Developing a Unified List of Physicians' Reasoning Tasks During Clinical Encounters

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Abstract

Purpose
The clinical reasoning literature focuses on how physicians reason while making decisions, rather than on what they reason about while performing their clinical tasks. In an attempt to provide a common language for discussing, teaching, and researching clinical reasoning, the authors undertook the task of developing a unified list of physicians' reasoning tasks, or what they reason about, during clinical encounters.

Method
The authors compiled an initial list of 20 reasoning tasks based on the literature from four content areas—clinical reasoning, communications, medical errors, and clinical guidelines. In the summer and fall of 2010, they surveyed a purposive sample of 46 international experts in clinical reasoning and communications. From the results of the first survey, the authors refined their list of reasoning tasks, then resurveyed 22 of the original participants. From the results of the second survey, they further refined their list and validated the inclusion of the reasoning tasks.

Results
Twenty-four of 46 (52%) and 15 of 22 (65%) participants completed the first- and second-round surveys, respectively. Following the second-round survey, the authors' list included 24 reasoning tasks, and a clinical example corresponding to each, that fell into four broad categories: framing the encounter (3), diagnosis (8), management (11), and self-reflection (2).

Conclusions
The development of this unified list represents a first step in offering a vocabulary for discussing, reflecting on, teaching, and studying physicians' reasoning tasks during clinical encounters.

During clinical encounters, physicians engage in numerous clinical tasks, including listening to the patient's story, reviewing his or her past records, performing a physical examination, choosing the appropriate investigations, providing advice or prescribing medications, and/or ordering a consultation. These behaviors are driven, or at least influenced, by "what" physicians think about and "how" they think. Since Elstein and colleagues'[1] 1978 seminal book on medical problem solving, numerous studies on clinical reasoning and expertise in medicine have been published.[2] This line of research has led to important insights on how novice and expert physicians reason during clinical encounters. Eva[3] categorized these various reasoning processes under two broad umbrellas: nonanalytical and analytical processes. Nonanalytical processes are automatic and unconscious, such as pattern recognition. Conversely, analytical processes are deliberate and detailed, such as hypothetico-deductive reasoning that involves the generation and testing of a set of hypotheses around a set of clinical data. Still, no one has published a comprehensive list of what physicians reason about during a clinical encounter, such as the precipitants or triggers to the current clinical problem or the impact of the available resources on the treatment options.

In an attempt to provide a common language for discussing, teaching, and researching clinical reasoning, we undertook the task of developing a unified list of physicians' reasoning tasks during clinical encounters. We purposefully distinguished between clinical tasks, reasoning tasks (the what), and the process of reasoning (the how). A clinical task is something that a physician does, such as eliciting a history, performing a physical examination, or ordering a consultation. A reasoning task is what a physician reasons about while performing a clinical task. The process of reasoning is the cognitive process in which a physician engages for the purpose of completing a clinical task. For example, in reviewing the results of numerous investigations and the report from a consultation (i.e., clinical tasks), a physician may consider the possible impact of the patient's comorbid conditions while at the same time also considering the resources available for his or her treatment (i.e., reasoning tasks), using pattern recognition or decision analysis (i.e., processes of reasoning). Whereas a physician's knowledge base, skills, and values each exert an influence on how well he or she performs clinical and reasoning tasks, we considered those attributes to be separate but related issues and did not address them in the present study.

Having a unified list of physicians' reasoning tasks for practice, teaching, and research in medicine is important for a number of reasons. For example, a large number of patients suffer from multiple comorbidities,[4–6] and research suggests that medical teams do not adequately address these patients' comorbid medical problems when admitting them to the hospital; thus, many of these patients are readmitted at a later date.[7,8] Whereas many factors contribute to such diagnostic and management errors,

