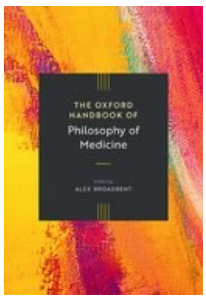

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CHAPTER

20 Medical Expertise

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Abstract

Whereas medical expertise was tacitly defined in early writings on medical ethics from various theoretical and medical traditions, advances in medical sciences and the professionalization of health care practice have increased the demand on medical experts to be knowledgeable, skilled, and ethical. Their social authority has grown alongside these demands. Drawing from expertise studies and the study of medical expertise in medical education and professionalization scholarship, four components of medical expertise are defined in this chapter: cognitive expertise, performance-based expertise, moral expertise, and social authority. Challenges from evidence-based medicine regarding the shortcomings of expert authority are also discussed. Finally, a sketch of a theory of medical expertise that utilizes Dewey's conception of intelligence is proposed. Currently, the social authority of experts waivers, yet the inescapable need for specialist knowledge and advice to promote well-being and survival ensures that medical expertise remains a crucial component of optimal patient care.

Keywords: expert performance, clinical knowledge expertise, clinical skills expertise, moral expertise, cognitivism, technical expertise, evidence-based medicine, clinical judgment, phronesis, Dewey

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1 Introduction

When medical school graduates take the Hippocratic Oath, they extend the discourse on medical expertise from antiquity to the present. The Hippocratic Oath appeared in the fourth century BCE and has remained "an expression of ideal conduct for the physician" (American Medical Association 1996). Although the Oath has been modernized to permit medical interventions that were previously forbidden (e.g., surgery and physician-assisted suicide), the ethos of the physicians' moral obligation to provide optimal care to patients remains unchanged.

This Oath, as well as centuries of Western and non-Western scholarship in medical ethics and philosophy of medicine, has served to blunt the power and prestige that is bestowed on physicians qua medical experts. Hubris can compromise professionals' duty to care. A pioneer in Chinese medicine, Sun Simiao (581–682 AD) argued in "On the Absolute Sincerity of Great Physicians" that the virtuous physician puts the medical needs of the patient over any other competing interests:

> A Great Physician should not pay attention to status, wealth or age; neither should he question whether the particular person is attractive or unattractive, whether he is an enemy or friend, whether he is a Chinese or a foreigner, or finally, whether he is uneducated or educated. He should meet everyone on equal grounds. He should always act as if he were thinking of his close relatives. (Unschuld 1979)

The Vaidya's Oath in ayurvedic medicine, and the writings of Sushruta and Charaka, similarly counseled prioritizing the care of patients above all other interests (Persaud 1984). Contemporary understanding of what it means to provide optimal care to patients tends to emphasize technique and technology, namely applying
p. 428 advancements in pharmacology and medical interventions on human bodies. Professional training ↳ and accreditation programs rely on defined and measurable cognitive and performance-based standards of medical expertise that health care professionals must continually meet. These ancient texts and sources show, however, that the scope of medical expertise was historically understood to be much broader. Although ancient medical ethics did not frame such ethical analyses as discourses on medical expertise, instead emphasizing the virtues of "the good doctor," the good (or great) doctor required a slate of cognitive and performance-based expertise, as well as moral expertise.

"Expertise," in its everyday use of the term, is taken to mean having a superior level of competency in a defined domain. With that competency, experts are often bestowed with social authority in those domains: to teach the relevant knowledge or skills to others, and to pronounce on or advise nonexperts on matters relevant to the domain of expertise. Although experts have long elicited some degree of skepticism (see, e.g., Plato's *Statesman*), their importance and necessity remain secure. Today, it is common practice to seek out a tax professional when our finances get complicated or to hire a lawyer rather than represent ourselves in court because those experts are recognized to stand in a better epistemic position with respect to specialized information or ability (Watson 2020). Yet, expertise can go awry when opportunists mislead and misguide people for personal gain or malicious intents, or because the presumed expert was never deserving of that authority and the trust of nonexperts. Expertise studies (Section 2), the interdisciplinary study of expertise, has flourished in the twenty-first century by virtue of an increasingly complex communications landscape in which social media, "fake news," celebrity influencers, and echo chambers invite intense examination of the apparent downfall of expertise.

Yet *medical* expertise has limited contact with this interdisciplinary research field. In the expertise studies literature, physicians are often referenced as secure examples of "traditional experts" (e.g., Watson 2020, 15) in order to parse the necessary and sufficient conditions of expertise and to explain why other experts do not receive comparable social recognition to doctors (along with "scientists, engineers, and tax accountants" [15;

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see also Agnew et al. 1997, 237]).[1] Where medical expertise *does* receive considerable scholarly attention is in medical education and professionalism research, most notably the early and programmatic writings on evidence-based medicine (EBM), which maligned "expertise" as authoritarian and nonsystematic (Section 3(c)), as well as expert performance research (e.g., Ericsson 2004, 2011) (Section 3(a)). Some medical professional groups have defined medical expertise for education and accreditation purposes. For example, the Royal College of Physicians and Surgeons of Canada's CanMEDS Framework (2022) is discussed in Section 3(b). Yet, this medical education and professionalization literature does not engage with expertise studies, thereby missing the opportunity to bring the former's empirical, experiential, and normative insight into medical expertise to bear on broader themes and questions pertinent to the study of expertise. This chapter brings the two areas of study into contact and offers a theory of medical expertise that draws upon John Dewey's concept of intelligence to capture the features of medical expertise recognized as salient by medical education and professionalization studies as well as expertise studies (Section 4).

