important insight into the demographics, training pathways, roles and responsibilities, job satisfaction, education needs, and training gaps of current medical directors.

KEYWORDS

accreditation council for graduate medical education, American board of internal medicine, medical directors, organ procurement and transplantation network, primary physicians, US centers for Medicare & Medicaid Services, united network for organ sharing

1 | INTRODUCTION

Organ transplantation in the United States is a highly regulated medical field with oversight from both the Organ Procurement and Transplantation Network (OPTN) managed by the United Network for Organ Sharing (UNOS), as well as the US Centers for Medicare & Medicaid Services (CMS), one of the largest payors for kidney transplant services. Given the constantly changing transplant landscape and time-consuming and stringent regulatory burden,^{1–4} successfully running a transplant program requires close coordination between the transplant administrator, the transplant program's "primary surgeon," and the "primary physician" as designated by OPTN/UNOS.⁵ The primary physicians are customarily given the designation of "medical directors" by their respective transplant hospitals due to administrative and leadership component of their job description that extends beyond patient care. Transplant medical directors generally work in close collaboration with other team leaders to achieve the three main objectives important to the success of any transplant program: sustain or increase transplant volume, maintain excellent outcomes, and contain costs.^{6,7} The administrative, regulatory, and leadership responsibilities of medical directors have increased over time to involve the need for complete familiarity and execution of OPTN/UNOS and CMS rules. In academic medical centers, transplant medical directors frequently must also balance renal division-related responsibilities, including mentoring and development of junior faculty and trainees, as well as fulfilling educational and, occasionally, research obligations. The American Society of Transplantation (AST) Medical Director Task Force constituted in June 2019 has recently published the expected roles and responsibilities of medical directors.⁸ However, due to little or no formal training during transplant fellowship in leadership, transplant regulation, and administration, the medical directors may face opaque expectations from their transplant programs leading to confusion, poor working relations with other leaders, and job dissatisfaction. In this study, we sought to capture the demographics, training pathways, definite roles and responsibilities, and job satisfaction of current medical directors of kidney and kidney-pancreas transplant programs in the United States using a survey.

2 | MATERIALS AND METHODS

A Google survey was designed to collect information on demographics, training pathways, roles and responsibilities, and job satisfaction of medical directors of adult kidney and kidney/pancreas transplant programs in the United States. The study was done in accordance with the Helsinki Declaration of 1975, and the survey was reviewed and approved by the Institutional Review Board (IRB)

of Willis-Knighton Health System, Shreveport, LA, as well as by the American Society of Transplantation (AST) Kidney Pancreas community of practice (COP), Transplant Administration and Quality Management (TxAQM) COP, AST Medical Director Task Force, and AST Education committee.

Out of the 249 total US transplant centers listed on the UNOS/OPTN website (<https://optn.transplant.hrsa.gov/members/members-directory/>), only 232 centers performed kidney and/or pancreas transplantation. Of these 232 kidneys and pancreas transplant centers, 36 programs performed only pediatric kidney transplants and 4 programs were inactive at the time of survey, leaving 192 active adult kidney and kidney-pancreas transplant programs eligible for the survey. A list of medical directors of these programs with their email addresses was created, using their contact information available on the respective programs' website or by individually contacting and requesting these centers to provide the emails of their medical directors. Of these 192 programs, we could not get the contact information of 9 medical directors. The survey was first emailed to 183 medical directors in June 2019 with subsequent six reminder e-mails sent every 1–2 months until August 2020 when survey was closed.

3 | RESULTS

The total number of medical directors that completed the survey was 123 of 183 (67.2% response rate).

3.1 | Baseline demographics

The baseline demographics and other characteristics of the medical directors who completed the survey and of their respective transplant centers are shown in Table 1. Most medical directors were older than 50 years (61%), males (80%), US medical graduates (58%), hold directorship roles of both kidney and kidney-pancreas transplants (52%), had that position for more than 10 years (47%), and belonged to transplant programs considered an independent identity and not under department of surgery or medicine (53%).