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a physician's failure to consider his or her patient's chronic active diseases—a reasoning task—may play an important role. During clinical patient safety audits or teaching rounds, explicitly considering this particular reasoning task could help physicians improve their practice. The literature supports that physicians frequently learn reasoning tasks tacitly through the case presentation and clinical documentation genres.[9–11] However, research also suggests that, at some institutions, the apparent purpose of the case presentation may be too focused on defending a diagnosis, which may hinder the learning of other reasoning tasks.[11] Although most physicians likely recognize that reasoning tasks completed during clinical encounters extend beyond diagnosis, the lack of a shared language for describing and labeling these tasks may perpetuate this misconception and hinder efforts to teach trainees the broader spectrum of reasoning tasks. As a first step in addressing this problem, the purpose of this study was to develop a unified list of what physicians reason about during clinical encounters.

Method

In the summer and early fall of 2010, we conducted a two-stage validation study by surveying a group of 46 international experts in clinical reasoning or communications in health care. Using a thematic summary of the existing literature, we created an initial list of reasoning tasks, and then, using our two surveys, we modified it and validated the final list. We obtained ethics approval from the psychology research ethics board at the University of Western Ontario and the research ethics board at the University of Illinois at Chicago. We conducted this study with local departmental funds and guaranteed confidentiality to participants.

Initial list of reasoning tasks

Although no one publication comprehensively identifies the reasoning tasks completed during clinical encounters, many discrete sources include fragmented lists. We compiled our initial list by searching four relevant content areas from the literature. We include here only those exemplary and/or key references from these topic areas: communications,[12,13] medical errors,[7,14,15] clinical reasoning,[1,16,17] and clinical guidelines. We chose these references because they most shaped our thinking on the topic and conveyed best our rationale for including one or more of the reasoning tasks that we identified on our list. We further modified this list and thematically organized the reasoning tasks through a formal iterative discussion process among the coauthors. We then piloted the list with four experienced physician colleagues familiar with the clinical reasoning and communications literature, and further edited the list on the basis of their feedback (see Appendix 1, Column 1, for our initial list).

Participants

During the first round of our study, we contacted 46 international experts. We chose these experts because each had published scholarly work in either clinical reasoning or communications in health care. We also included a purposeful mix of physician and nonphysician researchers in this group. In the second round of our study, we invited only half the original participants because of the high degree of consensus that they reached during the first round and to minimize the burden on them. This second group was again purposively selected on the basis of our knowledge of their areas of scholarship and to ensure that we included a mix of physician and nonphysician researchers.

Procedure

During the first round of our study, we contacted each participant via e-mail and sent a reminder two weeks later. In the e-mail, we directed participants to a Web-based survey that included instructions to complete the first survey. This first page of the survey also contained an explanation of the purpose of our study and the full list of reasoning tasks, organized into three thematic sections (i.e., framing the encounter, diagnosis, and management) (see Appendix 1, Column 1). We also asked participants to review and consider printing the list of reasoning tasks to ensure that they answered each question in the context of the complete list. On the second page of the survey, we asked participants to list their professional qualifications.

For each reasoning task, we gave participants the following statement: "The reasoning task X should appear on the final list of reasoning tasks in which physicians may engage during the course of a clinical encounter." The answer options were (a) yes as written, (b) yes with alternative wording, (c) no, or (d) unable to judge. We also provided participants with a comment box to suggest alternative wording. At the end of the survey, we asked participants to suggest additional tasks that we had not included.

During the second round of our study, we considered the suggestions made during the first round and modified our list of reasoning tasks accordingly. To improve the clarity of each survey item, we also added a relevant clinical example for each reasoning task and then sent a new e-mail to half the original participants. This second survey included the same set of questions regarding each reasoning task as the first survey.

All survey responses were anonymous.

