

A preliminary exploration of time management strategies used by physicians in the United States

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Abstract

Objectives: To investigate time management strategies used by experienced physicians, how they are acquired, and to what extent they are supported by tacit knowledge.

Methods: Five physicians, each with more than ten years of clinical experience, participated. Data were collected during three medical office observations and two in-depth interviews with each physician. The purpose of observations was to monitor events that had time management implications. The interviews consisted of 1) a stimulated recall procedure during which physicians were asked questions aimed at capturing, retrospectively, contents of working memory at a particular moment during an observed event with time management implications 2) questions that encouraged physicians to talk about the time issues they face in practice, what time management strategies they use, and how they developed these strategies.

Results: Physicians implemented many strategies that helped them manage time efficiently. These strategies were

supported by explicit and tacit knowledge. Instances of tacit knowledge use were automatic with little conscious deliberation. Inferences were made as to the specific knowledge supporting these instances.

Conclusions: The identified explicit strategies provided concrete examples of how physicians can circumvent time limitations and, since being explicit, could be included in undergraduate and graduate medical education and taught by direct instruction. Regarding strategies supported by tacit knowledge, the use of advice strategies was recommended to help novice physicians learn this tacit knowledge as opposed to direct instruction. Encouraging results presented here provide practical ideas on how medical professionals can circumvent time limitations in a busy clinical practice.

Keywords: Expertise, tacit knowledge, explicit knowledge, time management strategies, clinical physicians, stimulated recall technique

Introduction

Time pressure is a serious issue facing clinical physicians in today's health care environment. Health maintenance organization (HMO) regulations, lower insurance reimbursements, increasing costs of malpractice, and costs associated with running a medical office are among the reasons that contribute to increasing time demands posed on physicians.¹⁻⁶ More than ever, these time demands pressure physicians to see more patients per hour, limit physicians' ability to establish personal connections with patients, and oftentimes, force physicians to address only one of the many health issues of concern to patients during office visits.^{1-2,7-9}

Formal undergraduate and graduate medical education is lacking curricula that would prepare future physicians to deal efficiently and effectively with time constraints in a busy clinical practice. Despite the void of formal training with respect to time management of clinical practice, some experienced and highly competent (experts) physicians are able to use time management strategies that allow them to deal efficiently and effectively with time limitations in a managed care environment. How did they learn to do so, where did they acquire these strategies and how do they use them? While research has been carried out in many domains, including medicine, which helps us understand how

experts carry out tasks in their domain of expertise, there are two issues regarding this research with particular relevance for this study. First, the investigation of time management in clinical medicine is lacking; and second, the knowledge that supports expertise tends to be tacit.^{10,11}

Sternberg described tacit knowledge as having three major characteristics. First, it is procedural, that is, comprised of condition-action sequences. Second, tacit knowledge is practically useful in that it helps people attain goals that they value. Third, tacit knowledge is acquired without direct help from others, rather than direct instruction regarding the condition-action sequences mentioned above.¹²

Tacit knowledge, or as Schon calls it “knowledge-in-action”, is a vital part of a highly competent (expert) physician.¹³ In support of that, Dunn and colleagues found that physicians’ tacit knowledge enabled them to “categorize patients as good historians”.¹⁴ While physicians could not be precise about their criteria for “good historian”, this categorization enabled them to switch to a focused physical exam thereby saving considerable time. Others report that tacit knowledge is perhaps even more important to the practice of medicine than formally learned knowledge.¹⁵

The purpose of this study is to investigate the time management strategies that experienced physicians use, how they are acquired, and to what degree they are supported by tacit knowledge. The results of this research can be utilized for educational purposes and included in undergraduate, and perhaps more practically, in graduate medical education to help future physicians handle time constraints in their practice.

