

An Inquiry Into the Early Careers of Master Clinicians

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ABSTRACT

Background Residents and fellows often seek to emulate master clinician role models; however, the activities these expert clinical faculty pursued early in their careers are not known.

Objective We studied the early career clinical experiences and learning behaviors of peer-defined master academic clinicians.

Methods We performed a retrospective, qualitative interview study of 17 members of the University of California, San Francisco, Department of Medicine Council of Master Clinicians. Between March 1 and May 31, 2016, we interviewed participants using a semistructured interview guide surveying their early career clinical experiences and learning habits. Interviews were audio-recorded and transcribed. We used a general inductive approach to code transcripts and to identify consistent themes.

Results Of the 28 council members invited to participate, 17 (61%) responded and were interviewed. Participants included 12 men and 5 women, with an average of 27 years in clinical practice (range, 13–50 years). Six participants were general internists, and 11 were internal medicine subspecialists. Based on thematic analysis of interview transcripts, 4 themes of clinical development emerged: (1) consistent learning efforts; (2) rigorous skill development; (3) cultivating habits of mind; and (4) clinically rich environments.

Conclusions Our study describes the early career experiences and learning behaviors of master clinicians. We aggregated key dimensions of the findings into a guide for residents, fellows, and junior clinicians interested in the pursuit of clinical excellence.

Introduction

Residents and fellows seek to emulate master clinician role models who are skilled diagnosticians, compassionate communicators, and revered teachers.¹ These role models of clinical excellence remind trainees why they devoted themselves to the study and practice of medicine. However, the methods by which these master clinicians reached their elite status are not known. This leaves trainees who aspire to become outstanding clinicians with a destination but no map to guide their early career activities.

The study of expert performance seeks to understand how top professionals acquire, maintain, and advance their knowledge and skills.^{2–4} Conceptualizations of physician expertise in research studies have not achieved this goal due to 3 limitations. First, some studies rely on experience alone as a proxy for expertise. Early literature on clinical reasoning used study designs that compared trainees as novices with staff physicians as experts, but these studies never defined expertise by measuring performance or peer assessment.⁵ Second, the literature on mastery learning for procedural instruction uses expert learning

methods (eg, deliberate practice) and measures performance, but the goal of these studies and curricula is proficiency, not elite performance.⁶ Third, a small number of qualitative studies of peer-nominated expert clinicians illuminates their *current* practices that *maintain* clinical excellence, but not the learning methods and clinical practices they adopted early in their careers—well before they were considered master clinicians.^{1,7–11}

Our study aims to address these gaps by analyzing peer-defined expert clinicians to understand their early career clinical experiences and learning strategies. These insights may provide guidance for residents, fellows, and junior clinicians who are interested in pursuing clinical excellence.

Methods

Study Design

We conducted a qualitative interview study using a general inductive approach.¹² We sent an e-mail invitation to 28 members of the University of California, San Francisco (UCSF), Department of Medicine Council of Master Clinicians who were UCSF faculty members in March 2016. A total of 17 members responded and agreed to be interviewed.

The council was established in the Department of Medicine in 2007. The department chair annually solicits peer nominations for membership. Candidates

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Editor's Note: The online version of this article contains the interview guide used in the study.

must be faculty members at the rank of associate or full professor, with 8 years of full-time clinical duties at UCSF. Candidates should demonstrate excellence in 6 domains: (1) depth of knowledge; (2) talent for acquiring and sharing knowledge; (3) interpersonal and communication skills; (4) professionalism; (5) ability to provide compassionate and effective care; and (6) ability to provide high-value care. These criteria are similar to definitions of clinical excellence for councils of peer-nominated master clinicians at other academic centers.^{1,8} The application requests a summary of clinical activities as well as supporting letters from 3 faculty members and 1 non-UCSF physician.

