“I Was Worried About the Patient, but I Wasn’t Feeling Worried”: How Physicians Judge Their Comfort in Settings of Uncertainty

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Abstract

Purpose
Clinical educators often raise concerns that learners are not comfortable with uncertainty in clinical work, yet existing literature provides little insight into practicing clinicians’ experiences of comfort when navigating the complex, ill-defined problems pervasive in practice. Exploring clinicians’ comfort as they identify and manage uncertainty in practice could help us better support learners through their discomfort.

Method
Between December 2018 and April 2019, the authors employed a constructivist grounded theory approach to explore experiences of uncertainty in emergency medicine faculty. The authors used a critical incident technique to elicit narratives about decision making immediately following participants’ clinical shifts, exploring how they experienced uncertainty and made real-time judgments regarding their comfort to manage a given problem. Two investigators analyzed the transcripts, coding data line-by-line using constant comparative analysis to organize narratives into focused codes. These codes informed the development of conceptual categories that formed a framework for understanding comfort with uncertainty.

Results
Participants identified multiple forms of uncertainty, organized around their understanding of the problems they were facing and the potential actions they could take. When discussing their comfort in these situations, they described a fluid, actively negotiated state. This state was informed by their efforts to project forward and imagine how a problem might evolve, with boundary conditions signaling the borders of their expertise. It was also informed by ongoing monitoring activities pertaining to patients, their own metacognitions, and their environment.

Conclusions
The authors’ findings offer nuances to current notions of comfort with uncertainty. Uncertainty involved clinical, environmental, and social aspects, and comfort dynamically evolved through iterative cycles of forward planning and monitoring.

Clinical work is filled with uncertainty. Working effectively in clinical settings requires expert practitioners to tackle problems for which multiple interpretations of the situation and multiple management approaches may be reasonable as they work toward patient-centered solutions. Thus, there have been continued calls for clinicians to “tolerate” or respond more constructively to the uncertainty they face in authentic clinical settings aiming to avoid maladaptive behaviors such as “fitting” discrepant data into a diagnosis prematurely, pursuing unnecessary tests in pursuit of diagnostic certainty, or “ploughing through” situations while neglecting threats to patient safety. Yet most studies attempting to develop theoretical models of clinical reasoning and decision making have tended to use problems that are deterministic (one right diagnosis) or at best probabilistic (each diagnosis having a determinable probability of being correct). Drawing lessons from these models may work for well-defined problems with “absolutely correct and knowable solutions,” yet when applied in the ill-defined problem spaces commonly encountered in clinical practice they may implicitly promote the maladaptive behaviors they were intended to correct. This highlights a potential conceptual gap in our current literature: Do existing models of clinical reasoning based upon well-defined problems sufficiently capture and elaborate what clinicians do when wrestling with the ill-defined problems that they experience in authentic practice?

One approach to address this gap between theory and practice is to first better understand how clinicians experience and attend to uncertainty in their daily work. A more nuanced explication of the ways in which experienced clinicians proceed through the ill-defined problem spaces that are pervasive in practice has the potential to reconcile the disconnect between theoretical models of expert reasoning and authentic reasoning in clinical practice. Thus, the purpose of this study is to explore physicians’ experiences with uncertainty in their clinical work, elaborating what they notice and consider in these moments as they make judgments about whether they can capably handle uncertain situations safely and effectively. In particular, we were interested in exploring questions such as:

• What types of circumstances in clinicians’ daily work generate the sense that they have an incomplete or insufficient understanding of a situation, and how is this sense of uncertainty experienced?
• What types of activities or processes help clinicians to paradoxically remain “comfortable” handling a problem despite these feelings of uncertainty?
• How do experienced clinicians identify these moments and make real-time judgments about whether their knowledge and skills are sufficiently aligned with a situation to deliver safe and effective care?

In exploring these questions, we aim to provide linkages between theory and practice as a first step toward more purposefully understanding, studying, and promoting effective behaviors in practicing clinicians and trainees.

**Method**

We employed a constructivist grounded theory (CGT) approach,²⁶ using data from semistructured interviews to build understanding of cognitive and social processes that are not well explained by established theoretical constructs. CGT employs inductive reasoning to generate interpretive theory, placing emphasis on subjectivity over objectivity as the preferred path to making knowledge.²⁷ This approach acknowledges that meaning is created through the interaction between the investigators and participants, an important feature of our methodological orientation because the principal investigator (J.I.) is a practicing emergency medicine (EM) clinician–educator. Two study team members are clinicians (P.T., J.B.), 3 have backgrounds in qualitative research (P.T., J.B., G.R.), and 2 have training in cognitive psychology (A.dB., G.R.).