3.2 | Medical director training pathway

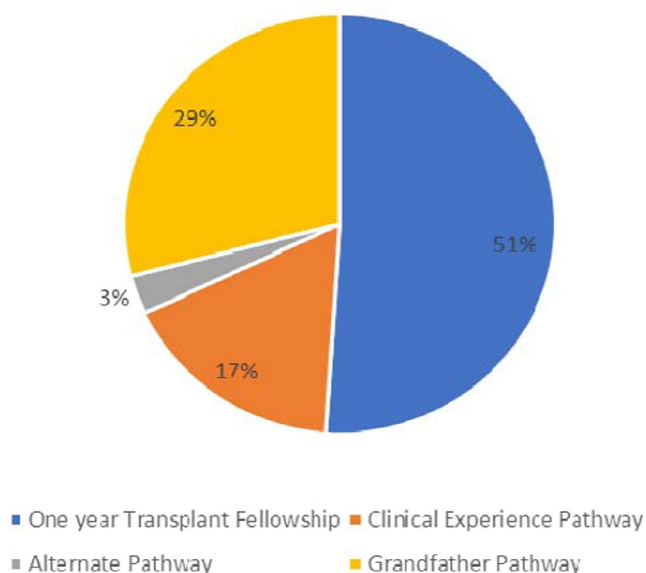
The medical directors reported obtaining the OPTN/UNOS accreditation for primary physician of the transplant center either via one-year transplant medicine fellowship ($N = 62$; 51%), or clinical

TABLE 1 Baseline demographics and characteristics of the medical directors and of their respective transplant centers

Baseline characteristics	Respondents N = 123
Age (years)	
30–40	13 (11%)
40–50	35 (28%)
50–60	49 (40%)
>60	26 (21%)
Gender	
Male	98 (80%)
Female	21 (17%)
Not answered	4 (3%)
Medical school	
United States	71 (58%)
International	52 (42%)
Years as Medical Director	
<5	34 (28%)
5–10	31 (25%)
>10	58 (47%)
Directorship role	
Kidney alone	59 (48%)
Kidney and pancreas	64 (52%)
Transplant program integration under	
Department of surgery	39 (32%)
Department of medicine	18 (15%)
Independent identity	66 (53%)
Numbers of organ transplants in past one year	
Kidney	
1–40	28
40–80	26
80–200	45
>200	24
Pancreas	
1–20	72
20–40	6
40–60	2
>60	0

experience pathway which became effective in year 2015 ($N = 21$; 17%), or alternate pathway (for individuals who did not meet the requirements for primary physician through the above two pathways ($N = 4$; 3%), or grandfather pathway for those individuals who did their training during the pre-accreditation era of transplant medicine fellowship prior to 1998–99 ($N = 36$; 29%) (Figure 1). Most respondents (71 of 123 [58%]) took on the director role with no prior administrative or leadership experience. The respondents who had administrative experience before medical director position (52 of 123 [42%]) had median 5 years (range 1–25 years) of prior administrative/leadership role. Most respondents who had completed

Medical Director Training Pathway

**FIGURE 1** Medical Director Training Pathway: Blue—directors trained in a one-year transplant fellowship, Orange—directors trained through the clinical experience pathway, Gray—alternate pathway, Yellow—grandfather pathway

one-year transplant nephrology fellowship (53 of 62 [85%]) reported having no to minimal leadership/administrative experience during fellowship. The medical director role was obtained at a median of 4.6 years (range 0–26 years) after completing specialty training (Nephrology or Transplant fellowship). Eight respondents attained the medical director position right after fellowship. Ninety percent (111 of 123) respondents believed that an educational curriculum in administration and leadership during one-year transplant fellowship would be helpful to the transplant fellows for their future role as a medical director.

3.3 | Medical directors' roles and responsibilities

The medical directors reported spending a median 50%–75% of time in clinical responsibilities, 25%–50% of time in administration, and 0%–25% time in research (Figure 2). Eighty percent of medical directors spent 50%–100% of their time doing clinical work. There was a wide variation in the time allocated for administration and the number of respondents spending a median 25%–50% of time on administration showed an upward trend as the transplant center volume (kidney transplants/year) increased (Figure 3). Most medical directors ($N = 102$, 91%) spent 0%–25% time on research, and only 10 (9%) medical directors spent 25%–50% time on research. The 10 programs where medical directors spent 25%–50% time doing research were mostly large volume centers (>200 kidney transplants per year) and performed other solid organ transplantation (pancreas, liver, lungs, and/or heart) besides kidney transplantation.

What percentage of your time is spent in each of the following 3 activities?

