

Alignment of Nephrology Training with Workforce, Patient, and Educational Needs: An Evidence Based Proposal

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Summary

Background and objectives Competency-based training programs focus on the *product* of training rather than the *process* with the desired attributes and skills set of the specialist directing the training program. These ideal skills and qualities have yet to be formally identified for nephrology training. The objectives of our study were: (1) to define the attributes of a “high quality” nephrologist from the perspectives of the trainer (nephrologist), trainee, and renal patient and (2) identify components and relative frequencies of nephrologists’ work practice.

Design, setting, participants, & measurements Four substudies were undertaken, utilizing a combined quantitative and qualitative approach: (1) a national nephrology workforce study, (2) in-depth interviews of nephrology patients, (3) in-depth interviews of nephrology trainees, and (4) in-depth interviews of practicing nephrologists.

Results Patients value good communication skills above other attributes. Nephrologists and trainees identify particular personal attributes, a holistic and evidence-based approach to patient care, and good clinical skills as paramount. Although nephrologists spend most of their time in clinical practice, substantial time is also spent in research, teaching, and administrative work.

Conclusions For the first time, an evidence-based approach has been used to help define qualities desired in a practicing nephrologist. Along with training and assessment in clinical practice, this research supports nephrology training programs incorporating training in basic interventions, research skill acquisition, administration, and teaching. Training toward high standards in advanced communication and the maintenance of a holistic approach to patient care are necessary.

Clin J Am Soc Nephrol 6: 2681–2687, 2011. doi: 10.2215/CJN.02230311

Introduction

Underpinning all medical endeavors in all disciplines is the goal of optimizing patient care. To achieve this aim, the selection, education, and training of individuals to deliver medical care is of paramount importance. Within the specialist setting in Australia, as opposed to general practice (1–4), there has been good will but a lack of academic rigor when attending to these processes. For example, in Australia, potential nephrology trainees have undergone a range of selection processes and variable undergraduate training and experienced 2 to 3 years of hospital-based clinical exposure. Subsequent assessment and progress is largely dependent on supervisors’ reports.

Internationally, Denmark, the Netherlands, and the U.S. Accreditation Council for Graduate Medical Education have adopted competency-based education programs (5) with a heavy reliance on the Canadian Medical Education Directions for Specialists findings (6). The Canadian Medical Education Directions for

Specialists system offers a great deal, but medical training should be tailored to the needs of specific countries and disciplines while retaining core international elements.

Logically, competency-based specialist training cannot be achieved in nephrology without understanding the innate and learned attributes of a “good” nephrologist and, fundamentally, how a nephrologist spends his/her work time. The central objective of this research was to define and describe the qualities and characteristics of a “good” or “inspirational” nephrologist from the perspectives of the patient, trainee, and trainer. In addition, we sought to identify what nephrologists actually do in their vocational setting.

Materials and Methods

Ethics approval was obtained through the University of New South Wales Human Research Ethics Committee (HREC 04155) and additionally from in-

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dividual hospitals with participating patients. A mixed-methods approach was adopted (Table 1) using qualitative and quantitative analyses as described below. Defining a good nephrologist used first an extensive literature search then semi-structured in-depth interviews of trainers, trainees, and patient groups. A national nephrology workforce questionnaire was designed to determine the components of day to day work of an Australian nephrologist.

Workforce Questionnaire

Because there was no pre-existing validated instrument, the workforce questionnaire was designed, piloted, and modified following review of other international and local workforce surveys. The questionnaire was delivered in self-administered mailed and electronic formats (see <http://notes1-med.med.unsw.edu.au/surveys/renal.nsf/RecordPrefs?OpenForm>).

The nephrologists surveyed were those practicing in Australia and listed with the Australian and New Zealand Society of Nephrology in 2007. The main information sought in this survey was: the number of full-time equivalent nephrologists working in Australia, their work hours, and how their work time was occupied. Analysis of the categorical components of the questionnaire (work time allocations) was undertaken using chi-squared and *t* tests within the Statistical Package for the Social Sciences (SPSS), version 17.0 (7).