**Setting, population, and sampling strategy**

This study took place at 2 large, urban, university-affiliated teaching hospitals between December 2018 and April 2019. We enrolled a cohort of practicing EM faculty, hypothesizing that because these clinicians regularly tackle clinical problems that are complex, dynamic, and undifferentiated, this study population would provide rich descriptions that are exemplary for the range of ways that physicians experience ill-defined problems in everyday practice. Importantly, the principal investigator (J.I.) also works in these environments and is well-acquainted with the clinical problems that participants’ encounter and the unique factors that impact care in these environments. Because we expected that “uncertainty” and “comfort” would be shaped by past experiences, we purposefully sampled participants with a spectrum of time in clinical practice. The University of Washington’s institutional review board reviewed the study protocol and determined that it met exempt status.

**Procedures**

The principal investigator (J.I.) conducted hour-long semistructured interviews with participants using a critical incident technique²⁸ to elicit narratives immediately after the conclusion of participants’ clinical shifts. Following a brief introduction, interviews began by prompting participants to think about cases from their shift when they needed help from others (or not), and instances when they made decisions to discharge or admit patients with a lingering sense of uncertainty. They were given 10 minutes to hand-draw visual representations of 2 such cases that were then used as prompts to elicit participants’ reflections and—with the aid of a case log listing all of the patients they had seen during the preceding shift—served as a starting point to discuss additional cases. We used probing questions that explored the origins of their uncertainty (or uncertainties) and how they approached and experienced these moments (including both emotional and somatic manifestations). As the interviews progressed, we adapted our interview guide iteratively to gather data based on evolving categories and themes.²⁹ Audio-recordings of the interviews were transcribed for analysis.

**Analysis**

We analyzed participants’ narratives iteratively alongside data collection. Two investigators (J.I., J.B.) coded data line-by-line using constant comparison to organize data into focused codes, key conceptual categories, and then major themes. We coded transcripts using Dedoose version 8.3.17 (SocioCultural Research Consultants, Manhattan Beach, California), which facilitated analytic memoing and network displays that enabled the entire team to discuss the evolving codes, their meaning in light of our research question, and connections between them. We identified relationships between codes and categories, and developed a conceptual framework reflecting the possible relationships between themes. After 10 interviews, the final 2 interviews offered no additional insights or counterexamples, and we deemed our sample theoretically sufficient to address the study purpose.³⁰

**Results**

Twelve EM faculty physicians (4 female) participated in this study. These clinicians had a broad range of years in practice (2–32 years) and had practiced at their respective clinical sites for an average of 7.5 years (range 0.5–13 years). Participants discussed a total of 55 unique patient cases, with a range of 3 to 7 cases per interview. Regardless of their years in practice, participants consistently described multiple forms of uncertainty that were manifest in their experiences, and multiple considerations they used to judge their comfort in these situations.

**Perceptions of uncertainty**

Participants’ experiences of uncertainty organized into the 2 broad categories that could be captured in the questions, “What is going on?” and “What should I do?”: These categories of uncertainty frequently coexisted in the same clinical case, and the relative contributions of each form of uncertainty evolved as clinicians engaged in the care of a given patient over time.

**What is going on?** This form of uncertainty generally centered around participants’ incomplete understanding of a problem’s root cause or uneasiness in predicting how a problem might progress. Efforts to understand the origins and evolution of the problem ranged from identifying a limited set of possibilities to acknowledging a vague and broader set of complete unknowns. A relatively extreme case of uncertainty with regard to both etiology and course was described by Participant 5 while caring for a patient after a skiing accident:

> It’s truly just a complete unknown why the kid is down…. He had no physical signs of trauma anywhere except that he’s got a bloody nose…. Could [he have] fainted? Could he have seized? Did he get that bloody nose after he got combative with medics? We just didn’t know…. This is one where I still kind of think like “what’s my initial gut sense?” but I have very low valence attached to it. This is
What should I do? Participants also told stories of uncertainty regarding management, which took 3 forms: (1) clinical uncertainty, generated when they were unsure which actions would be safe and effective; (2) skill-based uncertainty, when they perceived a possible mismatch between their skills and the problem at hand; and (3) moral uncertainty, when they expressed uneasiness about whether their actions aligned with patients’ goals of care, or with institutional expectations within their system of care.

