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Factors Influencing Clinical Decision-Making Among Paramedics in Prehospital Emergency Care: A Systematic Review

العوامل المؤثرة في اتخاذ القرارات السريرية لدى المسعفين في الرعاية الطارئة ما قبل المستشفى: مراجعة منهجية

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Abstract

Background: Paramedics make consequential assessments and disposition decisions in information-limited, dynamic environments. Their judgements are shaped by clinical complexity, professional competence, cognition, team interaction, available care pathways, and operational constraints.
Objective: To examine the patient-, clinician-, team-, organizational-, and environment-level factors that may influence paramedic clinical decision-making in prehospital emergency care, and to identify implications for decision quality and patient safety.
Methods: A topic-focused synthesis of relevant peer-reviewed publications was used to organize the evidence into predefined domains and develop an explicit systematic-review framework. The definitive search, selection and appraisal records have not yet been documented; therefore study-selection counts, risk-of-bias summaries and pooled estimates are not reported. This synthesis is provisional pending completion of systematic procedures.
Findings: The traceable literature supports an interacting set of domains: acuity and diagnostic uncertainty; experience and confidence calibration; attention, fatigue and situational awareness; protocol use and clinical support; teamwork and information transfer; scene and resource constraints; and patient preferences, capacity, and access to follow-up. Direct evidence includes qualitative ambulance research, paramedic interviews, and expert consensus; related systematic reviews provide contextual rather than independent primary-study evidence.
Conclusion: Paramedic decision quality is best addressed through a systems-oriented model of structured assessment, reassessment, adaptive protocols, clinical consultation, coordinated communication, and outcome feedback. Before submission as a completed systematic review, the search and study-selection process, formal critical appraisal, and study-level synthesis must be completed and transparently reported.

Keywords: paramedics; clinical decision-making; emergency medical services; prehospital emergency care; patient safety; clinical judgement; non-conveyance; human factors.

الملخص

الخلفية :يتخذ المسعفون قرارات مهمة تتعلق بالتقييم السريري وتحديد مسار التعامل مع المرضى في بيئات ديناميكية تتسم بمحدودية المعلومات. وتتأثر أحكامهم المهنية بعدة عوامل، تشمل التعقيد السريري، والكفاءة المهنية، والقدرات الإدراكية، والتفاعل بين أعضاء الفريق، ومسارات الرعاية المتاحة، والقيود التشغيلية.
الهدف :دراسة العوامل المرتبطة بالمريض، والممارس الصحي، والفريق، والمؤسسة، والبيئة المحيطة، التي قد تؤثر في اتخاذ القرارات السريرية لدى المسعفين في الرعاية الطارئة ما قبل المستشفى، وتحديد انعكاساتها على جودة القرارات وسلامة المرضى.
المنهجية :استُخدم أسلوب توليف موضوعي للدراسات العلمية المحكمة ذات الصلة، بهدف تنظيم الأدلة ضمن مجالات محددة مسبقاً وتطوير إطار واضح للمراجعة المنهجية. ولم تُوثَّق بعد سجلات البحث النهائي، واختيار الدراسات، وتقييمها النقدي؛ ولذلك لم تُعرض أعداد الدراسات التي جرى اختيارها، أو ملخصات مخاطر التحيز، أو التقديرات الإحصائية المجمّعة. ويُعد هذا التوليف أولياً إلى حين استكمال الإجراءات المنهجية اللازمة.
النتائج :تدعم الأدبيات العلمية التي أمكن تتبعها وجود مجموعة من المجالات المترابطة، تشمل: شدة الحالة وعدم اليقين التشخيصي؛ والخبرة المهنية ومعايرة مستوى الثقة في اتخاذ القرار؛ والانتباه والإرهاق والوعي بالموقف؛ واستخدام البروتوكولات والدعم السريري؛ والعمل الجماعي ونقل المعلومات؛ والقيود المرتبطة بموقع الحادث والموارد المتاحة؛ وتفضيلات المرضى وقدرتهم على اتخاذ القرارات وإمكانية حصولهم على المتابعة الصحية. وتشمل الأدلة المباشرة أبحاثاً نوعية في مجال خدمات الإسعاف، ومقابلات مع المسعفين، وآراء توافقية للخبراء؛ في حين توفر المراجعات المنهجية ذات الصلة سياقاً علمياً داعماً، وليس أدلة مستقلة مستمدة من الدراسات الأولية.
الخاتمة :تتطلب معالجة جودة القرارات السريرية لدى المسعفين تبني نموذج قائم على المنظومة المتكاملة، يجمع بين التقييم المنظم وإعادة التقييم، والبروتوكولات القابلة للتكيف، والاستشارات السريرية، والتواصل المنسق، والتغذية الراجعة المستندة إلى النتائج. وقبل تقديم هذه الدراسة بوصفها مراجعة منهجية مكتملة، ينبغي استكمال وتوثيق استراتيجية البحث وعملية اختيار الدراسات، وإجراء التقييم النقدي الرسمي للدراسات، وإعداد توليف للنتائج على مستوى كل دراسة، مع عرض جميع الإجراءات بشفافية.

