

The Changing Nephrology Workforce

These are certainly interesting times for nephrology education. As the number of patients with chronic kidney disease increases, the number of trainees seeking careers in nephrology is not keeping pace. The nephrology workforce forms the ASN, so this month we examine personnel issues, including changes in the education of nephrologists-to-be and those maintaining certification. Other topics of interest include international medical graduates, women, transplant nephrologists, and pediatric nephrologists.

We started with a curse; let's end with a wish: "May you find this an interesting section."

—Pascale Lane, editor in chief, ASN Kidney News

May you live in interesting times.

(attributed to ancient Chinese as a curse, although origins are not well documented.)

The Impending Workforce Crisis in Nephrology

By Susan Owens

The United States will face a shortage of nephrologists during the next decade. This shortfall will occur despite the fact that the number of nephrology fellows nearly doubled during the past 20 years, from 460 in 1987 to 863 in 2008 (1,2). The current disparities—by ethnicity, socioeconomic status, and geographical location—among patients with kidney disease will worsen as a result of this shortage.

At least three simultaneous trends are conspiring to fuel this crisis: Nephrology is not an appealing career option for the majority of U.S. medical school graduates (USMGs), the graduates of international medical schools are facing pressures not to seek additional training or to practice in this country, and the prevalence of chronic kidney disease (CKD) and end stage renal disease (ESRD) is rising dramatically.

Nephrology is not an appealing career option for the majority of USMGs

Today's medical students are fundamentally different from their predecessors. As has been well documented, they value a controllable work-life balance, define success within the context of their personal lives instead of professional accomplishments, sacrifice salaries and career advancement for time with families, and characterize professionalism differently.

Medical students also face staggering debt. According to a recent report from the Government Accountability Office (GAO), "The median amount of educational debt for indebted medical students graduating in 2008 was \$155,000—a 53 percent increase since 1998, controlling for inflation" (3). GAO calculated that

the monthly loan payment for a resident or fellow with a \$155,000 debt "could reach over \$1700 (about 48 percent of pretax income)." Given this financial situation, it is not surprising that medical students want to complete their training and start generating salaries high enough to pay down their debt.

These factors—combined with more career options (due to new specialties, such as sleep medicine)—have decreased the interest of USMGs in internal medicine residency positions, which are the pathway to nephrology fellowships. In 2009, 1196 fewer graduates of U.S. medical schools selected categorical residency programs in internal medicine than in 1985 (Figure 1). Many have commented that today's students see radiology, ophthalmology, anesthesiology, and dermatology as the "ROAD" to successful careers in medicine.

In addition to selecting from an already diminished pool of USMGs, nephrology is further challenged by the fact that students have little exposure to kidney disease before they must choose a career path. For most medical students, the first exposure to nephrology is during their third-year internal medicine clerkship, which in U.S. medical schools lasts on average 10.5 weeks.

Although internal medicine residency programs are required to include a "clinical experience" in each of the subspecialties of internal medicine, it is "not necessary that each resident be assigned to a dedicated rotation in every subspecialty" (4). Given the breadth and depth of internal medicine—let alone nephrology—it is not surprising that the exposure of medical students and residents to career options in nephrology is limited.