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2 Expertise Studies

Expertise studies—the study of experts, expert performance, and expertise in sociology, philosophy, psychology, and neurology—offers three dominant approaches to expertise that define what is an expert and explain how someone becomes an expert. The first is a "cognitivist" or "truth-based" account that ties expertise to cognition insofar as expertise involves extensive knowledge or skill-based competence in a domain. Both Alvin Goldman (2001, 2018) and Elizabeth Fricker (2006), for example, regard experts as having more true beliefs and fewer false beliefs than nonexperts in their domain of specialization.

The second account grounds expertise in performance, whereby experts earn their distinction due to high-caliber performance. Experts are distinguished from nonexperts because they perform their skill (surgery, trumpet playing, pole vaulting, etc.) considerably better than nonexperts. The "performance-based" account focuses on high performance expertise, as seen in phenomenological research by Stuart Dreyfus and Hubert Dreyfus (1985) and psychological research by K. Anders Ericsson (2008) and colleagues. Both research teams study how extensive practice translates into high performance, although they offer different explanations of *how* expert-level performance is achieved through practice. The Dreyfuses argue that repetition through practice allows the task to *integrate with the performer's body* and create a "flow" state of activity. Ericsson (2008), in contrast, argues for disassemblage rather than tacit integration in his conception of "deliberative practice" (see also Montero 2016). Elite athletes, for example, often break down their performance into components and apply conscious attention to studying and training for each part. This reductive approach allows the trainee to record millions of mental representations of the performed act that combine to form patterns which allow the expert to quickly notice deviations from the desired performance or changes in environment and to respond to them (Ericsson 1998). This account identifies active attunement rather than mindless "flow" by high performers.

The third approach, the "social approach," situates expertise in society. Social accounts of expertise focus on how society makes experts by creating the conditions for establishing and maintaining their authority (see Turner 2014). Although these accounts are criticized for inviting a certain relativism about what constitutes expertise (i.e., expertise is what society thinks it is), it is difficult to ignore the significance of social recognition of expertise. Experts cannot share their knowledge and skill if their authority is not recognized by others. They may become "Cassandras," as many climate scientists and global health experts claim to be, whereby nobody listens to their (correct) warnings (Hoyle 2019; Bruni 2020). Furthermore, the relativistic implications of social determinations of expertise have been disputed. Collins and Evans (2007), for example, argue that criteria for expertise and high-caliber performance in a domain can be objective even if the domain and/or problem at hand are defined by the interests and criteria of the social group (e.g., interested researchers and the publics).

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They make the ↳ case for intersubjective realism, where the domain is indeed socially constructed, but this does not stop expert performance from being defined by nonrelational criteria.

No one of the three approaches denies the other approaches' features as salient; that is, all sides agree that expertise involves cognitive, performative, and social dimensions, but each insists on their approach pinpointing the necessary condition(s) for expertise. A fourth approach has been introduced by Watson (2020), the "cognitive systems approach," which tries to draw the strengths from the three former approaches and avoid most of the challenges faced by each. This last approach incorporates different kinds of thinking required for different learning environments ("kind" vs. "wicked"[2]) by way of a "dual processing theory of reasoning," a cognitive framework introduced by psychologist Daniel Kahneman (2011). It also explains how hands-on training programs such as medical residency not only serve to impart knowledge and improve skills but also socialize and acclimate new practitioners to the social environment of professional practice.

This review of the three dominant accounts of expertise (cognitive, performance-based, and social) and a new fourth one helps explain why physicians are so frequently described as "traditional experts." They easily meet aspects of cognitivist, performance-based, and social expertise. The cognitive aspects of their highly specialized knowledge make experts' understanding of the body, pharmacology, disease etiology, and more superior to that of nonexperts. The performative aspects of medical expertise encompass clinical skills, from taking patient histories to performing surgical techniques. This skill set, similar to the knowledge base of physicians, is not available to nonphysicians who have not participated in training (medical school and clinical rotations) and professional socialization. Finally, the social aspect of physicians' expertise is very apparent in this heavy regulated field. Laws keep nonexperts from practicing medicine. As a whole, medical training, professional accreditation, and social authority easily distinguish health professionals from nonexperts. Physicians serve as easy examples of experts because they meet cognitive, performance-based, and social criteria for expertise.

3 Medical Education and Professionalization

(a) Performance Measures of Medical Expertise

This section and Sections 3(b) and 3(c) delve into the ways medical expertise is defined and understood *within* medicine. The understandings are not consistent. This section analyzes an entry on medical and surgical expertise written by medical educators Geoffrey R. Norman and colleagues and published in the 2018
p. 431 *Cambridge Handbook of Expertise and Expert Performance*. Section 3(b) examines the characterization of ↳ medical expertise by a professional medical body, the Royal College of Physicians and Surgeons of Canada, in the "CanMEDS framework." Section 3(c) examines the EBM movement's suspicion of medical experts, as well as criticisms of this view that expertise is both problematic to and eliminable from best practice. These three accounts of medical expertise reveal markedly different understandings and evaluations of the concept coming from within the medical profession.