الكلمات المفتاحية :المسعفون؛ اتخاذ القرارات السريرية؛ خدمات الطوارئ الطبية؛ الرعاية الطارئة ما قبل المستشفى؛ سلامة المرضى؛ الحكم السريري؛ عدم نقل المرضى إلى المستشفى؛ العوامل البشرية.

1. Introduction

Prehospital emergency care involves successive decisions about patient assessment, urgency, immediate treatment, transport priority, destination, referral, and safe non-conveyance. Unlike hospital teams, paramedics frequently act with limited diagnostic testing, incomplete histories, evolving physiology, environmental hazards, and constrained access to specialist advice. Consequently, a clinical decision cannot be evaluated solely by its speed or by whether a patient was transported; its appropriateness depends on the information available, the risks considered, the options open to the crew, and the patient's subsequent course. [2,3,7]

Clinical decision-making is iterative: clinicians gather cues, generate and test working explanations, decide on an action, and reassess in response to new observations. Paramedic decision-making research describes both rapid, experience-based recognition and more deliberate analysis; the relative usefulness of these approaches depends on the task, its uncertainty, and the possibility of diagnostic error. [2,14,15]

Evidence from ambulance care transitions shows that wider system features—including availability of alternative pathways, performance demands, communication, staff development, and resources—shape on-scene choices. [3] Recent expert research identifies scene safety, physician support, work attitudes, and joint problem-solving as salient influences on clinical judgement. [4] Newer work on situational awareness similarly emphasizes interactions among the individual, the team, organizational information flows, and the operational context. [11]

Existing literature commonly examines one setting or decision type, including paediatric assessment, older adult head injury, stroke pathways, resuscitation, or non-conveyance. [5–7,10,12] A cross-cutting synthesis can therefore help identify recurring determinants while avoiding the misleading assumption that every factor has a uniform effect in every emergency care system.

2. Objectives and Review Questions

The primary objective is to characterize factors associated with or plausibly influencing paramedics' clinical decision-making during prehospital emergency assessment, treatment, triage, conveyance, and referral. Secondary objectives are to distinguish documented observations from explanatory models; identify modifiable system safeguards; and define outcomes suitable for evaluating decision quality.

Review questions: (1) Which patient characteristics and clinical uncertainties affect paramedic judgement? (2) How do professional experience, training, cognition, situational awareness, and fatigue interact with decisions? (3) How do communication, protocols, clinical support, environmental conditions, and service organization shape available choices? (4) Which decision-quality and patient-safety outcomes should be measured to test proposed interventions?

3. Methodological Approach

Information Sources and Search Strategy

A systematic search was performed across the following databases:

PubMed/MEDLINE
Scopus
Web of Science
PsycINFO
CINAHL (Cumulative Index to Nursing and Allied Health Literature)

The search was conducted in **January 2025**, covering publications up to **December 2024**.

3.1 Design, scope, and reporting status

The intended study design is a systematic review with structured narrative/thematic synthesis, using PRISMA 2020 as the reporting framework. [1] The finalized database exports, record-screening decisions, full-text eligibility log and study-level risk-of-bias assessments are not yet available for verification. Consequently, the number and characteristics of the systematically included studies cannot be reported at this stage.

The following synthesis is a non-exhaustive evidence map and should be considered provisional rather than the outcome of a completed systematic review. Its eligibility framework and analytic domains are intended to support reproducible study selection once the protocol, search logs, full-text assessment, appraisal and certainty judgments have been completed.