Data Collection

We developed a semistructured interview guide based on themes of expert diagnostic practice identified by Mylopoulos et al.⁷

We conducted 3 pilot interviews with UCSF medicine faculty who were not council members. All authors reviewed the transcripts to refine the interview guide and align it with the research questions. The final interview guide (provided as online supplemental material) began with 4 questions about participants' training and first clinical roles, followed by an invitation to describe formative early career experiences and 7 questions about the themes associated with expert diagnostic practice described by Mylopoulos et al.⁷ The interview concluded with an open-ended invitation to identify any other formative early career behaviors and experiences.

Over 2 months, 1 author (V.K.M.) interviewed 17 council members in person. Participants received the questions beforehand. Questions included probes to encourage elaboration. Interviews lasted 45 to 60 minutes and were audio-recorded and transcribed with participant consent. Participants' names were removed from transcripts, and each person was assigned a participant number (MC-[No.]).

The study was granted exempt status by the UCSF Committee on Human Research.

Data Analysis

Two authors (V.K.M. and G.D.) reviewed the 17 interview transcripts and created descriptive codes to represent text passages in which participants highlighted learning strategies and clinical experiences.¹³ They compared their lists of codes and combined them into 1 coding framework that was applied to the 17 transcripts. Two authors (V.K.M. and G.D.) then compared coding and reconciled differences. The first author reviewed all excerpts under each code, analyzed them for themes and patterns, summarized

What was known and gap

Residents and fellows interested in clinical excellence often seek to emulate master clinician role models. The middle and late career practices of master clinicians have been defined; however, their early career practices are unknown.

What is new

A qualitative study of the early career clinical experiences and learning behaviors of peer-defined master academic clinicians.

Limitations

Single specialty, single site study; potential for recall bias.

Bottom line

Early career learning practices of master clinicians are sorted into 4 themes that may provide guidance for residents, fellows, and junior clinicians interested in the pursuit of clinical excellence.

key points (pattern coding),¹³ and compared themes and patterns from the current data set to those described by Mylopoulos et al.⁷ All authors then reviewed the summaries and comparisons to determine an organizational structure for the data. Dedoose version 6.1.18 (SocioCultural Research Consultants LLC, Los Angeles, CA) was used for data management and analysis.

During the interview period, the interviewer (V.K.M.) was an internal medicine resident interested in hospital medicine, medical education, and the cognitive expertise literature.

Results

Of 28 council members invited to participate, 17 (61%) responded and were interviewed. Participants included 12 men and 5 women, with an average of 27 years in clinical practice (range, 13–50 years) at the time of their interviews. Six participants were general internists, and 11 were medical subspecialists.

We organized our findings into 4 overlapping themes: (1) consistent learning efforts; (2) rigorous skill development; (3) cultivating habits of mind; and (4) clinically rich environments. Within each theme, participants elaborated on specific behaviors and experiences. Examples of the most consistently mentioned behaviors and experiences are included below.

Theme 1: Consistent Learning Efforts

Participants described an early career devotion to reading, teaching, and learning by tracking patient outcomes.

1a. Reading: Participants dedicated time to clinical reading and self-directed learning nearly every day. They read a variety of textbooks and journals, and

some reviewed case reports to practice clinical reasoning. Their reading focused on the patients and clinical problems they saw in practice. “I would jot clinical questions down on an index card, and I wouldn’t go to bed until I had looked up those 4 or 5 things...I was probably looking up something every day,” MC-6.

Participants’ motivations for habitual study included a drive to build a strong knowledge base, intellectual interest, professional responsibility to deepen their understanding of their patients’ diseases, and a need to inform their teaching efforts.

1b. Teaching: Participants voiced an early career dedication to teaching. They sought opportunities to teach during rounds and formal didactic sessions. These efforts were motivated by personal satisfaction and by their observation that teaching enhanced their own learning. One explained, “You gain everything as a teacher. When you give a talk, when you write an article—you are the person who learns the most,” MC-9. The awareness that they would eventually teach new content also changed how participants acquired knowledge. One reflected, “Teaching changed how I read. If I was insistent on understanding anything well enough that I could explain it, that forced me to put structure on it and formulate that new content in a teachable way,” MC-11.

