Enhancing Nephrology Career Interest through the ASN Kidney TREKS Program


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ABSTRACT
The Kidney Tutored Research and Education for Kidney Students (TREKS) Program is a product of the American Society of Nephrology (ASN) Workforce Committee that seeks to connect medical and graduate students to nephrology. This program starts with a weeklong camp–like course introducing participants to renal physiology through classic and modern experiments. Next, each student is matched with a nephrology mentor at his or her home institution to foster a better understanding of a nephrology career. Lastly, the students are encouraged to participate in scholarly activities and attend the ASN Kidney Week. Now in its third year, with a total of 84 participants, survey data suggest early success of the program, with a self-reported 40% increased interest in nephrology fellowship and/or research careers. In addition, students give high ratings to the course components and mentorship pairings. Continued student tracking will be necessary to determine the long–term program effect.


In the inaugural year of the United States nephrology fellowship match in 2009, there were 1.6 applicants for each posted position. However, there has been a steady decline in the number of applicants since, with just 0.6 applicants per position in 2015. This is one of the lowest ratios among the medicine subspecialties.1,2 In response to these trends, the American Society of Nephrology (ASN) Workforce Committee has developed several programs to enhance interest in nephrology careers. One of the successful endeavors is the Kidney Tutored Research and Education for Kidney Students (TREKS) Program. By combining nephrology–focused scientific experiences with a longitudinal mentoring relationship, the Kidney TREKS Program is a unique program designed to stimulate passion for lifelong engagement in nephrology clinical practice and/or research among medical and graduate students.

KIDNEY TREKS PROGRAM DESIGN
Students often choose their career paths during medical school on the basis of interest in the subject matter and mentorship.3–13 The Kidney TREKS Program was designed on the basis of these concepts (Figure 1). Annually, 25 medical students and five graduate students are selected from a pool of applicants to join the cohort. This mix was developed with an interest in trying to foster both clinical and research careers.

**Introduction to Physiology of the Kidney**
Each June, the Kidney TREKS Program is initiated with a 1-week introduction to kidney physiology. The Origins of Renal Physiology is modeled after the successful course offered to nephrology fellows, and it is directed by Mark L. Zeidel.14,15 The course is held at Mount Desert Island Biological Laboratory (MDIBL), which is a fully functional modern laboratory facility set in Bar Harbor, Maine. It offers a camp–like atmosphere for participants, with its ocean–side campus and dedicated student housing located adjacent to its state of the

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art laboratory buildings. Because MDIBL played an enormous role in the development of renal physiology as a discipline of study, the sense of history is ever present as the students perform their experiments and analyze their results.13

The instructional portion of the course includes six different investigational modules that are each 1.5 days in duration. Each student has an opportunity to participate in three modules over the 7-day course. Under the supervision of world class faculty, the students spend time absorbing didactics, conducting investigations, assessing the data, and presenting their work to the other students.

After finishing a module, the students enjoy the environment and receive formal and informal mentoring from faculty alongside other participants with similar interests. The ASN provides a travel stipend for transportation and covers the total cost of the course.

Mentoring
Students in the early years of medical school can find it difficult to become involved with an internal medicine subspecialty, but this involvement can have an effect on their career choice.3,9–13 A survey of non-nephrology internal medicine subspecialty fellows suggested that the lack of mentorship was a key factor for not choosing nephrology as a career.16

Through the Kidney TREKS Program, each student is paired up with a mentor from his or her home institution. There is reliance on the division chiefs and program directors to solicit volunteers for this role. Expectations, including at least three meetings per year, and a list of discussion topics are provided to the mentoring pair. The pairs meet to discuss career choices and clinical experiences, and the mentor may provide shadowing opportunities.

The graduate students already involved with nephrology research may choose to continue with his or her current mentor, but others may come to the program to explore nephrology, because their area of study has not included the kidney. These students are matched with a separate nephrology mentor.

Scholarly Activities
The Kidney TREKS Program encourages the mentees to match the student with a research project as a means for continued learning and interaction with nephrology. By fostering scholarly activities focused on nephrology topics, the Kidney TREKS Program aims to engage students as potential contributors to furthering nephrology knowledge. The student is encouraged to submit an abstract to the annual ASN Kidney Week.

ASN Kidney Week
Lastly, Kidney TREKS Program participants are invited to attend the ASN Kidney Week during their medical or graduate school career. They have an opportunity to be part of the Kidney Students and Residents at Kidney Week Program, which provides a framework to navigate the large Kidney Week meeting and interact with other trainees exploring nephrology.

RESULTS OF THE KIDNEY TREKS PROGRAM

Class Demographics
The Kidney TREKS Program was established in 2013 with the inaugural class of 24 medical students. In 2014, the class size was increased to 30 students (25 medical students and five graduate students) on the basis of the success of the first year and the robust demand from applicants. The addition of graduate students was an effort to expand nephrology research careers in addition to clinical careers. The program has received two to four applications per position in the 3 years that the course has been offered, with the majority of advertising done through internal ASN resources.