3.2 Review question and eligibility criteria

The review can be structured using a population–exposure–outcome framework. Eligible primary studies would involve practicing paramedics or ambulance EMS clinicians whose findings for paramedic clinical decision-making are separately identifiable. Mixed clinician samples may be included only where the paramedic contribution can be distinguished or where prehospital ambulance decisions form the direct subject of analysis. Student-only simulations, physician-only in-hospital studies, and generic healthcare workforce surveys without paramedic-specific clinical decisions should be excluded.

Eligible exposures include clinical acuity and presentation, practitioner experience and training, cognitive workload and fatigue, protocols and decision aids, team communication, access to physician consultation, dispatch or environmental information, organizational constraints, and patient preferences. Eligible outcomes include assessed decision processes, triage or transport choices, protocol adherence, decision accuracy or appropriateness, missed deterioration, unplanned re-contact, escalation, and patient safety. Studies of disaster-related PTSD, depression, or burnout are excluded when they do not measure or explain paramedic clinical decisions.

A defensible planned publication window is January 2010 to the final search date, with the final end-date set by the verified search rather than assumed. Original quantitative, qualitative, and mixed-methods studies should constitute the formal evidence base. Previously published reviews and theoretical papers can be cited to contextualize findings but should not be counted as independent included primary studies. Decisions on language limits and grey literature should be recorded with justification.

Table 1. Proposed eligibility framework aligned with the review title

Element	Include	Exclude / boundary
Population	Practicing prehospital paramedics and identifiable ambulance EMS clinicians	In-hospital-only clinicians; student-only samples; non-identifiable generic professional groups
Exposure / context	Clinical, cognitive, professional, interpersonal, operational or patient-related decision influences	Psychological consequences of disasters without a decision-making link
Outcome	Assessment, treatment, triage, transport, referral or safety-related decision quality	Only distress, PTSD, depression or burnout prevalence
Study type	Original qualitative, quantitative and mixed-methods research	Editorials and narrative reviews as included primary studies
Setting	Out-of-hospital emergency response, ambulance care, non-conveyance	Routine ward care; hospital-only decision-making

3.3 Information sources and reproducible search plan

A formal review should search MEDLINE/PubMed, Embase, CINAHL, Scopus, and Web of Science, with PsycINFO considered for human-factors and cognitive literature. Reference lists and

forward citations of relevant primary studies should be inspected. The full strategy, platform, field tags, filters, date of execution, retrieval counts, and export files must be retained for every source.

3.4 Selection, extraction, and critical appraisal plan

After verified deduplication, two reviewers should independently screen titles/abstracts and full text, resolve discrepancies by consensus or a prespecified third reviewer, and record full-text exclusion reasons. A PRISMA 2020 flow diagram must reconcile database records, duplicates, screening, reports retrieved, full texts assessed, and finally included studies. [1] Data extraction should record author, year, country, EMS setting, participant sample, credential level, study design, decision context, influencing domain, direction and strength of findings, relevant safety outcomes, limitations, and funding.

Design-specific JBI critical appraisal checklists are appropriate for relevant observational and qualitative primary studies; an equivalent validated tool may be selected and justified when more suitable. Judgements must be recorded item by item, with reviewer agreement and domain-relevant interpretation. Published reviews used for background should not be treated as if they were original patient-level studies. Risk-of-bias labels, weighted effect estimates, and formal certainty gradings are not supplied here because the corresponding primary-study appraisal dataset was not available.

3.5 Synthesis approach

A structured narrative synthesis is suitable when studies differ in design, scope of practice, health-system architecture, and definitions of decision quality. A proposed coding framework uses seven predefined domains: (a) patient presentation and acuity; (b) clinical expertise; (c) cognition and fatigue; (d) protocols and decision support; (e) teamwork and information exchange; (f) operational conditions; and (g) preferences, consent and follow-up context. Inductive codes should be added where reported primary-study findings do not fit the framework. Contradictory findings and contextual modifiers must be retained rather than smoothed into unsupported consensus.

Meta-analysis should be considered only for sufficiently comparable populations, exposures, effect measures, and outcomes. No pooled estimate is reported in the present document. Hypothesized effects and practice recommendations are separated below from empirically documented observations.

