The Role of Emotions in Medical Decision-Making

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ABSTRACT Medical decision-making has historically been modeled as a rational, cognitive process. Substantial evidence now challenges this view, demonstrating that emotions, both those arising from the clinical encounter itself and those carried over from unrelated contexts, substantially influence clinical judgment, risk assessment, and treatment choices. In this narrative review of foundational psychological theory and empirical studies in emotion science and clinical medicine, with emphasis on work published since 2000 and on recent systematic reviews, we examine how emotions affect medical decision-making, the psychological mechanisms involved as described by the appraisal tendency framework, and the evidence-based strategies for emotion regulation that can improve clinical reasoning. Emotions influence clinical decisions through multiple pathways: integral emotions, arising from the decision itself, directly shape risk perception and treatment intensity, while incidental emotions, carried over from unrelated events, systematically bias judgment. The appraisal tendency framework shows that emotions of the same valence can have different effects. Anger increases certainty and lowers perceived risk, fear heightens perceived risk and promotes cautious, extensive diagnostic testing, sadness favors loss-averse choices, and disgust reduces empathy and time spent with patients. Positive affect can broaden attention and support flexible reasoning, while mild negative affect may sustain vigilance; however, intense emotions of either valence can overwhelm systematic reasoning. Negative team climates are linked to communication breakdowns and technical errors. Reappraisal, mindfulness, and emotional intelligence training show the strongest evidence for reducing emotional interference with judgment, with mindfulness and emotional intelligence training linked to improved patient safety outcomes and communication competence in controlled studies. Emotions are an important and underappreciated component of clinical reasoning, and emotional awareness and regulation competencies should be explicit training targets in medical education.

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Herbert Simon, the Nobel laureate in economics, observed that, "in order to have a complete theory of human rationality, we have to understand the role emotion plays in it." In medicine, this observation has been largely ignored. Traditional models of clinical reasoning treat emotion as noise in the signal, a confounding variable to be minimized rather than a substantive component of judgment to be examined.

The evidence, accumulated across cognitive neuroscience, social psychology, and clinical medicine, tells a different story. Damasio's somatic marker hypothesis demonstrated that patients with prefrontal lesions who lose access to emotional signals make systematically poor decisions despite preserved logical reasoning [1]. The dual-process framework, set out in the review by Flugelman and Riskin in this issue of the *Israel Medical Association Journal (IMAJ)* [2], places intuitive processing at the center of everyday judgment. A growing body of research in clinical settings documents specific, predictable ways in which emotions shape diagnostic and therapeutic choices [3].

In this review, we synthesized the evidence on how emotions affect medical decision-making, examine the psychological mechanisms through which these effects operate, and evaluate evidence-based strategies for managing emotional influences to improve clinical reasoning. We focused on emotion as a decision variable.

CONCEPTUAL FRAMEWORK: EMOTIONS IN DECISION SCIENCE

Defining affect, emotion, and intuition

In the literature, several overlapping terms are used. Affect refers to the global positive or negative valence accompanying an experience, a background tone of pleasantness or unpleasantness. Discrete emotions are differentiated states with specific cognitive and behavioral profiles: fear, anger, sadness, disgust, joy, and pride each have characteristic appraisals, action tendencies, and physiological signatures [4]. Intuition, or gut feeling, refers to rapid, holistic judgments that draw on emotional and pattern-recognition processes without explicit deliberation, a central concept in expert clinical reasoning [2].

Two dimensions are particularly important for understanding emotion's influence on decisions. *Valence* (positive–negative) describes the hedonic quality of the emotion. *Certainty* (high–low) refers to the emotion's appraisal of predictability or uncertainty. As the appraisal tendency framework shows, valence alone is insufficient to predict behavioral effects, because emotions with the same valence can differ in their certainty and control appraisals [5].

THE SOMATIC MARKER HYPOTHESIS

Damasio's somatic marker hypothesis [1] proposes that emotional signals, which are bodily states associated with prior experiences and their outcomes, act as a rapid pre-screening of options, biasing attention and choice before conscious deliberation begins. Damage to the ventromedial prefrontal cortex, which interrupts access to somatic markers, produces characteristic decision-making impairments: patients cannot learn from feedback, persist in losing strategies, and fail to anticipate negative consequences, despite intact logical reasoning [1]. This neuroscientific evidence establishes that emotional processing plays an essential role in decision-making.