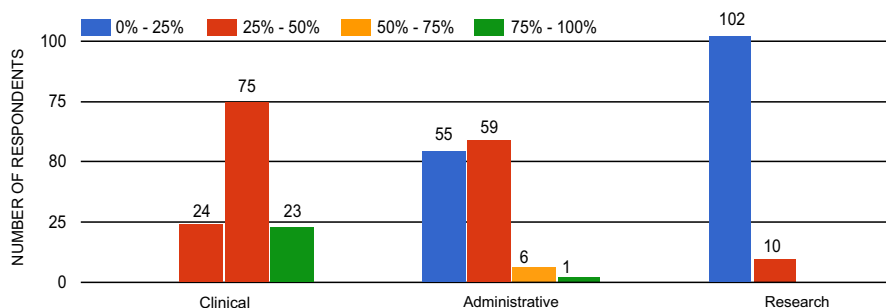


FIGURE 2 Percentage time spent by medical directors on clinical, research, and administrative work

Time Spent on Administration

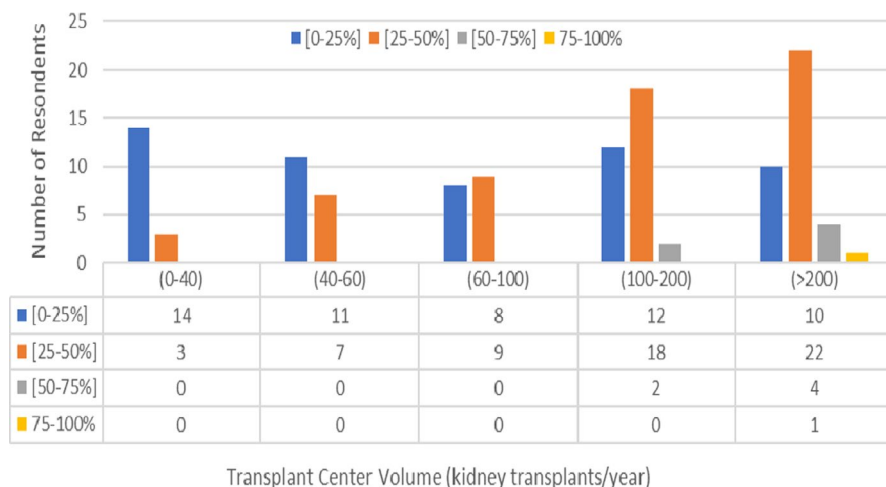


FIGURE 3 Relationship of the number of medical directors spending time on administration with the transplant center volume (kidney transplants/year)

How clearly are your roles and responsibilities as a Medical Director/Primary Physician outlined at your transplant center?

123 responses

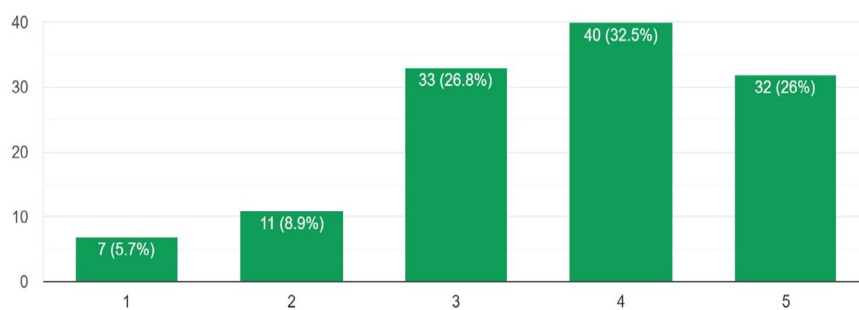


FIGURE 4 Responses of medical directors about clarity of their roles and responsibilities on a scale of 1 to 5 (1 = very poorly defined, 2 = poorly defined, 3 = neutral, 4 = well defined, and 5 = very well defined)

In response to a 5-point scale question on how clearly their roles and responsibilities are defined, 58% medical directors felt that they were well to very well defined, 27% were neutral, and 15% responded that they were poorly to very poorly defined (Figure 4). A majority (64%) expressed satisfaction with their work distribution, 23% were neutral, and 13% were not satisfied (Figure 5). The level of job satisfaction correlated with clarity of roles and responsibilities ($r = 0.6780$, $p < .0001$). Table 2 shows the association of clarity of roles and responsibilities with job satisfaction.

