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Article

Survey of Salary and Job Satisfaction of Transplant Nephrologists in the United States

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Abstract

Background and objectives There are no standardized benchmarks to measure productivity and compensation of transplant nephrologists in the United States, and consequently, criteria set for general nephrologists are often used.

Design, setting, participants, & measurements A web-based survey was sent to 809 nephrologists who were members of the American Society of Transplantation to gather data on measures of productivity, compensation, and job satisfaction. Factors associated with higher total compensation and job satisfaction were examined.

Results Of 365 respondents, 260 were actively practicing in the United States and provided data on compensation. Clinical productivity was assessed variably, and although 194 (76%) had their work relative value units (wRVUs) reported to them, only 107 (44%) had an established RVU target; 234 (90%) had fixed base compensation, and 172 (66%) received a bonus on the basis of clinical workload (68%), academic productivity (31%), service (32%), and/or teaching responsibility (31%). Only 127 respondents (49%) filled out time studies, and 92 (35%) received some compensation for nonbillable transplant activity. Mean total compensation (base salary and bonus) was $274,460±$91,509. The unadjusted mean total compensation was higher with older age and was higher for men; Hispanic and White respondents; adult care transplant nephrologists; residents of the western United States; US medical school graduates; nonuniversity hospital employees; and those with an administrative title, higher academic rank, and a higher number of years in practice. Two hundred and nine respondents (80%) thought their compensation was unfair, and 180 (70%) lacked a clear understanding of how they were compensated. One hundred forty-five respondents (55%) reported being satisfied or highly satisfied with their job. Job satisfaction was greater among those with higher amounts of compensation and US medical school graduates.

Conclusions We report significant heterogeneity in the assessment of productivity and compensation for transplant nephrologists and the association of compensation with job satisfaction.

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Introduction

Kidney transplant is the preferred treatment option for patients with kidney failure. Since the landmark publication by Wolfe *et al.* (1) in the late 1990s, the number of patients awaiting kidney transplantation has continued to rise. The success of kidney transplantation has led to an increased number of kidney recipients followed at transplant centers on an annual basis. Consequently, the role of transplant nephrologists has incrementally evolved from some participation in transplant-related activities to full-time involvement in managing patients before and after transplant. Because transplant nephrology fellowship is not accredited by the American Board of Internal Medicine and the Accreditation Council for Graduate Medical Education and because many nephrologists practicing transplant are not American Society of Transplantation (AST) fellowship certified, it is impossible to ascertain the exact number of US transplant nephrologists in clinical practice (2). The AST data suggest that there are only about 800 transplant nephrologists in contrast to >8000 nontransplant nephrologists in the country. This small pool of transplant nephrologists plays a critical role in providing and coordinating care to nearly 250,000 kidney recipients living with a functioning graft and over 100,000 patients on kidney transplant waiting lists in addition to patients in transplant referral and evaluation phases (3).

Compared with general nephrologists, transplant nephrologists spend significant time in nonpatient, nonbillable activities that are essential to both support multidisciplinary patient care and meet regulatory requirements. Examples of these activities include medical chart reviews, selection committee meetings, coordinating care with community providers, travel

to remote outreach clinics, *etc*. These activities are essential for day-to-day operations and transplant program growth. Many of these activities generate significant downstream revenue for transplant hospitals, not only from the surgery itself but also from laboratory and radiologic services and subspecialty consultations. The relative value unit (RVU) is commonly used to gauge clinical productivity, with physician compensation on the basis of work relative value units (wRVUs) generated through clinical activity. Because wRVU does not capture time spent on nonbillable activities by transplant nephrologists, its use to assess productivity and calculate compensation is considered inadequate and flawed (4). In 2020, the AST Medical Director Task Force conducted a survey of US transplant nephrologists to collect information on clinical productivity, compensation, job satisfaction, and burnout.

Materials and Methods

Survey Design

The survey (Supplemental Material), developed by the AST Medical Director Task Force members, was modeled after the 2019 National Early Career Transplant Hepatologist Survey (5) and the 2017 American Society of Transplant Surgeons (ASTS) Transplant Surgeon Compensation Survey (6). Key topics of the survey were (*1*) demographics; (*2*) professional data; (*3*) practice details, such as kidney and pancreas transplant volumes, transplant program alignment with the hospital, program clinical job description (time spent in clinical transplant, general nephrology, and dialysis), metrics for clinical activity (wRVU, billing, and transplant volume), and metrics for nonbillable clinical activities; (*4*) compensation structure, including base compensation, bonus, and adjustment for nonbillable activities; and (*5*) job satisfaction and self-reported burnout. The survey was approved by the AST Education Committee and exempted by the University of Michigan Institutional Review Board (Institutional Review Board protocol no. HUM00175039).

Survey Administration

The survey was distributed to all members of AST whose area of focus was nephrology as their primary specialty and who had opted to receive society emails (n=809). The survey was sent *via* email directly from Survey Monkey. Each person was provided a unique link to remove the ability for one person to take the survey multiple times and allow for targeted follow-up. We did not collect information on the name of their work institution. Five communities of practice received a hub post about the survey, with a request to those who did not receive it to add their email address. In addition, a post was made to the medical directors hub. Medical directors received an email from a peer (randomly assigned) promoting the survey to their transplant nephrology colleagues. Invitations to participate were sent out between March 2020 and October 2020. Individual email reminders were sent to the nonresponders at least twice.