Results

Of the original 46 participants invited to complete our first survey, 30 replied. Of those 30 participants, 3 indicated that they were unable to participate (insufficient expertise, maternity leave, and sabbatical leave), 27 began the survey, and 24 completed it, for an overall response rate of 52% (24/46). The respondents represented a variety of backgrounds, with just over one-third (9/24) having a doctoral degree and two-thirds (16/24) having a medical degree; six participants (25%) had more than one degree. The majority of physician respondents (13/16) had trained in either internal medicine or family medicine, and just over half of the doctoral respondents (5/9) came from cognitive psychology. The percentage of respondents with doctoral and/or medical degrees closely matched that in the original group of invited participants (i.e., 38% versus 28% with doctoral degrees and 67% versus 72% with medical degrees).

The main findings from our study are included in Appendix 1, which contains the original list of 20 proposed reasoning tasks (Column 1), the final list of 24 reasoning tasks (Column 2), and a set of illustrative case examples (Column 3) intended to help readers better understand our intent behind each reasoning task as well as the distinctions between tasks. For the purpose of clarity, we listed each task under only the

one category (framing the encounter, diagnosis, management, or self-reflection) that we felt best captured the overall intent of the reasoning task.

Our original list included 20 proposed reasoning tasks, organized into three categories (framing the encounter, diagnosis, and management) (see Appendix 1, Column 1). On average, 83% of respondents (20/24) agreed with the inclusion of all 20 original tasks (standard deviation [SD] = 12; range = 50–100; see Appendix 1, Column 5, for details). On average, 25% (6/24) made suggestions regarding the wording used to describe each task (SD = 14; range = 8–54). We made changes to the wording of all 20 reasoning tasks based on this feedback following the first-round survey. We followed respondents' suggestions on the basis of their ability to add clarity to the task (see Appendix 1 for the changes to wording between the original list and the final list). We followed additional suggestions from the respondents and added two new reasoning tasks to the list for the second-round survey.

Of the 22 participants whom we invited to complete the second-round survey, 19 began the survey and 15 completed it (68% response rate). Respondents again came from a variety of backgrounds: 6 (40%) had a doctoral or master's degree, 12 (80%) had a medical degree, and 6 (40%) had dual degrees. Again, the percentages of respondents with doctoral and medical degrees were similar for respondents and invited participants. Several of the participants contacted (3/22) who did not have a medical background felt that they could not complete the second-round survey.

During the second-round survey, 97% of respondents (14/15) agreed with the list of proposed reasoning tasks (SD = 4; range = 93–100; see Appendix 1, Column 7, for details). Twelve of the 22 tasks (55%) had unanimous approval. Compared with the first-round survey, respondents made approximately half as many suggestions regarding wording (2/15; 13%; SD = 11; range = 0–33). Moreover, of the changes suggested, many were related to the examples rather than to the reasoning tasks themselves. On the basis of this feedback, we made wording changes to 17 of the 22 reasoning tasks. The majority of these changes were more minor than the substantive changes we made as a result of the first-round survey. For example, we changed Task 6 from "identifying or determining potential alternatives for diagnostic workup (investigation)" to "determine diagnostic investigations" after the first-round survey, and to "select diagnostic investigations" after the second-round survey. The respondents' comments and suggestions also resulted in the addition of two new tasks. Although the group of expert reviewers did not validate these new items, we felt that they were well supported by the literature and had appropriate implications for shaping and studying clinical practice. Because the two additional items did not fit under the three original categories (i.e., framing the encounter, diagnosis, and management), we added a fourth category—self-reflection. Our final list thus included 24 reasoning tasks.

Discussion

The purpose of our study was to begin to develop a unified list of physicians' reasoning tasks during clinical encounters. Our two-round validation study resulted in the identification and initial validation of 24 reasoning tasks. What is unique about this list is not the items themselves but, rather, that we compiled them into a unified list and separated reasoning tasks from reasoning processes instead of considering them as a single construct, as others often do. For example, many studies have focused on diagnostic reasoning as if it were a single entity[1,3,18]; our list, however, contains eight related but distinct diagnostic reasoning tasks. Past research has shown the importance of case specificity with regard to diagnosis and management.[19] Case specificity may also extend to the reasoning task level (i.e., a student knowing how to determine that the most likely diagnosis is heart failure does not predict his or her ability to consider the implications of managing heart failure in the context of the patient's chronic kidney disease). Although further validation is needed, we hope that the development of this list of reasoning tasks will allow physicians, teachers, and researchers to begin to expand their thinking about clinical reasoning. The proposed list has the potential to impact clinical practice and teaching as well as future education and clinical research.

