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The Development of Newly Recruited Clinical Teachers at a Regional Medical School Campus

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Abstract

Background
Physicians who become clinical educators need specific forms of knowledge to become effective teachers. The purpose of this year-long qualitative study was to use the teaching and learning experiences of newly-recruited preceptors and students to understand what knowledge community physicians need as they develop into effective clinical teachers at a Regional Medical School Campus.
Methods
Semi-structured interviews with the 9 newly-recruited community hospital physicians and 37 medical students occurred at the beginning, weekly, and at the end of the year. Weekly rounding observations were also completed. Interview recordings and observation notes were transcribed confidentially and analyzed using inductive thematic analysis.
Results
Irby's forms of knowledge were selected as the underlying structure for presenting the results. For preceptors, the strongest areas were knowledge of medicine, patients, and context. For students, knowledge of medicine was strongest. Knowledge of pedagogy and learners was an area of weakness for preceptors and more work is needed to continue their developmental growth.
Conclusion
This study provides evidence that new teacher-physicians use and/or develop knowledge about medicine and patients, the healthcare context, and pedagogy and learning to effectively enable 3rd year students learn the clinical practice of medicine. New community physician preceptors require robust, ongoing faculty development to enable more effective interactions for teaching and learning.

Keywords: clinical teaching, community physicians, forms of knowledge, qualitative research

Introduction

Due to a growing physician shortage, the Association of American Medical Colleges (AAMC) called for a 30% increase in medical school enrollment in 2007.[1] The US is on track to meet this expansion soon by creating new medical schools and by increasing enrollments at existing medical schools on their main or regional campuses. Just as most medical schools expanded their enrollment since 2007, so did the Medical College of Georgia (MCG). In partnership with the University of Georgia, the state's land-grant research university, the combined years 1, 2, 3, and 4 model regional campus (RC)[2] was established in 2009 as the MCG/UGA Medical Partnership. Forty MCG students matriculated on the new campus in 2010, which was the site for this research project.

The rise in medical student enrollment, while a necessity, also increased the need for new clinical teaching faculty across the US. Many regional campus expansions (2 or 4-year campuses) have occurred in communities where no prior medical students or residents have been educated. Thus, the new regional medical school campuses rely on community physician preceptors who are inexperienced in teaching medical students.[3] For example, at RC approximately 650 new clinical preceptors have been recruited in northeast Georgia with 100 community preceptors actively teaching the third and fourth-year medical students at any one time. Currently,

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faculty development sessions are held with as many as possible to provide introductory skills needed for effective teaching of medical students.

The benefits of front-line physicians are many and are of high value for students.[4] However, one of the major challenges facing new regional medical campuses is preparing the new community physicians to teach in an office or hospital setting.[5-9] In that regard, Irby has provided a framework for the kinds of knowledge that supervising physicians need for teaching in clinical practice, including 1) medicine and patients: contextualized and integrated knowledge of medical science and clinical practice, 2) context: understanding the context (e.g., outpatient, emergency rooms) and how it impacts your treatment options, 3) pedagogy and learners: often learned through observation and apprenticeship, understanding what learners know and are able to do in clinical practice, and 4) teaching scripts: integration of all forms of knowledge into clinical cases, adjusting as needed for the context and circumstances, and "…contain 3-5 commonly used teaching points, which vary by case, circumstance and teaching method."[10(p 780)] Identifying ways to use the framework to inform ongoing research and practice can extend professional development for preceptors.

In an ongoing research initiative,[11] we sought to explore the opportunities and challenges associated with this new collaboration between a regional medical school campus and community hospital as a site for clinical education. Although there have been previous studies of the knowledge that new clinical teachers need,[5,10,12] two characteristics of our Regional Campus make this study unique. The first is that the study was conducted during the first year that the clerkships were conducted at the hospital. Secondly, residencies had not been developed at the time we conducted the study, so the attendings taught the medical students directly. The purpose of this study was to use the teaching and learning experiences of preceptors and students in order to understand what knowledge community physicians need as they develop into effective clinical teachers.

