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The chicken and the egg: Clinical reasoning and uncertainty tolerance

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In this issue, Stephens et al. present their investigation into medical students' experiences of uncertainty.[1] Although clinical uncertainty is ubiquitous in medical practice, development of uncertainty tolerance is too often left implicit, to the detriment of care and caregivers given that intolerance is associated with overuse of resources, burnout and psychological distress. Interestingly, Stephens et al. found that students reported greater experience of educational uncertainty (lack of clarity regarding how and what to learn), and professional uncertainty (who they would be as doctors), than clinical uncertainty (aspects of patient care). That clinical uncertainty was least often reported suggests a need for educators to broaden consideration of uncertainty. Educators should also consider whether the lack of reportage of clinical uncertainty is actually a reflection of students' reduced awareness, rather than reduced experience, of this common phenonenon. As students advance further in their training and develop their clinical reasoning skills, clinical uncertainty will be, as it is for practicing doctors, frequently encountered, leading me to agree with Stephens et al.,[1] that greater attention should be paid to clinical uncertainty. In addition, an understanding of the relationship between tolerance of uncertainty and development of clinical reasoning is needed. In order to explore this further, I consider the age old dilemma of what came first, the chicken or the egg: that is, does tolerance of uncertainty derive from or cause improved clinical reasoning?

An understanding of the relationship between tolerance of uncertainty and development of clinical reasoning is needed.

To develop skill in clinical reasoning, learning in the workplace and its accompanying opportunity to engage with real patients in an authentic context is critically important. That educational uncertainty was so prominent in the clinical environment, according to Stephens et al.'s findings, is concerning when juxtaposed with our own research that suggests self-confidence to be a key factor for enabling one to engage with clinical reasoning tasks.[2] Perhaps clinical uncertainty was less prominent because educational uncertainty prevents learners from noticing, appreciating, or sufficiently engaging with the clinical uncertainty that is likely to surround them during workplace-based training. Students with experience in clinical environments are more acclimatised to those settings[3] and better prepared to learn. This poses the question if those students are also better able to tolerate clinical uncertainty? As educational uncertainty declines, students might become more aware, and tolerant, of clinical uncertainty as a result of reduction in cognitive load that was derived from not understanding how to learn in the clinical environment. If this is the case, both educational and clinical uncertainty intolerance may best be overcome by having motivated teachers with dedicated time to teach, scaffolding students' learning and early clinical exposures aimed specifically at building confidence.[3]

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We must also question whether an apparent lack of clinical uncertainty is created by our educational processes. Ilgen et al. have highlighted a variety of ways in which educational practices lead students to underappreciate how much uncertainty is present in clinical practice.[4] Standardised medical assessments, to offer one example, may provide fair and equivalent measurements, but often disregard clinical uncertainty and ambiguity[5,6] by implying that there is always a correct answer to be found. This is not reflective of reality and risks reinforcing tendencies towards 'performance orientation' rather than 'mastery orientation',[7] potentially reducing engagement in the inherently uncertain clinical environment. I would argue, as did Ilgen et al.,[4] that there is value in promoting tasks where the answer is uncertain while ensuring alignment with assessments in order to encourage student engagement. Adaptations of competency-based curricula with Entrustable Professional Activities (EPAs)[8] should help to align workplace-based assessments with the realities of learning in the workplace. The re-introduction of 'long-cases' or novel assessment methods in the curriculum could also be considered.[9] These assessment practices often call for global measurements of competency with ambiguous cases or those with no clear diagnosis,[4] requiring students both to have good clinical domain knowledge but also grapple with the limits of their own knowledge and of what could be known. How to reach the optimal balance between the presentation of complex cases and the mastery that is important to enable tolerance of uncertainty in undergraduate training and assessment requires further research.[6]

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Stephens et al. suggest clinical uncertainty should be introduced after adequate mastery of the clinical domain has been achieved to replicate the realities of clinical practice and promote development of uncertainty tolerance.[1] Mastery within a clinical domain includes adequate development of clinical reasoning. There are many ways in which teachers might assess when relevant thresholds have been crossed. Longitudinal integrated clerkships (LICs) may be particularly valuable for enabling such conversations given that their greater degree of continuity in both clinical supervision and patient exposure[10] may aid teacher–student interactions more than the traditional rotational clinical placements. LICs permit individualised teaching through better understanding of students' requirements and as a result, clinical teachers in these educational environments may be more able to introduce clinical uncertainty to specific students in order to build tolerance for it. LICs can also improve self-confidence in the clinical environment as a result of familiarity, reducing educational uncertainty and therefore presenting further opportunities to develop clinical reasoning and clinical uncertainty tolerance.

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By promoting activities in which uncertainty is shared between teachers and learners,[4,11] and assessments that are inclusive of cases that reflect real clinical practice, we can hope to aid students in becoming better learners and, ultimately, become better practitioners. In other words, by incorporating educational interventions that specifically target clinical uncertainty and assessments that acknowledge it, uncertainty is integrated naturally into the curriculum. This may further encourage engagement in the clinical environment, helping learners to better recognise and appreciate clinical uncertainty as a means for fostering their clinical reasoning development. As clinical reasoning ability develops, so too does our learners capacity to tolerate and learn from uncertainty. The question of the chicken and egg: Does tolerance of uncertainty derive from or cause improved clinical reasoning? To this, as the original paradox, there is no answer. Both uncertainty tolerance and clinical reasoning ability are inextricably linked.

As clinical reasoning ability develops, so too does our learners capacity to tolerate and learn from uncertainty.

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Precepting medical students in the clinical setting: Its time, not money

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What motivates a clinically busy physician to teach? In the United States, the first 2 years of medical school are predominantly taught by basic science professors, some hired solely to teach medical students. Despite curricular pressures and changes in healthcare delivery toward outpatient settings, clinical training of third- and fourth-year medical students has remained largely hospital-based.[1] Physicians within university-based medical centres are comfortable teaching medical students in this context, and teaching medical students is an integral part of their academic professional identity.[2] However, utilising community-based physician preceptors, who may not share the same intrinsic motivation to teach, to meet the ambulatory educational needs of medical students in their clinical years is now a firmly established trend.[1,3]

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