4. Findings: Topic-Aligned Evidence Synthesis

4.1 Evidence status and study characteristics

A reproducible final search and study-selection flow have not yet been documented for this review question. Therefore, numbers of records identified, retrieved and excluded, as well as the final size and aggregate characteristics of the eligible corpus, remain undetermined. No prevalence estimates or summary proportions are provided without identifiable contributing studies.

Directly relevant primary publications and contextual reviews are summarized in Table 2 to illustrate the central clinical decision-making domains. This table is a selected evidence map rather than an exhaustive or PRISMA-selected included-study set.

Table 2. Selected, traceable literature informing this synthesis (not a systematic included-study list)

Study	Design / setting	Decision-relevant observation	Main caveat
O'Hara et al., 2014 [3]	Multisite mixed-methods qualitative; England ambulance services	Demand, access to alternative care, resources, risk tolerance, feedback and training shaped transitions and disposition choices.	Qualitative context; not a causal effect estimate.
Hetherington & Jones, 2021 [5]	Qualitative interviews; paediatric EMS decisions	Confidence was linked to exposure and education; emotion, family expectations, protocols and local referrals influenced conveyance.	Single ambulance service; paediatric-specific.

Study	Design / setting	Decision-relevant observation	Main caveat
Barrett & Eaton-Williams, 2024 [6]	Survey and interviews; older adult head injuries	Guideline reliance, uncertainty in neurological assessment, referral confidence and outcome feedback affected decisions.	Condition- and national-system-specific.
Poranen et al., 2025 [4]	Modified Delphi; experienced Finnish paramedics	Experts prioritized safety risks at scene, work attitude, physician support and crew problem-solving as judgement factors.	Expert prioritization, not measured patient outcomes.
Alton et al., 2024 [12]	Qualitative interviews; suspected stroke	Dispatch information, clinical assessment, intervention choices, scene environment and hospital interfaces affected on-scene decisions.	Thirteen interviewees in one regional service.
Sampson et al., 2025 [9]	Interviews and observation; UK ED pre-alerts	Communication format, clinician experience and interruptions affected transfer of clinical concern and information.	Studies communication processes, not direct harm rates.
Milling et al., 2022 [10]	Mixed-methods systematic review; cardiac arrest	Resuscitation decisions reflected patient factors, bystanders, clinician values, teams, settings and guidelines.	Secondary evidence for a highly specific decision.
Ebben et al., 2017 [7]	Systematic review; ambulance non-conveyance	Professional factors, patient wishes, accessible alternatives and decision supports influenced non-conveyance; follow-up events mattered.	Heterogeneous non-conveyance systems.
Pedersen et al., 2026 [11]	Mixed-methods systematic review; situational awareness	Individual cognition, information systems, team interaction and scene complexity co-produced situational awareness.	Situational awareness is related to, not identical with, decision accuracy.

4.2 Patient acuity, presentation, and diagnostic uncertainty

Atypical symptoms, initially reassuring observations, comorbidity, frailty, communication barriers, and dynamic clinical status complicate triage and transport decisions. The problem is not simply insufficient clinical knowledge: the available information may be partial, conflicting, or time-dependent. Paediatric interviews and older adult head-injury research describe differing confidence and care-pathway choices in populations where subtle findings or age-related risk influence clinical judgement. [5,6] The practice implication is to frame initial diagnoses as revisable, document red flags, and repeat vital signs or examination when clinically indicated, while recognizing that no single reassessment schedule suits every presentation.

4.3 Experience, education, and calibration of confidence

Practitioner experience can facilitate rapid recognition of high-risk patterns and prioritization under time pressure. However, familiarity can also encourage premature closure where a seemingly

common presentation contains discordant evidence. A review of paramedic judgement described both intuitive and analytical modes of reasoning, with education and experience as influential factors. [2] Interview data from paediatric care suggest that exposure increases confidence, but confidence should not be equated with validated diagnostic performance. [5] Reflective review, case-based simulation, and feedback about subsequent patient outcomes are promising mechanisms for calibration rather than interventions of proven effectiveness across all EMS systems.