In-depth Interviews

Patient Cohort. The sample was drawn using purposive sampling (8) but was limited to hospitals that had granted ethics approval. Directors of nephrology were asked to request nephrologists in their unit to provide patients they encountered (from clinics or inpatients) with information sheets outlining the purpose and design of the study. Patients were eligible if they spoke English, were not significantly hearing impaired, and received care from a nephrologist. All interviews were undertaken by one of the authors (C.L.). Two pilot interviews were undertaken but not transcribed or analyzed. The aim of the interviews was to identify what the patient perceived as a “good” nephrologist; this required an exploration of the treatment/management expectations. Literature surrounding patient satisfaction and chronic illness influenced and helped focus the cues and probes used within the interview process. The interview guide is included as Table 2.

Trainers and Trainees. Many similarities existed between the two procedural methods for the interviews with nephrology advanced trainees and consultant physicians.

Data collection for these two data sets occurred independently; however, insights from the interviews with advanced trainees provided a backdrop for interviews with consultants, and issues raised in the first interview data set were pursued and challenged in the second data collection.

Analysis of the two groups was undertaken together because after the completion of all interviews, it was apparent that the two groups had similar perspectives; the software (9) has the capability of comparing and contrasting variables (such as “interviewee designation”) so that this assumption could be continually challenged. All of the trainees ($n = 46$) listed with the Royal Australasian College of Physicians Specialist Advisory Committee in Nephrology were contacted to participate in the study. Twenty-three participated.

To avoid interviews of those nephrologists with little or no exposure to the training program, purposive sampling and snowball sampling techniques (8) were used on the basis of senior consultants’ supervisory and educational experience. Thirty-eight nephrologists were invited, and 26 agreed to be interviewed. Of the 12 who did not participate (one woman and 11 men), two were unwell, one was on leave, seven did not respond after three emails, and two initially agreed to participate but failed to provide a time for interview. Other than gender, no other characteristics were available for nonresponders.

Stories and experiences of nephrology healthcare delivery and training were deconstructed to examine and challenge the participants’ views of: (a) the qualities of an inspirational nephrologist; (b) whether the training program is promoting the acquisition of these qualities; (c) how they know (knew) what to learn; (d) how they go (went) about this learning task; and (e) what strengths and weaknesses they perceive in the current training program. Although many training and educational insights came from these interviews, the results presented here are restricted to the first of these interview issues.

Results

Workforce Questionnaire

The complete workforce report is available at <http://www.nephrology.edu.au/workforce/index.asp>. A response rate of 79% was achieved ($n = 280$). In 2007, there were 278 full-time equivalent nephrologists in Australia, an average of one per 60 end-stage kidney disease (ESKD) patients. Of full-time nephrologists, 140 (84%) work more than a standard 40-hour week without taking into account further on-call (after hours) commitments. The average weekly work hour of full time nephrologists was 52 h/wk.

Table 1. Mapping of research methods against data sets

Data Collections	A	B	C	D
Description	National workforce survey	Interviews with patients	Interviews with advanced trainees	Interviews with nephrologists
Sample size	280	11	24	27
Methodology ^a	QUANT and Qual	QUAL	QUAL	QUAL

^aQual refers to qualitative research, Quant refers to quantitative research, and capital letters denote the dominant approach (convention).

Nephrology Patient Interview Guide - Semi-structured (Guide Only)	
Table 2. Patient interview guide	
Introduction to research	
Tell me about how you first found out you had problems with your kidneys/blood pressure?	
When did you first meet a kidney specialist?	
If you think back over (appropriate time period), can you remember a time when you were happy or satisfied with the care you received? (Explore unhappy/dissatisfied.)	
You've indicated that you were dissatisfied/satisfied with the care you've received from your nephrologist. Tell me a bit more about that if you can.	
I can sense you're (un)happy with the treatment you've received so far. Can you suggest how to improve the delivery of care (even further)?	
How you are usually involved in the decisions surrounding your care? Or do you feel unable to participate?	
Explore with respect to specialist involvement.	
Explore how patient views specialist healthcare provision.	
Is there a difference in expectations when seeing a specialist <i>versus</i> primary healthcare provision? Do you have a general practitioner?	
Identify specific aspects/qualities of nephrologist that makes them good/bad.	
Is the nephrologist a good/bad communicator or time manager (<i>i.e.</i> , does the patient feel rushed)? Does the nephrologist not seem confident in terms of knowledge? Why? Where does this feeling come from? Does the nephrologist involved the patient in decision-making processes?	
What qualities do you look for in a kidney specialist?	
Check specifics, <i>e.g.</i> , English speaking/other language and gender of physician.	
Have you ever changed kidney specialists? Could you ever see this occurring? Why did you do (would you) do that?	
If you had to change kidney specialists (move, etc.) how would you decide upon a specialist?	
Demographics of patient: educational level, age, partner, rural/metropolitan.	