HOW EMOTIONS INFLUENCE CLINICAL DECISIONS

Integral emotions: arising from the clinical encounter

Integral emotions are those generated by the decision situation itself: the feelings that arise during the clinical encounter in direct response to the patient, the diagnosis, or the treatment choice. These emotions can be adaptive. Fear in a life-threatening situation focuses attention, compassion motivates thoroughness of care, and discomfort with uncertainty prompts a more extensive workup. The role of compassion was recognized by emergency department clinicians in a mixed-methods study, in which those experiencing positive affect or empathy toward a patient reported providing higher-quality care, including closer attention to medical and psychosocial complexity, additional testing or consultation to ensure an accurate diagnosis, and stronger patient advocacy [6]. The authors noted, however, that warm feelings toward a patient can occasionally lead to optimistic bias or to over-testing intended to reassure the patient.

Studies using interviews with emergency department physicians and nurses document that the most common integral emotions include frustration, anger, sadness, and gratification [6]. These emotions are not merely a secondary byproduct. Physicians self-report prescribing and referring more often, and communicating with patients less, on days they describe as being in a negative mood compared with days in a good mood [7]. Physicians who reported feeling pressured, helpless, or angry in response to a patient's request to increase their opioid dose were nearly twice as likely to prescribe a non-indicated opioid form than those who did not report such emotions [8].

Disgust is a particularly important integral emotion in clinical settings. Qualitative studies with nurses describe the emergence of disgust responses to certain patient presentations (wounds, secretions, deformities), which in some cases led to reduced physical contact, shorter bedside time, and diminished socioemotional engagement with patients, with potential consequences for monitoring and intervention [9,10].

Dermatologists interviewed about discharge decisions in outpatient clinics reported that, beyond clinical criteria, emotions about the patient, liking them or having a long-standing relationship, influenced their judgment about when to discharge [11]. This finding, while difficult to quantify, represents a form of emotional information processing that may be both appropriate and prone to systematic bias.

Incidental emotions: carry-over effects

Incidental emotions are those generated by events unrelated to the clinical encounter that nonetheless influence judgment. A physician arriving at a difficult case carrying residual anger from a personal conflict, or sadness from a difficult prior patient, enters that encounter with an altered emotional landscape that can shape risk perception, treatment intensity, and communication. Classic demonstrations of incidental emotion effects include weather-induced moods affecting life satisfaction judgments [12]. In clinical settings, studies show that physicians experiencing higher levels of negative affect make more risk-averse diagnostic decisions, order more tests, and hospitalize more low-risk patients. This finding has direct implications for healthcare utilization [13].

Incidental positive affect has been shown to enhance creative problem solving in clinical contexts. Isen and colleagues [14] demonstrated that medical students in whom positive affect was induced reached correct diagnoses faster and with less premature closure than controls, without sacrificing accuracy. The mechanism appears to involve broadened attention and increased cognitive flexibility, consistent with Fredrickson's broaden-and-build theory [15]. However, Heyhoe and colleagues [16] noted that positive emotions tended to reduce the amount of information clinicians gathered and shifted attention toward less specific features, whereas negative emotion increased information seeking and heightened sensitivity to detail, an effect that further differentiates by dis-

crete emotion. Fear-based appraisals promoted deliberative, risk-averse decisions (e.g., admitting a patient for overnight observation because a previous case with similar symptoms deteriorated), while anger-based appraisals promoted more spontaneous, risk-tolerant ones (e.g., discharging a frequently attending patient without a full examination).

The appraisal tendency framework: beyond valence

The dominant theoretical framework for predicting specific emotional effects on judgment is the appraisal tendency framework (ATF), which was developed by Lerner and Keltner [5]. ATF proposes that each discrete emotion carries characteristic cognitive appraisals that tend to persist and shape subsequent information processing, even in contexts unrelated to the triggering event.