The first, an entry in *The Cambridge Handbook of Expertise and Expert Performance* titled "Expertise in Medicine and Surgery" (Norman et al. 2018), is devoted entirely to the use of performance measures for assessment in medical training. The authors do not claim to take performance studies, specifically measures of motor skill development in clinical procedures, to capture the entirety of medical expertise, yet their decision to offer such as narrow literature review and discussion in a chapter titled "Expertise in Medicine" seems to suggest what the authors view as salient to expertise.

Norman et al. (2018, 330) open the chapter on medical expertise with the following remark:

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> The study of expertise in medicine has a long history, dating to early studies [of radiologists' performance interpreting chest radiographs] in the 1970s (Kundel & Nodine, 1975) and studies using general medicine cases and standardized patients (actors) [to assess clinical reasoning and competence] (Barrows, Norman, Neufeld, & Feightner, 1981; Elstein, Shulman, & Sprafka, 1978).

In defining the "long history" of medical expertise, Norman et al. (2018) point to a very narrow range of *technical* expertise in clinical practice yet misidentify it as "the study of expertise in medicine" as a whole. To be sure, medical expertise has been studied since antiquity (see Section 1). The remaining chapter is divided into two measures of medical expertise, clinical diagnosis accuracy and surgical technique, with specific attention to measurement studies of improved motor skill development for both. But medical and surgical expertise surely entails much more. The teaching of technical competencies is certainly an important part of medical education, as technical proficiency is said to reduce preventable medical error (Institute of Medicine 2000; Frank and Danoff 2007). But medical error arises not merely due to diagnostic error or poor surgical technique (the chosen forms of technical expertise discussed by Norman et al. 2018) but also from "system" errors such as failure in communication and ineffective and inefficient operation processes (Institute of Medicine 2000). The authors seem to understand this important point when they write,

> The execution of clinical procedures using motor skills involves more than simply movement proficiency. Certainly, success in a comprehensive surgical operation requires a deep knowledge of functional anatomy, managing the flow of the operation, intra-operative decision making, and inter-professional communication skills involving a diverse team. (Norman et al. 2018, 340)

p. 432 Although this comment seems to invite a robust definition of surgical expertise, the authors still confine the examination and discussion of "expertise in surgery" to the "development of psychomotor skill" (340). They do, however, shift their language for the remainder of the entry (without remark) from "expertise" to "*technical* expertise" to denote what improved precision is a measure of (340, 342; italics added).

Had Norman et al. (2018) engaged fulsomely with the interdisciplinary body of expertise studies (see Section 2), they could have identified their narrow focus as one approach to expertise studies, the psychological study of expert performance, and noticed their missive on competing approaches to defining and studying expertise. The practical importance of a more comprehensive account of medical expertise (i.e., an account that fits with historical, sociological, and philosophical thinking about expertise discussed in Section 2) is that such an account better captures the range of knowledge and skills possessed by excellent clinicians, translates into more robust standards of competency and excellence, and better equips us to judge clinical excellence. For example, the inclusion of cultural competence and communication skills as standards of medical expertise is warranted because those knowledge, skill, and value sets influence health care delivery and patient outcomes in all areas of medicine, including diagnostics and surgery.

Not all areas of medical education and professionalization conceptualize medical expertise narrowly to entail performance measures only. The early programmatic EBM literature, for example, boldly derided expertise (see Section 3(c)), but it was not performance measures that they objected to. They defined (and degraded) expertise differently. The CanMEDS framework offers an additional contrast by associating expertise with comprehensive and responsive patient care (see Section 3(b)).

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(b) The CanMEDS Framework and Medical Expertise

Professional medical associations represent the interests of physicians and work to maintain high standards of medical education and practice through accreditation of medical programs (e.g., Australian Medical Council 2024) and continuing medical education and professional development for practicing physicians (e.g., Royal College of Physicians and Surgeons of Canada 2025a). Professionalization is heavily focused on maintaining competencies by setting and enforcing standards of practice. It additionally brings accountability to the public by designating who is beholden to those standards and by publicizing those professional obligations when, for example, new graduates take public oaths.

These evaluations of both professionals and professional training programs operate with tacit conceptions of medical expertise, if only as an aspirational goal to guide training and assessment. Some medical professional societies refer to medical expertise more explicitly—for example, in the Royal College of Physicians and Surgeons of Canada's *CanMEDS 2015 Physician Competency Framework* (Frank et al. 2015). The CanMEDS framework strives to "improve patient care" by "identify[ing] and ↳ describ[ing] the abilities physicians
p. 433 require to effectively meet the needs of the people they serve" (Royal College of Physicians and Surgeons of Canada 2025b). Those abilities (referred to as "CanMEDS Roles") include communication, collaboration, leadership, and health advocacy (Frank et al. 2015, 10–12). The CanMEDS Web page explains that "a competent physician seamlessly integrates the competencies of all … CanMEDS Roles." Central to this seamless mixing is the integrative role of the *medical expert* (Royal College of Physicians and Surgeons of Canada 2025b):

