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Title: Reflections From the Rearview Mirror: Internal Medicine Physicians' Reactions to Clinical Feedback After Transitions of Responsibility

Reflections From the Rearview Mirror: Internal Medicine Physicians' Reactions to Clinical Feedback After Transitions of Responsibility

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Abstract

Purpose

Learning from practice is important for continuous improvement of practice. Yet little is known about how physicians assimilate clinical feedback and use it to refine their diagnostic approaches. This study described physicians' reactions to learning that their provisional diagnosis was either consistent or inconsistent with the subsequent diagnosis, identified emotional responses to those findings, and explored potential consequences for future practices.

Method

In 2016-2017, 22 internal medicine hospitalist and resident physicians at Oregon Health & Science University completed semistructured interviews. Critical incident prompts elicited cases of patient care transitions before the diagnosis was known. Interview questions explored participants' subsequent follow-up. Matrix analysis of case elements, emotional reactions, and perceived practice changes was used to compare patterns of responses between cases of confirming versus disconfirming clinical feedback.

Results

Participants described 51 cases. When clinical feedback confirmed provisional diagnoses (17 cases), participants recalled positive emotions, judged their performance as sufficient, and generally reinforced current approaches. When clinical feedback was disconfirming (34 cases), participants' emotional reactions were mostly negative, frequently tempered with rationalizations, and often associated with perceptions of having made a mistake. Perceived changes in practice mostly involved nonspecific strategies such as "trusting my intuition" and "broadening the differential," although some described case-specific strategies that could be applied in similar contexts in the future.

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Conclusions

Internists' experiences with posttransition clinical feedback are emotionally charged. Internists'

reflections on clinical feedback experiences suggest they are primed to adapt practices for the

future, although the usefulness of those adaptations for improving practice is less clear.

Learning from the problems of daily practice is fundamental to continuous improvement of practice.[1-3] It seems logical that patients' progression in response to clinicians' diagnostic decisions and therapeutic actions would provide a rich source of information that physicians could use to learn through practice. This clinical feedback—information derived from a patient's condition available to the clinician with or without interaction with others—is embedded in the diagnostic and management process. Assimilation of clinical feedback may often be tacit,[4] manifesting as subtle shifts in thinking as hypotheses are explored, patients' conditions evolve, and management strategies are adjusted until reasonable certainty about a diagnostic explanation or the appropriateness of a therapeutic plan is determined. Although this phenomenon is ubiquitous in clinical reasoning processes, remarkably little is known about how physicians assimilate clinical feedback and translate it into meaningful changes in practice.

One setting that might allow us to more effectively unpack this process of learning from clinical feedback occurs when physicians obtain information about a patient previously under their care. In these situations, perceived differences between one's (early) clinical interpretation and the evolved understanding of a patient's problem are more apparent. Thus, care transitions afford opportunities to examine how physicians react and respond to clinical feedback that either confirms or disconfirms early clinical interpretations and reasoning. Understanding how physicians respond to clinical feedback in daily practice and perceive ways in which it has shaped their future clinical performances could improve our ability to support learning about practice through practice.

In the context of a larger study exploring internal medicine (IM) residents' and hospitalists' experiences with interruptions in their clinical reasoning processes due to patient care transitions,[5,6] we collected data about internists' responses and reactions to posttransition clinical

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feedback and their perceptions about what they learned from these follow-up experiences. We engaged in a targeted analysis of these data with the purpose of describing internists' reactions to learning that their provisional diagnosis was either consistent or inconsistent with the subsequent diagnosis, exploring their emotional responses to those findings, and determining whether they considered changing their practice as a result of the clinical feedback they received.

Method

Theoretical perspective

We considered several theoretical frameworks for exploring physicians' responses to clinical feedback. Information processing theories offer insight into clinical reasoning by explaining, for example, how physicians use clinical feedback to calibrate knowledge structures.[7-9] However, this framework did not sufficiently attend to the contextual and emotional factors that we anticipated would accompany these feedback experiences. Situated cognition and variants of social cognition, such as adaptive expertise, which emphasize the role of reflecting on practice as a mechanism for learning through practice, offered a theoretical lens that would account for contextual factors that interact with personal (physician) factors to influence how physicians make sense of clinical feedback.[1,10-13] Thus, we designed our study to elicit physicians' situated experiences with patient care transitions and to probe their reactions and responses.

