Part IV

CLINICAL METHODS
Consider the following two cases, on a typical busy day of a primary care physician.

**Case 1**
A 3-year-old girl is brought to the clinic. Her father tells you that he has had a temperature of 38.2°C for 24 hours. She is slightly listless and has a cough and a runny nose. Physical examination reveals no worrisome evidence of serious disease. The physician reassures the father that the child has a common virus that is circulating in the community, counsels the use of antipyretic medication to reduce the fever, encourages rest and hydration, and clearly states that he should bring the child back for reassessment if there is any worsening of symptoms or failure to improve.

**Case 2**
An 84-year-old woman attends the clinic with her daughter. She has a long history of high blood pressure, type 2 diabetes, and suffers from osteoarthritis. She lost her husband 15 months ago. The woman denies any problems, but her daughter mentions that her mother is not eating well, is increasingly forgetful, and is not keeping her household as tidy as usual. The daughter is worried that her mother has dementia and is keen to get a specialist assessment. When asked directly, the woman admits to ongoing sadness at the loss of her husband, and jokes that everyone her age has problems with their memory.

We shall return to these cases below.

Clinical judgment refers to the range of complex reasoning tasks and actions performed by clinicians in the context of offering diagnosis, therapeutic options, and prognosis to patients regarding their health and illness. The philosophically relevant aspects of clinical judgment relate to the status of the reasoning and/or logic that inform clinical judgment.

It is evident that the concept of clinical judgment covers a very wide range of considerations in the philosophy of medicine. It is not possible to cover all of these in one chapter. In recent years the focus has moved away from consideration of overall clinical judgment, and research has concentrated on the study of dimensions of clinical reasoning through the lens of statistics, decision science, and cognitive science. Philosophers with an epistemological orientation...
have similarly moved away, being more concerned with analyzing and critiquing the claims of evidence-based medicine. Therefore, we will seek to revive the philosophical discussion around clinical judgment. We will revisit accounts of clinical judgment and then situate the discussion within recent scholarship in virtue theory in medicine.

Clinical Versus Statistical Judgment

In 1954, the psychologist Paul Meehl published a book summarizing the evidence comparing clinical versus actuarial judgment (Meehl 1954). Evidence that reasoning aided by some form of mathematical model, usually based in statistics or probability, was superior to unaided reasoning indicated a need for investing resources into what are now termed decision support systems. The general conceptual strategy would be to suggest that clinical judgment is “subjective” and actuarial judgment “objective.” Unaided reasoning is notoriously subject to numerous biases. These have been extensively documented in the psychology literature as well as in studies examining clinical reasoning. These biases increase risk and harm to patients and therefore are a concern for patient safety (Patel et al. 2015). Concerns about such biases have been influential in stimulating research into medical reasoning in order to make it more reliable and objective.

Meehl’s distinction between clinical and statistical judgment may represent an oversimplification in the case of medical reasoning. In what follows we will argue that a robust account of clinical judgment does not see as clear a distinction such as that posited by Meehl. Both clinical and statistical judgment are required. We will argue that there is much to gain from research into methods to make clinical reasoning more reliable by integrating decision aids and statistical approaches. However, we will also argue that given the extent to which uncertainty shapes the landscape in which clinical reasoning occurs, clinical judgment will always require more than simply actuarial approaches.

What Is Clinical Judgment?

It is important at the outset to get some clarity around what we are referring to when we discuss clinical judgment. What sorts of clinicians and what kinds of judgments?

In this chapter we will refer primarily to physicians, but other health care professionals, such as nurses, physiotherapists, occupational therapists, pharmacists, dentists, etc., exercise judgment and work as clinicians. “Clinical” also relates to the world of practice that is based in encounters with patients, families, and caregivers related to the health of patients or clients.
This will differentiate clinical judgment from the sorts of reasoning employed in research or in policy contexts. Although there is good reason to believe that judgment is exercised in these spheres of practice and they are no doubt relevant to health care and medical practice, they shall not be the focus of our analysis.

By judgment we refer to the collection of heterogeneous reasoning tasks involved in the formulation of a differential diagnosis, initiating and communicating a management plan, or communicating a prognosis. Judgment relates to the ability to take into account multiple sources of information as well as multiple constraints on a decision in order to formulate a course of action relevant to the problem at hand. In simple terms, physicians with good clinical judgment reliably demonstrate this quality in daily practice. The goal of educating health care professionals is to foster and develop good clinical judgment. These elements of clinical judgment are therefore core to medical practice and are constitutive of the expertise expected of health care professionals.

