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Editorial

Decision-Making in Emergency Medicine: Balancing Uncertainty, Time, and Human Factors

Eduardo Esteban-Zubero [a],* iD

[a] Emergency Department, Hospital San Pedro, Logroño, Spain

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La toma de decisiones en medicina de urgencias: equilibrando la incertidumbre, el tiempo y los factores humanos

INFO. ARTÍCULO

Decision-making in emergency medicine represents one of the most complex cognitive tasks in clinical practice. Physicians in emergency departments (EDs) operate under intense pressure, often with incomplete information, limited time, and life-threatening conditions that demand immediate action. The art of emergency decision-making lies not only in the application of evidence-based protocols but also in the clinician's ability to balance uncertainty, prioritize competing needs, and adapt rapidly to evolving circumstances. Understanding this process is essential to improve patient outcomes, reduce errors, and support the cognitive and emotional well-being of emergency physicians.

* *Corresponding author.*
E-mail address: eezubero@gmail.com

Clinical reasoning in the ED is unique in its context. Unlike other medical settings where data collection, reflection, and consultation are possible, emergency physicians must frequently make critical judgments within minutes. This time constraint fosters reliance on intuitive reasoning, also known as "System 1 thinking," characterized by pattern recognition and heuristics [1]. While this mode of reasoning allows rapid responses, it also predisposes clinicians to cognitive biases such as anchoring, premature closure, and availability bias. These biases may lead to diagnostic errors, estimated to contribute to nearly 10% of all adverse events in emergency care [2]. Awareness of these biases and the development of metacognitive strategies—thinking about one's own thinking—are key to mitigating such risks.

Despite these challenges, emergency physicians cannot afford to rely solely on deliberate, analytical reasoning ("System 2 thinking"), as it is too slow for many critical scenarios. The most effective decision-makers in emergency medicine integrate both modes fluidly: intuitive processes guide rapid assessments, while analytic reasoning intervenes when uncertainty increases or outcomes diverge from expectations. This dynamic interplay exemplifies the concept of "adaptive expertise," where clinicians flexibly switch between efficiency and innovation depending on the situation [3].

Team dynamics also play a decisive role. Emergency care is inherently interdisciplinary, involving physicians, nurses, paramedics, and specialists. Decisions are often collective, influenced by team communication, hierarchy, and shared situational awareness. Poor communication or unclear leadership can compromise patient safety, especially during handovers or resuscitation efforts. The use of structured communication tools such as SBAR (Situation–Background–Assessment–Recommendation) and closed-loop feedback has been shown to improve team coordination and reduce misinterpretations [4]. Fostering a culture of psychological safety, where all team members can voice concerns or alternative viewpoints, enhances collective decision-making and reduces the likelihood of critical omissions.

Technology increasingly influences decision-making in emergency settings. Clinical decision support systems (CDSS), artificial intelligence (AI), and predictive algorithms offer new opportunities to enhance diagnostic accuracy and triage efficiency. For instance, AI models can analyze electrocardiograms or imaging data within seconds, suggesting possible diagnoses or highlighting subtle abnormalities. However, these systems also introduce new challenges. Overreliance on automated outputs may erode clinical judgment or introduce "automation bias," where physicians fail to question incorrect system recommendations [4]. Therefore, the integration of AI tools must preserve the clinician's central role as decision-maker, emphasizing interpretive and ethical oversight.

Emotion and stress are often underestimated determinants of decision-making. Emergency physicians frequently operate under conditions of fatigue, emotional arousal, and moral distress, all of which impair cognitive performance. Studies show that sleep deprivation and workload directly affect diagnostic accuracy and the ability to process complex information [5]. Furthermore, exposure to traumatic situations can lead to burnout and emotional blunting, potentially influencing clinical empathy and patient-centered decisions. Institutions should recognize these psychological dimensions as integral to patient safety, implementing support systems and promoting resilience among emergency staff.

Training future emergency physicians requires more than procedural competence; it demands explicit education in cognitive strategies, bias recognition, and reflective practice. Simulation-based training offers a powerful tool for this purpose, allowing clinicians to practice high-stakes decision-making in a controlled environment. Incorporating debriefing sessions that explore thought processes, teamwork, and emotional responses helps bridge the gap between technical performance and cognitive mastery. Encouraging reflective habits, such as reviewing near-miss cases or discussing diagnostic uncertainty, nurtures an environment of continuous learning and humility.

Ethical dimensions further complicate decision-making in emergencies. Physicians often face situations where they must allocate scarce resources, respect patient autonomy under uncertain conditions, or balance beneficence with non-maleficence in resuscitation or end-of-life decisions. These moments demand moral reasoning as much as clinical skill. Transparent communication with patients and families, adherence to institutional policies, and interdisciplinary ethics consultations can support equitable and compassionate decisions, even when outcomes are unfavorable.

Ultimately, decision-making in emergency medicine cannot be reduced to algorithms or checklists. It is a human endeavor that blends science, experience, emotion, and moral judgment. The clinician's task is to navigate

uncertainty with confidence tempered by humility—to act decisively when necessary, yet remain open to correction when new evidence arises. As medicine advances toward greater technological integration, the human capacity for judgment, empathy, and adaptability remains irreplaceable. Supporting emergency physicians in honing these abilities is essential not only for patient safety but also for the sustainability and humanity of the profession itself.

1. CONFLICT OF INTERESTS

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