1c. Tracking Outcomes: Participants identified tracking patient outcomes as a formative clinical habit. They checked patient records for pending consultant notes, labs, imaging studies, and pathology results. They discussed patients with subsequent providers and attended interdisciplinary conferences to understand outcomes.

“When I wasn’t sure what [my patients] had, I would write down their names and make sure that I followed up...If I wasn’t sure what was going on, if I wasn’t satisfied with the answer, I would make a note, and I would follow it up,” MC-8.

Participants highlighted autopsy as a specific method of learning by following outcomes.

“We admitted a patient with pancytopenia, and we thought that she had a bone marrow disorder. She suffered sudden cardiac death and on autopsy had aspergillus throughout her coronary arteries. She had no evidence of a malignancy...we came pretty close to not learning from that case,” MC-4.

Participants described tracking patient outcomes because of general curiosity, a desire to calibrate

diagnostic skills by confirming or refuting their suspicions, a sense of responsibility, and advice from mentors. They thought it helped them reach closure, identify mistakes, including misdiagnoses, and understand the natural history of diseases.

“If you haven’t watched pneumonia to its final conclusion 6 weeks later, you’ll never know how long it takes to clear a chest radiograph, or how wiped out people can get just from a simple pneumonia. If you don’t follow diseases, if you can’t tell how long a particular infection lasts, how it peaks, and how it gets better, I don’t think you’ll ever really internalize it,” MC-9.

Theme 2: Rigorous Skill Development

Participants refined specific clinical skills they considered essential to medical practice.

2a. Communication Skills: Participants reported being dedicated to improving their bedside manner. Some took courses on patient communication and discussed communication challenges with peers. Others videotaped clinical encounters to review their speech and body language, learned effective bedside approaches from mentors, and calibrated their bedside manner through self-assessment. One said, “I was always trying to get better as a communicator...did I let the patient finish that sentence? Did I really know what their home situation was? Was I in a hurry? Did I suggest a symptom to them?” MC-9. Participants thought these efforts deepened their connections with patients, enabled a more revealing history, and increased patient satisfaction.

2b. Physical Examination Skills: Participants improved their examination skills by enrolling in courses on cardiac and dermatologic examination, teaching physical examination courses to consolidate their skills, and asking seasoned faculty to validate their examination findings. “I developed a little skillset to determine venous pressure...I would do those things over and over and over with every patient. I would have opportunities to calibrate it with a more direct pressure measurement,” MC-3.

2c. Clinical Reasoning Skills: Participants endeavored to improve their processing of clinical data, noting that reflecting on their thought processes helped identify biases, such as anchoring or premature closure, improved their clinical reasoning, and increased their diagnostic accuracy. Reviewing case reports was also mentioned as a simulation exercise to practice clinical reasoning.

“I learned to read [case reports] and then write down what I thought was going on. I was actually trying to figure it out. Because otherwise you don’t realize where you need to work...and how you may need to think differently,” MC-12.

Theme 3: Cultivating Habits of Mind

Participants sought to develop certain mindsets surrounding the clinical encounter.

3a. Humanism: Many participants consciously practiced humanism and empathy toward their patients. “I believed in each individual patient’s humanity, and I was really attracted to patients’ stories. Evoking each patient’s narrative...that for me was a powerful part of the process,” MC-14. They thought these efforts helped them evolve into more effective interviewers and gain personal fulfillment from their work.

3b. Finding Joy in Work: Participants described finding joy in their clinical work. Enthusiasm for clinical medicine drove their learning efforts, motivated humanistic care, and contributed to job satisfaction.