Clinical practice

In many jurisdictions, regulatory bodies require physicians to reflect on their practice or conduct practice audits to ensure that they maintain their competence. Whether or not it is required, many physicians still regularly spend time reflecting on their practice and identifying personal learning needs. To this end, we envision that a motivated practitioner might use our list of reasoning tasks to reflect on the extent to which he or she regularly addresses the various items, when warranted, during clinical encounters. For example, as we indicated earlier, reflecting on the reasoning tasks involved in caring for patients with multiple comorbidities would be beneficial to physicians.[6,7] Several reasoning tasks directly relate to this issue and may prompt physicians to question their tacit assumptions about what and how they reason when seeing this particular group of patients.[20,21] For those who work in interprofessional teams, the list may also be useful in clarifying role expectations. For example, in caring for a patient with new-onset diabetes who needs to learn about managing a diabetic diet, Task 19 ("select education and counseling approach for patient and family") could prompt the physician to involve the team's dietician. Although some physicians might be tempted to turn our list of reasoning tasks into a checklist to follow during clinical encounters, at this stage in its development we do not support this use.

Teaching

We envision several uses for this list in teaching, including supporting teachers while thinking aloud during case review to foster student learning. Many physician teachers have only a tacit understanding of the reasoning tasks of a clinical encounter.[20] By providing them with a standardized vocabulary and a list of the possible tasks that are part of their case-based teaching, they may be better able to reflect on and think aloud about their own reasoning[18]; this reflection is an essential step in practicum-based professional education.[21] In addition, the list may help students both to develop a deeper understanding of the multiple purposes of the clinical encounter and to connect the process skills of communication with the purpose of communication in

the context of the clinical encounter. For example, the first communication step that a student must take is to initiate the encounter.[13,22] As part of framing the encounter during this initial phase, we identified three related reasoning tasks—identify active issues, assess priorities, and reprioritize on the basis of assessment. A teacher could use these reasoning tasks to explore specific issues, such as how and when a physician should introduce health maintenance, screening, or smoking cessation into a clinical encounter, or how many issues a physician can and should address during an encounter and how he or she should prioritize them. Finally, the list also can be used to help students categorize the information that they learned in the classroom or from textbooks in such a way as to enhance their ability to use that information in the clinical setting.[23] For example, students could connect the content of a didactic lesson on the pharmacological principles of drug interactions with their consideration of "the consequences of management on co-morbid illnesses" (Task 15).

Education research

Each of the teaching suggestions above also should be studied in terms of its impact on learning and practice. In addition, other important, related research questions include "Do particular history-taking and case presentation practices support or deflect attention from certain reasoning tasks?" and "Does teaching students to approach patient care with these tasks in mind lead them to provide more comprehensive care than their current level of education would otherwise do?"

Clinical research

Those researchers who are interested in quality assurance and reducing medical errors may use the list in their root cause analyses to explore the extent to which certain error types are related either to framing errors or to the failure of physicians or clinical teams to address particular issues, such as those related to Tasks 14 and 15 (consider the impact of comorbid illnesses on management and consider the consequences of management on comorbid illnesses). In addition, in a recent article, Ely and colleagues[24] proposed using a checklist to enhance physicians' cognitive approaches to clinical encounters to reduce medical errors. Our list of reasoning tasks could help identify or refine items for such a checklist.