Methods

We used a qualitative design to conduct basic field research in this exploratory study.[13] Data was collected using interviews and observations of preceptors and students to inform the results.

Context and Participants. The study took place during six, 8-week Internal Medicine Clerkship rotations at a local community hospital after Human Subjects approval was granted (IRB #CR00000343). The community hospital where the data was collected has approximately 10 000 hospital discharges and 158 beds.

The overall study period was one year, July to June. Participants were working in the local community hospital and were either preceptors who were rounding with medical students for the first time or students who were rounding in internal medicine for the first time. We invited all 10 hospitalist preceptors to participate; 9 agreed through written consent. We also invited all 40, third-year medical students from the RC who rotated to the hospital; 37 agreed to participate through written consent. In a typical rotation, a group of 2-3 medical students would work with 3-4 different preceptors over an 8-week period. Prior to starting the clerkships, the preceptors received a 3-hour faculty development session on the "1-minute preceptor" at the community hospital. There were additional sporadic faculty development sessions conducted throughout the year.

Research Design, Procedures, and Analysis.

This year-long qualitative study involved data collection by the team of 5 experienced researchers. The research team conducted beginning and end of year interviews with the 9 preceptors and 37 students (one-on-one, face-to-face or by phone) as well as conducting weekly interviews with preceptors and students after they rounded during the Internal Medicine clerkship. Each interview took between 30-60 minutes, totaling more than 150 hours of interviews. Questions asked of the preceptors included best and most challenging

teaching moments. Questions asked of the students included best and most challenging interactions with preceptors.

Similar to Graffam et al.'s study,[5] the research team spent more than 100 hours during the year as a team in weekly observations (a minimum of 2 hours each week), recording interactions between the first-time preceptors and third-year medical students. Observations ranged from one-on-one teaching to bedside rounding to didactic small group teaching. Observations were completed in pairs so that the notes could be compared to generate final observation notes for each week.

Following confidential transcription of the interview recordings and observation notes, inductive analysis was used to code the open-ended responses from a representative sample of the large data set. The sample was selected based on the thoroughness of the responses (e.g., rich, thick descriptions of the preceptors' and students' experiences).[14] Using an interpretivist frame, initial data analysis was open-ended and conducted individually by members of the research team to identify preliminary patterns and themes. The research team met to compare codes and to generate the next level of patterns and themes. Updates to the list of themes were made based on negotiation and re-examination of the data. A subset of the data was coded by independent researchers to corroborate the themes identified by core researchers and establish inter-rater reliability. The final level of analysis by the research team was guided by Irby's framework of forms of knowledge.[10] Interpretative rigor was established through inter-rater reliability and triangulation of data to ensure trustworthiness.[12,15] Three forms of data triangulation were used in the study: data sources, investigator, and methodologic.[16]

Results

Irby's 4 forms of knowledge[10] needed to transform and master clinical teaching serve as a framework for presenting the results of this study: 1) medicine and patients, 2) context, and 3) pedagogy and learners (see Table 1 for an overview). Irby's fourth form of knowledge, teaching scripts, were not found in the data. As this is a relevant finding, it is discussed in the closing section.

Knowledge of Medicine and Patients: Preceptors. "The foundational knowledge of medical science and clinical practice forms the bedrock of clinical teaching."[10] The preceptors participating in this study showed evidence of a great depth of foundational knowledge. One important finding is how the preceptors viewed their work with the third-year students as a way to keep up-to-date with current knowledge. One preceptor noted what he was looking forward to as the year began: "*Just to be kept on my toes and to sort of see where they are in their learning in compared to where I am with my experience."* Preceptors continued to talk about their knowledge of medicine and patients during the year in terms of their teaching and learning with the students. Being able to interact and learn from and with the students over time was mentioned as a benefit by many preceptors. One preceptor shared a story relating to a particularly meaningful interaction with a long-term patient:

…We had a patient who had a devastating code, cardiopulmonary arrest and sort of talk and teach about the complexities of being managed by a lot of specialists. Then that left us with the family to really kind of be that connection between the specialist and the family and still being a part of that patient's care. To me, that was the most important thing I did this week because we lost a patient, we talked about how the whole cascade happened. We got to see some pretty fancy interventions by specialty doctors and then we also kept that family really connected through, I thought, a really difficult time, but they did great.