**How Has Clinical Judgment Been Defined?**

H. Tristam Engelhardt was one of the first to apply the insights of contemporary philosophy of science to medicine. In the introduction to a volume of essays devoted to the varied dimensions of clinical judgment, he observed:

> . . . an adequate assessment of the significance of clinical judgment is a complex endeavor in the epistemology of medicine. It involves . . . a fundamental critique of medical knowledge and the methods of clinical knowing. It is, moreover, much more than simply an enterprise in epistemology. Clinical judgments 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. . . . Ideas, concepts, and notional presuppositions and structures, including value judgments, fashion the actual practice of medicine. Medicine more than most endeavors of knowledge and technology is involved in the entire range of human values and the whole gamut of levels of reality (i.e., from subcellular processes to psychological and sociological interactions). In studying medical knowledge, in analyzing clinical judgment, one thus addresses a first instance of knowing and doing, the better comprehension of which is likely to illuminate our understanding of science and technology in general. That is, understanding medicine may shed light on areas of science and technology where the interplay of facts and values may not be as salient, or the consequences of different views of science and technology as immediately or as intimately intrusive.

(Engelhardt 1979: xxii–xxiii)

Engelhardt argues that the study of clinical judgment is part of the long tradition of making medicine more rational and of the evolution of medical reasoning. Medical reasoning since antiquity has abjured purely “metaphysical” accounts of disease and disease management and held closely to the requirement that physicians devote considerable time to develop their skills in physical examination through close observation of their patients.

Edmund Pellegrino, another renowned philosopher of medicine, notes that clinical reasoning and clinical judgment are goal oriented, aimed at clinical action, and often concerned with application of generalities to particular cases. Such judgments are often made with clinicians working with imperfect information (inaccurate history, equivocal physical or laboratory
findings) and uncertainty of prognosis and therapeutic effectiveness. He distills the process of clinical judgment to three questions:

1. What can be wrong?
2. What can be done?
3. What should be done? (Pellegrino 1979)

The difference between question two and question three is important in demonstrating the inescapable ethical dimensions of clinical judgment. This is an area where the actuarial approach has been much less successful in providing guidance to clinicians, as the particularities of each patient require tailored strategies for management.

**Feinstein and Clinical Judgment**

As discussed above, recent scholarship has shifted attention away from understanding the nature of clinical judgment in favor of developing more “objective,” algorithmic approaches to clinical decision-making, exemplified by EBM epistemologies. Nonetheless, earlier work on clinical judgment remains a valuable source for contemporary medicine. To this end, Alvan Feinstein's work remains especially salient, particularly his two seminal books *Clinical Judgment* (1967) and *Clinimetrics* (1987) (Feinstein 1967, 1987). Feinstein, hailed as the “Father of Clinical Epidemiology,” played an important role in shaping the EBM movement, although he later became an outspoken critic (Feinstein & Horwitz 1997; Fletcher 2001). Returning to Feinstein’s original arguments provides a useful starting point for understanding evidence-based approaches to clinical reasoning, and allows us to appreciate how current EBM epistemologies depart from this earlier work on clinical judgment.

For Feinstein, clinical reasoning is based firmly in clinical observation and measurement. Feinstein’s argument is both descriptive and prescriptive—not only does he view clinical judgment fundamentally as a process of logical inference based on available evidence, but further, he claims that the practice can be made more “scientific” through renewed attention to and explication of its methods (Feinstein 1967: 26). Feinstein hopes to dispel the “mystique” surrounding clinical judgment to make it transparent and teachable. His overall aim is to develop a scientific approach to clinical reasoning, which utilizes the tools of mathematics (i.e., set theory, symbolic logic, and Boolean algebra) to underwrite more reliable clinical decision-making. A key metaphor throughout Feinstein’s work is the identification of the clinician as an apparatus of scientific measurement. Feinstein argues that clinical medicine ought not pursue the scientific ideal by turning away from the clinic, seeking validity from paraclinical domains such as the laboratory, but rather should focus inward on the epistemology of everyday clinical practice to develop more robust standardized clinical measures and generate improved clinical taxonomies that allow for reliable and reproducible modes of inference for diagnosis, prognosis, and treatment (Feinstein 1983a, 1983b). This approach emphasizes the importance of data from the patient history and physical examination, in contrast to the more recent privileging of “objective” paraclinical data in EBM epistemologies (Henderson et al. 2012). Feinstein contends, “clinicians can bring science to clinical judgment by better exercise of the very human capacities that appear to impair it, and by giving increased attention not to laboratory substances and inanimate technology, but to sick people and the human methods of evaluating sick people” (Feinstein 1967: 29).