Clinical feedback

In this study, we used the phrase "clinical feedback" intentionally to highlight the process of a person individually grappling with the specifics of an evolving clinical case. This use of the term "clinical feedback" to reference information derived from clinical data as a potential source for learning and practice improvement distinguishes our definition from the interactional and

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relationally embedded framing of feedback that others have described when referring to the delivery of performance feedback to students or residents during or after clinical rotations.[14-19]

Design

For the larger study (described elsewhere),[5,6] we conducted semistructured interviews with volunteer IM hospitalist physicians and IM residents at Oregon Health & Science University. We used a critical incident technique[20] to collect data relevant to the current analysis, eliciting participants' memorable clinical cases (henceforth "cases") using two prompts that participants received 1 day before the interview (see Box 1). We asked participants to situate themselves in the context of transitioning responsibility for patients to other physicians before the final diagnosis was known and describe experiences of subsequently finding information: (1) *consistent* with their provisional diagnosis and then (2) *inconsistent* with their provisional diagnosis. Participants were encouraged but not required to describe 1 or more cases for both of the critical incident technique prompts. Because emotion is known to influence how individuals perceive and interpret information,[21-23] we specifically explored participants' emotional responses to finding follow-up information and their perceptions of how these follow-up experiences might have changed their practices. The institutional review board at Oregon Health & Science University approved the study. Informed consent was obtained from all participants.

Participants

Beginning in January 2016, the principal investigator (J.B.), an IM physician and education researcher familiar with participants' work context but without supervisory relationships with potential participants, recruited a convenience sample of physicians via email. Participation was voluntary and emails assured participants of privacy and confidentiality. We purposefully sought participants across a wide spectrum of experience. We completed 22 interviews between January

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2016 and February 2017. J.B. conducted 18 interviews with 7 residents and 11 hospitalists. To assess for data sufficiency to support the analysis, 2 research assistants conducted 4 additional interviews with 3 IM residents and 1 IM hospitalist. These participants contributed additional cases, but the content yielded no new findings. Therefore, we judged the sample of cases sufficient to address the goals of the study.[24]

Analysis

Our focus on cross-case comparisons guided our choice to use matrix analysis to analyze the data.[25] J.B. transcribed and anonymized the interviews. Four authors analyzed the data. In addition to J.B., 2 experienced health professions education researchers (B.O., D.I.) and an emergency medicine physician education researcher (J.I.) reviewed data and offered alternative interpretations, which were then discussed and reconciled. We used participants' cases-in-context as the unit of analysis. Common case contextual factors were identified and refined through multiple readings of case transcripts. (The final version of the coding matrix is available as Supplemental Digital Appendix 1 at http://links.lww.com/ACADMED/A697.) Each case was then coded for type of scenario (confirming, disconfirming), transition-related factors (transition context, method of finding out), emotional reactions, and considerations of changes to practice. Text from each case was pasted into a spreadsheet to facilitate sorting and additional analyses. For data coded as "emotional reactions," J.B., D.I., and B.O. independently coded data as positive (e.g., good, satisfying, proud), negative (e.g., terrible, weak, upset), or neutral when neither clearly positive nor negative (e.g., "I was surprised"). For data coded as "considerations of changes to practice," J.B. and J.I. developed 4 categories from the data: (1) general rules (nonspecific strategies applied broadly), (2) decontextualized conditional rules (case-specific strategies applied broadly without reference to context), (3) context-dependent conditional rules

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(case-specific strategies applied to cases with similar contexts), and (4) decisions to maintain current practice (the explicit reflective decision not to change practice on the basis of a single case); they independently linked each excerpt to 1 of these categories. Differing perspectives and interpretations were discussed until differences were effectively reconciled. We used the spreadsheet sorting function to analyze patterns within the dataset. Finally, we calculated frequencies for coded elements in the matrix to give the reader a general idea of their commonality.[26] Because some participants did not answer questions in ways that could be coded, elements were not detected for all cases. After patterns were identified, we returned to the qualitative data to select representative quotes to illustrate our findings.

Results

Twenty-two IM physicians, 10 residents and 12 hospitalists, participated in this study; half were female. Of 69 cases offered during the interviews, 51 were included. We excluded 8 cases without a clear transition of responsibility, 9 without a known final diagnosis, and 1 that did not take place in the hospital context. Participants' case contributions are shown in Table 1. Frequencies of findings among participant groups for confirming versus disconfirming feedback are summarized in Table 2.