Further research and limitations

Whereas our results have implications for current practice, they also represent the first step in building a unified list of reasoning tasks in medicine. Our list can, and should, be expanded in a number of ways. In developing the list itself, we made no attempt to identify or define the number of times that any task, or set of tasks, might be performed during a typical encounter or the sequence and relative hierarchy of each task in a given encounter. An appropriate next step in expanding our list would therefore be to study physicians in practice both to further validate our list and to begin to identify the relative influence of particular reasoning tasks on physicians' actions. Next, physicians may experience negative consequences when they engage in clinical encounters that require them to address specific reasoning tasks or multiple tasks at once. For example, Durning and colleagues[25,26] recently examined the influence of context on clinical reasoning and cognitive load. By linking how physicians think with what they reason about, we can expand Durning and colleagues' work and ask research questions like (1) How do physicians handle the cognitive load of multiple reasoning tasks during a clinical encounter? (2) Do physicians more frequently ignore certain tasks as a strategy for handling cognitive load? and (3) How do physicians handle the inherent multitasking and task-switching—going from one task to another—during a clinical encounter?

Although we know that physicians assume a variety of roles outside their one-on-one interactions with patients, the focus of our study was the reasoning tasks associated with those types of clinical encounters. As such, one of the limitations of our study is that our list of reasoning tasks does not represent all clinical reasoning tasks in all clinical contexts. For example, different reasoning tasks are associated with performing a surgery or running a busy emergency room than with caring for patients one on one. Therefore, we recommend that future research focus on broadening our list to include the reasoning tasks involved in these situations as well.

Similarly, our list is not intended to provide a language for communicating with patients. Whereas we consider many of the reasoning tasks to be patient-centered, the language that we used represents what physicians reason about, not what they say. Next, although we developed clinical examples associated with each reasoning task to provide clarity, users should not be constrained by these examples, because each reasoning task can lead a physician down many different paths of inquiry. For example, a patient being seen for health prevention or maintenance would yield a set of different clinical examples than would a patient presenting with a new problem in the context of prior active ones.

In conclusion, the development of this unified list represents a first step in offering a language for discussing, reflecting on, and studying what physicians reason about during clinical encounters. Whereas our list has many potential uses in current clinical practice and teaching, it also provides avenues for future research in clinical reasoning.

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Appendix 1

Initial and Final Lists of Physicians' Reasoning Tasks During Clinical Encounters With Clinical Examples and Survey Respondents' Approval of Including Each Reasoning Task in the Final List From Two Rounds of a Validation Study, 2010