Feinstein begins his exposition of clinical judgment by discussing the nature of clinical evidence and types of data inputs into clinical decision-making. He identifies three types of data: (1) the description of disease in impersonal terms (i.e., morphologic, chemical, microbiologic,
physiologic etc.); (2) the description of the host, in environmental, personal terms (i.e., age, sex, education, social status etc.); and (3) the description of the illness, the interaction between disease and environment (i.e., signs and symptoms) (Feinstein 1967: 24–25). All three types of data contribute to clinical reasoning, which he further categorizes into “therapeutic” and “environmental” reasoning. Therapeutic reasoning, which treats the patient as a representative case of disease, occurs alongside environmental reasoning, which individualizes management of an illness for a particular patient. Environmental reasoning, however, goes beyond simply individualizing therapy for a specific case and further encompasses the humanistic aspects of clinical practice, determining the “choice of methods of communication, accommodation, and human interchange that will best enable the sick host to bear the burdens of both ailment and treatment.” According to Feinstein,

A clinician’s privilege and power in clinical therapy is his ability to make both the therapeutic and the environmental decisions concomitantly. The clinician combines treatment for the patient as a personal case of disease, with concern for the patient, as a personal instance of mankind, into the unified mixture that is clinical care.

(Feinstein 1967: 26)

By breaking down clinical judgment into distinct yet concomitant processes of environmental and therapeutic reasoning and identifying their respective data inputs, Feinstein hopes to begin penetrating the complexity of clinical practice. This discussion provides a useful heuristic for clinicians in thinking about the domain to which Feinstein intended his “scientific” method of clinical judgment to apply. Feinstein’s “clinimetrics” is an approach to therapeutic reasoning (i.e., the treatment of patients as instances of disease), which he recognizes leaves out important domains of clinical evidence, namely the “environmental” and “host” data, and must always be performed in light of these contextual factors (Feinstein 1967: 25).

We believe that this basic insight, emphasized at the outset of Feinstein’s work, is often overlooked in contemporary treatments of clinical judgment, particularly those promoted by the EBM movement since the 1990s. Although Feinstein endeavors to make clinical judgment “scientific,” he is cognizant of the limitations of this approach and of the specific types of data to which such methods apply. Therefore, although he was a major influence in early EBM, the contemporary movement shows a two-fold departure from Feinstein’s clinical epistemology. Not only did it neglect to develop robust clinical measures based in the patient history and symptomatology, favoring instead “objective” paraclinical data, but it also failed to acknowledge the parts of clinical reasoning not included in Feinstein’s “scientific” approach, the “environmental” and “host” factors, which contribute to the value-laden, humanistic aspects of clinical practice (Feinstein 1967). As Feinstein argued, clinical judgment is a complex process that necessarily considers the totality of the evidence to arrive at clinical decisions. Virtue-based clinical epistemologies, which we turn to now, recognize the plurality of clinical evidence and give a more prominent role to the humanistic data often left out of quantitative, evidence-based methods.

**Uncertainty and Clinical Judgment**

Thus far we have established that clinical judgment integrates the totality of considerations in clinical practice relevant to the care of an individual patient. In agreement with the original description by Engelhardt, we view clinical judgment as a complex process. However, we will resist arguments that try to pit the strengths of clinical judgment against “statistical” or algorithmic forms of reasoning. Consistent with Feinstein, we believe that clinical judgment is better conceived as an amalgam of both. Resisting the obvious advantages of reasoning aided
by either computational devices or statistical tools would seem irrational. Similarly, arguing that all clinical reasoning can and should be reduced to such processes seems farfetched and overly reductionistic. A balanced account of clinical judgment would then have room for both styles of reasoning. There are good grounds for striving to value both.