We report results by question posed to participants. In the descriptions below, we identify representative quotes by case number and participants' experience level, either resident (R) or hospitalist (H). We did not find differences between case prompts by type of patient care transition or participant gender. When we found differences in patterns by experience level, we report these differences.

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Reactions to follow-up experiences

In response to the question, how did that feel?, participants described both their emotional reactions to the discovery and, for disconfirming cases, their interpretations of the situation. For emotional reactions, confirming clinical feedback uniformly generated positive emotions, whereas disconfirming clinical feedback generated either neutral or negative emotions. When interpreting disconfirming clinical feedback, participants sometimes described a mistake and sometimes offered rationalizations that either mitigated the impact of the mistake or mitigated its definition as a mistake. Frequencies of these emotional and interpretive reactions are summarized in Tables 2 and 3 and elaborated below.

Emotional reactions. For the 17 cases with confirming clinical feedback, 15 cases could be classified as having emotional content. In these 15 confirming cases, participants' emotional responses were uniformly positive (15/15, Table 2). Participants described receiving confirming feedback as exciting, satisfying, interesting, and fun. They felt proud and more confident as diagnosticians. A second-year resident remarked,

> It was very satisfying, . . . I think that it's nice when you can sort of line things up
> and say, "I'm pretty sure it's this and we're going to treat it," and then the right
> things happen from the treatment. (11,R)

In contrast, participants described neutral or negative emotional reactions in almost all cases of disconfirming clinical feedback (31/34, Table 2). Reactions were never positive, mostly negative (23/31), and consistently negative for hospitalists (15/17) when compared with residents (8/14). Participants described feeling terrible, frustrated, and upset. For example, a hospitalist expressed doubt about his abilities, saying,

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I was very upset . . . I felt like a weak physician. I felt like I let down a patient . . . I don't

know if feeling stupid is the right term, but I really questioned my physical exam skills. I

questioned my data gathering skills. (32,H)

Other hospitalists emoted about poor performances.

I distinctly remember feeling disappointed in myself . . . I also felt a little bit chagrined, a

little bit embarrassed because it was a colleague I really respect, and [I] was embarrassed

for him to see a clear omission [on my part]. (42,H)

Although residents expressed similar emotions (disappointment, embarrassment, guilt),

residents' emotional reactions were neutral in some cases of disconfirming feedback (6/14). In

half of these cases, a neutral reaction was followed by expressions of relief or remorse. After

expressing surprise about the diagnosis, a resident said, "It made me feel relieved that I did the

initial triage" (40,R). About a readmitted patient, another resident said,

[T]here was definitely this "oh my gosh, did we miss something?" . . . it was really

challenging but I still felt like I probably didn't do the most thorough exam that I could

have for this guy and we could have caught this on our admission. (18,R)

Perceived mistakes. In some cases of disconfirming clinical feedback, participants talked about

errors they made (19/34 overall; hospitalists 10/19; residents 9/15; Table 3), which were often

associated with negative emotions for both residents (5/9) and hospitalists (7/10). In these cases,

some participants described examples of anchoring on provisional diagnoses. For example,

I think our thinking was kind of skewed . . . this is a classic case of diagnostic

momentum . . . the Emergency Department sold us this heart failure patient and

we kind of bit the apple. . . . Some part of me anchored on the diagnosis. (21,R)

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Participants also gave examples of perceived errors of omission, such as failing to gather enough information. For example, a hospitalist said, "I went back and was a little self-critical about whether I'd missed a skin finding" (24,H). A resident described his failure to compare new echocardiogram findings with previous studies, saying, "I realized, looking back, they made the assumption that all my information was correct and it wasn't" (27,R). Others lamented their failure, saying, "it was nowhere in my differential" (19,H) or "that's something that hadn't crossed my mind at all" (35,H). Participants also described perceived errors of commission, such as a hospitalist who regretted having caused harm, saying, "I felt like the act of doing something that harmed somebody felt worse . . . than missing something" (20,H).

