

A Survey of Nephrologists Regarding Their Communication with Transplant Centers

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ABSTRACT

Background: Patients with end-stage renal disease (ESRD) undergo a transition of care between their primary nephrologist and the transplant center during evaluation for kidney transplantation. Due to medical complexity, high hospitalization rate, and involvement of multiple medical stakeholders, transitions of medical care among patients with ESRD are likely to be associated with suboptimal care and medical errors. Provider-to-provider communication improves outcomes among ESRD patients transitioning between dialysis and transplant. There is little data analyzing proper transition of care between the nephrologist and the transplant center (TC).

Objective: Using survey methodology, we examined nephrologists' current practice and experience regarding patient-related communication with the TC.

Methods: From among 822 nephrologists who were following at least 20 ESRD patients, we randomly selected 252 nephrologists to participate in the study. The survey consisted of 102 multiple choice and Likert-style items probing perceptions about various aspects of transplant, including communication between TC and nephrologist. Responses from 216 participants who submitted complete responses were included in the final analysis.

Results: Depending on the phase of transplant, nephrologist-TC communication varied between 50%–81% of nephrologists. Factors associated with higher likelihood of nephrologist-TC communication included attending transplant-related educational activity, practicing in a group with more than 5 nephrologists, and having more than 50 patients on dialysis. The majority of nephrologists indicated satisfaction with access to an attending physician in the TC, receiving timely and adequate information from the TC about their patients. Factors associated with higher likelihood of nephrologist satisfaction regarding communication with the TC included attending national nephrology meetings, medical directorship of a dialysis unit, fellowship training at an institution with an on-site transplant program, and availability of more than 2 transplant centers within 50 miles.

Conclusion: There is a lack of evidence-based guidelines for patient transfer of care between nephrologists and transplant centers during various phases of transplant referral, evaluation and post-transplant care. We found that the likelihood of the nephrologists' communication with the transplant center and their satisfaction with the communication are related to their training, participation in continuing educational meetings, their practice location and size, and the overall composition of their patient population.

KEYWORDS: End-stage renal disease; Kidney; Nephrologist; Transition; Transplant

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INTRODUCTION

Kidney transplantation is the preferred treatment modality for the majority of patients with end-stage renal disease (ESRD), offering advantages in survival, quality of life, and cost when compared to dialysis [1–3]. Patients with ESRD undergo a transition of care between their primary nephrologist and the transplant center (TC) during

Table 1: Frequency distribution of certain characteristics of respondents (n=216).

Characteristic	n (%)
Age <50 years	139 (64)
White	123 (57)
Male	182 (84)
Years from fellowship ≤10	116 (54)
Transplant program at fellowship institution	191 (88)
Received ≤5 months of transplant training in fellowship	152 (70)
Regularly attends at least 1 transplant-related CME* activity/year	129 (60)
Attended >2 national nephrology meetings in past 5 years	86 (60)
Academic affiliation	125 (58)
Medical director of dialysis	109 (50)
Practicing in a group with >50 patients on dialysis	163 (75)
Practicing in a group with >5 nephrologists	120 (56)
Practicing in an area with ≤2 transplant centers within 50 miles	148 (68)
Practicing in an area with >2 transplant centers within 50 miles	68 (32)
>50% of patients are unemployed or on disability	152 (70)

*Continuing Medical Education

evaluation for kidney transplantation. Transitions of medical care mark a time when patients are highly vulnerable to medical errors and clinical deterioration, regardless of specialty, medical care setting, or patient population [4, 5]. These transitions have a disproportionately increased effect on the ESRD population due to medical complexity, high hospitalization rate, and involvement of multiple medical stakeholders [6]. Collaboration and communication between the primary nephrologist and the TC are crucial, and ideally include discussion surrounding plans for transition of care both pre- and post-transplantation. Provider-to-provider communication during transitions of care improves outcomes among patients, including ESRD patients transitioning between dialysis and transplant [7-9].

While numerous studies have addressed effective transition of care in solid organ transplantations between pediatric providers and adult providers, there is little data analyzing proper transition of care among adult nephrologists and transplant centers [10-12]. Lack of structured communication strategies, ambiguity of roles, and use of indirect communication have been implicated as barriers in communication among physicians, in general [13, 14]. We are

unaware of any studies that have specifically looked at communication between nephrologists and transplant centers. Using survey methodology, we examined nephrologists' current practice and experience regarding patient-related communication with the TC.