Statistical Analyses

Responses were recorded anonymously. Surveys received from transplant nephrologists practicing outside of the United States were excluded from the study. We included only those responses that completed questions on compensation. We compared the demographic data of respondents with those of all AST nephrology members. Job satisfaction and burnout were gathered using a Likert scale, and the extreme two categories on either side of neutral were combined. Responses were tabulated and are presented as absolute numerical values and percentages of respondents to each survey question. For questions where participants were asked to "select all that apply," the denominator for calculating percentages was the number of participants responding to that question. The number of participants with missing data for each variable of interest was provided. Missing data were coded as a missing level and used as a categorical level for applicable analyses. Respondents provided a range for their base compensation. For the response variable of base compensation, we imputed a random value within each categorical range for the purpose of the analysis given uncertainty about the exact values and to reflect potential variation of the responses. Total compensation was calculated by adding the incentive dollar amount to the base salary. There was one outlier response with exceedingly high reported compensation that was removed from the analyses. We used univariable general linear models to evaluate factors associated with total compensation. For job satisfaction and burnout, the response variables were captured on a five-level Likert scale, and we used univariable and multivariable ordinal logistic models to evaluate the likelihood of higher-level responses. We tested the assumptions of proportional odds for each of these models using the score test. All analyses were performed using SAS (version 9.4; SAS, Cary, NC).

Results

Survey Participants

We received 365 survey responses. After excluding physicians who were not actively practicing medicine (n=27), who did not report compensation (n=68), or who were practicing outside the United States (n=10), there were 260 (32%) participant responses used for analysis (Figure 1). The median respondent age range was 45–54 years, 64% were men, 50% were White, 48% attended US medical schools, and 67% completed an AST-certified transplant nephrology fellowship. Ninety percent were practicing adult nephrology, 67% were affiliated with a university, and the median time range in practice was 10–14 years. Although there was good representation of the years of transplant nephrology practice and academic rank, 45% of respondents had one major administrative title, such as transplant center or kidney/kidney pancreas program medical directorship (Table 1).

Transplant nephrologists were hired directly either by the hospital (n=106; 41%) or by the academic departments that contracted with the hospital for services (n=125; 48%). Infrequently, the hospital contracted with a private nephrology group (n=29; 11%). Two hundred and eighteen respondents (84%) spent at least half of their time performing clinical transplant work, and 15% spent more than a quarter of their time in research and administration. Sixty-eight (25%) provided outpatient dialysis services, and 54% spent time doing some general nephrology. Fifty-one

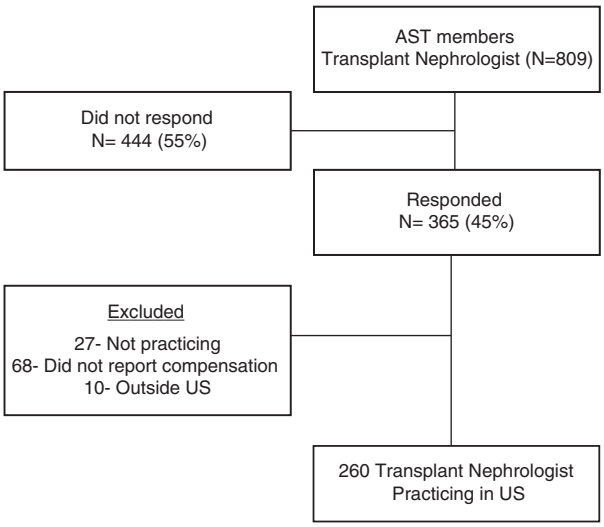

Figure 1. | **Flow chart of survey participants.** AST, American Society of Transplantation.

Table 1. Demographics and professional data of the survey respondents (nephrologists who were members of the American Society of Transplantation and filled out the survey) and American Society of Transplantation members