> As Medical Experts, physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centered care. Medical Expert is the central physician role in the CanMEDS Framework and defines the physician's clinical scope of practice. (Frank et al. 2015, 16; Royal College of Physicians and Surgeons of Canada 2025c)

Medical experts "draw upon an evolving body of knowledge, their clinical skills, and their professional values" in order to administer excellent health care:

> They collect and interpret information, make clinical decisions, and carry out diagnostic and therapeutic interventions. They do so within their scope of practice and with an understanding of the limits of their expertise. Their decision-making is informed by best practices and research evidence, and takes into account the patient's circumstances and preferences as well as the availability of resources. Their clinical practice is up-to-date, ethical, and resource efficient, and is conducted in collaboration with patients and their families, other health care professionals, and the community. (Frank et al. 2015, 16)

Rather than characterize medical experts by their performance levels, as we saw in the previous section, the Medical Expert Role is here understood to be "central to the function of physicians," drawing on the competencies included in the physicians' roles as communicator, collaborator, leader, health advocate, scholar, and professional (Frank et al. 2015, 16). In short, medical expertise is the glue that holds the various roles and abilities of the optimal physician together.

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(c) Evidence-Based Medicine and Medical Expertise

In medicine, the influential EBM movement framed expertise as exactly what was wrong with medicine. The early programmatic writings on EBM strongly criticized the convention employed by clinicians where "answers are frequently sought from direct contact with local experts or reference to writings of international experts" (Guyatt et al. 1992, 2421). EBM aimed to educate clinical decision-makers to consult the research evidence rather than the authoritative experts. The architects of EBM, calling themselves the Evidence-Based Medicine Working Group, wrote, "Evidence-Based Medicine de-emphasizes intuition, unsystematic clinical
p. 434 experience, and pathophysiological ↳ rationale as sufficient grounds for clinical decision making and stresses the examination of evidence from clinical research" (Guyatt et al. 1992, 2420).

The clinician who kept up on the medical literature, then, was privileged over experience-based expertise that came from clinical experience and received wisdom (what more senior colleagues held to be the case, or what clinicians had been taught in medical school). Wieten explains that

> the goal of (original) EBM was to put true knowledge in the place of unchallenged received wisdom based on power. Indeed, when asked for their motivation for creating EBM, many of the movement's early proponents pointed to incidents in their medical education in which they felt that their teachers were exercising expertise in this fashion. (2018, 5)

This motivating complaint casts clinical expertise in its most unfavorable light—that is, as an arbitrary honorific that invited abuse of power rather than as skilled familiarity or a valuable epistemic position gained by education and experience. EBM offers a hierarchy of evidence that places expertise ("expert opinion" or "clinical expertise") at the very bottom of the ranking (Sackett et al. 2000). This points to a conceptual error in thinking about expertise. EBM pointedly derided "clinical expertise" and "expert opinion" in cases in which empirical evidence outstripped expert reliability, yet it did not deny the importance of training and development of knowledge-based and skills-based expertise. EBM, then, conflated expertise with conventional thinking and practice secured by power, thereby denying the possibility of medical expertise grounded in knowledge, skill, experience, and social immersion.

This narrow reading of expertise as unwarranted, and even abusive, did not escape scrutiny (e.g., Goldenberg 2009). The iconoclastic spirit of EBM was appealing and was arguably warranted for disavowing some forms of professional hubris, but the epistemology of EBM did not and could not capture how physicians think and act (Tanenbaum 1994). The placement of expert opinion on the lowest rung of medical evidence, superseded even by methodologically flawed clinical research, was mistaken. Tonelli (1999), for example, argues that expert opinion derived from direct clinical experience "represents an alternative form of medical knowledge, one that may be complementary to empirical evidence" (1188). Clinical expertise, specifically, is needed to "overcome the intrinsic gap between clinical research and the care of individual patients" (Tonelli 1999, 1187). Tonelli's position is that clinical experience and clinical expertise are the needed bridge for *applying* generalized research information to individual patient care and for administering *ethical* care by incorporating consideration of the patients' values and wishes. Many EBM critics utilize the term "clinical judgment" to capture this context-specific application, and they liken this judgment to Aristotelian *phronesis* (practical wisdom) (e.g., MacNaughton 1998; Thornton 2010). In Thornton's (2006) characterization of the knowledge bases of clinical expertise, there is "an area of knowledge that can be made fully explicit or codified and which
p. 435 forms a central element of Evidence Based Medicine" as well as "uncodified good judgment." ↳ This distinction mirrors Aristotle's notion of *episteme* and *phronesis*. Thornton finds evidence of these two forms of knowledge being crucially employed in medical practice in the ethnographic research into medical expertise in anesthesiology by Smith et al. (2003). Clinical expertise in anesthesiology was characterized as involving (1) epistemic factors, (2) skills, (3) sensitivity to specific contexts or situations, and (4) sensitivity to specific patients (Smith et al. 2003), with *episteme* being more present in (1) and (2) and *phronesis* or *clinical judgment* capturing the contextual sensitivity needed for (3) and (4). Similar claims are made by MacNaughton (1998) and

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Tonelli (2006), both of whom are practicing physicians. Emphasizing the context particularity of the clinical encounter, MacNaughton (1998) writes that for health care providers,

> clinical judgment … is relevant to assessing relevance, weight and drawing conclusions, but judgment comes into its own when we deal with the range of complex factors in the clinical situation. This is a different sort of judgment, and requires different abilities. The judgments of the scientist … are technical; that of the clinician is based on what Aristotle calls phronesis or "practical wisdom." … These judgments have more to do with what is or is not appropriate for this patient, with this condition, and at this time. (91–92)

Clinical judgment, then, allows for specification of generalized knowledge to the particular. Treatment assessments, for example, must include consideration of the patient's likelihood of treatment compliance, their understanding of their condition, their trust in the doctor's recommendations, and the appropriateness of the treatment for the social situation of the patient (MacNaughton 1998).

