



# Clinical judgement: Multidisciplinary perspectives

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## 1 | INTRODUCTION

In 1979, Tristram Engelhardt et al published an edited volume entitled *Clinical Judgement: A Critical Appraisal*, which presented the proceedings of the “Fifth Trans-Disciplinary Symposium on Philosophy of Medicine” held in Los Angeles, California in 1977.<sup>1</sup> Contributors to the volume included prominent philosophers and scholars with diverse expertise, from Michael Scriven and Arthur Elstein’s contributions on clinical intuition, to Patrick Suppes’ paper on Bayesian reasoning, to Edmund Pellegrino’s chapter on the moral ends of clinical judgement. In the volume’s introduction, Engelhardt details contemporary issues in clinical judgement circa 1979. A major theme is the movement towards developing systematic, mathematical models of clinical judgement, motivated by a growing suspicion that “that the judgements of clinicians would be more reliable if rendered more rational by following explicit rules and recipes for diagnosis and treatment.” This interest in developing formal models included attempts to reconstruct processes of clinical reasoning in order to “have them matched by undertakings of artificial intelligence.” Alongside these developments, the volume includes discussions on the psychology of clinical judgement and role of intuition, as well as arguments for moral/ethical approaches to clinical judgement. As Engelhardt remarks: “The interest in clinical judgement is thus diverse if not contradictory: there is interest among clinicians and others in reducing the bias of medical decisions to formal rules as well as interest in denying that such rules would match the success achieved by intuitive decisions of clinicians.”

Forty years on, Engelhardt’s statement continues to resonate in the field of clinical judgement, and many of the same issues highlighted in this earlier volume have only increased in relevance. The 1990s gave rise to the Evidence-Based Medicine (EBM) movement, which promised to “revolutionize” clinical decision-making through more formalized systems of reasoning based in the evidence from the clinical research literature.<sup>2</sup> Since its inception, the EBM movement has engendered significant debate, which has featured

prominently in previous issues of this journal, including numerous philosophical critiques and analyses that have contributed to more sophisticated and nuanced understandings of EBM.<sup>3-7</sup> Statistical decision support tools have now become ubiquitous in clinical practice and have established new standards of practice for use in diagnosis, prognosis, and treatment decisions. From simple algorithms to determine the need for head imaging in trauma,<sup>8</sup> to scoring systems to determine diagnostic testing for pulmonary embolism,<sup>9</sup> to prognostic models for acute coronary syndromes,<sup>10,11</sup> statistical tools are now widely used by clinicians across various disciplines. The application of machine learning and artificial intelligence to clinical judgement looms on the horizon, with predictive analytics and big data promising newer, more accurate mathematical models.<sup>12</sup>

Despite this trend towards mathematical models and the ongoing quest for formalization, the humanistic and cognitive dimensions of clinical judgement remain of interest and have undergone significant developments. For example, work on cognitive biases and heuristics, in particular “dual process theory,” has been influential for researchers thinking about clinical reasoning and its potential pitfalls.<sup>13,14</sup> Some authors have attempted to integrate insight from dual process theory into clinical reasoning models,<sup>15</sup> while others have offered expanded accounts of tacit knowing and clinical intuition,<sup>16</sup> and examined the narrative and hermeneutic elements of clinical judgement.<sup>17</sup> Alongside these developments, education researchers have focused on the psychology of clinical problem-solving and expertise.<sup>18-20</sup>

Despite this growth in literature on clinical judgement, and the elaboration of many themes found in the early volume by Engelhardt et al, the field has also undergone a divergence along disciplinary lines, each discipline developing with its own problems, research methods, conferences, and journals—from philosophy of medicine, to medical education research, to medical decision-making, to clinical epidemiology, to bioethics. Each discipline is keen to pick away at its own area of focus: philosophy of medicine has focused on examining EBM, while medical decision-making and clinical epidemiology on

generating formal tools and frameworks. Clinical judgement as an area of study remains fragmented. Given this state of affairs, it seemed unlikely that these distinct voices would again gather at a single "Trans-Disciplinary" conference as they did in 1977.