One argument for valuing both clinical and statistical judgment comes from the extensive uncertainty that arises from the nature of the clinical encounter combined with the limitations of medical knowledge. Most clinical encounters result in a fragmentary understanding of the patient’s problems. Diagnoses are often provisional, and even if definitive, seldom accompanied by certainty that treatments will be effective. Prognoses are always hedged with statements of uncertainty. This situation likely prompted Osler to call medicine the art of probability and the science of uncertainty. Djulbegovic, Oz, and Greenland (2011) provide a comprehensive taxonomy of uncertainty in clinical medicine. Uncertainty arises from lack of evidence, conflicting interpretations of evidence, inability to access evidence in a timely manner, concerns about the application of aggregate statistical data to individual cases, and lack of clarity regarding patient preferences and values. In any clinical case, therefore, uncertainty plays a role. As they state: “Uncertainty is inherent in medicine. It occurs at every level of the clinical practice and research. It has multiple causes, with important implications for decision making, quality of care, and patient management. It will remain a central feature of medical practice” (Djulbegovic, Oz & Greenland 2011: 347).

The inherent uncertainty in medicine means that it is unlikely that statistical judgments will completely determine decision-making. There will always be the need to integrate values into decisions, and medical decisions have an inherent value dimension to them.

A Virtue-Based Framework

Some believe that a future state awaits wherein complete and perfect knowledge will occur that will render all clinical reasoning amenable to mathematical characterization. But as we have shown, this is not possible or achievable. An adequate philosophy of clinical judgment must rest on a theoretical basis that can accommodate both factual and normative considerations. Virtue theory seems to have the requisite components of both ethics and epistemology that could provide both a descriptive and normative account of clinical judgment.

As Rosalind Hursthouse notes, virtues are more than simple traits, but “well entrenched” dispositions that are consistently manifested:

A virtue such as honesty or generosity is not just a tendency to do what is honest or generous, nor is it to be helpfully specified as a “desirable” or “morally valuable” character trait. It is, indeed a character trait—that is, a disposition which is well entrenched in its possessor, something that, as we say “goes all the way down,” unlike a habit such as being a tea-drinker—but the disposition in question, far from being a single track disposition to do honest actions, or even honest actions for certain reasons, is multi-track. It is concerned with many other actions as well, with emotions and emotional reactions, choices, values, desires, perceptions, attitudes, interests, expectations and sensibilities. To possess a virtue is to be a certain sort of person with a certain complex mindset. (Hence the extreme recklessness of attributing a virtue on the basis of a single action.)

(Hursthouse 2003)

Clinical judgment is no doubt part of a “complex mindset” of particular dispositions with respect to the pursuit, analysis, interpretation, application, and responsibility for knowledge
and information as it pertains to the practice of medicine. James Marcum, in a paper entitled “The epistemically virtuous clinician,” explicates the features of this complex mindset. He argues that epistemic virtue in clinical practice requires both reliabilist and responsibilist virtues (without arguing for the primacy of one over the other). Reliabilist virtues include “sight or hearing for sensory or perceptual faculties, and memory, intuition, inferential reasoning, insight, or introspection for cognitive or conceptual faculties” (Marcum 2009: 250). Responsibilist virtues include “honesty, courage, open mindedness, humility, fairness, curiosity, tenacity and integrity” (Marcum 2009: 251). In addition to these, Marcum argues that two additional considerations are required for epistemic virtue: love of knowledge and theoretical and practical wisdom. Clinical judgment would then be the exemplification of virtue in practice.

It has been argued that EBM is compatible with virtue theory. Zarkovich and Upshur (2002) argued that the definition of EBM lends itself to a virtue theory account in that the most influential definition of EBM is “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.” They further argue virtue theory may provide an organizing account of clinical judgment as it is able to incorporate both considerations of intellectual and moral capabilities of clinicians. Intellectual virtues relate to the clinician’s motivation for knowledge and the quest for truth through knowledge. These are typically demonstrated by the ability to access and assess information relative to the patient problem at hand. Moral virtues aid in the pursuit of patient welfare. Applying both the intellectual virtues and moral virtues to medicine, it can be argued that the definition of clinical judgment requires a combination of intellectual and moral virtues. Zarkovich and Upshur (2002) argue that the term “conscientiousness” is an intellectual virtue and “judiciousness” a moral virtue. The call for explicitness would indicate an attempt, as much as it is possible, to have clinical decisions rest on clearly stated reasons.

Back to the Cases

How does the above discussion relate to the cases stated at the beginning of the chapter?

Case 1 represents one of the most typical clinical encounters in medicine. Children with fevers are among the most frequent reasons for consulting physicians, and this child has a fever. Viral illnesses are very common in this age group, causing listlessness, cough, and runny noses. For the most part, the diagnosis is straightforward, management simple, and prognosis uniformly good. In this case, one may wonder whether any sort of clinical judgment is required. Some would wonder why a physician or other health care provider need be involved at all. If the condition is common and self-limiting, it could be argued that it is preferable to have this managed by the parents themselves (and indeed many parents do so).