Rationalizations. In several of the cases of disconfirming clinical feedback, participants reflected on clinical outcomes in ways that rationalized the situation (19/34, Table 3). Most of these rationalizations were associated with negative emotions (residents 5/7, hospitalists 9/12). Some of these rationalizations involved participants downplaying the consequences of the error, saying, "nothing bad happened to him"(28,H) or "he probably wasn't going to do well long term, not that that makes any excuse for what happened . . ." (37,H). Other rationalizations invoked situational factors that mitigated personal responsibility. For example, a hospitalist pointed to case complexity, saying, "And to be honest, I heard that story, but . . . there were so many other things going on with him and he looked so well" (72,H). Still other rationalizations focused on the patient's inadequate communication as the source of error. For example, one resident said, "the neurological exam is difficult when the patient doesn't respond" (39,R), and a hospitalist rationalized, "[the] presentation wasn't classic or typical, and [the patient had] difficulty communicating symptoms" (44,H). Finally, some rationalizations appeared as a form of "norm referencing," as in the case of a hospitalist who remarked, "If 4 other people didn't get it, I can't

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really beat myself up for that" (47,H). Interestingly, these rationalizations often tempered negative emotional responses but did not entirely eliminate them.

Considerations of changes to practice

We identified 4 patterns in response to the questions, how do you think finding out has influenced your practice going forward? and what do you think you do differently as a result of this case? (Table 2). Frequencies were similar for situations of confirming feedback (12 of 17 cases) and disconfirming feedback (25 of 34 cases).

General rules. For both critical incident scenarios, reflections were often general in nature (16/37 overall; 6/12 confirming and 10/25 disconfirming clinical feedback cases). When clinical feedback was confirming, approaches were reinforced and confidence was buttressed. A hospitalist said,

> I'm not sure it had a lot of influence. I think it reaffirmed some of the practices I
> was doing. I think it encouraged me to continue doing the same . . . (15,H)

A resident reflected on elements of the case "not sitting right," saying, "It was a nice exercise in sort of trusting your gut when things don't fit, even this early in the game of training. . . ."(12,R). Contrarily, when clinical feedback was disconfirming, participants proposed remediating strategies that included slowing down, staying broad, reconsidering the provisional diagnosis, and reviewing primary data. A hospitalist said,

> It's a reminder to really just make sure that I've slowed down when things are not
> adding up or the patient is not responding appropriately, revisiting the differential
> and talking it out. (32,H)

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Decontextualized conditional rules. Although the learning was case-specific, some participants described strategies they would apply broadly beyond the context in which they were learned (11/37). For example, a hospitalist perceived that his actions of giving intravenous fluids too quickly had precipitated acute heart failure in a patient. The event was intensely emotional, and led him to adopt an approach of being generally cautious when administering fluids, saying,

> I found myself now doing a liter [of intravenous fluids] over 10 hours . . . if
>
> they're not hypotensive and there's no reason to slam them with fluids. I want it
>
> to go a bit longer. (20,H)

Context-dependent conditional rules. When finding disconfirming clinical feedback, some participants described case-specific rules they could apply to similar specific contexts in the future (8/37). Rules reflected clinical signs that these physicians newly associated with a particular illness and their revised weighting of diagnostic considerations in specific contexts. In some cases, specific symptoms or signs triggered activation of knowledge in a new way. A hospitalist said,

> And some [of the things I learned] are just things that then become almost
>
> axiomatic: "In IV drug users, check the SC joints" is sort of the rule I think of
>
> now when I see IV drug users with bacteremia. (4,H)

A resident used a missed diagnosis to broaden her approach for specific patients, saying,

> I now have intracranial hemorrhage in my differential for people with hepatic
>
> encephalopathy . . . I look at bleeding risk a little bit more closely in patients with
>
> cirrhosis, not just GI bleeding. (39,R)

Occasionally, participants described context-dependent conditional rules when receiving confirming clinical feedback. For example,

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I think it was useful for me to reemphasize objective findings, like these effusions

. . . if I am really that suspicious of sepsis, I should start antibiotics rather than

waiting for the confirmatory test because I can always stop antibiotics if I'm

wrong. (5,R)

Decisions to maintain current practice. It is worth noting that in 2 cases, participants described

engaging in careful, intentional reflection that led to an explicit decision not to change practice as

a result of the experience (2/37). A resident reflected on a case of confirming clinical feedback

that reinforced decision making, saying, "although unfortunately now I want to get a head CT on

every 90-year-old who has vomiting, which is probably not the right takeaway . . ."(12,R).