In a subset analysis, we found that a larger proportion of kidney and pancreas medical directors compared to kidney alone medical directors were US medical graduates (67.7% vs. 45.6%, $p = .01$), had prior administrative/leadership experience before taking leadership role (50% vs. 32%, $p = .007$), spent median (25%–50%) time in administration (59.4% vs. 35.6%), and belonged to large volume (≥ 100 kidney transplants/year) centers (68.7% vs. 28.8%, $p < .00001$). No differences were noted in medical directors of kidney vs. KP programs in terms of age, gender, training pathway (grandfather vs. alternate vs. experience vs. fellowship pathway), years practicing

FIGURE 5 Satisfaction of medical directors about their job and work distribution on a scale of 1 to 5 (1 = very unsatisfied, 2 = somewhat unsatisfied, 3 = neutral, 4 = satisfied, 5 = very satisfied)

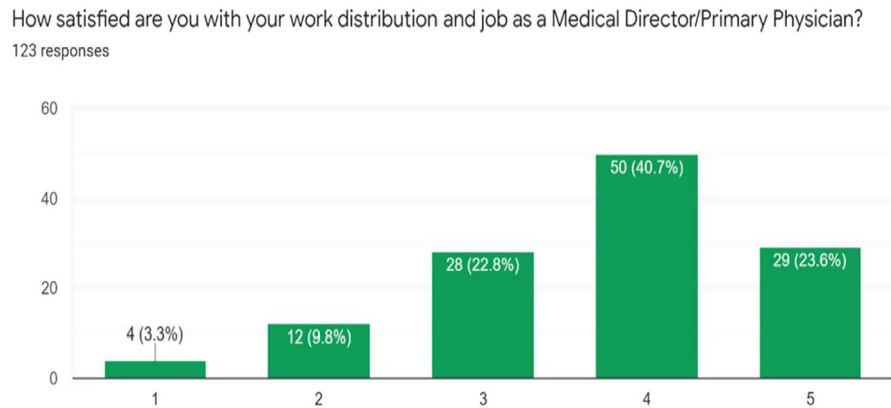


TABLE 2 Association of clarity of roles and responsibilities with the job satisfaction

How clearly are your roles and responsibilities as a Medical Director/Primary Physician outlined at your transplant center? ^a	Number of responses	Average Job Satisfaction Score (In response to Question: How satisfied are you with your work distribution and job as a Medical Director/Primary Physician?) ^b
1	7	2
2	11	2.91
3	33	3.27
4	40	3.87
5	32	4.62
Grand total	123	3.71

^aResponses of medical directors about clarity of their roles and responsibilities on a scale of 1 to 5 (1 = very poorly defined, 2 = poorly defined, 3 = neutral, 4 = well defined, and 5 = very well defined).

^bSatisfaction of medical directors about their job and work distribution on a scale of 1 to 5 (1 = very unsatisfied, 2 = somewhat unsatisfied, 3 = neutral, 4 = satisfied, 5 = very satisfied).

transplant, job satisfaction, or whether the transplant program was integrated under Department of Surgery or Medicine or was an "Independent Identity."

The survey also captured various administrative roles of medical directors vis-à-vis other transplant leaders in response to a question on who is responsible for those activities at a transplant program (response allowed more than one person be responsible for a particular activity). A considerable overlap in duties was noticed among different transplant leaders in areas of developing programs' goals and objectives, writing policies and protocols, staff education, marketing, quality improvement, communication with OPO, ensuring adherence to regulatory agencies, and liaison with other departments of the hospital (Table 3). About 26% of medical directors reported that overlapping roles/responsibilities in the transplant program create confusion and poor working relations with other leaders.

Some activities that were reported as lacking in the responsibility area of any transplant programs' leader (responsibility gap) were staff recruitment, fundraising, running a transplant fellowship program, managing transplant staff, and team building/conflict resolution. Eight medical directors of centers with median kidney transplant volume of 30 per year raised concern about their hospital's poor emphasis on marketing, outreach, and quality program as well as lack of support and alignment of goals with the transplant program and three of these centers did not perform pancreas transplantation.

The survey identified 3 (2.4%) programs where medical directors also hold the position as program directors of the transplant programs. Using 75% response rate to indicate a response by majority of transplant programs, 53% of transplant program administrative functions (8 of 15 questions) were ascribed to medical directors and transplant administrators while only 13% of the transplant program administration functions (2 of 15 questions) were ascribed to program/surgical directors.

In response to a question, "Do you believe that a common platform for medical directors at American Society of Transplantation will be helpful for exchange of ideas and coordination?" (with 1 being not helpful and 5 being extremely helpful), 96% respondents reported that it will be helpful to extremely helpful (Figure 6).