Methods

The University of Toledo Institutional Review Board approval was obtained and five experienced physicians were identified for participation in this qualitative study. They were selected with the help of an independent physician “gatekeeper.” The criteria for selection included board certification in general internal medicine, practicing clinical medicine for more than 10 years, working in private practice, and being a U.S. medical school graduate. Practical experience was an important criterion as the interest here was to explore the kind of professional knowledge that seems to come from years of practice and experience. Informed consent was obtained from both the physician and the office staff.

Data were collected from medical office observations and in-depth physician interviews. There were fifteen medical office observations, three observations for each physician. The observations were three half-day blocks in each physician’s office.

The researcher did not directly observe the interaction between the physician and patient in the examining room. However, all other office interactions were observed and written notes were taken. The second and third observa-

tions were followed by physician interviews. The information collected from the observations provided a foundation for these subsequent interviews. These interviews were tape recorded and later transcribed for data analysis. Other than an initial introduction, the observer did not interact with the office staff and tried to be as unobtrusive as possible.

There were two parts to the interviews which followed the second and third observation. The first part consisted of a stimulated recall session. During this session the researcher asked the physician questions (e.g., “What were you thinking about at that time?”) based on the observed events that had time implications. These questions were aimed at capturing, retrospectively, contents of working memory at a particular moment during an event. Ericsson and Simon have described the theoretical and practical implications of stimulated recall (they referred to it as retrospective reporting) in considerable detail.¹⁶ Similarly, Dunn and colleagues have used stimulated recall strategies to capture tacit knowledge.¹⁴

The second part of the interviews consisted of general questions that encouraged physicians to talk about the time issues they face in their practice, how they manage these issues, what time management strategies they use, and how they developed these strategies. Some questions were expected to access explicit knowledge and strategies, as would be the case if a physician had formal training in time management and was able to relate how that training affected their practice.

From the data collected, Sternberg’s depiction of tacit knowledge as procedural in nature was used to identify instances of tacit knowledge.¹² Procedural knowledge includes condition – action pairs (“if” – “then” sequences). That is, *if* particular conditions exist, *then* particular actions are executed (e.g., *if* a patient is late for an appointment *then* the physician chooses to see or not to see that patient at that time). Some procedural knowledge is quite explicit in that the factors in determining if certain conditions exist are knowable and can be described to others. In order to be tacit knowledge, these conditions – action pairs cannot represent formal, well-documented knowledge. It is from the physician’s deliberations of these conditions, and their subsequent decisions/actions that we hope to identify tacit knowledge.

Results

A summary of characteristics for each physician pseudonym is shown in Table 1.

All physicians used time management strategies that were supported by tacit as well as explicit knowledge. First, we present selected examples of strategies supported by tacit knowledge for each physician, then selected examples of strategies supported by explicit knowledge. Finally, a summary of all strategies for each physician is presented at the end of the Result section in Table 2. Selected examples

of strategies supported by tacit knowledge for each physician:

Dr. Brown

Dr. Brown was asked about her decision to answer or not answer the phone while working with a patient. She responded that she decides whether to answer a phone call, put the patient on hold, or let the patient leave a voicemail, based on how much longer the present appointment will last. Dr. Brown said:

"I found that whenever possible, if I can answer the phone at that time, I don't have to call back, it saves me time. Oftentimes I answer and ask them to hold and take care of the patient in my office at that time. However, if I know that I have time left because this visit will not take as long as I thought and I'm going to have a 15 minute block before my next patient, then it's better not to answer the phone and put one patient on hold, and then also hold up the patient who's in front of me."

Dr. Stone

An example of decision-making supported by tacit knowledge was noted when Dr. Stone made decisions as to patients' treatment without much deliberation. For example, it was observed that the physician, after seeing a patient, left the exam room, checked on the patient's electrocardiogram (EKG) result and then went back in the patient's room. This elicited a question as to his thought process at that time (i.e., stimulated recall question: What were you thinking at that time?) and how it relates to his time efficiency. He explained that at that particular time he had to decide whether the patient's EKG had a significant abnormality and he thought it was best to tell the result to the patient right then, so the patient would not need to call him later about it.