MATERIALS AND METHODS

We have described participant recruitment elsewhere [15]. We used the AMA Masterfile to identify and invite 3180 nephrologists practicing in the eastern United States to participate in the survey study. Among those who expressed interest in participating, 822 were following at least 20 patients with ESRD. We randomly selected 252 nephrologists to participate in the study. The survey instrument consisted of 102 multiple choice and Likert-style items probing perceptions about various aspects of transplant, including communication between TC and nephrologist. The questions were generated by a review of literature and focus group discussions [16]. We used descriptive statistics and stepwise regression analysis.

The variables in the multivariate analyses

Table 2: Independent predictors for nephrologists to contact the transplant center during various phases of transplantation

Phase	Variable	OR (95% CI)
Referral	Attended ≥ 1 transplant-related CME* activity/year	3.77 (1.99–7.13)
	>5 nephrologists in group	2.30 (1.09–4.87)
Listed	Attended >2 national nephrology meetings in the past 5 years	3.25 (1.67–6.32)
	>50 patients on dialysis	2.30 (1.07–4.91)
	>50% of patients unemployed/disability	0.43 (0.21–0.88)
After	Attended at least 1 transplant-related CME* activity/year	3.35 (1.54–7.25)

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included demographics of respondents (age, race, sex), training characteristics (years from fellowship, transplant program at fellowship institution, months of transplant rotation during fellowship), attendance at national professional meetings, and practice characteristics (academic affiliation, medical directorship of dialysis unit, number of patients on dialysis, number of nephrologists in practice, number of transplant centers within five miles, employment status of patients in practice). Responses from 216 participants who submitted complete responses were included in the final analysis. All analyses were conducted using SAS ver 9.2 (SAS Institute Inc, Cary, NC, USA).

Ethics

The Institutional Review Board of Penn State College of Medicine approved the protocol and the survey instrument.

RESULTS

The 216 responders had a mean \pm SD age of 45.7 \pm 9.8 years. Characteristics of responders are presented in Table 1. Prior to referral, 50% of nephrologists contacted the TC to discuss the patients being referred. After listing, 57% of the nephrologists contacted the TC to provide updates on new events that had

occurred in their patients after listing. In the post-transplant period, 81% of nephrologists contacted the TC to discuss the care of their transplanted patients.

In multivariate analysis (Table 2), factors associated with higher likelihood of nephrologist-TC contact during the referral phase included attending at least one yearly transplant-related CME activity (OR: 3.77, $p=0.01$) and practicing in a group with more than five nephrologists (OR: 2.30, $p=0.03$). During the listed phase, there was higher likelihood of nephrologist-TC contact among nephrologists who had attended more than two national nephrology meetings during the previous five years (OR: 3.25, $p=0.01$), and had more than 50 patients on dialysis (OR: 2.30, $p=0.03$). Nephrologists were less likely to contact the TC with updates on their patients during the listed phase if more than half of their patients were on disability or unemployed (OR: 0.43, $p=0.02$). During the post-transplantation phase, attending at least one transplant-related CME activity increased the likelihood of nephrologist-TC contact (OR: 3.35, $p=0.02$).

Table 3 shows the percentage of referring nephrologists who were satisfied with various aspects of communication with the TC. Ninety percent of nephrologists indicated access to

Table 3: Nephrologists' satisfaction about communication with the transplant center

Item	Satisfaction level
Access to attending transplant physician	90%
Timely informed when patients are transplanted	87%
Adequately informed about patients' conditions	79%
Informed about changes in plan (e.g., medication changes)	72%

Table 4: Independent predictors of nephrologists' satisfaction regarding communication with the transplant center about their patients

Type of communication	Variable	OR (95% CI)
Access to attending transplant physician	Attended >2 national nephrology meetings in the past 5 years	4.90 (1.33–18.14)
	Medical director of dialysis unit	3.53 (1.22–10.20)
	Transplant program at fellowship institution	3.41 (1.02–11.35)
Adequacy of information received from transplant center	Transplant program at fellowship institution	5.37 (1.84–15.71)
	>2 Transplant centers within 50 miles	2.89 (1.10–7.62)

an attending physician in TC to discuss patient-related issues. The majority of nephrologists (87%) indicated that they receive timely information when their patients undergo kidney transplantation; 79% of the nephrologists indicated receiving adequate information from the TC about their transplanted patients. Seventy-two percent of nephrologists were satisfied with the information they received from the TC about changes in plans, including medication changes, relating to their patients.