This challenge, combined with our desire to bring together scholars working in disparate fields to reinvigorate debates around clinical judgement, motivated us to host a 1-day symposium on clinical judgement, entitled "Clinical Judgment: Multidisciplinary Perspectives." The conference was held in Toronto on June 22, 2017, ahead of the 2017 International Philosophy of Medicine Roundtable. The conference was attended by scholars and trainees from a wide range of disciplines, including philosophy of medicine, medical education, medical humanities, clinical epidemiology, and clinical medicine. Topics discussed ranged from Bayesian approaches to clinical judgement, to medical decision-making, to the role of clinical experience and implications for medical education. Videos from the symposium documenting the complete range of topics can be found at ([www.torontophilmed.com](http://www.torontophilmed.com)).

Key themes that emerged through lively discussions are highlighted in Figure 1, which demonstrates the breadth of issues covered at the symposium. As seen in Figure 1, various domains of clinical judgement were covered: *diagnosing*, *prognosticating*, *therapeutic reasoning*, *decision-making* (and *shared decision-making*), and *communication*. Some of the discussion was *descriptive*, describing and understanding clinical judgement in practice, while other parts were *prescriptive* or normative, offering criticisms and new approaches to clinical judgement. Various elements of clinical judgement were explored, including *intuition*, *evidence*, *uncertainty*, *rationality*, *heuristics*, *exemplars* and *the patient*. Several approaches were taken, from *statistical* to *interpretive* and *narrative*. Finally, many "theories" or ideas were developed and deconstructed, including: *practical knowledge* (or *phronesis*) and *explanatory coherence* from philosophy; *Bayesianism* from statistics and epidemiology; and *dual process theory*, *adaptive expertise* and *cognitive integration* from psychology and medical education research.

We are excited to publish a selection of papers from the symposium in this special section of the journal, "Clinical Judgment: Multidisciplinary Perspectives." The section begins with an article by Benjamin Chin-Yee and Ross Upshur,<sup>21</sup> which surveys approaches to

clinical judgement in the literature, focusing on the implications of big data and machine learning for clinical judgement. They discuss how clinical judgement remains fraught with irreducible uncertainties not easily overcome by more data and artificial intelligence and argue that clinical judgement remains a pluralistic practice that necessarily integrates quantitative models within a narrative, virtue-based framework. Mark Tonelli<sup>22</sup> agrees with the call for methodological pluralism and argues that realizing the vision of precision medicine will require an integration of mechanistic research, research from the social sciences, and traditional EBM knowledge in a framework of case-based reasoning.

Computational models of clinical judgement are further explored by Paul Thagard and Laurette Larocque in their article on mental health assessment.<sup>23</sup> Using a computer-simulated cognitive model based in a theory of explanatory coherence, a form of inference to the best explanation, they attempt to reproduce the reasoning processes performed by mental health professionals in identifying medical causation and arriving at a diagnosis. This is followed by a paper by Benjamin Djulbegovic et al which discusses rational decision-making in medicine and analyzes the implications of different theories of rationality for overuse and underuse of health care resources, a pressing issue in contemporary medicine.<sup>24</sup>

The discussion then turns to the field of health professions education with 2 articles, each offering a unique perspective. Sandra Monteiro et al explore 3 clinical epistemologies and their different conceptions of the types of knowledge that underwrite clinical reasoning, contrasting approaches from clinical epidemiology, cognitive psychology, and experience-based reasoning from exemplars.<sup>25</sup> The article by Maria Mylopoulos et al<sup>26</sup> discusses the concept of adaptive expertise, which moves clinical reasoning beyond the simple application of a pre-existing knowledge base to include the creation of new knowledge in response to novelty and complexity.

We hope that the reader finds these articles engaging and that these multidisciplinary perspectives encourage further exploration of connections among the topics discussed, to move the field towards richer descriptive and normative models of clinical judgement. We would like to thank all of the conference delegates and attendees for a stimulating discussion and successful symposium, as well as the editors, reviewers, and contributors to this special issue. We would especially like to thank Ross Upshur and Manuel Gitterman for their instrumental roles in organizing the symposium. We are grateful for support from the Robert & Francine Ruggles Health System Research Award, the University of Toronto's Faculty of Medicine, the Dalla Lana School of Public Health, Bridgepoint Active Healthcare, the Lunenfeld-Tanenbaum Research Institute, and the University of Toronto Medical Alumni Association.

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**FIGURE 1** Word cloud containing key themes that emerged during talks and panel discussions at the symposium "Clinical Judgment: Multidisciplinary Perspectives"

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