Novel Educational Approaches to Enhance Learning and Interest in Nephrology

Kenar D. Jhaveri, Matthew A. Sparks, and Hitesh H. Shah

The number of U.S. medical graduates pursuing careers in nephrology has declined over the last several years. Some of the proposed reasons for this declining interest include difficult-to-understand or unstimulating kidney pathophysiology courses in medical school; disheartening inpatient elective experiences; and few opportunities to experience the other aspects of nephrology careers such as outpatient nephrology clinics, outpatient dialysis, and kidney transplantation. Novel and alternative educational approaches should be considered by the nephrology training community to enhance the understanding of nephrology from medical school to fellowship training. Newer teaching methods and styles should also be incorporated to adapt to today's learner. These innovative educational approaches may not only increase interest in nephrology careers, but they may also enhance and maintain interest during nephrology fellowship. In this article, we will review several educational approaches that may enhance teaching and learning in nephrology.

Key Words: Nephrology education, Fellowship, Residency, Fellows, Innovation, Education research

Introduction

Academic nephrologists at many medical centers in the United States have leadership roles and are considered excellent teachers and mentors.[1] However, innovation and research in nephrology education is lacking. Current teaching approaches to our trainees should be reexamined. Novel teaching and learning strategies should be considered to adapt to the changing needs of today's learner. In addition, nephrology in the United States is facing a challenging time with difficulty in attracting excellent prospective residents and medical students into nephrology.[2,3] Many factors can influence medical students' and residents' career choices, including intellectual interest in a particular field, the presence or lack of a significant procedural component, earning potential, job opportunities, financial debt, family commitments, and geographical constraints, among others.[1,4-7] Medical student and resident exposure to various subspecialties may be one such variable that can strongly influence their career choices.[4,5] Although several factors may play a role in attracting medical trainees into nephrology, one important factor may be related to how nephrology is presented to trainees.[4] A traditional inpatient consultative-based nephrology elective during medical school or residency may not provide the optimal exposure to the field. Studies from our group and others have shown that one of the reasons why nephrology was not chosen as a career by medical students and residents was due to lack of mentorship and/or as a result of poorly taught nephrology courses in medical school and residency.[1,4-7] For example, complex acid-base or electrolyte disorders may be seen as intimidating or even seem irrelevant to many who otherwise might have considered a career in nephrology.[1,4,6,7] A survey conducted in 2010 suggested that innovative teaching tools may increase interest in nephrology careers.[8] We suggest that novel and alternative teaching pedagogies aimed at nephrology education will enhance our ability to teach nephrology and make the field more attractive to medical students and residents.[1,8]

Traditional teaching methods have focused on didactic lectures. This approach requires substantial preparatory time but only targets one style of learning. However, we feel that integrating multiple teaching tools using all forms of teaching perspectives will help target a wider variety of learning styles.[9] This article will review the science behind learning and teaching and then summarize what tools nephrologists are using to educate our trainees (medical students, residents, and fellows). We feel that the tools discussed in this review could make learning topics in nephrology more interactive and "learner centric". Thus, the adoption of these tools may also enhance interest in nephrology careers during medical school and residency. In addition, this review will highlight certain areas in which education in nephrology fellowship can improve. Web-based and social media tools of education in nephrology will be

From Division of Kidney Diseases and Hypertension, North Shore University Hospital and Long Island Jewish (LIJ) Medical Center, Hofstra North Shore-LIJ School of Medicine, Great Neck, NY; Division of Nephrology, Duke University Medical Center, Durham, NC; and Division of Kidney Diseases and Hypertension, North Shore University Hospital and LIJ Medical Center, Hofstra North Shore-LIJ School of Medicine, Great Neck, NY.

The authors report no financial conflicts of interest.

Address correspondence to Kenar D. Jhaveri, MD, Division of Kidney Diseases and Hypertension, North Shore University Hospital and Long Island Jewish Medical Center, Hofstra North Shore-LIJ School of Medicine, 100 Community Drive, 2nd Floor, Great Neck, NY 11021. E-mail: kjhaveri@nshs.edu

1548-5595/$36.00

http://dx.doi.org/10.1053/j.ackd.2013.03.006

briefly mentioned but covered in more detail elsewhere in this issue of the journal.