Anger is characterized by high certainty and individual (rather than situational) control appraisals. Anger promotes confident, rapid judgment and reduces risk perception [17]. Angry physicians may underestimate clinical uncertainty and may make more definitive diagnoses than warranted. In emergency medicine, providers reported that anger influenced their clinical decision-making through concrete lapses in thoroughness, including incomplete history taking or physical examination, premature diagnostic closure, and reduced time spent with patients [6]. A smaller subset of providers in the same study reported over-treating or over-testing when angry, suggesting that anger's dominant effect is reduced diagnostic thoroughness and engagement rather than a simple reduction in resource use.

Fear is characterized by high uncertainty and situational control appraisals. Fear increases risk perception and promotes cautious, information-seeking behavior [13,17]. Emergency physicians reporting high fear of malpractice litigation ordered significantly more diagnostic tests and hospitalized more low-acuity patients [18]. This pattern is consistent with research linking fear and anxiety to more conservative, defensive clinical behavior. Concerns about adverse outcomes have been associated with increased test ordering and diagnostic interventions. Anxiogenic emotions have more generally been linked to defensive medicine and over-investigation [19].

Sadness is characterized by appraisals of loss and lack of control. Sadness promotes present-focused thinking and willingness to accept lower future payoffs, a form of temporal discounting that may affect end-of-life and long-term treatment planning [20].

Disgust is characterized by appraisals of contamination and a desire to expel. In clinical settings, disgust responses to certain patient presentations can reduce empathy and shorten time spent with patients [9].

Critically, anger and fear share negative valence but have opposite effects on risk perception. Anger reduces perceived risk while fear increases it [17]. This distinction is missed by valence-based models but captured by the ATF.

Emotional effects on depth of reasoning

Emotions influence not only the content of clinical judgment but also the depth of cognitive processing. The mood-as-information hypothesis [12] proposes that positive affect signals a safe, familiar environment, reducing motivation for systematic analysis and increasing reliance on heuristics, whereas negative affect signals a problematic environment, motivating more systematic, detail-oriented processing.

In clinical contexts, this translates into a counterintuitive pattern. A mildly positive affect may promote rapid, heuristic-based diagnosis, efficient in familiar presentations, while a degree of negative affect (concern, mild anxiety) maintains vigilance for atypical features. The challenge is that extreme negative states, such as panic, overwhelming distress, severe frustration, overwhelm System 2 resources and paradoxically return the clinician to heuristic-dependent reasoning, with the specific biases catalogued in the review of cognitive biases and heuristics in this issue [21].

Emotional contagion and team dynamics

Emotions transmit between individuals through facial expression, vocal tone, and behavioral cues, a process termed *emotional contagion* [22]. In medical teams, a physician's emotional state can spread to nurses, technicians, and trainees, amplifying individual emotional effects at the team level. Conversely, positive emotional climates characterized by warmth and mutual recognition support psychological safety, information sharing, and adaptive error correction. The experimental evidence on how the affective climate of a clinical team, incivility on the one hand, gratitude on the other, alters diagnostic and procedural performance is presented in the review of group dynamics and social biases in this issue of *IMAJ* [23]. The team-level consequences of emotional contagion make emotion regulation not merely a personal skill but an organizational competency.

EMOTION REGULATION STRATEGIES FOR CLINICAL SETTINGS

Recognition that emotions systematically influence clinical judgment raises the question of what can be done. Consistent with the division of debiasing content across this issue, the following strategies address the mechanism specific to this review: regulation of the emotional state itself. Evi-

dence supports several categories of regulation strategy [4].

Cognitive reappraisal

Reappraisal–consciously reinterpreting the meaning of a triggering event to alter its emotional impact–is the most evidence-supported emotion regulation strategy [4]. Reframing a difficult patient as a person in pain who lacks better coping strategies activates compassion rather than frustration. Reframing diagnostic uncertainty as an opportunity for systematic learning rather than a threat reduces fear-induced over-testing.

Importantly, reappraisal targets the antecedent of the emotion rather than suppressing its expression. *Suppression*–effortful inhibition of the outward expression of emotion reduces expressive behavior but does not reduce internal emotional experience and may actually amplify it while consuming cognitive resources [4]. Reappraisal changes the internal state.