The average time nephrologists spent on various duties is summarized in Figure 1. Nearly all nephrologists were involved in delivering clinical nephrology services and spend on average 59% of their work time in clinical practice (nephrological and non-nephrological). Within clinical nephrology, the management of patients with chronic kidney disease consumed the most time, with over 60% of nephrologists dedicating up to 40% of their clinical workload in this area. Nearly all clinical nephrologists (96%) participated in the provision of care for patients with chronic kidney disease, and 94%

managed dialysis patients. Over 50% of nephrologists dedicated up to 30% of their time managing dialysis issues. The median percentage of time dedicated to ESKD (the composite of acute and chronic transplantation and dialysis) was 41% of clinical work hours, which represented 20% of the total workload of a nephrologist in this study; only 14% of nephrologists spend greater than 10% of their time managing acute transplantation.

Nephrologists spent, on average, 14% of their time in research, 8% each in administration and teaching, 6% in con-

The Time Nephrologists Dedicate To Various Duties

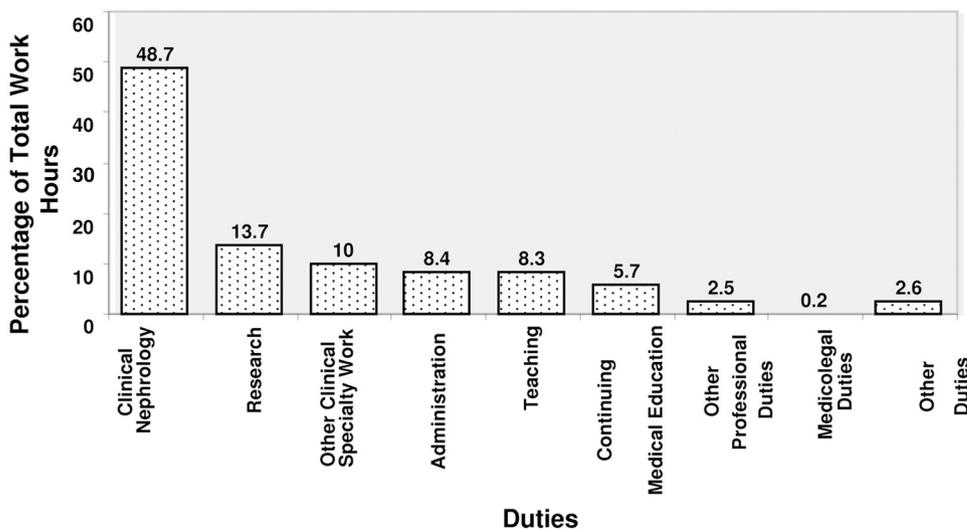


Figure 1. | Work profile of nephrologists practicing in Australia (2007).