First, participants wrestled with the competing risks and benefits of particular treatment decisions and described how time impacted case-specific hypothetical pros and cons. For example, Participant 4, when caring for a patient whose clinical presentation suggested that she might be having a stroke (e.g., infarct), described real-time struggles around whether or not to give tissue plasminogen activator (tPA), a medication that could potentially restore blood flow to injured parts of the brain but carried the risk of life-threatening bleeding:

The risks are that she’s going to have an infarct and … and have disability from this. That’s one of the risks. Another risk is that she would get tPA and have bleeding in her head, whether she was having a stroke or not. That risk maybe varies by magnitude, varies by whether or not she’s actually having a stroke, so that’s … a variable risk, so there’s a variable benefit. And as time goes by, the amount of benefit of the drug is dropping, 10 million neurons a minute or … something ridiculous like that. (Participant 4)

Second, even when treatment decisions seemed fairly clear, participants sometimes expressed insecurity around whether their own skills were aligned, or sufficiently practiced, to deal with the task at hand. Some expressed tentativeness around whether they were the “right” person to embark on a management step, particularly if others with these skills were available in their resource-rich environment. As one participant described:

I have placed one suprapubic catheter in my life, one, when I was a resident…. Could it if I had to? Yeah. But if it were my dad, would I want the person who’s done it once to do it? Probably not. (Participant 1)

Third, on occasion, participants expressed uncertainty about whether a decision was morally appropriate. We observed this uncertainty in 2 ways: whether they were doing the right thing when patients’ preferences or treatment goals were unknown, and whether their actions aligned with being a good steward of the health system. As described by Participant 3, who was wrestling with whether to intubate a minimally responsive and critically ill patient with a terminal illness:

We potentially can offer other sorts of life-sustaining or life support skills. But, that’s where the sort of hesitancy and the uncertainty came in: Is that something we actually want to do to this person? (Participant 3)

The uncertainty about health system stewardship seemed to stem from ambiguity about institutional policies. As one participant described, “I’m not even sure if I’m breaking the guidelines and rules here, but I felt really confident that we were providing the right care for this woman” (Participant 10).

Considerations that influence comfort Participants noted a sense of “comfort” when describing situations where they felt like they could take the next step forward despite unresolved uncertainties. Comfort was not a static state but rather a dynamic cognitive, emotional, and physical experience. This dynamic experience was influenced by the intersection of multiple considerations and was determined in 2 ways. First, participants described projecting forward to imagine whether they could imagine managing the paths that might ensue as a problem evolved and set boundary conditions that would signal a problem was progressing beyond their capacity to manage it effectively. Second, they gathered signals from their experiences in real time, monitoring the patient’s progress, themselves, and their environment to gauge whether the interpretation of the situation was remaining within their capacity to manage and control.

Projecting forward and setting boundaries. Participants frequently described mental simulations of the kinds of things that might happen as a problem evolved over time. These mental simulations enabled participants to get a sense of whether the range of possible downstream clinical events remained within the boundaries of their knowledge, skills, and resources. When participants interpreted alignment between their skills and the situation, their comfort seemed to reflect a confidence that they were unlikely to get themselves into situations they could not handle. As a part of this process, participants imagined events that signaled the borders of their expertise. Signposting these conditions allowed participants to plan for how they could move forward with deliberate caution, using the manifestation of these boundary conditions as stopping points where they would access help from others. In the context of anticipating a challenging procedure, Participant 5 reflected:

It was either going to be easy or not, and if it anything other than easy, like I was ready to abort … I’m not going to force this process. Like there’s nothing about this where I have to step that far beyond my own comfort zone. (Participant 5)

Interestingly, participants also projected forward as a means to make predictions about how others might analyze and critique their decision making post hoc. These projections regarding social judgments served as a proactive means for participants to weigh the defensibility of their actions and often centered around a sense that they might be deviating from institutional norms or practices—even when they were confident in the appropriateness of their management. As described by Participant 10: “What am I worried about? I’m worried that in 3 days from now I’m gonna get some angry email from some angry orthopedist telling me that I’m a bad doctor.” (Participant 10)

Monitoring. As participants engaged in decision making while experiencing uncertainty, they described 3 ways that they actively monitored these situations, including (1) the ways in which their observations were aligned or misaligned with how they predicted a patient’s illness to evolve, (2) their internal emotional and somatic state as they worked through these problems, and (3) observations of their environment—as manifested by the activities of their team members and/or the availability of resources—that allowed them to reflect upon whether the environmental conditions would effectively support their management efforts.