Tonelli similarly characterizes clinical judgment as follows: "Clinical judgment, then, can be understood as bringing to bear all relevant kinds of medical knowledge, along with patient goals, values, and preferences, in order to reach the best possible decision for the patient-at-hand" (Tonelli 2006, 73).

Even when the quality and quantity of empirical medical evidence are optimal (which is rarely the case), expert opinion will remain necessary for integrating all considerations into the best clinical practice (Tonelli 1998). Clinical expertise, furthermore, is not secondary to knowledge but, rather, is a form of knowledge.

Tonelli's criticisms capture a characterization of clinical judgment that predates EBM. In 1979, Pellegrino's "Anatomy of Clinical Judgment" characterized the clinical encounter as a moral encounter, and clinical judgment recalled an Aristotelian notion of doing the right thing for the particular patient. Clinical judgment integrates the art and science of medicine, according to Pellegrino, by using scientific reasoning based on observation and testable hypotheses to arrive at defensible conclusions as well as artfully bringing in clinical experience to each uniquely situated patient. Feinstein's *Clinical Judgment* (1967) had similarly wedded the measurable (clinimetrics) with normative and socially situated particularies of the case at hand (environmental and host factors).[3] Engelhardt characterized clinical judgment as complex and value-laden: "Clinical judgments
p. 436 in their rich and full sense are freighted with values, including ethical and ↳ moral values. Evaluation and explanation properly and inextricably are bound together in medicine in general and in clinical judgment in particular" (1979, xxiv).

Expert clinical judgment, then, could not be reduced to clinical research findings, to pathophysiology, to mechanistic reasoning, and so forth. Medical practice eschewed this kind of linear reasoning. "Ideas, concepts, and notional presuppositions and structures, including value judgments, fashion the actual practice of medicine," according to Engelhardt (1979, xxiii). EBM's epistemological fault lies in the movement's failure to recognize this complexity.

The above-mentioned philosophers of medicine similarly point toward medical expertise as playing the sort of "integrative role" that the CanMEDS framework described for application of medical evidence to particular cases and for incorporating patient values. Aristotelian *phronesis* is, once again, invoked to capture the pragmatic and context-specific nature of clinical judgments and clinical expertise (see Kaldjian 2010; Kotzee et al. 2016; MacNaughton 1998). The vigorous insistence by critics that clinical judgment and expertise played ineliminable roles in clinical decision-making led to changes in EBM doctrine.

In response to criticism, members of the Evidence Based Medicine Working Group revised their early antipathy toward expertise by admitting that

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> external clinical evidence can inform, but can never replace, individual clinical expertise, and it is this expertise that decides whether the external evidence applies to the individual patient at all and, if so, how it should be integrated into a clinical decision. (Sackett et al. 1996, 72)

The exact nature of this expertise is not well articulated; however, the epistemic status of expertise in EBM appears to be elevated. Guyatt and Rennie (2002, 6) admit that "evidence is never enough" in clinical decision-making because of the unavoidable gap between research data and individual patients and because patients' values must be taken into account. This admission invites consideration of clinical knowledge expertise, clinical skills expertise, and moral expertise (see Section 4) as necessary components of clinical excellence or "medical expertise." These revised accounts adopted the same language of "integration" found in the CanMEDS framework's definition of medical experts. EBM was redefined as not merely applying the best evidence to the patient's care (Guyatt et al., 1992) but, instead, "*integrating individual clinical expertise* and the best external evidence" (Sackett et al. 1996, 71–72; italics added) and revised again to read "evidence based practice is the integration of the best research evidence with clinical expertise and patient's values" (Sackett et al. 2000, 2). Clinical expertise is explicitly restored into evidence-based thought by Haynes et al.'s (2002) "Clinical Expertise in the Era of Evidence-Based Medicine and Patient Choice," in which the authors argue,

> Clinicians must be atop not only the research evidence, but they must also acquire and hone the skills needed to both interpret the evidence and apply it appropriately to the circumstances—doing the right things. Finally, although communication with ↳ patients has always been important, determining the role in decision making that patient's desire, ascertaining their preferences, and providing patients with the information they need to make an informed choice has never been more challenging. (38)

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Wieten (2018) reads Haynes et al. (2002) to be (re)introducing clinical expertise as the component that brings together the research evidence, the clinical circumstances, and the patients' preferences. In all these revised accounts of EBM, best practice (even *expert* practice) integrates the multiple warrants that inform clinical decision-making. How the medical expert does this was not made clear, however. The EBM originators soon admitted that despite evidence-based health care having "come a long way" from its early bluster about overthrowing traditional medicine in favor of medical practice based on the best evidence, the "incorporation of evidence and patient values into all clinical decision-making remains a distant goal" (Guyatt et al. 2004, 990–991).