In multivariate analysis (Table 4), factors associated with higher likelihood of nephrologist satisfaction regarding access to an attending transplant physician in the TC included attending more than two national nephrology meetings during the previous five years (OR: 4.90, $p=0.01$), medical directorship of a dialysis unit (OR: 3.53, $p=0.02$), and fellowship training at an institution with an on-site transplant program (OR: 3.41, $p=0.04$). Fellowship training at an institution with a transplant program was also associated with higher likelihood of satisfaction with adequacy of information received from the TC (OR: 5.37, $p=0.002$). Availability of more than two transplant centers within 50 miles was also associated with higher likelihood of satisfaction with adequacy of information received from the TC (OR: 2.89, $p=0.03$).

DISCUSSION

In this study, we used a survey to evaluate nephrologists' perceptions of their communication patterns with the transplant centers. Communication between nephrologists and transplant centers increased with successive

phases of transplantation. Attending professional conferences, practicing in large nephrology groups, and having large dialysis practices increased the likelihood of nephrologist-transplant center communication. Having a large unemployed or disabled patient population decreased the likelihood of communication. Overall, nephrologists were satisfied with access to attending transplant physicians, as well as timely and adequate information exchange on mutual patients, including information on medication changes. The likelihood of satisfaction with communication was higher among nephrologists who attended professional conferences, those with medical directorship of dialysis units, those who had trained at institutions with a transplant program, and those with access to multiple transplant centers.

Our finding that the likelihood of communication is lowest during the referral phase was consistent with previous studies which have suggested that suboptimal provider-to-provider communication is among the most significant patient-identified barriers to completing pre-transplant evaluations [17, 18]. For wait-listed patients, inadequate communication between nephrologists and transplant centers may lead to early removal of patients from the list resulting in lower likelihood of transplantation [19, 20]. Attendance at professional meetings is likely to lead to attainment of updated knowledge, resulting in more frequent and more informed communication between the referring nephrologist and the transplant center. Additionally, professional meetings allow for face-to-face familiarity between providers which facilitates future communication and information exchange leading

to increased satisfaction with communication. The findings that practice in groups with larger number of nephrologists and larger dialysis patients was associated with increased likelihood of nephrologist-TC communication may be reflective of availability of an infrastructure in larger practices for communication with transplant centers. Although the reason for decreased likelihood of communication by nephrologists with a large number of unemployed or disabled patients is unclear, it might be one of the contributors to suboptimal care based on socioeconomic status, resulting in non-adherence and poor follow-up among transplanted patients [21-23].

While the overall nephrologist satisfaction with access to the attending transplant physician was high, there was lower satisfaction with information exchange regarding changes in plan, including medication changes. Poor health care communication practices between providers and patients may adversely impact post-transplantation adherence, as patients rely on dynamic provider-provider interactions to address issues related to follow-up protocols, misconceptions about immunosuppression side effects, and overall expected outcomes [24-26]. Medication non-adherence is associated with higher allograft loss and substantial costs; this is largely preventable by patient-centered, multidisciplinary and longitudinal communication [27-29]. Medical directors of dialysis units are more likely to have longer practices with stronger peer networks and a higher likelihood of shared patients [30]. Proximity to multiple transplant centers increases the likelihood of meaningful nephrologist-TC interactions and allows for increased information exchange. These factors contribute to improved satisfaction with communication.

As in most survey studies, a limitation of this study was responder bias. The study sampled nephrologists in the eastern US, thus limiting generalizability of the results. Other than an approximation of employment status, we did not look in depth at the socioeconomic status of the patient population characteristics of the nephrologists. We did not specify methods of

communication between transplant center and nephrologist and we did not probe the affiliation of the nephrologist with transplant centers.

We concluded that there is a lack of evidence-based guidelines for patient transfer of care between nephrologists and transplant centers during various phases of transplant referral, evaluation and post-transplantation care. We found that the majority of surveyed nephrologists communicate directly with the transplant centers and are satisfied with the communication. The likelihood of the nephrologists' communication with the transplant center and their satisfaction with the communication are related to their training, participation in continuing educational meetings, their practice location and size, and the overall composition of their patient population. Future areas of investigation include the effect of patient demographics on nephrologist-TC communication and the specific types of communication in various phases of transplantation.

CONFLICTS OF INTEREST: None declared.

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