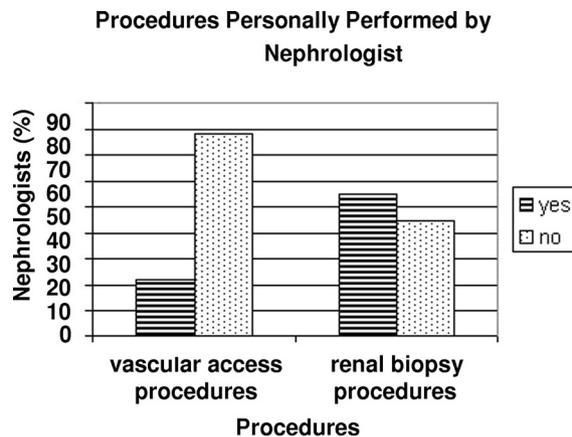


Figure 2. | Procedures performed by nephrologists practicing in Australia.

tinuing medical education, and smaller amounts in professional, medicolegal, and other duties. Over half of the respondents (145) spent some time in a research capacity, although for most (99), this took up less than 20% of their time. More respondents perform renal biopsies (55% of respondents, $n = 138$) than vascular access (22%, $n = 57$). Both procedures were performed by 49 nephrologists (19%), and 108 (43%) nephrologists did neither procedure (Figure 2). In the qualitative responses, heavy workloads and clinical demands were nominated as problematic and a cause for a lack of control over work hours.

In-depth Interviews

Patient Cohort. Eleven interview transcripts formed the sample for the patient interviews, and patient demographics are detailed in Table 3. Patients (often with multiple specialists involved in their care) felt that the qualities of a “good doctor” were cross-disciplinary. Nephrology patients identified that having a chronic disease required a different specialist management approach than that from a specialist managing a patient with a limited or acute health

problem. They defined a good nephrologist as one who: (a) is a good communicator; (b) has an interpersonal relationship with the patient; (c) has the ability to relate and empathize; (4) recognizes the patient as an individual; (5) has a strong knowledge base; and (6) is trustworthy and in whom they have confidence. Patients relied heavily on communication and verbal cues to determine a doctor’s strength in the above mentioned categories. For example, knowledge base was assessed utilizing a doctor’s *explanation* of the proposed treatment or disease process.

Trainers and Trainees

Interviewee demographics are detailed in Table 4. The majority of nephrologists interviewed were male, whereas half the trainees interviewed were female, reflecting the changing demographics of the Australian nephrology workforce (10). Most physicians (nephrologists and trainees) felt that patients were not good arbiters of clinical competency, suggesting that they inadvertently proxy nonclinical skills such as communication for clinical competency.

As depicted in Table 5, three defining categories for an inspirational nephrologist were valued by this group: (1) personal attributes: intelligence, compassion and approachability, enthusiasm for the job, being inclusive of team members, and a strong work ethic and work-life balance; (2) approach to patient care: holistic and balanced, logical, and evidence and research based; and (3) skills: strong knowledge base, good clinical skills, the capacity to teach, and research and academic skills. A focus toward patient well-being was the single most mentioned quality of all (51 references) when defining the inspirational nephrologist. Interviewed doctors admired the *holistic* as opposed to the *organ-in-isolation* approach.

Good clinical skills and a strong knowledge base were the top two skills mentioned by doctors as important in defining a good nephrologist. The currency of these skills was referenced in terms of experience, exposure, and an understanding of research methods.

Table 3. Demographics of patients interviewed

ID	Age (years)	Gender	Income	Metropolitan or Rural	Years Seeing Nephrologist	Level of Education	Marital Status	Time on Dialysis (years)	Type of Illness
1	53	F	2	R	26	5	1	5	2a, 3
2	55	M	3	M	26	5	1	3	2a, 3
3	51	F	X	M	21	X	2	X	2a
4	77	M	1	R	X	2	1	X	1
5	51	M	X	M	0.2	4	X	0	1
6	55	F	1	R	X	3	2	0	1
7	38	F	2	M	9	2	1	9	2a
8	25	F	2	R	13	4	1	0	1
9	39	M	2	R	9	2	1	0	1
10	X	M	1	M	2	1	1	1	2b
11	X	F	1	M	X	1	1	0	1

X, unassigned. For level of education, 1 indicates primary school, 2 indicates school certificate (or equivalent), 3 indicates higher school certificate (or equivalent), 4 indicates college/TAFE, and 5 indicates university. For income, 1 indicates <\$399/week, 2 indicates \$400 to 699 per week, and 3 indicates >\$700 per week. For marital status: 1 indicates married or long-term relationship and 2 indicates single, divorced, or separated. For type of illness, 1 indicates chronic kidney disease and/or hypertension, 2a indicates peritoneal dialysis, 2b indicates hemodialysis, and 3 indicates previous or current renal transplant recipient.