Dr. White

Dr. White spent more time with his patients than the other physicians involved in the study. This allows him the opportunity to get to know them in more detail. His detailed knowledge of patients helps him save time. Dr. White commented on his detailed knowledge of patients:

"I have a very good knowledge of my patients. I know everything about them, which is a time saver. I know who demands time. I know their medical and family history, and what medications they take. Because I know them so well, I don't order as many tests as other doctors. This saves me time since I'm not spending time tracking all of this extra information. I don't have to spend time to look things up in the chart. I don't have to ask them as many questions. I don't have to have the nurse spend time briefing me. I pick up on certain cues from the patient and identify them in the first few minutes. This intimate knowledge allows me to save time. But I think this comes from experience and I don't think I can teach it to anyone. It comes from practice."

Dr. Miller

In some instances, appointments can be time consuming when patients come together with their spouses. Dr. Miller said:

"It can slow me down because spouses want to keep interjecting or have questions about themselves rather than about the patient. When this happens, I redirect my questions to the patient and if it doesn't work I politely ask the spouse to schedule his or her own appointment. It can, however, also be a time saving situation when the spouse brings up specific health concern regarding the patient or fills in important information."

Dr. Miller is able to recognize what constitutes important information as well as when it is time to redirect questions to the patient. He minimizes interjections and redirects questions to the patients politely. This skill is supported by self-knowledge of working with patients, detailed knowledge of patients, and by medical knowledge.

Dr. Smith

Dr. Smith multitasked with ease and this aided him in managing time efficiently. When finished seeing patients, he walked them to the front desk and at the same time gave medical advice, answered last questions, wrote for medication and completed the encounter form.

"When patients are leaving I walk with them, it's a habit I've developed and it allows me to get a few precious extra seconds in reinforcing instructions, give directions, and counsel the patient. At the same time, I have the encounter form in my hand, so, I will take it up to the front desk and fill needed information in."

When asked about this instance ("What were you thinking at that time?"), he acknowledged that some things come automatically and he is not thinking about them. However, he believed that he was thinking about the patient's treatment plan and what instructions may be useful for that particular patient. He also indicated that he was planning ahead for the upcoming patient encounter. He believed that the things that come automatically and do not require much deliberate thinking were the tasks he does often and they come as "second nature". These included matters such as writing a prescription and giving directives to the medical assistant to order tests.

Other strategies and decision-making were supported by tacit knowledge. The use of tacit knowledge was most apparent in the physicians' ability to automatically classify various aspects of the environment, essentially pattern recognition, and subsequently execute actions to satisfy these environmental conditions (e.g., medical-decision-making). This was most evident in situations calling for prioritization, multitasking, and planning ahead. While the physicians were aware of making decisions regarding planning ahead and prioritizing tasks, they were not aware of the tacit knowledge supporting these decisions. Their decisions were automatic - without much deliberation, like

pattern recognition (e.g., the physicians automatically classified conditions in a situation and followed with an action). Also, it was difficult for them to verbalize what kind of knowledge they believe supports their decision-making, which is consistent with the definition of tacit knowledge as being difficult to verbalize. Finally, the physicians indicated that they did not learn in medical school how to manage time efficiently in clinical practice, but they learned it “on the job” through practical experience. Retrospective validation confirmed that indeed they were not aware of the tacit knowledge that supported their decision-making that resulted in time efficiency.