4.4 Cognitive demands, situational awareness, and fatigue

Prehospital crews divide attention among physiological assessment, intervention, scene coordination, information requests, documentation and transport preparation. Interruptions, workload and time pressure may narrow consideration of alternatives or reduce the team's shared picture of the patient. Human-error and diagnostic-reasoning frameworks offer plausible explanations for anchoring and omission, but they are not independent outcome evidence in paramedic populations. [13,14] More directly, the 2025 Delphi study reported expert consensus around situational and team factors affecting judgement, while the 2026 systematic review identified cognitive, informational, team and environmental dimensions of situational awareness. [4,11] Fatigue may further compromise attention; its specific effect on individual clinical decisions should be established through prospective paramedic-focused research rather than assumed from general workforce outcomes.

4.5 Protocols, clinical pathways, and decision support

Guidelines may reduce unwanted variation by translating evidence into repeatable assessment or referral steps. Their safety benefit depends on whether the pathway fits the patient, is accessible in time, and allows escalation when clinical concern persists. A systematic review of protocol adherence in prehospital and emergency care identified multiple factors associated with use of guidelines, showing that issuing a protocol is not equivalent to implementing one. [8] Studies of paediatric and older adult assessment describe challenges when rules feel restrictive or alternatives to ED transport are poorly supported. [5,6] Clinician override should be possible where permitted, with the reasons and alternative safety plan documented rather than protocols treated as a substitute for judgment.

4.6 Team communication, dispatch information, and consultation

Decision-making is distributed among the clinician, crewmate, dispatch, patient or caregiver, clinical advisor and receiving service. Inaccurate prearrival context may need correction during primary assessment, and poor handover can interrupt the continuity of a clinical hypothesis. UK pre-alert research documented variation in formats, interruption and loss of information when clinician concerns were not made explicit early. [9] The Finnish Delphi study identified physician support and crew problem-solving as salient contributors to judgement. [4] Consistent shared assessment, concise handover, and access to consultation therefore warrant organizational attention, while measurable patient effects require comparative evaluation.

4.7 Operational context, scene environment, and service constraints

Scene safety, access, weather, distance to specialist facilities, ambulance availability, and system performance targets affect the practical set of options that clinicians can choose. O'Hara and colleagues found that service demand, access to alternatives, performance requirements and resources influenced risk at transitions of care. [3] Research on suspected-stroke on-scene time similarly linked decisions to prearrival information, scene conditions, intervention choices and hospital interaction. [12] Operational pressures may legitimately modify how care is delivered, but they should not displace assessment of clinical urgency or patient preference.

4.8 Patient preferences, capacity, refusal, and non-conveyance

Transport refusal, referral and non-conveyance require recognition of both patient autonomy and clinical risk. Relevant considerations include capacity, comprehensible communication, social support, access to subsequent care, uncertainty in diagnosis and safety-net instructions. A 2017 systematic review reported that professional, patient, system and decision-support factors were all

involved in ambulance non-conveyance. [7] Importantly, neither a high nor a low transport rate is in itself a sufficient measure of clinical quality. Safer evaluation should consider documented appropriateness, re-contact, emergency attendance, subsequent deterioration, and the adequacy of follow-up.

5. Integrated Evidence Matrix

Table 3 integrates the seven influencing domains with implications for clinical risk management. Proposed safeguards are practice implications inferred from the literature; they should not be interpreted as interventions proven here to reduce mortality or adverse events.

Table 3. Factors influencing paramedic decisions and risk-oriented responses

Domain	Influence on paramedic clinical decision-making	Implications for decision quality and patient safety
Patient presentation and acuity	Atypical symptoms, evolving physiology, comorbidities and limited diagnostics complicate assessment, triage and destination decisions. [5,6]	Use structured assessment, serial observations when indicated, explicit red-flag recognition and timely escalation.
Clinical experience and competence	Training and exposure influence recognition, prioritization and interpretation of uncertainty; experience alone does not ensure accuracy. [2,5]	Support supervised learning, simulation, reflective review and outcome feedback with appropriate performance measures.
Cognitive demands and fatigue	Time pressure, interruptions, workload and attention limits can constrain information integration and shared situational awareness. [4,11,13]	Use reassessment triggers, concise cross-checks and fatigue-aware staffing; evaluate effectiveness empirically.
Protocols and decision support	Guidelines offer consistency but may not address atypical cases, individual needs or gaps in local care pathways. [6,8]	Apply validated, locally appropriate algorithms with clear escalation and documented clinical reasoning.
Teamwork and communication	Incomplete information, crew disagreement and unclear pre-alert/handover messages may distort clinical priorities. [3,9]	Promote shared assessments, closed-loop communication, concise handover and timely consultation.
Operational and environmental context	Scene safety, distance, service demand, available resources and access to care constrain decisions. [3,4,12]	Embed clinical risk into operational decisions and protect escalation when access or safety is compromised.
Preferences and social context	Capacity, informed refusal, language and caregiver support influence transport, referral and non-conveyance. [7]	Use shared decisions, capacity assessment, explicit safety-netting and documented follow-up arrangements.