Respondent Characteristics and Level	Survey Respondents, n=260, n (%)	American Society of Transplantation Members, n=809, n (%)
Age, yr		
25–34	19 (7)	80 (10)
35–44	105 (41)	302 (37)
45–54	66 (25)	169 (21)
55–64	51 (20)	126 (15)
65 or older	19 (7)	109 (13)
Missing		23
Sex		
Men	165 (64)	429 (64)
Women	91 (35)	263 (28)
Not reported	4 (1)	117 (7)
Race		
Black	4 (1)	[a]
White	131 (51)	
Asian/Asian American	99 (38)	
Other	11 (4)	
Not reported	15 (6)	
Ethnicity		
Hispanic	18 (7)	[a]
Non-Hispanic	224 (86)	
Not reported	18 (7)	
Geographic region		
Midwest	53 (20)	185 (23)
Northeast	74 (28)	186 (23)
South	87 (34)	285 (35)
West	46 (18)	152 (18)
Missing		1
Medical school		
United States based	125 (48)	[a]
Non–United States based	135 (52)	
AST fellowship		
No	86 (33)	[a]
Yes	174 (67)	
Practice type		
Adult	234 (90)	663 (80)
Adult and pediatric	7 (3)	42 (6)
Pediatric	19 (7)	95 (13)
Missing	0	9 (0.7)
Time practicing transplant nephrology, yr		
0–4	58 (22)	[a]
5–9	60 (23)	
10–14	41 (16)	
15–2	32 (12)	
20–24	25 (10)	
25+	44 (17)	
Practice affiliation		
University	175 (67)	[a]
Nonuniversity	56 (22)	
Private	25 (10)	
VA	4 (1)	
Academic rank		
Instructor	9 (4)	[a]
Assistant professor	92 (35)	
Associate professor	65 (25)	
Professor	55 (21)	
None	39 (15.0)	
Kidney transplant volume, patients/yr		
<50	46 (18)	[a]
50–100	44 (17)	
101–150	44 (17)	
151–200	31 (12)	
201–250	40 (15)	
251–300	38 (15)	
>300	17 (6)	
Pancreas transplant volume, patients/yr		
0	74 (28)	[a]
1–5	57 (22)	
6–10	59 (23)	
11–20	46 (18)	
>20	24 (9)	
Job allocated to clinical transplant nephrology, %		
0–25	10 (4)	[a]
26–50	32 (12	
51–75	23 (9)	
>75	195 (75)	
Job allocated to administration, %		
0–25	226 (87)	[a]
26–50	33 (13)	
51–75	1 (0.4)	
>75	0	
Job allocated to research, %		
0–25	240 (93)	
26–50	10 (4)	[a]
51–75	9 (3)	
>75	1 (0.4)	
Job allocated to general nephrology, %		
0	116 (45)	[a]
1–25	100 (38)	
26–50	30 (11)	
51–75	12 (5)	
>75	2 (0.8)	
Job allocated to dialysis, %		
0	192 (74)	[a]
1–25	64 (25)	
26–50	4 (1)	
51–75	0 (0)	
>75	0 (0)	

Table 1. (Continued)

Respondent Characteristics and Level	Survey Respondents, n=260, n (%)	American Society of Transplantation Members, n=809, n (%)
Transplant center director/UNOS medical director for kidney or kidney/pancreas		
Yes	117 (45)	[a]
No	143 (55)	

AST, American Society of Transplantation; VA, Veterans Affairs; UNOS, United Network for Organ Sharing.
[a]Data not available.

(21%) took organ offer calls. Half of the respondents engaged in outreach or telemedicine clinics. Median frequency of half-day outreach clinics was 2.5/mo.

Clinical Productivity and Compensation

Clinical productivity was measured as a combination of individual or group billing and RVU, cash collection, participation in nonbillable activities, and transplant volume. Over 60% reported that individual wRVU generation was the main measure of their clinical productivity. Half of the medical directors received some wRVU credit for administrative work. Only 31 respondents (11%) were aware of receiving proxy wRVUs for nonbillable activities, such as waiting list management, meeting attendance, and quality improvement program participation, although most (154; 56%) were not sure if they received any RVU credit for such work. Although 194 (76%) had their RVUs reported to them, only 107 (44%) were aware of an established wRVU target; of these, 102 (95%) worked at a university hospital. The average annual wRVU target for these 107 individuals was a mean of 4765. The most common source for wRVU target setting was reported to be the Association of American Medical Colleges. Other sources included the Vizient/Clinical Practice Solution Center, the University Health Consortium, and the Medical Group Management Association.

One hundred and twenty-seven respondents (49%) filled out time studies, 99 did not, and 34 were unsure. Only 92 respondents (35%) received some compensation for nonbillable transplant activity and did so by reduction in wRVU, paid dollars per hour, proxy RVU, bonus, full-time equivalent support, or rolling it into the base salary. The mean (±SD) total compensation of respondents who completed time studies (n=127) when compared with those who did not (n=99) was significantly higher ($302,221±$89,663 versus $247,065±$86,767, respectively; $P<0.001$).

Mean total compensation was $274,460±$91,509, with a wide range (median=$261,813; quartile 1=$205,092; quartile 3 =$323,491) (Figure 2). Base compensation was fixed for 234 respondents (90%), and for the remaining respondents, it varied on the basis of wRVU and cash collections. One hundred and seventy-two respondents (66%) received bonus compensation over and above base salary. Bonus payments were on the basis of clinical workload (68%), academic productivity (31%), service (32%), and teaching (31%). Incentive payments for clinical activities were calculated on the basis of a variety of metrics, including wRVU generated (20%), number of visits (10%), individual/group metrics (35%), or quality metrics (14%). Thirty-two respondents (13%) received separate payment for call time or directorships. Table 2 shows factors associated with total compensation on unadjusted analysis.