Similarly, a hospitalist concluded that learning from a missed diagnosis due to a rare presentation

should not unduly influence the differential, saying, after the patient died,

We did a lot of reflecting as a team. Should we have imaged? Should we have

considered this diagnosis? And none of us were able to convince ourselves that

we should have . . . So, I don't think the next time I see a chronically ill guy with

diarrhea that I'm going to think pancreatitis. (44,H)

In both cases, participants appeared to recognize these atypical presentations compared with base

rate data, cautioning against giving these cases excessive weight when contemplating practice

changes.

Discussion

This study explored IM physicians' responses to finding information about their provisional

clinical decisions in the context of care transitions as a means of understanding uptake of clinical

feedback and learning from evolving patient cases. Reflection on activities of daily practice is

important for identifying and addressing performance gaps; clinical feedback provides necessary

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information for reflection and learning in discontinuous care settings.[1-3] From the perspective of situated cognition, we identified interactions between physician factors (experience, self-confidence or doubt, perceived cultural expectations for making the "right" diagnosis, and emotion) and contextual factors (confirming or disconfirming clinical feedback) that shaped how participants interpreted their experiences and considered changing their practices.[11-12]

We found that receiving clinical feedback was an emotional experience in nearly all cases, and participants' reactions and perceived learning differed, depending on whether they discovered information about patients' outcomes that confirmed or disconfirmed their provisional diagnosis at the time of transition. When clinical feedback confirmed provisional diagnoses, participants recalled positive emotions, judged their performance as sufficient, and generally reinforced current approaches. When clinical feedback disconfirmed provisional diagnoses, most participants recalled a range of negative emotions, judged their performances as suboptimal, and frequently commented about mistakes, although references to a mistake were often tempered with a variety of rationalizations. Even so, participants' reflections suggested an adaptive capacity to learn from these experiences, although some lessons might be seen as more useful and more likely to be enduring than others.

Participants' considerations of changes to practice demonstrated a range of perceived learning responses to clinical feedback, which varied when clinical feedback outcomes confirmed versus disconfirmed prior reasoning efforts. Many participants translated their clinical feedback experiences into useful learning responses. We saw several examples of cautious and sensible modifications to practice, some describing specific contextual factors that were integrated into scripts for case-specific applications to future practice. We also saw some sensible examples of reflection that led to a decision not to modify practice based on concerns about undue influence

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of memorable experiences. Alternatively, some of the learning responses participants described may be of limited value in guiding future practice. General assertions that we observed under both outcome conditions, such as "trust my intuition" and "slow down, stay broad," lack characteristics typically associated with critical reflection.[27]

We observed developmental differences in participants' reflections, providing evidence that physician factors of experience, self-confidence, and self-doubt likely shaped their learning responses to clinical feedback. Residents found opportunities to consider improvement in practice when clinical feedback confirmed their prior reasoning, whereas hospitalists did not, suggesting that residents and hospitalists processed clinical feedback from these cases differently. Residents, as less-experienced physicians in training, may not have established tacit routines to be able to intuitively do what works. Instead, they may have interpreted situations of finding confirming clinical feedback less confidently as being a direct consequence of their own reasoning, and reflections in these cases might represent continued efforts to calibrate their performances. In contrast, hospitalists likely have more established tacit procedures whereby confirming clinical feedback intuitively reinforces a sentiment to keep doing what works.[4] Without conscious processing, specific learning from cases in which usual practices are reinforced may remain hidden and potentially problematic for both hospitalists and residents, resulting in the general reflective admonitions to "trust my intuition" that we observed.[4] More research is needed to understand how bringing these routinized practices to conscious reflective awareness might affect interpretation of outcomes and add value to clinical care and learning[28-30]

We intentionally explored participants' emotional reactions to receiving clinical feedback. Although our interview prompts did not ask participants to describe emotionally charged experiences, they recollected their emotions in nearly all cases. Thus, emotions experienced at