4 | DISCUSSION

Two-thirds of the invited medical directors completed the survey, which highlights several important aspects about demographics, training, education, and roles and responsibilities of medical directors of kidney and kidney-pancreas transplant programs in the United States. One notable finding was that the female medical directors made up just 17% of the respondents, which is significantly lower than approximately 40% female transplant nephrologists in

TABLE 3 Distribution of Administrative Roles and Responsibilities across Kidney Transplant Programs (Captured by the survey in response to a question on who is responsible for those activities at a transplant program [response allowed more than one person be responsible for a particular activity])

		Medical Director	Program/ Surgical Director	Transplant Administrator	Others
1	Develop transplant program goals and objectives	90%	77%	60%	1% (Other Surgeons and Nephrologists)
2	Writing policies, protocols, and guidelines	91%	65%	50%	3% (QAPI Coordinator)
3	Writing operational policies (patient follow-up, ABO blood type verification etc)	62%	45%	77%	3% (QAPI Coordinator); 1% (Compliance Coordinator); 1% (Clinical Operations Director); 1% (Clinic Coordinator)
3	Outreach to Referring Physicians	93%	49%	32%	10% (Outreach Coordinator); 3% (Other Surgeons and Nephrologists)
4	Outreach to dialysis units	75%	34%	34%	15% (Outreach Coordinator); 2% (Social Workers); 2% (Clinical Coordinators); 1% (Marketing Team)
5	Transplant Centers' Staff Education	80%	49%	55%	2% (Transplant Coordinators); 1% (Education Coordinator); 5% (Other Surgeons and Nephrologists)
6	Marketing of transplant center	62%	51%	78%	9% (Marketing Team); 3% (Surgeons) 2% (Outreach Coordinator)
7	Research	82%	60%	9%	2% (Research Director); 4% (Other Surgeons and Nephrologists)
8	Quality/performance improvement	83%	70%	77%	25% (QAPI Coordinator); 1% (Clinic Manager); 3% (Other Surgeons and Nephrologists)
9	Develop transplant program budget goals	26%	46%	92%	3% (Hospital Administration)
10	Taking organ offer calls	30%	92%	0%	5% (Via Transplant Coordinators; 7% (Transplant Surgeons)
11	Fundraising	36%	44%	60%	2% (Marketing); 5% (Administration/ Foundation/Philanthropy Office); 2% (Finance Coordinator)
12	Communication with OPO	42%	61%	86%	2% (QAPI team); 2% (Clinical Operations Director); 2% (Transplant Coordinators)
13	Insurance contract negotiations	8%	27%	87%	20% (Hospital Administration/Financial Consultants/Contracting or Billing Office); 3% (Finance Coordinator or Manager)
14	Ensuring Program Adherence to OPTN/UNOS, CMS and other regulatory agencies' policies	74%	68%	92%	10% (QAPI Coordinator); 3% (Transplant Coordinators); 2% (Clinic Manager); 1% (Operations Director)
15	Liaison with other Departments/ Support Services in the Hospital	75%	67%	77%	3% (All Physicians)

Abbreviations: CMS, Centers for Medicare & Medicaid Services; OPO, organ procurement organization; QAPI, Quality Assurance and Performance Improvement; UNOS, United Network for Organ Sharing.

the United States (based on recently conducted unpublished AST transplant nephrologist's compensation survey). The lack of female representation in leadership positions is not exclusive to the field of medicine and has been well described in a broad range of other professions including legal, academia, politics, finance, etc.⁹ The basis for this disparity is unclear but may be similar to the basis of gender disparity in other fields, such as gender bias

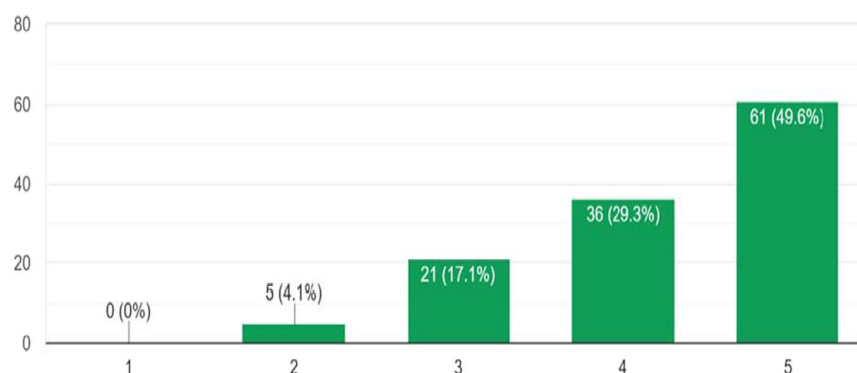
and stereotypes, women being held to higher standards, and lack of female mentorship.^{10,11} The lower representation of women in medical director position suggests that a mentorship program for women early in their career to support their transition to leadership positions may be of value.