Job Satisfaction and Burnout

One hundred and forty-five respondents (55%) reported being satisfied or highly satisfied with their job. Table 3 shows factors associated with the highest job satisfaction. On adjusted analyses, higher total compensation (odds ratio, 1.30 per higher satisfaction level) and graduation

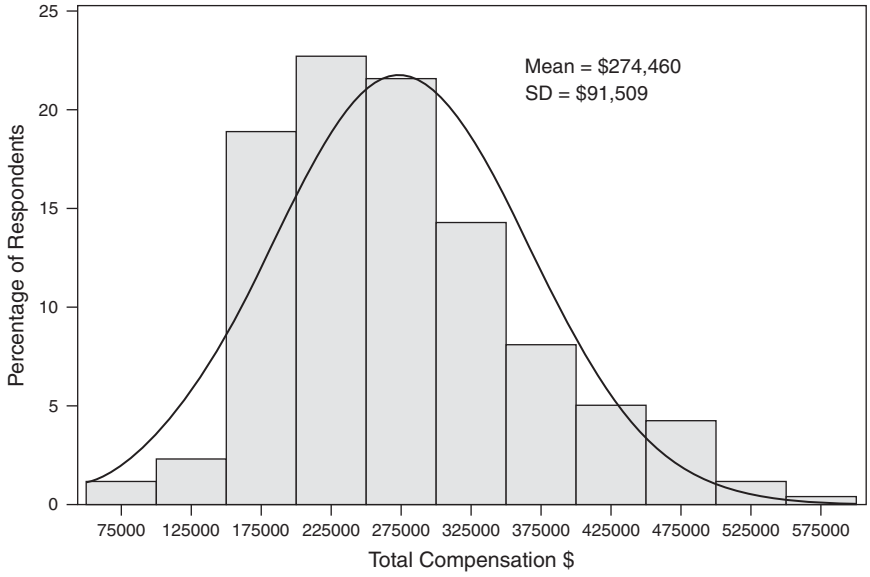

Figure 2. | **Distribution of total compensation.**

Table 2. Unadjusted mean total compensation by respondent characteristics

Respondent Characteristics and Level	Total Compensation,[a] Mean, $	*P* Value
Age, yr		
25–34	197,797	<0.001
35–44	243,395	
45–54	308,942	
55–64	311,247	
65 or older	306,410	
Sex		
Men	290,082	<0.001
Women	244,232	
Race and ethnicity		
Hispanic and Latino	309,266	0.01
White	285,871	
Asian and Asian American	251,768	
Other	285,474	
Practice type		
Adult/adult-pediatric	280,020	<0.001
Pediatric	204,225	
Geographic region		
Midwest	262,320	0.02
Northeast	253,332	
South	287,357	
West	298,568	
Annual kidney transplant volume		
<50	248,227	0.45
50–100	271,802	
101–150	291,954	
151–200	274,821	
201–250	281,190	
251–300	279,717	
>300	279,192	
Annual pancreas transplants		
0	255,205	0.14
1–5	294,395	
6–10	268,242	
11–20	285,684	
>20	278,631	
Medical school		
United States based	297,568	<0.001
Non–United States based	252,904	
AST fellowship		
No	289,250	0.07
Yes	267,235	
Practice affiliation		
University	263,943	0.02
Nonuniversity	304,862	
Private	287,534	
VA	230,505	
Practice, yr		
0–4	200,606	<0.001
5–9	266,697	
10–14	281,516	
15–29	323,661	
20–24	324,652	
25 or more	311,683	
Academic rank		
Instructor	174,192	<0.001
Assistant professor	236,076	
Associate professor	274,324	
Professor	318,294	
Nonacademic	327,925	
Transplant center director/ medical director for kidney or kidney/pancreas		
Yes	316,085	<0.001
No	240,694	

AST, American Society of Transplantation; VA, Veterans Affairs.
[a]Total compensation includes base salary and incentive per year.

from a US medical school (odds ratio, 1.85 per higher satisfaction level) were statistically significant factors associated with higher job satisfaction. Most (209 of 260) respondents (80%) thought their compensation was unfair, and 180 (70%) lacked a clear understanding of how they were compensated. One hundred and nine respondents (43%) reported some or complete burnout at their current job. Respondents who were 55–64 years of age, women, and physicians spending >75% of their time in clinical transplant were more likely to report complete burnout (Table 4). None of the factors related to burnout were significant on multivariable analyses.

Discussion

This is the first study reporting a detailed analysis of the clinical productivity, compensation, job satisfaction, and burnout of US transplant nephrologists. The clinical productivity of transplant nephrologists is assessed variably *via* individual or group wRVU generation, cash collection, profitability of the transplant center, transplant volume, administrative duties, participation in nonbillable/nondirect patient care, or a combination of them. Regardless, wRVU remains the most widely used yardstick. The wRVU is a good measure of clinical encounter–based patient work but fails to capture nonbillable aspects of work significant to transplant. Time studies for the Center for Medicare & Medicaid Services (CMS) for pretransplant work could capture these efforts but were completed by fewer than half of the respondents, implying a potential loss of revenue for the division and hospital. Although some transplant physicians complete monthly time studies, this payment is to the hospital/transplant program and may not be allocated back to the transplant nephrologists (2); although in our study, the total compensation of respondents who completed time studies was significantly higher compared with the total compensation of those who did not. The wRVU model also ignores the value- and quality-based care that transplant centers are expected to provide (7). A recent survey of ASTS transplant surgeons reported that most have RVU-based compensation and very little financial incentives tied to outcomes (6). The new Organ Procurement and Transplant Network metrics for assessment of program performance include patient and graft survival at 1-year contingent upon 90-day survival (8), which may more accurately reflect transplant nephrologist effort. CMS and private payors have launched value-based payment systems for several specialties, including primary care, where the reimbursement is determined by quality of care and outcomes rather than by patient volumes (9). Abouljoud *et al.* (10) have proposed creating a virtual RVU to account for non-RVU activities as well as to promote value-based outcomes. Others have recommended creating a customized RVU to capture nonbillable work as well as creating outcome value units to support optimal transplant outcomes and cost reduction (11). The use of wRVU-based productivity models in transplantation fails to capture downstream revenue generated for transplant hospitals attributable to transplant-related laboratory and radiologic testing. An often marginalized or neglected variable is the dollar amount assigned to the wRVU for each respective specialty. Benchmarks are often community based, not