First, as participants engaged with problems, they described multiple ways...
that clinical data signaled whether a patient’s status and course were evolving in expected ways. When predicted paths came to fruition, participants’ gained confidence in their understanding of a problem. Comfort, as Participant 1 described, was generated when things seemed to be “on track.”

Second, clinicians seemed to be deliberately monitoring their own internal reactions to these situations. Comfort with the situation was inferred from their experience of a mental state associated with calm feelings and a lack of somatic cues, even when participants described a conscious sense of concern for a patient. These experiences of comfort seemed to arise from a sense of being in control of a situation, as Participant 1 described:

> It’s kind of hard to put a feeling on it…. It’s almost the opposite of emotion. I wasn’t feeling particularly scared or happy or sad or worried. I mean I was worried about the patient, but I wasn’t feeling worried, if that makes sense. (Participant 1)

Conversely, when participants faced problems that were rapidly progressing, insufficiently predictable, or at the borders of their expertise, they described experiencing a sense of fear, worry, or a vague sense that “something’s not right” (Participant 11). This lack of comfort was often identified first through the growing awareness of palpable physical symptoms: “I feel my heart speeding up. I feel like talking faster and louder. I feel like I want to take some deep breaths.” (Participant 7)

Third, participants frequently described monitoring environmental cues that extended beyond their own direct interactions with patients. Even when they lacked a complete understanding of a situation, participants used these observations to assess whether their team had a sufficiently aligned understanding of the situation such that the team could engage in the most pressing work, align resources, and plan ahead together. As Participant 7 reflected: “You’re worried the nurses don’t understand but then you realize they’re both putting in large bore 18s in his arms and so then you realize, okay, at least they’re with me.” (Participant 7)

### Moment-by-moment interpretations of relative comfort

Importantly, participants saw the experience of comfort as neither dichotomous (comfortable or not) nor stable. As participants moved through problems with which they experienced uncertainty, they seemed to be continuously engaging in a process of projecting forward and monitoring, weighing the relative contributions of a multitude of clinical, metacognitive, somatic, and environmental cues that simultaneously influenced whether they were more, or less, comfortable in a given moment. As participants reflected at the intersection of these cues, they seemed to be working toward holistic judgments about whether they were sufficiently comfortable to take particular diagnostic or management steps forward.

This balancing act was described by Participant 12:

> I had competing feelings in my mind. I was both happy, glad, and feeling comfortable that I was moving towards what I thought it was. But still there’s this gnawing feeling … [an] uneasiness that you don’t want to get burned. What are the high-risk scenarios? What are the things that can go wrong with a patient? It was a duplicitous sense about, or 2 competing senses or feelings that are held in contrast. It’s almost a ratio as to which one is winning at that particular time. (Participant 12)

### Discussion

The data from our study suggest the need to nuance some of our traditional understandings of the notions of “comfort with uncertainty.” We saw interesting complexities in our participants’ experiential representations of uncertainty that were more aligned with what they were uncertain about in the moment rather than the sources of these uncertainties in an epistemological sense. Moreover, our participants’ comfort in these moments was more nuanced than a dichotomous sense of being comfortable or not; instead, comfort was an ever-evolving spectrum, informed by participants’ predictions for how a problem was likely to play out and the emerging stimuli that they noticed during these patient care experiences.

In eliciting narratives from clinicians regarding experiences in practice, it became clear that feelings of uncertainty went beyond merely uncertainty regarding the root causes of a patient’s illness or in the potential evolution of their disease process. It also pertained to the optimal management of the problem, which was affected by a variety of factors such as the affordances of the environment and the imagined critiques of others. These findings are consistent with survey-based research by Gerrity and colleagues who also identified environmentally and sociologically embedded aspects of uncertainty, and complement their work by providing a descriptive richness to these phenomena in context. It is our hope that such richness can better support the development of “constructive responses” to uncertainty as promoted by White and Williams.