A significant proportion (42%) of physicians surveyed were international medical graduates (IMGs) which is commensurate with

FIGURE 6 Opinion of medical directors about the utility of having a common platform at American Society of Transplantation for exchange of ideas and coordination (1 = not helpful, 2 = little helpful, 3 = helpful, 4 = very helpful, and 5 = extremely helpful)

Do you believe that a common platform for Medical Directors/Primary Physicians at American Society of Transplantation (AST) will be helpful for exchange of ideas and coordination?

123 responses



the representation of IMGs in the nephrology workforce as up to 40% of active nephrologists in clinical practice in the United States are IMGs.^{12,13} It also highlights an important contribution of IMGs to the field of nephrology and transplantation. The fact that 47% of medical directors have a tenure >10 years suggests that subsequent career growth beyond this point may be limited for individuals choosing this path.

Only 51% of current medical directors had taken that position after completing an AST-accredited transplant fellowship and a significant percentage (29%) were grandfathered in that position as they had done their training in nephrology prior to 1998–99 during the pre-accreditation era of transplant medicine fellowship. The grandfather pathway is not an available option for those newly applying for medical directorship as OPTN/UNOS currently qualifies a primary kidney transplant physician either via transplant fellowship or clinical experience or an alternate pathway.¹⁴

The survey provides detailed insight into the roles and responsibilities of medical directors at their institutions. The medical directors reported spending a median 50%–75% of time in clinical responsibilities, 25%–50% of time in administration, and 0%–25% time in research. This information may be helpful to the medical directors in negotiating the time required to perform administrative and research responsibilities in their respective roles. The information is also helpful to the transplant hospitals in understanding the work performed by medical directors at their transplant centers. The survey found a wide variation in the time allocated for administration and the number of respondents spending a median 25%–50% of time doing administration went up as the transplant center volume increased. A significant amount of time spent on administration by medical directors at large volume transplant centers is likely facilitated by strong administrative and structural support available at their institutions. Necessary support teams include quality, compliance, financial, budgetary, marketing, outreach, and philanthropic support working in close partnership with the medical director to ensure the success of the transplant program and to make sure the vision of the program is realized and maintained. This support is vastly

different across different transplant centers and may have an impact on the success of program. Being a medical director seems to limit opportunities to engage in research as 91% of respondents (especially from low to moderate volume kidney transplant programs) reported spending <25% of their time on research. Few programs ($N = 10$; 9%) where medical directors spent 25%–50% time doing research were mostly large volume centers (performing >200 kidney transplants per year) and performed other solid organ transplantation (pancreas, liver, lungs, and/or heart) in addition to kidney transplantation.

The survey shows a significant overlap in roles of medical directors with those of transplant administrators and surgery directors. The overlap in responsibilities showcase the teamwork necessary to successfully operate a transplant center. However, as some respondents pointed out, this tripartite approach to leadership may also result in job dissatisfaction, confusion, and poor working relations with other leaders. Many programs have a surgical versus medical leadership slant (as shown in Table 1 under Transplant Program Integration) which may create imbalance in roles and responsibilities between medical and surgical leadership. We believe that the medical director, surgical director, and transplant administrator are three important pillars of leadership in a transplant program, and an environment of teamwork and cooperation is critical to program success. Our survey highlights the importance of transplant centers identifying areas where responsibility gaps exist such as staff recruitment and management, team building/conflict resolution, fundraising, and running a transplant fellowship program.

According to OPTN/UNOS policy, a kidney transplant program must identify at least one designated staff member to act as the transplant program director, a person responsible for overall supervision of the transplant program. The director must be a physician or surgeon who is a member of the transplant hospital staff.¹⁴ The survey identified most of the administrative functions ascribed to medical directors (Table 2). However, very few medical directors also hold the position of program director of the transplant program (2.4%); and as a result, they may not be able to marshal the hospital support necessary to fulfill their duties.