Table 3. Distribution of job satisfaction (n=254 total respondents)

Respondent Characteristics	Very Dissatisfied/ Dissatisfied, %	Neutral, %	Satisfied/Very Satisfied, %	P Value[a]
Age, yr				
25–34	10	32	58	0.24
35–44	18	29	54	
45–54	21	20	58	
55–64	22	28	50	
65 or older	0	16	84	
Sex				
Men	15	25	60.5	0.28
Women	21	27	52	
Race and ethnicity				
Hispanic and Latino	22	28	50	0.42
White	16	21	63	
Asian and Asian American	17	28	55	
Other	25	36	39	
Geographic region				
Midwest	18	31	51	0.72
Northeast	18	30	52	
South	17	22	61	
West	21	18	61	
Medical school				
United States based	12	24	64	0.03[b]
Non–United States based	23	27	50	
AST fellowship				
No	7	28	65	0.01[b]
Yes	23	24	53	
Practice type				
Adult/adult-pediatric	19	25	56	0.32
Pediatric	5	26	69	
Annual kidney transplant volume				
<50	16	20	64	0.11
50–100	11	34	55	
101–150	23	22	65	
151–200	18	21	61	
201–250	15	30	55	
251–300	13	38	49	
>300	41	24	35	
Annual pancreas transplant				
0	13	22	65	0.08
1–5	21	19	60	
6–10	16	30	55	
11–20	16	25	59	
>20	33	42	25	
Practice affiliation[c]				
University	21	30	49	0.02[b]
Nonuniversity	13	14.3	73	
Private	8	28	64	
Job allocated to clinical transplant nephrology, %				
0–50	11	26	63	0.22
55–75	13	28	59	
>7	25	23	52	
Practice, yr				
0–4	18	27	55	0.70
5–9	26	23	51	
10–14	12	29	59	
15–29	19	28	53	
20–24	21	25	54	
25+	9	23	68	
Transplant center director/UNOS medical director for kidney or kidney/pancreas				
Yes	13	21	66	0.03[b]
No	22	29	49	
Total compensation, US $				
≤200,000	19	32	49	0.13
201,000–250,000	22	33	45	
250,000–300,000	18	25	57	
301,000–400,000	16	23	61	
≥400,000	11	7	82	

AST, American Society of Transplantation; UNOS, United Network for Organ Sharing.

[a]A chi-squared P value for the test of the association of job satisfaction and respondent characteristics was used. Significant multivariable model factors included total compensation (adjusted odds ratio, 1.30 per higher satisfaction level) and US medical school (adjusted odds ratio, 1.85 per higher level).

[b]P value is significant.

[c]Veterans Affairs is not shown (less than five completed responses).

Table 4. Distribution of burnout (n=254 total respondents)

Respondent Characteristics	None, %	Occasional, %	Definitely Symptoms, %	Complete Burnout, %	P Value[a]
Age, yr					
25–34	16	68	16	0	<0.001
35–44	16	41	31	12	
45–54	12	31	40	17	
55–64	14	38	28	20	
65 or older	53	37	10	0	
Sex					
Men	22	42	27	9	<0.05
Women	9	36	36	19	
Race					
Hispanic/Latino	11	45	33	11	0.71
White	20	38	26	16	
Asian/Asian American	18	40	30	11	
Other	7	39	43	11	
Practice type					
Adult/adult-pediatric	18	40	30	12	0.87
Pediatric	11	42	32	16	
Geographic region					
Midwest	14	49.0	22	15	0.60
Northeast	19	45	26	10	
South	16	34	37	13	
West	20	32	34	14	
Annual kidney transplant volume					
<50	18	36	25	21	0.43
50–100	11	46	32	11	
101–150	30	41	25	4	
151–200	18	29	43	10	
201–250	15	43	30	12	
251–300	16	35	27	22	
>300	6	53	35	6	
Annual pancreas transplant					
0	20	44	25	11	0.20
1–5	26	30	22	22	
6–10	16	30	31	23	
11–20	26	23	25	26	
>20	0	35	34	31	
Medical school					
United States based	20	37	29	14	0.76
Non–United States based	15	42	31	12	
AST fellowship					
No	22	41	28	9	0.35
Yes	159	39	31	15	
Practice affiliation[b]					
University	17	39	30	14	0.64
Nonuniversity	20	45	25	10	
Private	12	32	44	12	
Job allocated to clinical transplant nephrology, %					
0–50	34	40	17	9	<0.05
55–75	17	41	33	9	
>75	13	39	31	17	
Practice, yr					
0–4	14	52	25	9	0.32
5–9	14	39	30	17	
10–14	15	41	32	12	
15–29	16	31	41	12	
20–24	25	17	33	25	
25	25	43	25	7	
Transplant center director/UNOS medical director for kidney or kidney/pancreas					
Yes	23	33	32	12	0.08
No	13	46	28	13	