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the time of follow-up likely played an important role in triggering the cases participants discussed and how they remembered them. Given the role of emotional arousal in enhancing episodic memory, this finding is not surprising.[31] Emotions are integral to human cognitive processes, enhancing memory and influencing the ways in which physicians identify, process, and act on information.[21-23] Although our participants' intense emotional reactions to clinical feedback are not surprising, how these emotions may have influenced the judgments they made about clinical feedback and their perceptions of future changes to practice were unexpected. Participants' descriptions of positive emotions were often associated with reinforcing current approaches. Participants' descriptions of negative emotions were frequently associated with framing the clinical outcome as a consequential mistake and rationalizing in ways that may have mitigated the emotional experience. Rationalizations, however, did not seem to interfere with participants' willingness to reflect or describe potential changes to future practice. Further, residents' neutral emotional responses to some instances of disconfirming feedback may suggest another developmental difference, raising questions about more experienced physicians' self-imposed expectations of getting the diagnosis right and experiencing negative emotions when they do not.

The natural course of patients' illnesses and their responses to treatment may evolve for a multitude of reasons that are dependent or independent of our participants' prior decision making. Thus, our participants' tendencies to frame confirming (or disconfirming) clinical feedback as a reliable signal of their own competence (or incompetence)—irrespective of the processes that drove how they arrived at these decisions in the moment—is problematic.[32,33] Being right may not necessarily be the result of sound clinical reasoning, yet confirmatory clinical feedback tended to reinforce participants' perceptions that current practices were

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sufficient. Being mistaken may not necessarily be the result of poor clinical reasoning, yet disconfirming clinical feedback tended to lead participants to question current practices and abilities. Researchers have argued that using information about clinical outcomes to evaluate decision quality is a suboptimal strategy.[34,35] Sacchi and Cherubini demonstrated physicians' biases in response to outcome information, speculating that sensitivity to outcomes in some circumstances may have a positive effect and cause physicians to correct their knowledge, but in other circumstances they may resist correcting it or revise correct knowledge inappropriately.[34] Zwaan and colleagues have shown that learning about clinical outcomes that are not available at the moment of decision making injects significant hindsight bias into clinicians' retrospective judgments regarding the appropriateness of prior decisions.[35] Our findings add to these concerns about the role of physicians' retrospective reflections on clinical feedback as part of the unguided and idiosyncratic process of learning through work. We extend these findings to include our observations of the emotional impact on physicians when they reflect on their own clinical outcomes. How these emotions influence physicians' learning processes and outcome biases are important considerations in future research, especially if error attribution in hindsight leads to misguided learning responses.[36]

Limitations

Our methodological choices place limitations on how broadly we might speculate about our findings. First, by interviewing volunteer IM hospitalists and residents at a single academic medical center, we obtained their insights in the context of their institution, which might not be the same elsewhere. Cases and the associated emotions and reflections may be different for other physician specialties and practice contexts. We did not intend to identify differences among residents by level of experience; future studies designed to explore such differences may uncover

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important developmental transitions during the training period.

Second, our participants' cases are retrospective reconstructions of clinical events. As such, their reflections may represent recall of prior reflections (unprompted by the interview) or reflections on those cases for purposes of the interview. Their interpretation, in the context of an interview and after passage of time, may be different from the time of the event. Their responses may or may not correspond to actual changes in behaviors and thought processes.

Third, we purposefully chose to explore physicians' responses to clinical feedback after transitioning responsibility for patient care to other physicians. In contrast with circumstances of continuous care, we surmised such cases would be easier to recall. We are not sure how discontinuity might have affected their reactions and perceptions of learning. Physicians may experience postcare transition clinical feedback differently from the usual iterative diagnostic process that allows for fine-tuning. When physicians relinquish control to others, they are unable to fix their own mistakes. Do physicians experience more embarrassment, shame, or humiliation when being mistaken becomes more public as a part of the transition of responsibility?[37-39] If transitions of responsibility intensify emotions, how might that affect learning in practice? Thus, how our findings translate to circumstances of clinical feedback under conditions of continuous responsibility will require further investigation.

Conclusion

These limitations notwithstanding, our findings offer a first glimpse into the process by which clinicians learn from their own practice. Learning about one's practice from clinical feedback is a key source of learning in practice.[1,13] Our results reveal that IM residents' and hospitalists' reactions to posttransition clinical feedback are emotionally charged experiences that often prime them to adapt practices for the future. How useful those individually derived adaptations actually

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are for improving practice is less clear. Although further research is needed, we see potential

benefit of guided, critical reflection[27] for learning from self-selected cases[5] under both

circumstances of confirming and disconfirming clinical feedback[40] in emotionally safe learning

environments.[41] Such educational strategies might lead to improved learning from practice.