Thus far, all medical students have come from allopathic medical schools, and all have been affiliated with an academic medical center. The majority of the students (73%) attend after the first year of medical school. Women make up 56% of the classes, with the majority of participants classifying themselves as white (41%) or Asian (27%); 22% of students have come from traditionally under-represented groups: Black (11%) and Hispanic (11%). There has been a relatively equal distribution of students coming from the northeast (27%), southeast (30%), and midwest (29%) regions of the United States. Fewer students come from the west (10%) and south (2%)
regions of the United States and Canada (2%) (Table 1).

Renal Physiology Course Evaluation
The MDIBL conducts a survey at the conclusion of the week, with an 87% completion rate since course initiation; 94% of participants rate the overall course as excellent or very good, and 100% report that they enjoyed their experience. Evaluation of the six learning modules consistently rates proximal tubule handling and salt and water homeostasis the highest, with acid-base balance being the lowest-rated module. Outstanding ratings were given to all modules by the majority of the students. Many of the components of the course, such as faculty members, mentoring experiences, and the facilities, also received outstanding ratings. Areas suggested for improvement include expanding the precourse communication and updates to the accommodations. Several written comments focused on the positive role that mentors play during the course as well as the vast amount of learning achieved. The most frequent complaint expressed is that the attendees want to have the opportunity to participate in all of the modules instead of being limited to three.

Follow-Up Survey
Approximately 1 month after the annual MDIBL course is concluded, an ASN survey is sent to determine the effect that the course has made on the student. Responses were obtained from 64% of the participants. Most students report choosing the Kidney TREKS Program, because they have an interest in internal medicine/nephrology (89%) or they enjoy the subject of nephrology during medical school coursework (74%). Each year, the students have reported an increased interest in pursuing a nephrology fellowship and/or a career in nephrology-based research. When asked to compare their thoughts before and after the course, there was an increased interest of 41.6% in pursuing nephrology fellowships and 40.5% in nephrology research careers. When asked to rate the value of various aspects of the program on a 1–10 scale, the highest ratings went to the hands-on course work (mean =9.1), mentorship during the course (mean =9.2), and the ASN opportunities that are provided (mean =9.2).

Table 1. Demographics of the Kidney TREKS Participants

<table>
<thead>
<tr>
<th>Kidney TREKS Participant Demographics</th>
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<th>2015</th>
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Mentorship
A survey was conducted to determine the effectiveness and longevity of the mentoring pairs. Of the 54 mentor-student pairings in the initial two classes, 23 mentors and 22 students responded. Mentors reported 494 interactions with the students; 70% of the mentors had contact with their student >10 times, with the majority of these being in person and by email. Of the respondents, 42% of pairs had performed some type of tutoring through these meetings. A minority (23%) had invited the student to clinic or rounds. Thus far, 46% of responding mentors feel that their student is likely or very likely to enter a career in nephrology.

The students rated the mentoring experience at a mean of 7.1 on a 10-point scale; 77% had fulfilled the expectation of meeting with their mentor at least three times per year, and 27% of the Kidney TREKS mentor pairs conducted research projects together that resulted in very regular meetings (>10 times in a year), whereas the other pairs met less frequently. Students reported various meeting frequency and methods of contact with mentors (range from once to daily), but all of the pairs had met in person at least once.

Participation at the ASN Kidney Week
Many of the initial Kidney TREKS Program participants are currently reaching the third or fourth year of medical school; therefore, they will start to have a larger presence at the annual ASN Kidney Week: 98% of participants have indicated that they plan to attend the event. Thus far, 15 of the 54 potential Kidney TREKS students have attended Kidney Week, with five students presenting seven posters.

INITIAL INSIGHTS
Initial results of the ASN Kidney TREKS Program show that considerable student interest exists in nephrology-specific experiences and that students can be successfully engaged in a sustained,
longitudinal relationship with local mentors and the ASN. Although there have been other programs that have provided students with extra experiences in the field, none have combined a structured learning experience with a long-term mentoring opportunity as seen with the Kidney TREKS Program. We are able to show increased self-reported interest in nephrology careers and nephrology research, longevity of a mentoring relationship, and participation in the ASN Kidney Week Meeting. Continued follow-up of Kidney TREKS Program cohorts will be required to discern if the program fulfills its ultimate goal to shepherd more students into research and clinical care careers in nephrology.

FUTURE PLANS

Because of the numbers of applicants with relatively minimal advertising and the successful survey outcomes, it is evident that students value the opportunities that Kidney TREKS Program provides. The ASN will launch a second Kidney TREKS Program site in the summer of 2017 to double the annual enrollment. The University of Chicago has been selected to host the second site and will offer a more clinically oriented focus of experiences. With this expansion, it will be possible to reach out to under-represented medical schools and osteopathic medical schools and further expand the diversity of nephrology.

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DISCLOSURES

None.

REFERENCES