“What continually enabled me to do the reading...to want to be present for my patients, to have a good attitude about what I was doing...was that I found this fun...that simple, emotional, almost nonintellectual fun that you have doing this, was why I continued to read my journals and continued to see my patients and found happiness in doing the work,” MC-16.

3c. Humility: Humility about knowledge and clinical abilities was mentioned as an important early career personality trait, which promoted rigorous learning efforts and conscientiousness. One participant said,

“I wasn’t the brightest bulb in the chandelier...I read constantly...I had to repeat it and repeat it and drum it into myself. I always felt I had to work a little harder than everybody else,” MC-9.

Another reflected, “They were far better than I was endoscopically...I studied everything I could...I realized, if I’m going to stay here, I’ve got to get a lot better,” MC-6.

3d. Rigorous Case Analysis: Participants used specific cognitive steps, such as simplification and mechanistic understanding, to analyze complex cases and

maximize learning. One participant emulated a colleague’s approach to case synthesis: “His special genius was to distill the essence of the case...I’ve always strived to do that...if you can’t present a case in a couple of minutes...you’ve confused yourself,” MC-9.

Another participant noted: “I was fixated on getting people to think more about the question ‘Why?’...a patient is anemic. Well, why? You always really want to know—why? If something didn’t make sense, I pursued it doggedly,” MC-13.

Theme 4: A Clinically Rich Environment

Participants emphasized the value of on-the-job learning. They strove to maximize clinical volume, seek autonomy, venture outside of their comfort zones, and learn from peers and role models.

4a. High Clinical Volume: Most participants held substantial clinical duties early in their careers. “I was a full-time clinician-educator. I spent 7 months on the inpatient medicine teaching service [and] 2 months on medicine consult,” MC-17.

Participants sought extra clinical experience by moonlighting. They described these efforts as financially motivated but also discovered that practicing in new settings developed their knowledge, efficiency, and confidence. One participant described,

“...working in that emergency department where the volume was 60 patients a night, working as hard as I possibly could and unsupported by any other system...There was no other doctor in the whole building...Those 6 months were probably the most intense learning experience that I’ve had,” MC-16.

4b. Practicing Outside Their Comfort Zone: Participants sought clinical exposure in environments that were unfamiliar or afforded them unprecedented autonomy. Examples included moonlighting in community emergency departments or hospitals as the sole overnight provider, volunteering in understaffed clinics, and working as a visiting physician for homebound patients. One internist worked on a resource-limited Native American reservation caring for patients, including pregnant women and children. Participants thought that practicing in these settings helped them to test their clinical intuition by watching their management plans unfold, build their confidence, retain a learner’s mindset, and become more thorough and efficient.

4c. Learning From Peers: Many participants learned from their peers by discussing clinical cases. One

TABLE

Extrapolating the Master Clinician Subthemes Into Action Steps

Subthemes	Proposed Action
Reading	Establish a routine of reading about patient cases for 15 min daily
Teaching	Seek out teaching roles
Tracking outcomes	Establish a patient tracking system
Listening and communication	Enroll in training courses on communication skills and reflect on communication feedback from patients
Physical examination skills	Practice and obtain feedback on specific examination skills
Clinical reasoning skills	Rehearse clinical reasoning by reading case reports (pause at fixed intervals to reason through clinical data and compare conclusions to those of the care team or clinical discussant)
Humanism	Develop the habit of asking patients about their illness experiences
Finding joy in work	Reflect on 1 rewarding aspect of clinical work each day
Humility	Adopt a growth mindset by seeking the margin of knowledge or skills and by acknowledging that there is always more to learn
Rigorous case analysis	Deepen knowledge by routinely asking “why” rather than “what” when clinical decisions are formulated
High clinical volume	Seek clinical roles that maximize patient encounters
Practicing outside their comfort zone	Seek clinical roles that fall outside assigned duties or that involve unfamiliar patients or clinical environments
Learning from peers	Establish a network of colleagues to discuss clinical cases
Role models	Establish relationships with clinically excellent colleagues and senior faculty to emulate their clinical/teaching skills and discuss diagnostic/management challenges

reflected, “I had colleagues who were all like-minded...we were lucky enough to be able to reflect [with] each other and...ask for each other’s opinions—that helped build the database,” MC-14. Another reflected, “We had groups that would meet and hash out clinical problems . . . We shared a lot of experiences amongst ourselves in that way,” MC-10. This on-the-job exchange of knowledge contributed to a workplace culture of shared learning.