Preceptors indicated another meaningful student interaction was "talking through a case," which enabled a thorough review of the issues leading to a diagnosis. It is important to note that the preceptors also expressed concerns related to knowledge of medicine and patients. This was particularly evident at the beginning of the

year. Several preceptors expressed being nervous about their knowledge base as exemplified in this quote: "*I'm a little bit nervous about how far behind I may be and so a little bit of trepidation there.*"

Knowledge of Medicine and Patients: Students. Foundational knowledge for the third-year medical students was clearly not as rich as that of their preceptors; that said, the students expressed their eagerness to be in a real-world context and to learn from the preceptors. Specifically, the students mentioned that they were looking forward to applying their knowledge from classes taken during their first two years and to working with the preceptors to learn. One student conveyed his excitement as follows: *"…The idea that we're going to be having 3 or 4 patients a day…That's actually really exciting because we're just going to be actually practicing what we've been doing for the past two years … every single day in a functional environment."*

Students also expressed some concerns related to their knowledge base as the year started. Students shared concerns if their knowledge of medicine and patients was "good enough" for the task ahead, particularly working with the preceptors. As one student stated: *"I've never been under the gun at all times and I know our experience is going to be different because we don't have that buffer between us and the attending physician [or patient]. So, I guess being on the spot and 'on' all the time."*

As the year progressed, students continued to share insights related to knowledge of medicine and patients. For example, the majority of the students mentioned "clinical pearls" given by the preceptors as one of their best learning moments. Several mentioned that getting first-hand knowledge and basic concepts from the preceptor enabled valuable learning. Following patients through an entire process and learning about the care management team was also a valuable learning moment. As one student indicated: *"The meaningful interactions for me were learning moments where we were talking, discussing our patients, and they [the preceptors] were helping me make connections, helping me walk through their processes and how they were treating the patients."* Many students stated that the larger view enabled them to see multiple perspectives from different preceptors as well as others on the care management team.

Another meaningful interaction frequently mentioned by the students was the preceptor modeling a doctor-patient interaction. As stated by most of the students, this enabled them to gain valuable experience for their own interactions with patients. One student shared an example of how her preceptor modeled knowledge of medicine and patients for her:

He's so comfortable talking with the patients. Not that he makes light of their situation but he knows how he can approach them. He lets them know what's going on and what we're doing about it and is very upbeat about it without making light of it… I think that makes a big difference to the patient.

The students also mentioned several challenges with knowledge of medicine and patients in comparison to their preceptors. The volume of information needed was mentioned by many as an enormous challenge, although the students also recognized that *sometimes you can only know/do so much*. Managing a difficult patient/family situation was also mentioned as a challenge. Some students also indicated they did not always feel like they had the complete story, with some wondering if their position as a medical student had an influence. One student shared the following story related to knowledge of medicine and patients: *"I met him for the first time; he had a long history of alcohol abuse and liver failure. He was telling me how bad he hurt and I automatically questioned him because he had never complained to anyone else. You don't know if they're telling the truth."*

Knowledge of Context: Preceptors. The preceptors working with the third-year medical students had a great deal of knowledge about context, particularly inpatient services and the emergency room. Most preceptors had worked in the hospital for many years, thus had considerable understanding of "...types of patients seen, [typical] diseases treated and treatment options available."[10(p 779)] As the year started, all preceptors made note of the unique opportunity of having the third-year medical students in the context, indicating learning together as a team as a positive aspect.