Innovative Teaching Styles/Techniques

The Science of Learning and Teaching

How can a physician's learning style drive educational planning and teaching methods? This question was answered in the 1970s by David Kolb when he defined the current paradigm in describing experiential learning by putting forward four distinct learning styles.[9] Beyond describing distinct learning styles, Kolb also framed learning as a process in which knowledge is created through the transformation of different experiences. According to Kolb, two phases are required for learning to occur. The first phase, termed "grasping" or" perceiving", can be achieved by concrete experiences or abstract conceptualization, such as observing a patient with a symptom or reading about the same condition. The second part, termed "transformation" or "processing", is achieved by actively performing the task or having a reflective observation, such as acting upon the symptom or discussing what the optimal therapy is.[9] Within this framework of an evolving continuum, Kolb described the four learning styles (diverging, converging, accommodating, and assimilating; Fig 1). He defined the diverging learning style as a learner who takes a concrete experience and then reflects upon it (a "watcher"). The converging-style learner takes an abstract concept and performs an experiment to test this new information for validity (a "doer"). The accommodating-style learner takes a concrete experience and then performs an experiment (a "feeler"). However, the assimilating style of learning describes how reflection is used to assimilate new knowledge (a "thinker"); Fig 1). Understanding how learners use each of the four learning styles described by Kolb is important because most learners may use some or all of these styles. Just as we are providing "patient-centered" care in the clinic, our educational goal should mimic this to provide "learner-centered" education. As physicians' design an educational curriculum in nephrology, prior knowledge of the learner's preferred learning style can be useful to the teacher or mentor. Accordingly, this four-stage framework of learning promotes active learning through practice and reflection.

As Kolb and colleagues describe different learning styles, Dan Pratt and John Collins describe five perspectives on teaching styles. These teaching styles include transmission, apprenticeship, developmental, nurturing, and social reform.[10] Data from 120,000 educators from many nations showed that most teachers hold one of the above teaching styles as their dominant view of teaching with one or two as additional back-up teaching styles. Back-up teaching styles allow the teacher to adapt to changes in learner style and educational circumstance of the learner without moving too far from their more dominant view of teaching. Table 1 discusses the definition of all five styles. As a teacher, one can identify with the style that is most dominant to oneself and try to improve on this by creating a back-up teaching style.[11]

During medical school, residency, and nephrology fellowship training, there may be several shortcomings in the way a trainee is educated and trained. However, keeping the theory of learning and teaching in mind, a curriculum that includes each of the different learning styles can help improve how information is shared. Experimenting with novel teaching styles such as e-learning modalities, simulation teaching stations, or other such methods as described in the next section are ways in which program directors and the training community can augment and improve teaching.

CLINICAL SUMMARY

- Novel and alternative educational approaches should be considered by the nephrology training community to enhance the understanding of nephrology from medical school to fellowship training.
- These innovative approaches may not only increase interest in nephrology careers, but they may also enhance and maintain interest during nephrology fellowship.

Rapid Teaching Methods

Rounding in the hospital or the clinic is one of the most common ways of teaching medical information to our trainees. This style of teaching and learning lends itself to a more active environment compared with a static lecture-based model. The "one-minute preceptor" model is a teaching method often used during rounds. This is performed by the teacher asking the simple question "What do you think is going on?" and then asking the learner to provide evidence for or against the diagnosis. The one-minute preceptor method ends with a general teaching objective. The teacher needs to observe the learner doing something correctly, reinforce this behavior, and discuss areas for improvement.[12] Another teaching method called the "Aunt Annie" model is what we do on a daily basis with our trainees. It allows the learner to see the patient first without the teacher and then articulate a complete history and physical with a "one-liner" with a presumptive diagnosis to the teacher.[13] The teacher then examines the patient with the learner and makes a diagnosis and management plan while the learner writes a note. The discussion should entail reviewing the learner's note. The Aunt Annie method can be augmented by using the SNAPP method. This teaching method is performed by allowing the learner to