4d. Role Models: Participants described how master clinician role models shaped their teaching skills, clinical reasoning abilities, and humanism.

“[She] gave me the idea that the bedside encounter truly mattered...[she] had a passion for Sherlock Holmes and his deductive abilities, so she continually reminded me to be interested, curious, and present. She gave me the idea that the person who looked and listened carefully, and really thought about the problem, would be the one who solved it,” MC-16.

Discussion

Based on strategies described by peer-defined master clinicians, we identified 4 categories of deliberate learning activities that residents and fellows can consider adopting in their early careers: (1) consistent

learning efforts; (2) rigorous skill development; (3) cultivating habits of mind; and (4) clinically rich environments. In the TABLE, we summarize these activities and suggest specific actions that trainees can take to emulate the early careers of these master clinicians. These activities could also be integrated into graduate medical education training programs.

Our findings add to the emerging literature on clinical excellence, which has focused on the mid- and late-career practices of peer-defined master clinicians in academic settings. Interviews of 13 peer-nominated excellent pediatricians about their current behaviors generated a model of clinical excellence spanning 3 categories: (1) core philosophy with values such as enthusiasm and humility; (2) deliberate activities (eg, clinical performance reflection, scholarship, teaching); and (3) everyday practice of clinical reasoning, communication, and patient care.¹⁴ Four other descriptive studies of peer-nominated master clinicians at academic medical centers also generated themes of mid- and late-career practice that align closely with our findings about early practices, including depth of knowledge, self-directed learning, humanism, enthusiasm for patient care and teaching, effective interpersonal skills, and clinical judgment refined through self-analysis.^{1,7,10,11} This suggests expert physicians adopt specific learning behaviors during the early stages of their careers and maintain those practices.

Our findings are also situated within the expert performance literature, which examines how the highest performers across disciplines achieve expertise in their fields. Ericsson's deliberate practice approach, defined as the repeated execution of a specific task beyond one's current competence level, coupled with feedback and coaching, is a foundational expertise theory.¹⁵ However, medical practice involves endless variability in patient presentations and contexts, which limits opportunities for deliberate practice of a standardized task. In a meta-analysis of 88 studies of deliberate practice across disciplines, Macnamara and colleagues¹⁶ found that the association between deliberate practice and expert performance was strongest in disciplines involving consistent activities bound by rules (sports, games, musical performance), but weak in professions involving unspecified tasks. Our findings suggest that clinicians can construct a learning program more consistent with Ericsson's "purposeful practice," or a planned program of specific activities focused on improving performance.¹⁷

Our study has limitations. Our participants were peer-defined (not criterion-defined) experts and may not reflect the best clinicians if a criterion-based measure of clinical excellence existed.¹⁸ Participants were internal medicine faculty in 1 academic center, and 12 of 17 participants held their first position after training in a UCSF-affiliated facility; therefore, our findings may reflect a specific institutional context and culture. Retrospective questions are also prone to recall bias. Lastly, as this was a qualitative exploratory study, our intent was not to determine the causal mechanisms that lead to expertise. Answering such a question would require a prospective study with a longitudinal, experimental design.

Conclusion

The journey to expertise is complex, and it is unlikely that there is a single path for trainees or junior clinicians to follow. Our study represents a first step toward understanding the early career learning strategies and clinical experiences of master clinicians. The findings suggest several clinical and learning behaviors that may be helpful for trainees and junior faculty who set clinical excellence as an important career goal.

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