As the year progressed, most of the preceptors continued to indicate that having the third-year medical students working as an inter-disciplinary team was positive, noting the value of multiple perspectives. Preceptors and students had iPads that further enabled ready access to information at the point-of-care for patients.[11] A preceptor described the value of these additions: *"I was trying to look up something I didn't know the answer to; none of us could find the answer. It was about a different kind of bacterial infection, whether or not it was a true pathogen. Each of us found it on our own later on and shared."*

The preceptors mentioned several contextual challenges. At the beginning of the year, the preceptors expressed concerns about balancing time with daily tasks, and finding good spaces for effective teaching. Time continued to be mentioned by the preceptors as a challenge to interactions throughout the year, specifically noting: flow of the day, time management, time for students to present, and simply having too much to do. Several preceptors mentioned *having too many patients* or *the topic being discussed is too big* (i.e., patient presentation is too complex) given limited time.

Knowledge of Context: Students.

Students had varying clinical experiences coming into the hospital for the Internal Medicine rotation. Some may have had experience in inpatient services, others in outpatient settings. All of the students indicated that they were looking forward to working in the hospital independently and on a team with their peers and the preceptor.

As the year progressed, the students continued to express the value of learning in the hospital context. Many students stated that the larger view enabled them to see multiple perspectives from different physicians and others on the care management team. Students also mentioned that participating in catastrophic medical events under the guidance of their preceptors as a "best" and "invaluable" learning moment because those were immersive experiences with high emotional content.

While the benefits of the real-world context of the hospital were clear, the students also expressed concerns about meeting the expectations of preceptors and patients, particularly at the beginning of the year. Some students also expressed concern that this was the first time medical students would be rounding with preceptors at the hospital, expressing concern about logistics management and the limited teaching experience of the preceptors. One student articulated the concerns relating to knowledge of context as follows: "*The fact that they have not had students at all or maybe just not recently. We're kind of the first ones through here, so I am sure there will be bumps in the road."*

Concerns raised by the third- year medical students throughout the year included the demands and time pressures of inpatient services. Like the preceptors, the lack of time to discuss patients was one of the biggest challenges expressed by the third-year medical students. Closely related, students mentioned the caseload as a challenge and indicated they had too many patients assigned to fully engage in meaningful interactions with the patients and preceptors.

Knowledge of Pedagogy and Learners: Preceptors. Naturally, all of the preceptors had experienced being a student and resident in a clinical setting, learning "...by observing positive and negative examples of teaching."[10(p 780)] However, none of the preceptors had any recent experience teaching students or residents. Despite this interval, there was evidence throughout the year of preceptors asking questions, engaging in case discussions, observing and giving feedback, and other clinical teaching methods (e.g., one-minute preceptor).[17] One of the most positive aspects noted by the preceptors was the ability to teach in the moment. As many preceptors indicated, seeing the patient over a series of days enabled them to teach at the point of care, thus facilitating real world learning and problem solving.

It is important to note that preceptors expressed concerns at the beginning of the year about their lack of formal training to teach medical students; these concerns continued throughout the year. Preceptors described how unexpected patient complications were a challenge to teaching. Knowing how and what to teach was also mentioned as a concern. One preceptor shared a larger perspective on his concerns related to

knowledge of pedagogy and learners*: "I am trying to develop some flow through the week and not really knowing how to make sure they are getting their monies worth… we want to be the best, we want to compete against every other program around."* Lastly, preceptors mentioned concerns related to their perception of themselves as teachers and their teaching abilities: "*Am I teaching them what they need to know?"* and "*Am I growing as a teacher?"*.