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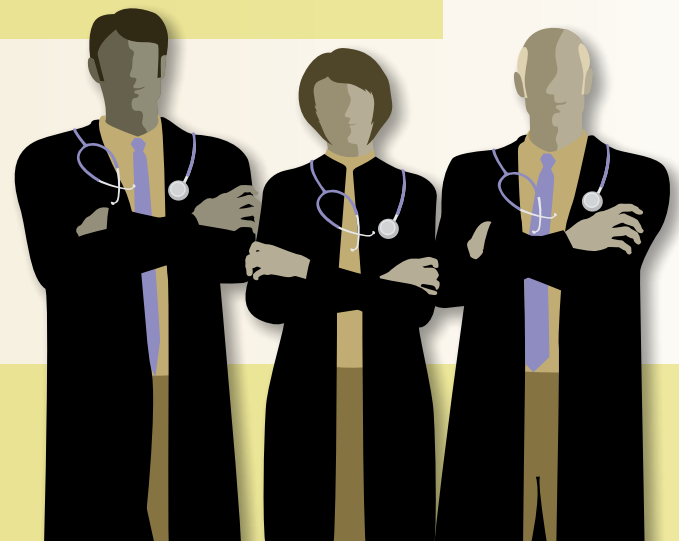
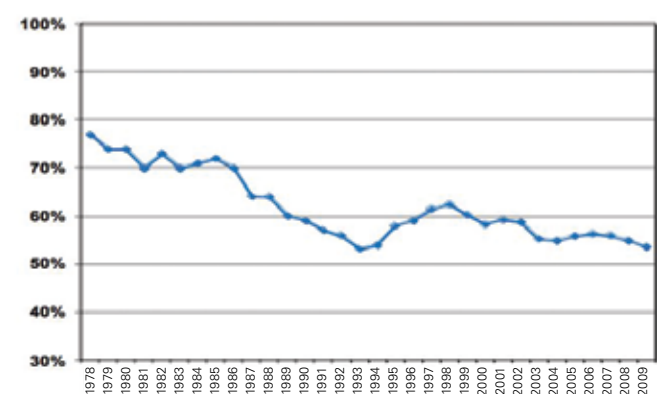
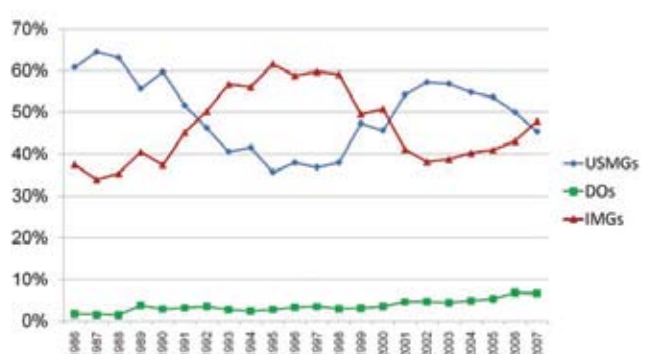


Figure 1 Percentage of graduates of U.S. medical schools who matched into categorical residency positions in internal medicine (1978–2009)



Source: National Resident Matching Program, Washington, DC

Figure 2 Percentage of nephrology fellows in accredited positions who were USMGs, DOs, and IMGs (1986–2007)



Source: Journal of the American Medical Association: Education Issues 1987–2008

International

MEDICAL GRADUATES IN NEPHROLOGY: Benefit, Challenge, or Both?

By Allison Haupt

For years, international medical graduates (IMGs) have comprised a significant percentage of the fellows in nephrology training programs who prepare to provide treatment to the rapidly growing population of patients suffering from kidney disease. In the 2006–2007 school year, physicians trained in foreign institutions constituted 47 percent of the fellowship class, an increase over the historic low of 38 percent in 2002–2003, and a return to the high percentages posted in the late 1990s. IMGs comprised 59 percent of all nephrology fellows in 1997–1998 (Table 1).

While IMG interest is vital to the success of nephrology training programs and the nephrology field as a whole,

their high concentration in the nephrology arena portends a number of potential challenges.

Compared with other internal medicine specialties, nephrology programs attract a higher proportion of IMGs. Of internal medicine specialties with a comparative number of participating programs in the 2009 Match, nephrology programs matched the greatest percentage of IMGs (49 percent), according to Donald Kohan, MD, PhD, director of the nephrology training program and assistant dean of graduate medical education at the University of Utah School of Medicine, and Mark Rosenberg, MD, director of the division of renal diseases and hypertension at the University of Minnesota School of Medicine. Gastro-

enterology programs matched the fewest (19 percent), while rheumatology, endocrinology, and hematology/oncology were closest with 36 percent.

Many in academic medicine fear that the declining interest in primary care—and the disinterest among medical school graduates in internal medicine residencies—is the culprit behind declining numbers of U.S. graduates specializing in nephrology. Although that must play a significant role, why are other internal medicine specialties bearing less of the impact? If specialties that offer similar compensation are better able to attract U.S. medical graduates, members of the nephrology community should consider how to better market the specialty to physicians-in-training.

IMGs supplement the overall physician workforces of various medical specialties and historically have provided necessary care in medically underserved areas that are unable to attract U.S. physicians. Due to restrictions associated with the J-1 visa—a cultural exchange visa historically used by most IMGs—IMGs must return to their home countries for two years after the completion of training. To circumvent the return requirement, IMGs can apply for the Conrad 30 waiver program. This federal program allows each state to hire up to

30 foreign-trained physicians to practice in rural and inner-city areas in need of primary and specialty care.

According to *American Medical News* (March 10, 2008), 10,901 IMGs entered the United States on J-1 visas in 1995–96. That number has significantly declined. In 2006–07, only 6033 IMGs entered on J-1 visas. However, the net number of IMGs has significantly increased. Since 1978, the IMG workforce has more than doubled, and now IMGs comprise approximately 25 percent of all practicing physicians.