Table 4. Abbreviated demographics for nephrologist and nephrology advanced trainee in-depth interviews

	Consultant Nephrologists (n = 26)	Nephrology Advanced Trainees (n = 23)	Unassigned
Male (n)	22	12	
Female (n)	4	11	
Average age (years)	44	31	1
Long-term relationship (n)	15	18	10
Dependents (n)	13	9	9

Table 5. Identified qualities of a “good” nephrologist (more than one response permitted)

Most Frequently Referenced Qualities	Number of References
Personal or humanistic attributes	65
intelligence	14
compassion	14
enthusiasm for job	14
work-life balance	13
Approach taken to patient care	67
holistic and balanced	51
logical and sensible	17
evidence and research based	9
Skill or action displayed	91
strong knowledge base	22
good clinical skills	21
research and academic skills	17
teaching	14

Table 6. International comparison of nephrologist work hours

Country	Weekly Work Hours
Australia	52 ^a
Full-time Australian nephrologists exceeding 50 h/wk (%)	35
United Kingdom	56
United Kingdom nephrologists exceeding 48 h/wk (%)	41 ^b
United States	57.6 ^c
Canada	56.95 ^d

^aFull-time workers (defined as working ≥35 h/wk). Part-time workers excluded.
^bData from 27 English and Welsh units participating in the United Kingdom Renal Registry during a 5-year period from 2002.
^cAd hoc Committee on Nephrology Manpower Needs 1997. Executive Summary.
^dRoyal College of Physicians and Surgeons of Canada.

Two relatively equal groups were evident when considering the particular time in the training continuum where communication skill training should be delivered: (1) those who felt it was inappropriate to be addressing communication at the time of advanced training and that such skills should be a prerequisite, assessed at the time of undergraduate selection or taught early in medical school, and (2) those who felt that communication should be incorporated into an advanced training curriculum. Several cave-

ats were placed on the inclusion of this domain. It was recognized that like any skill, some had a natural strength, and for such trainees laboring on these basics would be pedestrian, providing little engagement in learning. Others, without a natural strength in this area, require assistance, and a minimum level of performance must be evident and assessed so that those who are poor communicators are prevented from independent practice until completing formal remediation. It was suggested that learning goals must be specifically tailored to nephrology and not on the basis of generic “motherhood” statements concerning effective communication. Scenarios suggested included: dealing with difficult or combative personalities (patients and colleagues), communications with other specialists and allied health teams, dictation techniques, and raising end of life discussions.

Discussion

This study shows that patients value good communication skills above other attributes, whereas nephrologists and trainees identify particular personal attributes, a holistic and research-based approach to patient care, and good clinical skills as paramount. Not all of these factors can be learned. Nephrologists spend most of their time in clinical practice, but time is also spent in research, teaching, and administrative work.

Over the last 20 years, methods and organizations (11) have been developed to assess the patient’s perspective of their healthcare, commonly referred to as “patient satisfaction.” We know the higher the satisfaction, the better the health outcomes (12,13) and that patient satisfaction is a valuable proxy measure for quality of care (14).

Underpinning competency-based training programs is the notion that the doctor is trained in the professional activities and skills required in the workplace, i.e., what type of doctor is produced, rather than the educational process per se (15). Fundamental to this educational model is an appreciation of the desired capabilities of the doctor. The professional activities and skills required by a nephrologist practicing in Australia have not been described, and, aside from one U.S. study from the 1990s (16), have not been studied elsewhere.

The first part of this research targeted what nephrologists do in the workplace. At the time of these data being collected (late 2007), there were 278 full-time equivalent nephrologists who, on average, worked 52 h/wk before considering on-call demands. This compares similarly with the situation in the United Kingdom, United States, and Canada (Table 6); on the basis of the Australian 2007 ESKD population (17), this workforce provides a ratio of ESKD patients:nephrologist of 60:1. It is apparent that manage-

ment of chronic kidney disease and dialysis comprises the majority of nephrologists' daily clinical workload, and accordingly training and assessment in these areas is important.