The CanMEDS framework, EBM criticisms, and subsequent revised EBM converge on the position that clinical decision-making requires consideration of multiple, even conflicting, warrants for action. The EBM critics have forcefully argued that each of these kinds of medical knowledge has its own strengths and weaknesses, and the negotiation of disparate warrants cannot be plugged into a preset decision-making algorithm. It requires a sort of practical intelligence (see Section 5) and an acquired competency to deal with uncertainty and complexity that comes from clinical experience.

To be sure, clinical judgment holds paradoxical aspirations, and its restitution in EBM is unlikely to steer health care practice toward overreliance on intuition and nonsystematic knowledge sources. Engelhardt's comment on the "contradictory" aspirations of clinical judgment still resonates today:

> 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. (1979, xi)

Today, the "formal rules" forge ahead alongside the opposing insistence that intuition, clinical expertise, and other humanistic dimensions of clinical judgment cannot be reduced. For example, statistical decision support

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tools for diagnosis, prognosis, and treatment decisions are now ubiquitous in clinical practice (Chin-Yee and Fuller 2018), even as the case for tacit knowledge and clinical expertise remains intact (Henry 2006, 2010; Serrano-Zamago and Altamirano-Bustamante 2021).

4 Moral Expertise in Medicine

The view that clinical decision-making must involve the patient, specifically that the patient's values and
p. 438 interests must be integrated into the process, extends the demands ↳ of medical expertise beyond advanced knowledge and skill to include *moral* expertise.[4] Although even clinical ethicists bristle at the designation of "moral experts" (Watson and Guidry-Grimes 2018) insofar as they (rightly) do not view themselves as the final arbiters of right action in moral conflicts, moral expertise still has a place in clinical settings.

Histories of contemporary biomedical ethics begin in the 1960s and 1970s and frame the emergence of the scholarly discipline and profession as a challenge to medical paternalism (Jonsen 1998, 2004). Medical paternalism placed epistemic authority in the hands of physicians, and moral authority as well. Doctors were presumed to know what was right for the patient. Their moral authority was so secure that informing the patient was not even standardly prescribed (Beauchamp 2011; Kumar 2013). Medical paternalism and hard normative ethical expertise went hand in hand. The good doctor was assumed to know what was right for the patient, both epistemically and morally. By challenging the moral acceptability of medical paternalism, Kovács (2010, 769) argues, modern bioethics "has in fact challenged the doctrine of ethics expertise in medicine." As he sees it, "the whole bioethics movement can be seen as a radical denial of the doctrine of physician's hard expertise in moral matters" (767). By challenging medical paternalism, "modern bioethicists have been medical doctors' gadflies reminding them of the limits of their moral expertise" (767).

But this does not signal the end of moral expertise. As Kovács (2010) explains, the hard ethical prescriptivism of medical paternalism, where "doctor knows best," was replaced by modern bioethics' introduction of "soft" ethics expertise. This new form of moral expertise prioritizes value pluralism and promotes patient input and dialogue in order to affirm the values relevant to the case and promote the best action. The firmamenting of ethics education in medical training, the challenging of conventions and norms, and the emphasis on value sensitivity have shifted the presumption that medical expertise entails hard moral expertise and guards against professional hubris regarding moral issues in health care.

The notion of "soft" ethics expertise also bypasses the nagging philosophical question whether there can be ethics expertise at all. A common argument against moral expertise is that in a pluralistic society with competing moral theories, no one can claim expertise regarding others' conduct on ethical grounds (Marino 2015). There are simply too many reasonable moral values and intuitions that affect theory choice and its application, and expertise must be epistemically uniform. Ruth Shalit (1997), for example, adopts this position, as well as its implicit anti-realist view on moral facts, to undermine the clinical bioethics profession. She argues,

> "Clinical ethics" is not medicine, which is to say it is not science, which is to say it is to a very large degree whatever anyone wants it to be.... The surgeon's recommendation rests on an agreed upon set of facts and criteria.... The philosopher's recommendation depends on a set of criteria that is not agreed upon, but varies from culture to culture and, more and more, from individual to individual. One man's categorical imperative is another man's heresy. (1997, 24)

p. 439 In short, Shalit understands millennia of disagreement between moral philosophers on all matters, including whether moral facts exist, to mean that there can be no expert authority on ethical issues.

Peter Singer, in contrast, holds a more optimistic view about moral expertise:

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> Someone familiar with moral concepts and with moral arguments, who has ample time to gather information and think about it, may reasonably be expected to reach a soundly based conclusion more often than someone who is unfamiliar with moral concepts and moral arguments and has little time. Moral expertise would seem to be possible. (1972, 117)

The argument for the possibility of moral expertise rests on the possibility of better or worse ethical arguments, which in turn rests on better or worse understanding of moral concepts and familiarity with moral reasoning.[5] This knowledge and skill are cultivated through ethics education and applied ethics training (e.g., clinical bioethics programs). Three bases of expertise (see Section 2) are thereby met with respect to moral expertise: There is a knowledge base, a performance base, and social recognition through accreditation.