Rather than entering on the J-1 visa, IMGs are selecting the more expensive, yet less restrictive, H-1B visa. This change in immigration practice has led to a depletion of physicians interested in serving in medically underserved areas. In 1995, 1374 IMGs requested a J-1 visa waiver. In 2006, that number declined to 903. Ironically, a greater percentage of J-1 visa holders are applying for the waiver program (12.6 percent of J-1 visa holders in 1995 versus 15.0 percent in 2006).

Concerns about U.S. medical graduate interest in nephrology as well as geographic distribution are magnified when compared with data illustrating the impact of kidney disease across the United States. According to a state-by-state analysis of the Conrad 30 program, 10 states histori-

Table 1. Comparison of states with high kidney disease prevalence and those filling J-1 visa waiver positions

Year	Number of programs	Fellows	USMGs*	%USMGs	DOs	%DOs	IMGs	%IMGs
1986	149	240	146	60.83%	4	1.67%	90	37.50%
1987	152	460	297	64.57%	7	1.52%	156	33.91%
1988	153	486	307	63.17%	7	1.44%	172	35.39%
1989	150	212	118	55.66%	8	3.77%	86	40.57%
1990	146	417	249	59.71%	12	2.88%	156	37.41%
1991	149	482	249	51.66%	15	3.11%	218	45.23%
1992	143	544	252	46.32%	19	3.49%	273	50.18%
1993	141	628	255	40.61%	17	2.71%	356	56.69%
1994	142	637	265	41.60%	15	2.35%	357	56.04%
1995	139	580	207	35.69%	16	2.76%	357	61.55%
1996	137	609	231	37.93%	20	3.28%	358	58.78%
1997	135	635	234	36.85%	22	3.46%	379	59.69%
1998	129	638	242	37.93%	19	2.98%	377	59.09%
1999	127	678	321	47.35%	21	3.10%	336	49.56%
2000	127	626	286	45.69%	22	3.51%	318	50.80%
2001	128	649	352	54.24%	30	4.62%	267	41.14%
2002	128	711	407	57.24%	33	4.64%	271	38.12%
2003	128	772	439	56.87%	34	4.40%	299	38.73%
2004	130	772	423	54.79%	38	4.92%	311	40.28%
2005	135	822	441	53.65%	44	5.35%	337	41.00%
2006	136	802	401	50.00%	55	6.86%	346	43.14%
2007	139	808	367	45.42%	54	6.68%	387	47.90%
1986–2007	-10	568	221		50		297	
1986–2007 (percent change)	-6.71%	236.67%	151.37%		1250.00%		330.00%	

Table 2. Changes in numbers of training programs, fellows, and type of graduates, 1986–2007.

States with top ten highest kidney disease prevalence rates, 2008 USRDS	States that traditionally fill all J-1 visa waiver positions
California	California
Texas	Texas
New York	New York
Florida	Florida
Illinois	Illinois
Ohio	Ohio
Pennsylvania	Arizona
Michigan	Massachusetts
Georgia	Rhode Island
North Carolina	Missouri

*USMGs includes graduates of Canadian medical schools

cally use all 30 of their available waiver slots. A review of the 10 states with the highest end stage renal disease (ESRD) prevalence rates identifies six states cross-referenced on both lists (Table 2).

The states that need and use the waiver program are the same states that are in the greatest need of nephrologists to care for their large populations of kidney disease patients. If use of the J-1 waiver program continues to decline, many states may face serious physician shortfalls in medically underserved areas (not to mention that states that already have difficulty luring J-1 visa waiver applicants will face a virtual drought).

The problem is further exacerbated when reviewing the pediatric nephrology workforce. Nationwide, we face a significant workforce problem, with only one pediatric physician for every 167,000 children. In Georgia, where ESRD prevalence rates are the ninth highest in the nation, there is only one pediatric nephrologist for every 410,000 children. Yet many children's hospitals are not included as "underserved areas," even though they may

require more subspecialty support.

Although many states allow IMGs to practice their designated specialties in underserved areas, some require they only practice primary care, even if the state illustrates growing specialty needs. California, Idaho, Nevada, North Dakota, and Utah all do not accept specialists into the Conrad-30 program. Considering California posted the highest ESRD incidence rates in 2008, according to the U.S. Renal Data System, it might be to the nephrology community's benefit to encourage broader support for specialty care when the Conrad-30 program is up for extension in September 2009. According to Sen. Kent Conrad (D-N.D.), the original sponsor of the program, he plans "to expand and improve Conrad 30 through further legislation."

By depending on IMGs to fill gaps in kidney care, the nephrology community must also consider medical challenges that extend beyond the United States. Some critics argue that an influx of IMGs into U.S. medical programs leads to a deplorable "brain drain" in which talented physicians

are removed from nations in desperate need of skilled medical labor.