List of reasoning tasks			First-round respondents (n = 24)		Second-round respondents (n = 15)	
Initial	Final	Clinical example	Yes with alternative wording, no. (%)*	Total yes, no. (%)†	Yes with alternative wording, no. (%)‡	Total yes, no. (%)§
Framing the encounter						
Identifying or determining active problem(s)	1. Identify active issues.	Patient is seen in the emergency room for a possible pneumonia and a previously unrecognized microcytic anemia. The patient is on warfarin and is worried about his elevated blood levels.	7 (29)	23 (96)	5 (33)	15 (100)
Identifying or determining an agenda for the encounter	2. Assess priorities (based on issues identified, urgency, stability, patient preference, referral question, etc.).	Patient presents to her family doctor for routine follow-up of her thyroid condition. On blood work done the day before, she is found to have hyponatremia.	9 (38)	23 (96)	4 (27)	15 (100)
Identifying or determining urgency, patient stability	3. Reprioritize based on assessment (patient perspective, unexpected findings, etc.).	Patient presents to his family physician for follow-up of chronic hip pain. The physician finds a blood pressure of 220/125. The physician suggests that the blood pressure requires urgent action.	10 (42)	24 (100)	5 (33)	14 (93)
Diagnosis						
Identifying or determining potential alternative diagnoses	4. Consider alternative diagnoses and underlying cause(s).	Patient presents with a story highly suggestive of pulmonary edema. In taking the history, his physician wonders about emphysema as an alternative diagnosis. Hearing a heart murmur on exam, he also wonders about the possibility of valvular heart disease.	9 (38)	23 (96)	5 (33)	14 (93)
Identifying or determining precipitant(s)	5. Identify precipitants or triggers to the current problem(s).	Patient presents with acute hepatic encephalopathy on a background of chronic liver disease. Has the patient stopped his lactulose? Been eating a high-protein diet? Had a gastrointestinal bleed?	13 (54)	21 (88)	3 (20)	14 (93)
Identifying or determining potential alternatives for diagnostic workup (investigation)	6. Select diagnostic investigations.	Patient presents with new weakness in his lower extremities and incontinence. An MRI is ordered to rule out cauda equina syndrome.	12 (50)	18 (75)	5 (33)	14 (93)
Identifying or determining diagnosis and underlying cause	7. Determine most likely diagnosis with underlying cause(s).	In reviewing the history, physical exam, and results of investigations, the patient is diagnosed with congestive heart failure secondary to severe mitral regurgitation. The possibility of infectious endocarditis is still being considered.	8 (33)	24 (100)	4 (27)	15 (100)
Identifying or determining risk factors	8. Identify modifiable risk factors.	Patient with hypertension is identified as being a smoker with high cholesterol which may contribute to the development of vascular diseases such as coronary artery disease.	6 (25)	21 (88)	2 (13)	15 (100)
Identifying or determining diagnostic or treatment complications	9. Identify complications associated with the diagnosis, diagnostic investigations, or treatment.	Patient with chronic renal failure is started on an angiotensin-converting enzyme inhibitor for hypertension. The physician plans to follow his potassium and renal function closely.	6 (25)	19 (79)	1 (7)	15 (100)
Identifying or determining progression and prognosis	10. Assess rate of progression and estimate prognosis.	Patient with acute renal failure secondary to acute tubular necrosis and progressively worsening creatinine over a period of two weeks. Concern is raised that she will require dialysis.	4 (17)	21 (88)	2 (13)	14 (93)

(*Appendix Continues*)

Appendix 1, Continued

List of reasoning tasks			First-round respondents (n = 24)		Second-round respondents (n = 15)	
Initial	Final	Clinical example	Yes with alternative wording, no. (%)*	Total yes, no. (%)†	Yes with alternative wording, no. (%)‡	Total yes, no. (%)§
Identifying or determining physical and psychosocial impact	11. Explore physical and psychosocial consequences of the current medical conditions or treatment.	Patient with rheumatoid arthritis and multijoint involvement. Because of a combination of pain and physical limitations she is no longer able to live independently. She is having a hard time coping with the loss of her independence.	3 (13)	21 (88)	2 (13)	15 (100)
Management						
Identifying or determining priorities and goals for treating symptoms and altering prognosis	12. Establish goals of care (treating symptoms, improving function, altering prognosis or cure; taking into account patient preferences, perspectives, and understanding).	Patient with prostate cancer, metastatic to bone causing a pathologic fracture, also has severe end-stage dementia. In keeping with his previously expressed wishes, family would like comfort and palliative care measures only.	6 (25)	21 (88)	2 (13)	14 (93)
Identifying or determining context and its impact on management	13. Explore the interplay between psychosocial context and management.	In a patient with type 2 diabetes who lives alone and has visual impairment, starting with a drug that is less likely to cause hypoglycemia and does not require regular in-home checking of his sugars is considered.	8 (33)	20 (83)	1 (7)	15 (100)
n/a	14. Consider the impact of comorbid illnesses on management.	Patient with congestive heart failure, an ejection fraction of 20%, class III New York Heart Association symptoms, and chronic renal failure with persistently borderline elevated potassium on a low-dose angiotensin-converting enzyme inhibitor. Decision is made to add a beta-blocker but not spironolactone.	n/a	n/a	1 (7)	14 (93)
n/a	15. Consider the consequences of management on comorbid illnesses.	Patient with pneumonia on warfarin. Decision is made to choose an antibiotic less likely to interact with the warfarin and to arrange for a follow-up blood level on days 3 and 7 of the antibiotics.	n/a	n/a	1 (7)	15 (100)
Identifying or determining alternatives (informed choices)	16. Weigh alternative treatment options (taking into account patient preferences).	Patient with multiple medical problems is seeing his family physician regarding knee pain and osteoarthritis. The pros and cons of surgery, physiotherapy, and use of chronic pain medications are considered.	7 (29)	20 (83)	2 (13)	15 (100)
Identifying or determining resource availability (office, hospital, and community)	17. Consider the implications of available resources (office, hospital, community, and inter- and intraprofessionals) on diagnostic or management choices.	Patient with lower-leg cellulitis and poor baseline mobility is admitted to hospital instead of being sent home. She lives alone and has no family in town, and the home care nursing team would only be able to see her once daily.	3 (13)	19 (79)	0 (0)	15 (100)
Identifying or determining appropriate management plans (regarding symptoms, underlying cause, complications, community spread)	18. Establish management plans (taking into account goals of care, clinical guidelines/evidence, symptoms, underlying cause, complications, and community spread).	Patient with presumed clostridium difficile diarrhea is admitted to treat the infection as well as for rehydration. She is placed in a private room with contact precautions initiated.	2 (8)	20 (83)	2 (13)	15 (100)
Identifying or determining education strategy for patient and family (information and motivation)	19. Select education and counseling approach for patient and family (taking into account patients' and their families' levels of understanding).	Patient and his wife, with limited understanding of arithmetic, are referred to the diabetes educator when he is diagnosed with new-onset type 2 diabetes.	2 (8)	18 (75)	0 (0)	14 (93)