Table 1. Summary characteristics for each physician

Physician Pseudonym	Years of practice	Average number of patients seen per day	Practice style/unique features
Dr. Brown	11	10	<ul style="list-style-type: none"> ▪ No medical or office staff ▪ Answers all calls, brings patients in, triages them, processes paperwork, and completes all other duties
Dr. Stone	19	16	<ul style="list-style-type: none"> ▪ Sends reminders to patients regarding upcoming appointments
Dr. White	45	5	<ul style="list-style-type: none"> ▪ Spends 45 minutes to 1 hour per patient visit ▪ Patient population primarily geriatric and middle aged adults ▪ Patient is first brought to his private office, then moved to examining room after obtaining history
Dr. Miller	10	25	<ul style="list-style-type: none"> ▪ Performs a number of procedures in addition to seeing patients
Dr. Smith	10	40	<ul style="list-style-type: none"> ▪ Utilizes the internet to obtain patient information and search for medical information

Selected examples of explicit strategies for each physician:

Dr. Brown

1. Uses customized computer software that helps her automatically process patient information right from the exam room (she enters the data) and generates a printout ready for patients to pick up on their way out. It also prompts her of routine checkups, lab results, and updates patients’ records. The use of such programs is gaining popularity, but for Dr. Brown it is an essential tool. She enters data while working with the patient in the exam room. While she is collecting medical history or talking to the patient about social issues, she is clicking standardized boxes on the screen to record the patient’s information. With regard to using this program Dr. Brown said:

“I have time to talk to the patient about social aspects of life and other issues and get to know them better since I don’t need to spend time recording things in longhand. Knowing

more about patients’ social background helps me manage time in that it aids me in medical decision-making. For example, it helps me to decide whether this patient will be compliant with a certain treatment or not.”

Dr. Stone

1. Asks patients to bring their medication bottles to the appointment, which allows him to obtain quick and accurate medical information (e.g., refill, doses).
2. Leaves some appointments open at the end of the day for sick calls (emergent calls). This avoids double booking appointments that otherwise would create more time pressure.
3. Office provides a prescription refill line.

Dr. White

1. Makes sure that the charts of patients who are scheduled for that day are ready, test results are read, and any instruments needed for that day are placed in the exam rooms.
2. Uses color-coded chart filing system and preprinted forms, as well as schedules staff to arrive early to make sure things are ready for that day.

Dr. Miller

1. Uses preprinted standardized forms
2. Dictates progress notes rather than writing in longhand

Dr. Smith

1. Utilizes color-coded chart system and color-coded prompts indicating status of triage

All participating physicians used many of the same explicit time management strategies, or strategies supported by explicit knowledge such as:

- Using standardized forms
- Dictating progress notes instead of writing them in longhand
- Using prescription refill line
- Using technology for information and to process patient records
- Limiting interruptions by asking pharmaceutical representatives to schedule appointments
- Using purposeful scheduling (e.g., leaving appointments open at end of the day, scheduling patients according to their complaint)

However, some explicit strategies were specific to particular physicians and these included:

- Using customized computer software to process patient information
- Having patients bring medication bottles to appointments in order to quickly and accurately obtain medical information
- Practicing outcome oriented medicine (e.g., spending time to discuss preventive medicine and providing patient education since it is targeted by HMOs and also increases billing)

Table 2. Summary of strategies supported by tacit and explicit knowledge for each physician