AST, American Society of Transplantation; UNOS, United Network for Organ Sharing.
[a]Nothing was statistically significant in multivariable analyses.
[b]Veterans Affairs is not shown (less than five completed responses).

accounting for payer mix, patient complexity, or uncompensated academic or patient-related activities. As recommended by Agarwal and Ibrahim (12), perhaps there is a need to develop wRVUs specific to transplant nephrology considering the unique clinical coordination inherent to the specialty. The results of our survey provide an opportunity to reconsider transplant nephrology payment models.

Many nontransplant nephrologists also perform nonbillable activities, such as reviewing laboratory study results, coordinating dialysis care, attending quality improvement meetings, driving to units, and more. However, the time spent in performing these activities is typically offset by higher RVU generation per service visit(s) as opposed to established outpatient clinic visits for patients with transplants (13). Similar to dialysis nephrologists, transplant nephrologists care for patients with transplants who have highly complex medical needs. One equitable solution would be to have a higher rate of compensation for transplant nephrologists who care for patients with transplants, similar to that of nephrologists who care for patients on dialysis. Finally, it is worth noting that nephrology care of patients on dialysis is typically supported by a robust dialysis facility infrastructure and care team, for which dialysis corporations receive monthly payments. In contrast, transplant centers receive no payment for the cost of nurse coordinators, social workers, pharmacists, and other care team members who support post-transplant care provided by transplant nephrologists. Under-resourced transplant centers can put a disproportionate burden of effort on transplant nephrologists in safeguarding the care of patients after transplants, which can further exacerbate the risk of burnout.

The majority of respondents (90%) had a fixed base salary. Like their peer general nephrologists, transplant nephrologists received a bonus for clinical and academic productivity, teaching, or administrative work. Only one third of respondents received compensation for nonbillable services, and the compensation varied from getting an hourly payment to reduction in wRVU or clinical full-time equivalent to an extra bonus. Only 13% received other cash compensation for reasons such as administrative titles (*e.g.*, medical director of the transplant program). This is quite different from payments made to medical directors of dialysis units, which are standard and calculated similarly across the country at fair market value accounting for patient mix, geographic location, patient volume, *etc*. Our survey shows that there are no guidelines for transplant hospitals to calculate a medical director stipend for overseeing a kidney transplant program. The kidney transplant medical directors who get a separate stipend for their position are compensated as cash compensation, RVU, clinical full-time equivalent reduction, or variable combinations of these options. The median total compensation for our survey respondents was $261,813, which is close to the median total cash compensation of $273,600 for transplant nephrology reported by the Sullivan Cotter 2019 Physician Compensation and Productivity Survey (14).

As expected, the salary was higher for those with a higher number of years in practice, those with administrative titles, and adult transplant nephrology providers. Women had a lower mean total compensation compared with men. The sex-related pay gap is reported to exist across practice types, specialties, and ranks (15–17). Fewer productivity-based bonuses, fewer promotions, negative performance evaluations, and fewer leadership opportunities for women physicians have been touted as reasons for this sex-related pay gap (15). Nonuniversity hospital–employed physicians had higher salaries than those hired by universities, Veterans Affairs hospitals, or private practices, and these differences need to be further explored. Finally, respondents practicing in the western and southern United States had a higher mean total compensation than in other regions, but the analysis was not adjusted for the cost of living. In adjusted analyses, job satisfaction was lower among survey respondents graduating from non-US medical schools and those with lower total compensation. Physician perception of pay fairness is linked with work satisfaction (18). In our survey, the majority of respondents thought their compensation was unfair and lacked a clear understanding of how they were compensated.

The 2019 Advancing American Kidney Health Initiative (AAKHI) aims to transition 80% of new patients with kidney failure to either home dialysis or transplantation by 2025 and to double the number of kidneys available for transplantation by 2030 (19). This will increase the workload for the current pool of transplant nephrologists. Also, the advantages for transplant nephrologist participation in AAKHI payment models are not clear currently as the incentives seem to be more directed toward nontransplant nephrologists and dialysis providers (20). Hence, it is critical that compensation models are defined for transplant nephrologists that are commensurate with their effort and adequately reflect their role in the delivery of transplant care to maintain job satisfaction, prevent burnout, and encourage future recruitment of the transplant nephrology workforce.