Yet, good clinical judgment is required to manage even the simplest case, and such judgment must be exercised with every patient encounter regardless of its nature. In this case, once the father and child have engaged the physician, the physician has an obligation to exercise all of the relevant skills he or she possesses in determining the nature of the illness, the best course of action, and the likely prognosis. The physician may avail him or herself of a structured scoring system or algorithm to determine the likeliest diagnosis and best management plan. However, few such tools are used in routine clinical practice, particularly in North America. Context matters in clinical diagnosis, and this will very much influence clinical judgment. If this case were in a malarial zone, one would take a very different course of action, and the consideration of cause would also be adjusted to explain the fever.

Clinical judgment is required in this case for the clinician to be assured that there is no more serious underlying cause that may explain the fever. In the case of children, the concern may
be for a more serious underlying bacterial infection such as pneumonia or meningitis. These conditions can be somewhat reliably excluded on the basis of the physical examination, but experienced clinicians know that the observations they make on any particular patient are limited to the time they are examining the patient. As all disease states are dynamic, it is prudent, as in this case, to communicate the diagnosis and explain the conditions that would warrant reconsideration of the initial diagnosis. In the case of illness in children, considerable parental anxiety often needs to be managed.

A simple case thus demonstrates the complex interplay of facts and values, and the requisite exemplification of reliabilist virtues (physicians must be competent and confident in their history and physical examination skills) and responsibilist virtues (physicians must demonstrate the requisite concern for the welfare of the patient, be attentive to the anxiety of the parent, and demonstrate a willingness to revisit the diagnosis in the event that either the initial diagnosis was incorrect or the illness worsens).

Case 2 is more complex as it involves more interacting issues and a more subtle set of judgments. In this case, the use of more actuarial or aided reasoning may play a role in improving upon the clinician’s reasoning. As in the first case, context matters, but regardless of how much we vary the case or add detail, it simply reinforces the point of how complex clinical reasoning and the exercise of clinical judgment is in practice.

In this case, the patient denies any concern, but the collateral information given by the daughter requires revisiting the situation in more depth. The woman has many risk factors for conditions that can impair her memory, as well as recent life events that are well known to impair well-being and manifest with self-neglect and sadness (grief). In this case, there are many factors to consider, but to simplify the case we can center the concerns on two conditions: depression and dementia. Both of these are common conditions in older adults that can often be mistaken for or overlap with grief. In this situation, a physician may choose to employ standardized assessment tools for both dementia and depression. There are many such valid instruments to use, all with suitable limitations, but it would be good judgment to employ them in this case to assess cognitive function and depression. Relying on their knowledge of the patient or their intuition in this case would likely not be sufficient. Depending on the results, a management plan could be instituted at that particular visit, or a referral made to an appropriate specialist. Again, both reliabilist and responsibilist virtues are exemplified in the management of the case.

In both cases, it is unlikely that any actuarial tool or model could be employed that would answer all of the questions raised in very typical cases. They no doubt would aid in certain elements of decision-making and contribute to more accurate, less error-prone decisions. However, given the multitude of uncertainties in both cases (not fully catalogued in the analysis to be sure, but easily elicited), judgment will be required in many of the elements. The analysis also shows how the humanistic elements of clinical reasoning that Feinstein believed to be important can be integrated into more structured reasoning.

Conclusion

In this chapter we have discussed the complex nature of clinical judgment. We have argued that clinical judgment should not be conceived in opposition to more structured and guided forms of reasoning (actuarial judgment), but both are required. The ubiquity of uncertainty in clinical medicine necessitates that some form of “unaided” reasoning will be required in many cases. We have further argued that the work of Alvan Feinstein, coupled with virtue theory, provides a basis for a theory of clinical judgment that is more aligned with actual clinical practice than one that is reliant on either clinical or statistical judgments on their own.
References


Further Reading


Alvan Feinstein’s book Clinical Judgment (Baltimore: The Williams & Wilkins Company, 1967) still contains much that is of great value.

Edmond Murphy’s The Logic of Medicine (Baltimore: Johns Hopkins Press, 1997) contains a section on epistemology that covers diagnostic reasoning and focuses on issues related to measurement.

The second edition of Clinical Epidemiology: A Basic Science for Clinical Medicine by David Sackett et al. (Boston: Little Brown, 1991), published before the advent of evidence-based medicine, contains an excellent account of how quantitative reasoning aids in clinical judgment.