Physician pseudonym	Tacit knowledge	Explicit knowledge
Dr. Brown	<ul style="list-style-type: none"> ▪ Multitasking (spoke with patient on phone while viewing computerized medical record) ▪ Prioritizing (decision to answer or not answer phone) ▪ Planning ahead (avoids double booking appointments) ▪ Minimizing interruptions ▪ Detailed knowledge of patients (knows how much time she needs for which patient) ▪ Self-knowledge of working with patients 	<ul style="list-style-type: none"> ▪ Uses purposeful scheduling ▪ Time efficient logistical arrangements ▪ Has procedures in place for patients who are late for appointments ▪ Leaves appointments open at end of day ▪ Practices outcome oriented medicine ▪ Uses technology ▪ Sees pharmaceutical representatives only on certain days and times ▪ Keeps low overhead ▪ Practices own punctuality
Dr. Stone	<ul style="list-style-type: none"> ▪ Multitasking (giving instructions to patients, writing prescription or a referral) ▪ Prioritizing (based on the nature of the call chooses to answer some immediately, others later, and some lets the staff to triage) ▪ Planning ahead (when patients ask for forms to be filled out he requires them to schedule appointment as they may be questions that need to be answered with the patient present) ▪ Minimizing interruptions ▪ Detailed knowledge of patients ▪ Self-knowledge of working with patients (rather than answering inquiries from patients over the phone prefers face to face time) 	<ul style="list-style-type: none"> ▪ Uses purposeful scheduling ▪ Has his own medical assistant ▪ Has procedures in place for patients who are late or miss appointments ▪ Makes duplicates of prescriptions and lab orders and places them in charts ▪ Uses medication lists ▪ Has patients bring their medication bottles to appointment to obtain information ▪ Sees pharmaceutical representatives only by appointment ▪ Dictates progress notes ▪ Has patients schedule appointments if they need lengthy forms filled out by the MD ▪ Has patients schedule appointments if they need extensive questions answered ▪ Uses prescription refill line
Dr. White	<ul style="list-style-type: none"> ▪ Multitasking (answering nurses inquiry while writing in patient's chart) ▪ Prioritizing ▪ Planning ahead ▪ Detailed knowledge of patients (knowing their health history, family history, he spends little time reviewing the chart) ▪ Self-knowledge of working with patients (uses self developed "two step" approach to seeing patients; first in his office then followed by examination in the patient room) 	<ul style="list-style-type: none"> ▪ Uses color coded chart filing system ▪ Uses standardized forms ▪ Avoids double booking appointments ▪ Has his own nurse ▪ Delegates responsibility to the staff ▪ Has staff arrive early to make sure tests were ordered and results received ▪ Practices own punctuality
Dr. Miller	<ul style="list-style-type: none"> ▪ Multitasking (reviewing patients charts, answers nurses questions) ▪ Prioritizing (whether to answer a patients call or talk to a pharmaceutical representative) ▪ Planning ahead ▪ Minimizing interruptions ▪ Detailed knowledge of patients(knowing how much time he will need to schedule for a patient based on their level of complaint as well as patient characteristics) ▪ Self-knowledge of working with patients 	<ul style="list-style-type: none"> ▪ Uses purposeful scheduling ▪ Has his own medical assistant ▪ Uses medication lists ▪ Limits time spent with pharmaceutical representatives ▪ Dictates progress notes ▪ Employs time efficient logistical arrangements ▪ Uses standardized forms
Dr. Smith	<ul style="list-style-type: none"> ▪ Multitasking (while walking out patients gives them instructions, completes encounter form, writes for medication) ▪ Prioritizing (based on pattern recognition, extracts from chart only information pertinent for that appointment) ▪ Planning ahead ▪ Minimizing interruptions (uses staff based on their skill level to triage phone calls and inquiries) ▪ Detailed knowledge of patients ▪ Self-knowledge of working with patients 	<ul style="list-style-type: none"> ▪ Uses purposeful scheduling ▪ Employs time efficient logistical arrangements in the office ▪ Uses technology ▪ Uses color coded chart filing system ▪ Uses color-coded door indicators ▪ Uses standardized forms ▪ Writes progress notes during patients' visits or at end of day (when busy) ▪ Uses prescription refill line

Discussion

The findings indicate that there are detectable time management strategies that physicians employ throughout the day. Some were quite explicit and others supported by tacit knowledge. These physicians made decisions throughout the day that had time implications and various sources of knowledge (e.g., medical knowledge, specific knowledge of

particular patients, self-knowledge regarding working with patients) supported these decisions. While some of this knowledge is explicit, much of it is tacit and learned from experience. Several situations were identified that activated decision-making that was supported by tacit knowledge and were examples of procedural knowledge.