The strengths of our study include broad representation of transplant programs across the United States in terms of both location and volume as well as by age, sex, years in practice, and type of practice. Limitations include a modest response rate of 32%, which is typical of survey-based studies. The survey responses relied upon subjective reporting rather than administratively collected data. Our survey results may be confounded by selection bias as we did not have adequate representation of transplant nephrologists practicing at low-volume kidney transplant programs (<50 transplants a year) and from pediatric transplant programs; however, there was over-representation of individuals with an administrative title. We also did not collect identifiers like institutions to maintain confidentiality and encourage people to complete the survey. Hence, we cannot rule out if we had multiple respondents from the same institution/center. A minority of respondents (6%) spent >50% of their time practicing general nephrology, and their compensation models might have been different than the rest of the predominantly transplant-practicing nephrologists.

In summary, our study highlights the wide variation in the assessment of clinical productivity and compensation of transplant nephrologists and a large chasm in recognizing and reimbursing for vital nonbillable activities. Transplant outcomes are important metrics for CMS and United Network for Organ Sharing certification, and yet, they are not included in assessing performance and compensation of transplant nephrologists. We need to address these

issues urgently to improve job satisfaction and to sustain an adequate transplant nephrology workforce going forward to meet the needs of patients and society.

Disclosures

E. Akalin reports consultancy agreements with CareDx and Immucor; research funding from Angion, CareDx, Immucor, and the National Institutes of Health (NIH); honoraria from CareDx and Immucor; and serving in an advisory or leadership role for CareDx and Immucor. R.D. Bloom reports consultancy agreements with Veloxis Pharmaceuticals; research funding from CareDx, CSL Behring, Natera, and Veloxis Pharmaceuticals; honoraria from Veloxis Pharmaceuticals; serving in an advisory or leadership role for Allovir, CareDx, Natera, Paladin Labs, QSant, and Veloxis Pharmaceuticals; royalties from UpToDate; and serving on the editorial board of *American Journal of Kidney Diseases*. D.M. Dadhania reports consultancy for the advisory boards of AlloVir Inc., CareDx, and Veloxis Pharmaceuticals; research funding from AlloVir Inc., NIH, and Vitaeris Inc.; serving as section editor of *Nephrology Dialysis Transplantation* and associate editor of *Transplantation*; and is an AST committee member and a member of the LiveOnNY Medical Advisory Board. J. Friedewald reports consultancy agreements with Eurofins–Transplant Genomics, Inc. and Sanofi; research funding from CSL Behring, Eurofins Viracor, Inc., Hansa BioPharma, NIH, and Veloxis; honoraria from Sanofi; patents or royalties from Northwestern University/Scripps Research Institute; serving in an advisory or leadership role for Eurofins–Transplant Genomics; and speakers bureau for Sanofi. C. Klein reports consultancy agreements with CareDx, Nephrosant, Sanofi, and Veloxis Pharmaceuticals; research funding from Eurofins Viracor; honoraria from CareDx, Sanofi, and Veloxis Pharmaceuticals; royalties from UpToDate; serving in an advisory or leadership role for the LifeLink Board of Governors; and speakers bureau for Sanofi and Veloxis Pharmaceuticals. N. Leca reports consultancy agreements with CareDx, Transplant Genomics, and Veloxis Pharmaceuticals and research funding from Angion, CareDx, CSL Behring, Natera, Novartis, Transplant Genomics, and Verici. K. Nicoll reports employment with and ownership interest in TransMedics. T. Pesavento reports employment with the Katherine M. Cyran Breast Center; ownership interest in the Katherine M. Cyran Breast Center; research funding from CareDx, Natera, NIH, and Talaris; and serving in an advisory or leadership role for the LifeLine of Ohio Board of Directors, the NephrSant Advisory Board, and the Ohio Solid Organ Transplant Consortium. M. Samaniego-Picota reports consultancy agreements with CareDx, Natera, and Verici Dx; research funding from Natera and Verici DX; honoraria from CareDx and Natera; serving in an advisory or leadership role for the Gift of Life of Michigan Board of Advisors and the education committee of the Transplantation Society; serving as an AST Fellowship Committee Cochair, an AST Kidney Pancreas Community of Practice Executive committee member, a Medeor Data Safety Monitoring Board member, the National Kidney Foundation Vice Chair of the Public Policy Committee, and a Transplantation Society Education Committee member; and other interests or relationships with AST, the Gift of Life of Michigan Board of Advisors, the National Kidney Foundation as Vice Chair of the Public Policy Committee, and the Transplantation Society as an Education Committee member. J.D. Schold reports employment with Cleveland Clinic; consultancy agreements with eGenesis, NephroSant, Novartis, and Sanofi Corporation; research funding from the One Legacy Foundation; honoraria from eGenesis, NephroSant, and Sanofi Inc.; serving as a data safety monitoring board member for Bristol Myers Squibb and on the board of directors of the Lifebanc organ procurement organization; and speakers bureau for Sanofi. N. Singh reports consultancy agreements with CareDx, Mallinckrodt, Natera, Transplant Genomics, and Veloxis Pharmaceutics; research funding from CareDx and Transplant Genomics; honoraria from CareDx, Mallinckrodt, Natera, Transplant Genomics, and Veloxis Pharmaceutics; serving as the AST Kidney Pancreas Community of Practice Cochair; and speakers bureau for CareDx, Mallinckrodt, Natera, Transplant Genomics, and Veloxis Pharmaceutics. A.C. Wiseman reports employment with Centura Transplant; consultancy agreements with CareDx, Hansa, Horizon, Immucor, Meteor, Natera, Nephrosant, and Veloxis Pharmaceutics; and speakers bureau for CareDx, Sanofi Genzyme, and Veloxis Pharmaceutics. All remaining authors have nothing to disclose.