In an earlier study, we reviewed barriers to entering nephrology training (18) and found that feeling unsupported when managing an unwell dialysis patient with multisystem problems was a deterrent to young doctors entering nephrology training. This raises a training tension in that nearly all nephrologists must be trained in dialysis issues, yet early exposure to dialysis, if not supervised properly, is a disincentive to pursuing a career in renal medicine.

The antithesis of this situation is renal transplantation, regarded as an optimistic treatment and cited positively as a career attractant (18). However, training positions with acute transplantation exposure are limited; furthermore, this research shows that only a small percentage of nephrologists actually manage (and can therefore provide adequate supervision in) acute transplantation. Some such exposure is ideal, but the training emphasis should be on long-term transplant management, usually undertaken by the patient's "usual" nephrologist, who may not necessarily be a transplant physician.

The qualitative components of this research addressed qualities desired in a nephrologist. Communication is valued highly by patients and doctors, although patients used communication unwittingly as a proxy for knowledge, trust, and empathy.

Even in this small study, patients tended to support the notion of a patient-centered approach to care, but, as noted by others (19–21), one approach does not suit all. As a training point, there is a need for flexibility when adopting a patient-centered approach and the less requested doctor-centered approach to patient care and management; doctors must be trained to *recognize* and participate in *both* models of care.

Further consideration needs to be given to what other components of a good nephrologist can be *learned* and which are *innate*. For example, are compassion, enthusiasm, and capacity to generate work-life balance factors amenable to training? At the least, this research suggests that selection processes should include attention to these factors (Table 5). Nephrologists spend less than 10% of their time teaching, but the qualitative responses from the workforce survey suggest that this is due to lack of time available to dedicate to supervision and training.

Relying on goodwill to drive our training programs seems unlikely to be sustainable. Although some qualities are best taught on-the-job, utilizing role modeling as the primary instrument, this as a lone teaching tool is insufficient, and this research suggests, at least in Australia, that some dedicated time is necessary for trainers to attend to training and supervision.

The implications of this research for trainers are that it provides a basis for discussion between trainee and trainer in regards to ascertaining or assessing the key components now identified in a good nephrologist. In the future, trainers might use this information to modify local training programs so as to ensure they will result in a trainee developing or reinforcing the qualities listed in Table 5.

The strengths of this study are the high survey response rate and the approach of researching the views of patients, trainees, and nephrologists (trainers). One potential weakness is the apparently small sample size of interviewees. This study was a mixed qualitative and quantitative design; although a detailed discussion of qualitative research methodology is beyond the scope of this paper, it is well recognized that sampling strategies differ considerably from those used in quantitative research (22). The goal of qualitative research is to provide the patient with the opportunity to describe his or her personal medical journey and to gain insights into their care; the validity of this technique is tested through the process of "saturation" analysis, whereby further interviews are not conducted once the same themes keep emerging. The goal is not statistical representation, and a significant amount of information can be obtained from fewer subjects than would usually be enrolled in qualitative research.

A second possible weakness is that the findings may not be reflective of the entire community's needs, and in particular, groups such as the Australian aborigine and those with a non-English-speaking background were not represented in this research. This remains a research opportunity for the future.

Despite these limitations, we believe that our findings can inform training-program designers, educators, and trainees. To the best of our knowledge this is the first research description of what qualities help define a "high quality" nephrologist. One way of applying this research to training is for trainees and their supervisors to reflect periodically on the desirable qualities and work practices described in this research. Where deficiencies are found, further targeted work can be undertaken to address these deficiencies along the training pathway.

Acknowledgments

The authors wish to acknowledge and thank all those nephrologists and trainees who responded in the above mentioned surveys and in-depth interviews. Thank you for your time and honesty.

Disclosures

None.

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Received: March 9, 2011 **Accepted:** August 15, 2011

Published online ahead of print. Publication date available at www.cjasn.org.

See related editorial, "Traning the Next Generation of Nephrologists," on pages 2564–2566.