The position that clinical judgment must include the integration of patients' values, now designated as a CanMEDS feature of optimal patient care and a goal of (revised) EBM, places a demand on medical professionals as medical experts to engage in "soft" normative ethics. Physicians are now expected to elucidate patients' values, communicate responsively, and integrate patient perspectives into the deliberative process. Moral expertise, therefore, is still a component of medical expertise.

Much like medical knowledge and clinical skills are divided among various medical specialists—where patients are referred to different specialists rather than have all ailments treated by one practitioner—moral expertise has been professionalized and specialized in the role of the clinical bioethicist. Although all health care professionals receive some bioethics education in their professional training programs and continue to learn via informal conversation with colleagues, bioethics rounds and lunchtime ethics education sessions in clinical settings, as well as ethics publications in health professional journals, expertise likely remains elusive to busy clinicians. Clinical ethics consultants help health practitioners navigate complex ethical issues and build ethics capacity and culture within a health care institution through ethics education (e.g., the "hub and spoke model" [McRae et al. 2005]).

5 Medical Expertise and Intelligence

Among the characteristics commonly attributed to experts is the ability to draw from their intellectual and practical resources to solve *new* problems. John Dewey made this point in Chapter 11 of *How We Think* (1910/2009) in his distinction between ↳ empirical method and scientific method. The former, by his characterization, invites practitioners to follow deductive rules, whereas the latter demands novel inquiry and creative problem-solving. A theory of expertise can be gleaned from these remarks, and, by Barrotta and Gronda's (2022) reading of Dewey, a distinction between the scientist and the scientific expert. Dewey disputes the position that expertise can be strictly performance-based; being able to do something well is not a mark of expertise. Experts are instead distinguished from high performers by their ability to handle novel problems. A scientist can be highly competent in empirical method but struggle when presented with something new due to their "mental inertia, laziness, unjustifiable conservatism" (Dewey 1910/2009, 149). Such scientists are surely not experts and not deserving of the social authority bestowed on experts.

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It is arguably these faux experts that invite anti-expertise sentiments, whereby experts are viewed as undeserving authorities and reliance on expertise is construed as a problem that EBM needs to fix. Dewey thought poorly of conventional thinkers and scientists:

> Certain men or classes of men come to be the accepted guardians and transmitters—instructors—of established doctrines. To question the beliefs is to question their authority; to accept the beliefs is evidence of loyalty to the powers that be, a proof of good citizenship. Passivity, docility, acquiescence, come to be primal intellectual virtues. Facts and events presenting novelty and variety are slighted, or are sheared down till they fit into the Procrustean bed of habitual belief. (1910/2009, 149)

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This idea that an expert is distinguished from a nonexpert, even someone well acquainted with "established doctrines," is still found in expertise studies. Goldman (2001), for example, argued that an expert in a domain "possesses an extensive fund of knowledge (true belief) and a set of skills or methods for apt and successful deployment of this knowledge to new questions in the domain" (92). Critics of cognitivist approaches to expertise argue that "scientific knowledge is a necessary but not sufficient condition for scientific expertise" (Barrotta and Gronda 2022; see also Almassi 2022), and offer alternative conditions for the successful response to new questions and challenges in the domain. Barrotta and Gronda (2022) argue that what is also needed is "intelligence" in the Deweyan sense of the word. What puts expertise to the test, they propose, is one's ability to "transform in determinate situations into problematic situations," and only true scientific experts can successfully pay attention to the "contingent and precarious aspects that make the situation they face unique" (Barrotta and Gronda 2022, 3).

In *The Quest for Certainty* (1929/2008), Dewey defines intelligence as follows:

> Intelligence ... is associated with judgment; that is, with selection and arrangement of means to effect consequences and with choice of what we take as our ends. A man is intelligent not in virtue of having reason which grasps first and indemonstrable truths about fixed principles, in order to reason deductively from them to the particulars which they govern, but in virtue of his capacity to estimate the ↳ possibilities of a situation and to act in accordance with his estimate. In the large sense of the term, intelligence is as practical as reason is theoretical. (170)

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Intelligence, then, is the capacity to address a specific situation, to consider possible outcomes, and to deploy the means that are likely to attain the chosen end. Dewey understood intelligence to be practical knowledge focused on the case at hand, whereby generalized knowledge is applied to the particular in order to achieve the desired goal. Scientific expertise, according to Barrotta and Gronda (2022, 8), thereby operates in a logic of inquiry that cannot subsume the particulars into more general knowledge, and must inhabit the epistemic uncertainty that follows from such particularism.

Dewey's concept of intelligence, then, echoes characteristics of clinical judgment (and clinical expertise) previously discussed (see Section 3(c)). The "selection and arrangement" of the means to reach a desired end is akin to the "integration" of multiple evidentiary warrants to attain individualized and ethical patient care. The desired end is determined by elucidation of the patients' goals and values. How to assemble all warrants and/or considerations correctly is not prescribed by any decision-making algorithm; instead, clinical expertise or *intelligence* guides this exercise.