In addition to being an excellent clinician, a medical director is expected to be a role model, a strong and transformational leader, good communicator, team builder, a catalyst for change, one who can manage conflicts, and has clear vision for transplant program growth and success. These attributes are essential to engage and inspire team members to perform at their highest level and succeed, manage relationships, and increase and maintain transplant referrals. Unfortunately, most transplant medicine fellowship programs in the United States provide no formal training in leadership, administration, and management which is essential for successfully running a transplant program. The transplant fellows are usually not educated in CMS and OPTN/UNOS bylaws, rules, and regulations during their fellowship, but become eligible to take the role of a medical director straight after fellowship without any prerequisite of having some prior experience as a faculty which is unlike the nephrology program directors who are required to have at least five years of participation as an active faculty member in an ACGME-accredited internal medicine residency or nephrology fellowship to qualify for that position.¹⁵ In our survey, respondents identified this education gap in administration and leadership during transplant fellowship for the trainees for their successful future role as medical directors. The AST Medical Directors Task Force constituted in June 2019 plans to address the identified education gaps in leadership and administration by conducting webinars, boot camps, and annual meetings for the transplant nephrologists that are interested in pursuing this career path, and refresher courses for incumbent medical directors to provide updates in a fast-changing arena.

The OPTN Membership and Professional Standards Committee (MPSC) has a proposal currently available for public comment from January 21, 2021, to March 21, 2021, which stipulates a new requirement for completion of an OPTN orientation curriculum for individuals moving into the role of a primary surgeon or physician for the first time. The MPSC has suggested that the yet to be developed OPTN orientation curriculum could include education on the role of the OPTN, OPTN bylaws and policies, the transplant system, and the roles and responsibilities of the program primaries.¹⁶ We support this proposal and believe that the survey results could be helpful to OPTN for creating the planned curriculum and an outline of the roles and responsibilities of the program primaries. Although most roles and responsibilities of transplant leaders overlap, and the survey had primarily focused on the medical directors, we believe that surgical directors also provide a unique program perspective and have challenges separate but still important from those of the medical directors and transplant administrators. In addition to fulfilling their organ-specific responsibility, surgical leaders play a significant role in patient advocacy, managing transplant center finances, research, organ recovery and transport, education and training of staff, residents and fellows, communication with OPTN/UNOS and OPO, and acting as a liaison with hospital administration.

Finally, a large majority (96%) of respondents in the survey favored having a common platform for medical directors for exchange of ideas, coordination, and shared learning. An online AST

kidney and pancreas medical directors' hub was launched in early 2020 with the goal of providing networking, collaboration, and learning opportunities among medical directors. This approach would be helpful to the new medical directors who may benefit from mentorship and learning essential skills to lead their transplant programs. Recent exchanges on this portal were particularly helpful as program navigated the rapidly changing environment of the COVID-19 pandemic.

The study has limitations. Due to self-reporting by medical directors, the survey has implicit bias as the percentage of responsibilities reported by medical directors in various areas of transplant care could have probably looked different if surgical directors or administrators were surveyed. It is possible our survey respondents included higher proportion of medical directors who are passionate about their leadership position and job and their personal biases might have influenced the responses to our survey. The findings represent practices and experiences as they are reported; we cannot verify how accurately the survey represents the actual practices at the centers. The future studies should assess the perspectives of surgical directors and transplant administrators in transplant leadership. Sixty (33%) medical directors did not respond to the survey (non-response bias), and nine medical directors could not be sent the survey as their information was not available. The survey provided a "snapshot" of medical director's administrative roles which continue to evolve over time. The survey did not capture data on race, ethnicity, and compensation of medical directors—information we have collected using a separate recently concluded, yet to be published transplant nephrologist compensation survey. The survey also did not include pediatric transplant nephrologists.

The survey provides information about demographics, training, and roles and responsibilities of medical director at a transplant center as well as the education gaps in leadership and administrative skills that exist in transplant medicine fellowship training curriculum. We have identified measures that can address the gaps in training and daily execution of the roles of a medical director.

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DISCLOSURES

The authors of the manuscript have no conflict of interest to disclose as described by the American Journal of Transplantation.

AUTHOR CONTRIBUTIONS

All authors contributed equally to the concept, design of the survey, data analysis and interpretation, and drafting of the manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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