For example, Dr. Brown works alone so she makes decisions about whether to answer or not answer the phone while working with a patient. Essentially, this is pattern recognition and it would be reasonable to infer that various sources of knowledge support these decisions, including: knowledge of diseases and their progression, general knowledge of patients, specific knowledge of this particular patient, and self-knowledge regarding working with patients. Some of this knowledge is explicit, while much of it is tacit and learned from experience. This application of tacit knowledge is consistent with Sternberg's depiction of tacit knowledge as procedural (i.e., condition – action sequences).¹² Essentially, when the phone rang, Dr. Brown determined (quite automatically), if certain conditions existed and then executed some actions (answer or not answer the phone). The conditions related to categorizing the present patient with regard to seriousness of the presenting problem and an estimate of time still needed, and similar categorizations for the patient on the phone.

One additional point of note is the observation that Dr. Smith sometimes utilized the strategy of walking patients to the front desk while discussing aspects of their care. While this gives a physician an additional amount of time that may be valuable, this time-saving strategy could lead to an inadvertent breach of confidentiality in that others (including patients at the front desk waiting to check-in or patients in the waiting area) could potentially overhear aspects of the conversation.

We are not suggesting that time management is a primary quality indicator for healthcare. Physicians may develop excellent time management strategies, but this does not necessarily mean that they are providing a higher quality of care. The issue of whether a particular physician needs to physically see a certain number of patients in a given day (e.g. Dr. Smith sees 40 patients a day compared to Dr. Brown who sees 10 patients a day) rather than an alternative means of delivering care may depend on a number of factors including examples such as the size of the practice, the complexity of patient problems, the availability of ancillary assistance (in the form of office staff or non-physician providers such as Medical Assistants or Physician Assistants), or the information technology (IT) infrastructure available in a physician's office. Perhaps a physician could meet fewer patients physically, but we posit that the physician would still benefit from developing time management strategies to handle the alternative means for delivering care to patients.

Of particular interest in this study was that much of physicians' tacit knowledge use seems to be in the service of time management. This can be linked to a survival characteristic, in that if physicians could not multitask, prioritize, and plan with automaticity, they would not be able to handle the patient load. While apparently useful, can we help physicians acquire this tacit knowledge?

Since tacit knowledge is learned from experience, and without direct help from others, direct teaching is unlikely. However, Dunn and colleagues have explored methodologies for identifying tacit knowledge and have recommended how that knowledge may be used.^{14, 17-19} When an instance of tacit knowledge use has been identified they recommend:

- a) Restating the instance of tacit knowledge as a capability so that it takes the form of "...in these types of situations (if X) the individual is able to do the following (then Y)."
- b) Inferring what capabilities are prerequisite to this initial capability by carrying out a modified learning hierarchical analysis. This analysis procedure is similar to what Gagné wrote about learning hierarchies over many years.²⁰⁻²² His work was done within the context of instructional design and the capabilities generated in his hierarchical analyses were relatively explicit, and amenable to direct instruction. The capabilities generated from an analysis of a tacit capability, as the case here, are often tacit themselves and therefore not amenable to direct instruction.
- c) Using tacit capabilities (both the original and prerequisites) to help plan experiences for novice professionals and also help more advanced professionals (e.g., medical preceptors) influence/guide the behavior of novice professionals during those experiences. This guidance is often in the form of advice strategies.^{14,17}

An advice-strategy is an "instruction" that encourages a learner to look for relationships/patterns to facilitate development of knowledge that may be used in subsequent problem solving. Advice-strategies do not teach intellectual skills directly. They essentially provide guidance about how to best take advantage of domain related experiences. Advice-strategies are intended to influence learners in various ways including using questions or advice to point out relationships between concepts, reminding learners of earlier examples, helping learners focus their search, using analogies to assist learners in identifying commonalities between problems, and/or prompting learners to define the problem or a plan of action. These efforts are not intended to promote general reflection but promote acquisition of specific capabilities, albeit tacit. Using advice-strategies is similar to what occurs in guided discovery. They can also be used in problem based and case based learning situations.^{13,23}

An example of tacit knowledge identified in this study is described that has been a) restated as a capability, b) analyzed for prerequisite knowledge, and c) incorporated in related advice strategies.