Our participants’ narratives also highlight that comfort was neither a binary nor static phenomenon. Instead, it was a dynamic cognitive, emotional, and physical experience that was informed by a multitude of external and metacognitive cues in ways that are reminiscent of Koriat’s cue utilization framework. These cues shifted participants’ sense of whether problems were sufficiently predictable and progressing in ways they expected would be aligned with their own capabilities, or alternatively were leading them toward trouble. Participants’ confidence in their management plans was often tempered or counterbalanced by deliberate efforts to both imagine potential risks and to monitor (in patients, themselves, and the environment) for responses that suggested they were headed for trouble. The integration of multiple cues seemed to provide participants with a holistic sense of whether they had sufficient comfort to proceed. And, the act of wrestling with and attempting to predict the progression of ill-defined problems provided the necessarily vigilance and attention to notice when problems were going off track. In this way, the maintenance of uncertainty served as a motivating and enabling trigger to assess and reassess one’s comfort in these moments.

Finally, our findings illustrated clear linkages between the different forms of uncertainty that evolved throughout the
course of a clinician’s engagement with a particular case. Participants in our study 
frequently paired their considerations of “what is going on?” and “what should I do?” when they discussed their fluid 
and rapidly cycling efforts to define and respond to the problems in front of them. These efforts to concurrently define and 
address a problem that lacked obvious solutions encapsulated participants experience of grappling with ill-defined 
problems,4,25 and highlighted the multidimensional, situationally bound, iterative nature of reasoning in practice. Such an approach to problem solving 
in ill-defined spaces is reminiscent of paradigms such as soft systems 
engineering.33–35 As Cristancho describes, a core premise of soft systems engineering is that the knowledge gained from trying to understand and solve a complex situation will change the parameters of the system itself.33 Thus, effective “problem solving” in the soft systems engineering tradition necessarily involves iterative cycles of problem solving and problem defining.34,36,37 Viewing reasoning processes through a soft systems lens, 
therefore, may offer promise for studying and teaching the fluid and idiosyncratic ways that complex, ill-defined problems are understood and addressed in practice.

Limitations

Our findings must be interpreted and extrapolated in light of our methodological decisions. We sampled among a cohort of urban emergency physicians as a means to understand the experiences of clinicians who regularly work with complex, dynamic, ill-defined problems. Yet this practice setting is importantly distinct from other settings, with patient care relationships that neither predate nor follow from these clinical encounters, access to tests and consultative resources that are unavailable in other contexts, and with training and practice cultures that are embedded in unique professional and institutional norms. These factors may limit the transferability of our findings to other settings where different forms of uncertainty exist or comfort is generated through other mechanisms. In studying participants’ experiences with uncertainty and comfort, we also acknowledge that what was consciously available to participants as they reflected upon cases likely offers only a glimpse of the conscious, subconscious, and environmental factors that influenced their experiences in these moments.38–40 Direct observation in situ coupled with 
provider reflections may offer promise as a means to get closer to these lived experiences.

Additionally, several questions remain unanswered on the basis of our current work. First, because we gathered post hoc reflections from our participants without direct observation or knowledge of downstream outcomes, it may be that how comfortable our clinicians determined themselves to be in these situations is different from how an outside observer might have judged how comfortable they should have been. A different paradigm would be necessary to assess the extent to which an individual is effectively using the variety of cues available to them to accurately determine the limits of their abilities in a given situation.41 Further, while this cohort of faculty clinicians seemed to judge their comfort level based upon their facilities to make predictions and monitor their progress, the applicability of these cues to others—particularly those with less experience—remains unclear.42 Finally, how clinicians experience and attend to experiences of insufficient comfort or frank discomfort was beyond the scope of this current investigation, as was explorations of how clinicians actively engaged with problems to increase their comfort more purposefully. These questions require future study.

Conclusions

Despite these limitations, our findings provide an important first step in understanding clinicians’ lived experiences with ill-defined problems in practice. By recognizing the ways in which different forms of uncertainty interact with clinicians’ judgments of comfort, we can begin to deconstruct the influences at play in these moments. Doing so will provide important insights for how experienced clinicians might attend to these moments more effectively, how novices might experience these moments differently, and how to more effectively train these skills in the future.

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