Intelligence, then, captures much of the critical and complex decision-making that philosophers of medicine ascribe to the term "clinical judgment." Recall that Tonelli (2006) criticized EBM for falling short of the goal of providing optimal patient care:

> The optimal care of the individual patient certainly requires an understanding of the relevant published evidence, but still demands the integration of other kinds of medical knowledge, both physiologic and experiential, along with the elucidation of patient goals and values, all within a complex system of health care delivery. (74)

Tonelli (2006) concludes that EBM "promises much to clinicians, but it cannot promise to make sound clinical judgment an easier task" (74). Instead, optimal patient care requires knowledge-based expertise, performance-based expertise (including critical thinking and problem-solving abilities under conditions of uncertain and complexity), and moral expertise in order to explicate and include patients' values and interests. There is no algorithm for weighing competing warrants; instead, medical expertise, the "integrative role" in the CanMEDS framework, guides this critical assemblage of disparate warrants. All the while, medical personnel need the social authority to do this important work. They need to be trusted by their patients and all other stakeholders.

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The onus is on experts to earn and maintain that trust, rather than assume or demand it (Goldenberg 2021), through demonstrations of competency and reciprocity (Almassi 2022).[6]

Intelligence, like clinical judgment, entails a "capacity to apply general knowledge to particulars" (Barrotta and Gronda 2022, 8). The problem of generalizability is familiar terrain in philosophy of science scholarship, and many EBM critics have homed in on the movement's own generalizability problem, specifically its overreliance
p. 442 on randomized trial evidence at the expense of external validity (see Cartwright 2007, 2010; ↳ Rothwell 2005). Tonelli (2006), as we have already seen, points to the gap in application of clinical research to individual patients. Specifically,

> Empirical clinical research, usually performed in a manner that may randomize away clinically important individual characteristics, provides useful knowledge regarding populations, but application to individual cases requires clinicians to ask whether the patient-at-hand differs in any meaningful way from the "average" patient of the clinical trial. (Tonelli 2006, 72)

Here, contextual features of the patient and their circumstance must enter into clinical decision-making. In addition, value judgments must guide what is hoped to be achieved in the clinical encounter. The intelligence characteristic of (deserving) medical experts permits this integrative exercise.

6 Conclusion

In this chapter, medical expertise was characterized as tacitly formulated in early writings on medical ethics from a variety of theoretical and medical traditions. Advances in medical sciences and the professionalization of health care practice increased the demand on medical experts to be knowledgeable, skilled, and ethical. Their social authority grew alongside these demands.

Drawing from expertise studies and the study of medical expertise within medical education and professionalization scholarship, four components of medical expertise were defined: cognitive expertise, performance-based expertise, moral expertise, and social authority. Finally, the sketch of a theory of medical expertise that utilized Dewey's conception of intelligence was offered as the beginnings of an integrated theory. While the social authority of expertise waivers, with low public trust in scientific experts (by some measures) pushed up against the inescapable need for specialist knowledge and advice to promote well-being and survival, medical expertise remains intact as a crucial part of optimal patient care.

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Notes

1. For example, Agnew et al. (1997, 237) describe how "doctors, lawyers, accountants, coaches, teachers, technicians, etc.…
p. 443 these experts sometimes pass extensive domain entry hurdles ↳ and keep passing domain-specific performance tests." Watson (2020, 54) illustrates the continuum of competency from novice to expert with the example of a cancer doctor: "To be a cancer doctor, you have to have extensive knowledge of other domains of medicine: cardiology, pulmonology, hematology, nephrology, hepatology, and so on. So, while one might specialize in oncology, they nevertheless have general expertise in other domains of medicine." Meanwhile, a second-year medical resident is a doctor but not an expert due to their limited clinical experience (Watson 2020, 99–100).

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2. Watson (2020) addresses medical expertise explicitly here by describing "training in internal medicine" as an example of a *wicked* learning environment and characterizes residency programs as cultivating the dual processing (quick recall and slow reflection) required for internal medicine practice. The distinction between kind and wicked learning environments, the former allowing for accurate inferences between two settings due to close matches between the informational elements of the two, whereas wicked learning environments involve mismatches, comes from psychologist Robin Hogarth. See Hogarth (2001) and Hogarth et al. (2015).

3. Chin-Yee and Upshur (2018) argue that Alvin Feinstein's *Clinical Judgment* (1967) has been misread by EBM proponents as a predecessor to the evidence-based movement due to Feinstein's attention to more "scientific" clinical judgments. However, a closer reading of *Clinical Judgment* shows the totality of evidence required to arrive at clinical judgments to be broader and more pluralist than EBM allows. In the effort to make clinical decision-making more objective, EBM attended to the "clinimetric" aspects of Feinstein's account of clinical reasoning but minimized the influence of environmental and host factors.

4. "Moral expertise" and "ethics expertise" are used interchangeably in this section due to common use of both terms in the relevant scholarly literature.

5. Singer's account implies the existence of moral facts on which moral arguments can be built; however, Scott Yoder (1998) argues that ethical expertise does not require moral realism. This discussion is beyond the scope of this chapter.

6. Discussion of trust and expertise is beyond the scope of this chapter. On this topic, see Whyte and Crease (2010), Goldenberg (2021), Contessa (2023), and Almassi (2022).

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