Capability statement

Physician able to make predictions regarding how long an interaction with a patient will take.

All physicians provided evidence that they estimate

how long it will take to work with a particular patient. If one considers that physicians can do this for a variety of patients and for a variety of medical conditions, there would be a considerable body of knowledge, much of it acquired from experience, which supports these predictions. Below are some examples of inferred knowledge that supports physicians' capability to make these time predictions.

Inferred Prerequisite Knowledge

- a) Self knowledge regarding efficiency and competence in getting an adequate history, carrying out a physical exam, and/or dealing with a specific issue. This is essentially self-efficacy for carrying out the necessary tasks.
- b) Being able to identify the most important issues/symptoms.
- c) Being able to classify the patient as one who accurately reports history.

For example, considering "c", this substantial knowledge indicates that physicians are able to integrate their knowledge of the natural history of disease, with how the progression of various diseases is exemplified in the lives of actual patients. If all the features of a clinical problem are present and the sequence of the patient's presentation of those features is also consistent with the problem, the physician is able to spend less time reviewing the history with the patient. If you were to ask a physician at this point how he or she knows if what the patient reports is trustworthy, the answer in most cases would not be based on explicit knowledge. If, however, the sequence of events presented by a patient is unclear or inconsistent, the physician must take more time to sort it out, perhaps search for more explicit information. Subsequent decisions will be much less automatic. The time saving benefits of trusting what patients report was also reported by Dunn, Taylor, and Lipsky.¹⁴

Related Advice Strategies

If physicians do learn how to estimate how much time it will take to work with a patient, what advice strategies might help physicians acquire this knowledge?

Examples:

1. "While you work with patients today see if you can focus on why you think some patients' reports are more trustworthy than others."

This kind of statement encourages novice physicians to be mindful of particular events that are likely to occur in an encounter with a patient. While some direct teaching is possible in some cases (e.g., warnings about trusting what Alzheimer's patients report), most of what physicians learn about judging the reliability of what patients report is learned from experience. This topic could then be a focus in discussions between the novice physician and preceptor.

2. "When faced with a multitasking situation, keep track of the rationale for your prioritization decisions."

Multitasking was a frequent occurrence for the physicians in this study. They reported making automatic decisions that included time estimates of appointments with one or more patients. The advice strategy above would be intended to focus a physician's attention on how he or she made these decisions. The advice does not tell the physician how to prioritize. The novice physician's rationale for prioritization decisions could be a focus for meetings with a preceptor.

Conclusion

This qualitative study identified two types of time management strategies used by clinical physicians. The first category of time management strategies includes those supported by tacit knowledge, especially in situations calling for prioritization, multitasking, and planning ahead. Tacit knowledge use was particularly noteworthy in the physicians' ability to automatically classify various aspects of the environment (essentially pattern recognition) and subsequently execute actions to satisfy these environmental conditions. While this tacit knowledge cannot be taught directly, its acquisition may be accelerated through the use of advice strategies.

The second category included a variety of procedures that are quite explicit and can be "taught" to others directly. Physicians indicated that they acquired these strategies from discussions with other physicians, CME, medical journals, and companies that design office management procedures. However, they learned little about how to manage time in clinical practice as part of their undergraduate and graduate medical education.

The present study provided encouraging results that can help other physicians who experience time constraints. However, further research with more subjects needs to be compiled to explore how physicians, including those in other specialties such as surgery, psychiatry, or pediatrics deal with time limitations. It may be reasonable to assume, since their context is different from internal medicine, that they may also exhibit different time management strategies. In addition to private practice clinicians, academic physicians may also exhibit strategies and decision-making that has time implications and this may provide further data on time management in the medical profession. Certainly, as the paradigm of healthcare continues to transform in the U.S. (e.g. more team based approaches to patient care), so too will the strategies that physicians employ to meet these changes.

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