Knowledge of Pedagogy and Learners: Students. The students indicated the immersive learning experience in the hospital as invaluable. Students noted some specific pedagogical techniques used by the preceptors that were useful, including when the preceptor questioned the student to commit to what is going on with the patient, enabling students to share their knowledge and demonstrate their thinking process. The majority of students also indicated that a detailed discussion of a patient after examination was meaningful.
The students mentioned several challenges with their preceptor interactions related to pedagogy. For example, students raised concerns that the preceptors rarely observed their history and physical examinations in the hospital, and, as indicated earlier, students were concerned about the teaching experience of the preceptors. As one student stated: *"The challenge was just that they haven't had students before. I guess gauging my level of where I was, it seemed like there was both under and overestimation."*

Discussion

This year-long, in-depth qualitative study provided a rare opportunity to study the addition of teaching responsibilities to a cohort of busy hospitalists at a community hospital while a new medical school campus was using these hospitalists for the internal medicine clerkship for the first time. Numerous studies have been conducted of barriers and motivations for clinicians becoming preceptors and the process of learning to become a clinical teacher. [5-8] However, this study was able to explore these issues and processes with preceptors with no prior history of teaching in a new Internal Medicine clerkship.
One major conclusion of this natural educational experiment was that as physicians undertake the role of teachers, they experience learning processes similar to that of third-year students learning the clinical practice of medicine: it evolves and deepens over time. Preceptors and medical students were both concerned about how they would manage multiple responsibilities as they were, respectively, learning new skills as educators and aspiring physicians, and whether they were prepared to succeed in learning these new roles. Preceptors and medical students found that "learning by doing" (see, for example, Kolb, 1984)[18] during the clerkship was essential to becoming teachers and physicians deepening their understanding of multiple forms of knowledge.[10] It was important for the preceptors and students to accept the complexity of clinical situations as they found these were both the best, and most challenging teaching moments.
Graffam, et al.[5] developed an approach to clinical instruction for medical education, explaining that the "model would introduce a method of guided reflection for clinicians who, generally lacking pedagogical training, teach as they were taught."[19,20] The preceptors in our study had little pedagogical training, and we confirmed that many of their teaching processes were based on their experiences as residents. Throughout the year, preceptors questioned if they were teaching what the students needed to learn, but also if their clinical teaching methods were effective. Central to the Graffam, et al. model[5] is the role of reflection, which is as important for learning the practice of precepting as it is for learning the practice of doctoring.[21-23] Our data indicated many missed opportunities for effective teaching throughout the year, which may have been lessened if a model of reflection had been used to coach the preceptors to develop effective teaching strategies. Helping the preceptors to think about how they can improve their pedagogical practice is an important barrier to remove so they can explore what they do not know.
Time was one of the most significant challenges for the preceptors and students. Finding ways to increase time so the preceptors can work on skills to become effective clinical teachers is important. Preceptors need

time and training to develop: 1) knowledge of pedagogy and learners and 2) the ability to get that knowledge effectively across to the medical students. Enabling preceptors to teach in other contexts (e.g., the medical school campus) can also assist with deepening pedagogical strategies and techniques. In doing so, preceptors will be able to create integrated teaching scripts,[10] which were not evident in this study. We hypothesize that Irby's fourth form of knowledge was not found because these new clinical teachers had not yet developed teaching scripts. Additionally, partnering master clinical teachers from the medical school campus with the community physicians may help to alleviate some of the concerns voiced in our study. The use of mentoring, role-modeling, and frequent feedback will help to accelerate the development of the community physicians. This "academic infusion" of clinical teachers to the learning process will not only help the development of the new preceptors, but also improve the teaching and learning processes for the medical students.

We found that the single most valuable pedagogical strategy was to focus on improving students' clinical reasoning processes. Students reported their most meaningful interactions were when the preceptor pressed them to make a commitment about the patients' histories and findings with supporting evidence and reasoning. Although the preceptors were exposed briefly in a workshop to the "one-minute clinical preceptor"[24,25] as well as other models of clinical teaching,[24] these approaches were not always evidenced in the learning experiences of the students. Modeling of the clinical reasoning process is critically important for faculty development efforts, because there is substantial evidence for its effectiveness.[26,27]