Mindfulness-based approaches

Mindfulness practice–sustained, non-judgmental attention to present experience–has been evaluated in clinical settings in several randomized trials. In a randomized controlled trial, Liu et al. [24] assigned physicians to an 8-week mindfulness meditation program versus a waitlist control. The intervention group showed significant improvements in mindfulness scores and patient safety culture ratings. They also showed significantly lower rates of self-reported adverse events compared with controls.

The proposed mechanisms include increased metacognitive awareness of emotional states, enabling their recognition before they distort judgment; reduced rumination; and a strengthened capacity to return attention to the clinical task after emotional disruption. The monitoring capacity on which this mechanism depends is analyzed in the review of metacognitive effects in this issue of *IMAJ* [25].

Emotional labeling

Research in affective neuroscience demonstrates that verbally labeling an emotional state; that is, giving it a name, reduces amygdala activation and subjective emotional intensity [26]. Clinically, this translates into a practice of pausing to identify: "I am feeling frustrated right now" or "I notice discomfort with this patient" before proceeding with assessment. This simple metacognitive step creates distance between the emotion and the clinical action.

A 4-step structured approach has been proposed: identify the emotion and name it with a single word; acknowledge the feeling without judgment; make space for it and tolerate the discomfort without acting on it immediately; and expand awareness, observing how the feeling changes as time passes. This framework is consistent with acceptance-based approaches in cognitive behavioral therapy.

Emotional intelligence

Emotional intelligence (EI) is the ability to perceive, understand, manage, and use emotions effectively. It has been linked to better decision-making across domains. A systematic review by Horne and colleagues [27] of 39 studies found that higher EI correlated with lower burnout, along with reduced anxiety, stress, and depression. Specifically among physicians, higher EI or empathy was also linked to better clinical performance outcomes, including higher patient satisfaction, improved communication ratings, better patient information recall, and improved decision-making under operational stress. EI training programs in medical education have shown promising effects on self-reported regulation and peer-rated communication competence [3,28].

Structural safeguards: protocols and accountability

Structural interventions that externalize clinical standards reduce the space for emotional distortion. Standardized diagnostic protocols, explicit documentation requirements, and mandatory second opinions for high-stakes decisions create accountability structures that counteract idiosyncratic emotional influences. Choice architecture approaches such as thoughtfully designed default options in electronic order sets can similarly reduce emotionally driven deviations from evidence-based care [3,29,30].

DISCUSSION

The evidence reviewed here converges on a clear conclusion: emotions are not the opposite of rational clinical judgment, rather they are woven into it. The question is not whether emotions influence medical decisions but how they do so, and how clinicians can develop awareness and tools to work skillfully with this reality.

Several practical implications are discussed. First, medical education should include explicit training in emotion recognition and regulation, not as an add-on but as a core clinical competency alongside history-taking and physical examination. Second, organizational structures should support rather than discourage emotional disclosure. Formal debriefing after difficult cases, peer support programs, and supervision cultures that normalize emotional processing create conditions for better self-regulation. Third, clinical protocols and decision

aids should be designed with awareness of the emotional contexts in which they will be used because complexity and length that require extended System 2 processing are unlikely to be adhered to under high emotional load.

Important considerations apply. Most experimental studies use analogue or simulated paradigms. Ecological validity in real clinical settings requires further study. Cultural variation in emotional expression and regulation norms is substantial and inadequately studied in clinical contexts. The relationship between emotional experience and decision quality is not linear. Moderate emotional engagement may enhance care while emotional flooding may impair it. The optimal zone varies by individual and context.

CONCLUSIONS

Emotions are an integral component of clinical reasoning that influence risk perception, treatment intensity, interpersonal behavior, and diagnostic quality through multiple mechanisms. The ATF provides a theoretically grounded and empirically supported account of how specific discrete emotions produce distinct and predictable biases, which explains an important part of this process. However, it does not capture the full complexity of clinical decision-making, and further research is needed to determine how these effects interact with context, experience, and organizational factors across diverse clinical settings. Evidence-based strategies, such as reappraisal, mindfulness, emotional labeling, and structural safeguards, can reduce unwanted emotional influences on clinical decisions. Integrating emotional awareness and regulation training into medical education and professional development is both feasible and necessary for improving care quality.

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