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Data Sharing Statement

All data used in this study are available in this article.

Supplemental Material

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Supplemental Material. AST Transplant Nephrologist Compensation and Job Satisfaction Survey.

References

1. Wolfe RA, Ashby VB, Milford EL, Ojo AO, Ettenger RE, Agodoa LY, Held PJ, Port FK: Comparison of mortality in all patients on dialysis, patients on dialysis awaiting transplantation, and recipients of a first cadaveric transplant. *N Engl J Med* 341: 1725–1730, 1999
2. Heher EC, Hricik DE, Brennan DC: Securing the future of kidney transplantation by addressing the challenges of transplant nephrology. *Am J Transplant* 21: 37–43, 2021
3. Concepcion BP, Alasfar S, Levea SL, Singh P, Wiseman A: The transplant nephrology workforce in the United States: Current state and future directions. *Adv Chronic Kidney Dis* 27: 336–343.e1, 2020
4. Chon W, Pavlakis M, Witkowski P, Chen L.-X, Kadambi P: A web-based survey of academic transplant nephrologists in the U.S. on relative value unit (RVU)-based productivity assessment and financial compensation. Paper presented at: 2016 American Transplant Congress; June 11–15, 2016; Boston, MA
5. Kriss M, Te HS, Verna EC, VanWagner LB, Scott FI, Lai JC: National early career transplant hepatologist survey: Compensation, burnout, and job satisfaction. *Hepatol Commun* 5: 701–712, 2021
6. American Society of Transplant Surgeons: American Society of Transplant Surgeons (ASTS) Compensation Survey, 2017. Available at: https://www.compensationreport.com/report/american-society-of-transplant-surgeon-asts-compensation-survey/. Accessed January 25, 2022
7. Abecassis M, Pearson T: Fee-for-value and wRVU-based physician productivity-an emerging paradox. *Am J Transplant* 15: 579–580, 2015
8. Organ Procurement and Transplantation Network: Enhance Transplant Program Performance Monitoring System. Available at: https://optn.transplant.hrsa.gov/policies-bylaws/public-comment/enhance-transplant-program-performance-monitoring-system/. Accessed January 25, 2022
9. Liao JM, Navathe AS, Werner RM: The impact of Medicare's alternative payment models on the value of care. *Annu Rev Public Health* 41: 551–565, 2020
10. Abouljoud M, Whitehouse S, Langnas A, Brown K: Compensating the transplant professional: Time for a model change. *Am J Transplant* 15: 601–605, 2015
11. Giacoma T, Ayvaci MUS, Gaston RS, Mejia A, Tanriover B: Transplant physician and surgeon compensation: A sample framework accounting for nonbillable and value-based work. *Am J Transplant* 20: 641–652, 2020
12. Agarwal A, Ibrahim T: Stepping into the void: Remunerating, valuing, and understanding nephrologists. *Clin J Am Soc Nephrol* 15: 1832–1834, 2020
13. Rosner MH, Falk RJ: Understanding work: Moving beyond the RVU. *Clin J Am Soc Nephrol* 15: 1053–1055, 2020
14. Sullivan Cotter: Physician Compensation and Productivity Survey, 2019. Available at: https://sullivancotter.com/surveys/physician-compensation-and-productivity-survey. Accessed February 18, 2020
15. Gottlieb AS, Jagsi R: Closing the gender pay gap in medicine. *N Engl J Med* 385: 2501–2504, 2021
16. Dandar VM, Lautenberger DM, Garrison G: Exploring faculty salary equity at U.S. medical schools by gender and race/ethnicity, 2021. Available at: https://www.aamc.org/data-reports/workforce/report/exploring-faculty-salary-equity-us-medical-schools-gender-and-race/ethnicity. Accessed January 25, 2022
17. Doximity: 2019 Physician Compensation Report: Third Annual Study, 2019. Available at: https://s3.amazonaws.com/s3.doximity.com/press/doximity_third_annual_physician_compensation_report_round3.pdf. Accessed January 25, 2022
18. Kao AC, Jager AJ, Koenig BA, Moller AC, Tutty MA, Williams GC, Wright SM: Physician perception of pay fairness and its association with work satisfaction, intent to leave practice, and personal health. *J Gen Intern Med* 33: 812–817, 2018
19. Mehrotra R: Advancing American Kidney Health: An introduction. *Clin J Am Soc Nephrol* 14: 1788, 2019
20. Hippen BE, Reed AI, Ketchersid T, Maddux FW: Implications of the Advancing American Kidney Health Initiative for kidney transplant centers. *Am J Transplant* 20: 1244–1250, 2020

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