This study has several limitations, two of which were part of the study context: 1) there was only sporadic, unplanned faculty development to enhance teaching effectiveness, 2) there were no residents in the hospital that would have typically been a part of the medical team, and 3) there was an existing relationship with participants by three of the five members of the research team (i.e., in supervisory roles for the students). While the first two contextual characteristics may have limited what might have been possible with the preceptors and medical students, they also provided a unique opportunity for more first-hand interactions between the preceptors and medical students. This not only provided the medical students with a rare experience, it also enabled the preceptors to extend and enhance their practices as educators in ways that might not otherwise have been possible. Although some of the challenges did continue throughout the year (time, balancing teaching and patient care), the preceptors also indicated that the "flow" of the interactions in terms of logistics and student interactions did improve over the year.

Conclusion

We had a unique opportunity to study a context that is rare: a new regional medical school offering rotations in the third year for the first time in a setting with no residents to act as mediators between the third-year students and the preceptors. We found that learning how to teach in a busy clinical setting has similarities to learning the practice of medicine: both take time. Lessons for practice include:

- Finding ways to increase preceptors' time and training to work on skills to become effective clinical teachers is important.
- A valuable pedagogical strategy is to focus on improving students' clinical reasoning processes.
- Modeling of the clinical reasoning process is critically important for faculty development efforts.
- The use of mentoring, role-modeling, and frequent feedback will help to accelerate the development of the community physicians.
- Helping the preceptors to think about how they can improve their pedagogical practice is an important barrier to remove so they can explore what they do not know.

Several recommendations result from the study and include: 1) New regional campuses partnering with community hospitals must take seriously the importance of preparing preceptors to teach medical students, particularly if they are new to this role, 2) Faculty development should use existing evidence-based models,

such as the one-minute preceptor or SNAPPS,[24,25] to provide effective learning for medical students, 3) Time is always going to be limited so focusing on key aspects of educating the students (e.g., clinical reasoning, modeling patient interaction, observation of unique cases) is critical for continued development of the medical students, 4) Preceptor caseloads should be managed so that time for teaching is more robust and effective for the preceptor and medical students, and 5) Hiring academic physicians to assist with teaching in clinical settings may assist with balancing the work load for the community physicians. Future research could replicate this study with the initiation of new residency programs, as the issues and learning processes for new teaching new residents is likely to mirror the processes of the preceptors learning to teach new medical students.

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Table 1. ***Forms of Knowledge for Teaching and Learning: Perceived Strengths and Concerns about Preceptor and Student Knowledge Bases*.**

	Preceptors	**Students**
Knowledge of Medicine and Patients	Strengths • Keeping up to date • Interacting with and learning from students overtime • Thoroughly reviewing and talking thru diagnosis Concerns • Concerns with being behind with knowledge base	Strengths • Applying knowledge • Valuing clinical pearls • Teaching in the moment; real-life situations; seeing a longitudinal perspective • Modeling doctor-patient interaction Concerns • Questioning knowledge base (i.e., is it enough) • Volume of information need to know • Managing a difficult patient situation
Knowledge of Context	Strengths • Unique opportunities • Learning together as an interdisciplinary team with multiple perspectives • Teaching/treating at point of care with technology Concerns • Time: balancing tasks, managing time/tasks, time for teaching, too many cases • Not having a good space for discussions • Unexpected patient presentations: lots of patients all at once, not so straight forward	Strengths • Working independently and in a team • Experiencing real-world experiences with multiple perspectives • Learning from “catastrophic” medical events Concerns • Preceptor and patient expectations • First time happening (MP/STMH) • Demands and time pressures • Case loads
Knowledge of pedagogy and learners	Strengths • Teaching in the moment • Learning together/interactions over a series of days Concerns • Teaching experience and/or training limited or no prior experience • Questioning own teaching abilities and struggling with new identity as a teacher	Strengths • Valuing immersive learning • Seeking preceptor probing student to commit to what is going on with patient • Having detailed discussion of patients Concerns • Preceptors not observing • Need to recognize that sometimes can only know/do so much