"There are always costs to the source country in terms of financial resources (investment in education) and human capital (gifted, ambitious people)," said Fitzhugh Mullan, MD, professor of medicine and health policy at George Washington University School of Public Health and Health Services in Washington, DC. "Moreover, many medical schools in source nations are influenced by the 'Western aspirations' of their students, so that their training programs are not well aligned with local patterns of disease and levels of technology."

While attempting to distribute IMG physicians to underserved areas in the United States, we may be adding to the list of underserved areas worldwide in need of appropriate care. Does the nephrology community need to consider the international implications of the IMG influx, or should it encourage anyone willing to practice in the United States to flock to our medical schools, teaching hospitals, and community centers?



Without IMGs, the nephrology workforce would likely be in serious decline. IMGs supplement the general workforce and provide additional care in medically underserved areas. While not suggesting that IMGs interested in the profession should be discouraged or underappreciated, the nephrology community should assess why the specialty is less appealing to U.S. medical graduates and consider ways to encourage greater attention to diseases affecting the kidney. ●

Allison Haupt was ASN research policy coordinator until June 2009, when she left the Society to attend the New York University School of Law.

Workforce

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IMGs face pressures not to seek additional training or to practice in this country

Approximately 25 percent of U.S. physicians hold J-1 visas (and remain in the United States as part of a waiver program that requires them to work in an underserved area for three years), hold H1-B visas, have become naturalized U.S. citizens, or are U.S. citizens who traveled abroad for medical school. An estimated 40 percent of nephrologists in the United States graduated from an international medical school, making nephrology more dependent on international medical graduates (IMGs) than any other specialty, except geriatrics (5).

A "convergence of technology" and other factors (such as global supply chains) is causing the developing world—particularly India and China—to provide opportunities for well educated people to work in efficient systems. A reduction in IMGs from these countries could have long-term consequences on the nephrology workforce. Together, India and China account for more than 20 percent of IMGs in the United States (6).

Complicating matters, the immigration process became more restrictive with its move, after September 11, 2001, from the Department of State to the Department of Homeland Security. The number of IMGs entering the coun-

try on J-1 visas dropped from 11,471 in 1996 to 6033 in 2006. As a result, underserved rural and urban communities must meet workforce needs with a smaller pool of J-1 visa holders.

At the same time, the number of H1-B visa holders—who have no requirement for working in underserved areas—is increasing. These trends (fewer J-1 and more H1-B visa holders) have several implications for nephrology. Fellowship program directors need to rely more on IMGs with H1-B visas, IMGs who are U.S. citizens, and graduates of osteopathic medical schools to fill training positions. The number of DOs in nephrology fellowships increased from seven in 1987 to 54 in 2007 (Figure 2).

The prevalence of CKD is rising dramatically

An estimated 31 million adults in the United States (or 16 percent of the population) currently have some form of CKD, and another 20 million are at risk for developing it. As the U.S. population ages—and a greater number of individuals suffer from diabetes, hypertension, and obesity—the prevalence of CKD rises. For the first time, the United States Renal Data System (USRDS) in 2008 included a separate volume focusing solely on CKD in its Annual Data Report.

Some of the data for this report were collected from the National Health and Nutritional Examination Surveys (NHANES). These surveys, conducted by the National Center for Health Statistics (part of the Centers for Disease Control and Prevention), indicate that

the prevalence of CKD has increased by 20 to 25 percent during the past decade. Josef Coresh, MD, and colleagues evaluated the same data for a study published in the *Journal of the American Medical Association* in 2007. Their study found that the prevalence of CKD rose from 10 percent of the population in 1988–1994 to 13 percent in 1999–2004 (7).

The increasing prevalence of CKD also threatens to multiply the number of patients with ESRD. In 2005, 484,995 U.S. adults had ESRD. USRDS estimates that this number will increase by 60 percent by 2020, to nearly 785,000. The incidence rate of ESRD is expected to increase by 41 percent to 151,000 new cases in 2020 (8).

With 7550 active physicians, nephrology currently ranks 22nd among 36 physician specialties in the United States. The nephrology workforce is larger than that of child and adolescent psychiatry but smaller than the physical and rehabilitation medicine workforce.

At this time, there are 39,950 people per nephrologist in the United States. As the prevalence of CKD and ESRD escalates—and the gap widens between the number of people and the number of nephrologists to treat them—who is going to care for all the patients with kidney disease? If fewer IMGs train or practice in the United States, who will care for poor patients as well as patients in underserved rural and urban communities? If USMGs continue to pursue other career pathways, who will care for underrepresented populations, such as African Americans, who already have a disproportionate share of kidney disease? ●

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