(*Appendix Continues*)

Appendix 1, Continued

List of reasoning tasks			First-round respondents (n = 24)		Second-round respondents (n = 15)	
Initial	Final	Clinical example	Yes with alternative wording, no. (%)*	Total yes, no. (%)†	Yes with alternative wording, no. (%)‡	Total yes, no. (%)§
Identifying or determining collaborative roles for patient, family, and intra- and interprofessionals	20. Explore collaborative roles for patient and family.	Elderly patient who frequently forgets to take her medications agrees that having the pharmacy make up her weekly prescription in a pill dosette would be helpful. At her son's suggestion, she also agrees that he could double-check that she has remembered to take her pills each day.	6 (25)	18 (75)	0 (0)	14 (93)
Identifying or determining follow-up and consultation strategies	21. Determine follow-up and consultation strategies (taking into account urgency, how pending investigations/results will be handled).	Twenty-five-year-old patient with new intermittent bloody diarrhea is seen by his family physician. A consultation is arranged with the urgent gastroenterology clinic. He is also counseled on which symptoms should lead him to go to the emergency room if they appear. A follow-up appointment is arranged for one week.	3 (13)	23 (96)	1 (7)	15 (100)
Identifying or determining documentation strategy	22. Determine what to document and who should receive the documentation.	Patient is referred to the urgent neurology clinic by the emergency room physician. In addition to the referral letter, results of key investigations are included. His family physician is copied on the referral letter.	2 (8)	12 (50)	1 (7)	14 (93)
Self-reflection						
n/a	23. Identify knowledge gaps and establish personal learning plan.	A 45-year-old patient with type 2 diabetes and no complications is seen in the clinic. Question is raised as to the evidence supporting primary prevention of cardiovascular disease with aspirin.	n/a	n/a	n/a	n/a
n/a	24. Consider cognitive and personal biases that may influence reasoning.	An emergency room physician is seeing a patient with a presumed myocardial infarction and is sensitive to the fact that he recently failed to recognize an aortic dissection and the impact that may have on his current thinking.	n/a	n/a	n/a	n/a

* Mean = 26.3; standard deviation (SD) = 14; range = 8–54.
† Mean = 85.3; SD = 12; range = 50–100. Total yes includes survey responses of both "yes with alternative wording" and "yes as written."
‡ Mean = 14.5; SD = 11; range = 0–33.
§ Mean = 96.8; SD = 4; range = 93–100. Total yes includes survey responses of both "yes with alternative wording" and "yes as written."