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Table 1

Participants' Case Contributions From Semistructured Interviews in Study of Internal Medicine Physicians' Reactions to Clinical Feedback Confirming or Disconfirming Diagnoses After Transitions of Responsibility, Oregon Health & Science University, 2016-2017

Contribution	Cases of receiving *confirming* clinical feedback	Cases of receiving *disconfirming* clinical feedback
Cases contributed (N = 51)	17	34
Resident cases (n = 24)	9	15
Hospitalist cases (n = 27)	8	19
Cases contributed per participant		
Residents, mean (range)	1.12 (0-2)	1.50 (1-3)
Hospitalists, mean (range)	1.14 (0-1)	1.58 (1-4)

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Table 2

Differential Findings Among Residents and Hospitalists Who Received Confirming and Disconfirming Feedback After Transition of a Patient's Care in Study of Internal Medicine Physicians' Reactions to Clinical Feedback, Oregon Health & Science University, 2016-2017

Finding	Cases of receiving confirming feedback			Cases of receiving disconfirming feedback		
	Residents	Hospitalists	Total	Residents	Hospitalists	Total
Cases, no.	9	8	17	15	19	34
Method of receiving clinical feedback						
Method detected (n = 50/51)[a]	9	8	17	15	18	33
Isolated (EHR) chart review	6	7	13	9	10	19
Personal communication	3	1	4	6	4	10
Serendipitous	0	0	0	0	4	4
Emotional reactions						
Emotions detected (n = 46/51)[a]	8	7	15	14	17	31
Positive emotion	8	7	15	0	0	0
Negative emotion	0	0	0	8	15	23
Neutral emotion[b]	0	0	0	6	2	8
Considerations of changes to practice						
Considerations detected (n = 37/51)[a]	7	5	12	11	14	25
General rules[c]	4	2	6	6	4	10
Decontextualized conditional rules[d]	0	2	2	3	6	9
Context-dependent conditional rules[e]	2	1	3	2	3	5
Decisions to maintain current practice[f]	1	0	1	0	1	1

Abbreviation: EHR indicates electronic health record.

[a]Numerator indicates cases in which finding was detected in the qualitative data; denominator is total cases.

[b]Data were coded as neutral when emotion was neither clearly positive nor negative.

[c]Nonspecific strategies participants perceived applying broadly to future cases.

[d]Case-specific strategies participants perceived applying broadly without reference to context.

[e]Case-specific strategies participants perceived applying specifically to cases with similar context in the future.

[f]Explicit and reflective decision *not* to change practice on the basis of a single case.

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Table 3

Cases in Which Disconfirming Feedback (n = 34) Was Perceived as a Mistake[a] or Rationalized[b] and Participants' Emotions Associated with These Findings in Study of Internal Medicine Physicians' Reactions to Clinical Feedback, Oregon Health & Science University, 2016-2017

Finding	Perceived Mistakes		Rationalizations	
	Residents	Hospitalists	Residents	Hospitalists
Total possible cases, no.	15	19	15	19
Finding detected[c]	9	10	7	12
Associated emotion				
Positive emotion	0	0	0	0
Neutral emotion	4	1	2	2
Negative emotion	5	7	5	9
No emotion	0	2	0	1

[a]Any reference participants made to making mistakes or committing errors.

[b]Any statement participants made that further explained their perceptions of the clinical outcome.

[c]Indicates cases in which finding was detected in the qualitative data.

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Box 1

Critical Incident Interview Triggers in Study of Internal Medicine Physicians' Reactions to Clinical Feedback Confirming or Disconfirming Diagnoses After Transitions of Responsibility

Confirming clinical feedback. Think about a time when, as a diagnostician, you worked through a challenging clinical case that was your responsibility and that others had not yet figured out. After your responsibility for this case ended and you handed it over to others, you learned that the final diagnosis was the *same* as you originally thought it might be.

Disconfirming clinical feedback. Now think about a time when you worked through a challenging clinical case that was your responsibility and that others had not yet figured out. After your responsibility for this case ended and you handed it over to others, you learned that the final diagnosis was *different* from what you originally thought it might be.