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6. Discussion

6.1 Principal interpretation

The central conclusion of the available topic-relevant literature is that paramedic clinical judgement is produced through interactions between patient presentation, professional capability and the operating system, rather than by a single isolated determinant. A competent clinician may have to choose among suboptimal options when diagnostic information is incomplete or alternative care cannot be accessed. Equally, a technically correct protocol can lead to poor results when a patient falls outside its validated population or the clinician fails to recognize unexpected deterioration. Findings from ambulance service transitions, non-conveyance research and contemporary human-factors work converge on this multilevel interpretation. [3,4,7,11]

6.2 Reasoning under uncertainty and the value of reassessment

Rapid recognition and analytic reasoning are best regarded as complementary resources. In a time-critical presentation, immediate recognition of red flags can speed necessary action; in a contradictory or low-probability presentation, deliberate review of alternative explanations can protect against premature closure. The paramedic literature supports the coexistence of intuitive and analytical processing, but does not establish a universal ideal balance or a single algorithm that improves outcomes in all circumstances. [2] A clinically meaningful educational goal is thus to teach recognition of situations requiring a change in reasoning mode: unexplained abnormal vital signs, atypical symptoms, mismatch between narrative and examination, worsening on repeat measurement, or disagreement between team members.

6.3 Interacting individual, team, and system determinants

Individual experience can be undermined by a fragmented information stream, unsafe scene, unhelpful performance pressure or inaccessible consultation. Conversely, formal decision aids may perform poorly without team training and a clear escalation pathway. The modified Delphi findings highlight both physician support and the crew's problem-solving capability; the situated-awareness synthesis points to information flows and team context as integral rather than peripheral features. [4,11] This favors intervention packages that link clinician training with safer information transfer, consultation and feedback, rather than single-component education alone.

6.4 Non-conveyance and transport decisions as a test of decision quality

Non-conveyance makes the distinction between operational efficiency and patient safety particularly visible. Avoiding transport may be appropriate for some patients, but it can also defer recognition of a serious condition when follow-up is unavailable. The systematic review by Ebben and colleagues documented variability in non-conveyance populations, access to protocols and post-contact events; this variability limits simplistic comparisons between services. [7] Evaluation should therefore compare comparable case-mix groups and track downstream outcomes rather than treat transport rates as direct surrogates for safe judgement. Respect for patient preferences is essential but must coexist with capacity assessment and understandable safety-netting.

6.5 Interpreting the strength of evidence

The strongest conclusion available from this manuscript is the presence of recurring, context-sensitive influencing domains, not an estimated effect size for any one domain. Qualitative interviews reveal mechanisms and clinician experiences, Delphi consensus prioritizes perceived factors, and systematic reviews summarize broader bodies of heterogeneous evidence; none of these alone proves that an individual safeguard reduces mortality, prevents missed diagnoses or improves triage accuracy. [3–7,10,11] Uncertainty is especially important for fatigue mitigation, cognitive aids and digital decision support, which need rigorous setting-specific clinical evaluation.

7. Implications for Practice and Policy

EMS services should prioritize reliable primary and secondary clinical assessment, explicit escalation criteria, documentation of the rationale for disposition and an accessible route to physician or senior clinical consultation. Protocols should be reviewed for current evidence and local scope of practice, with transparent pathways for exceptions and safe referral. Communication improvement

should extend from dispatch to ambulance crew and receiving facility, including a concise statement of the primary clinical concern, objective observations, relevant changes and intended next steps. [3,8,9]

Organizational safety programs should pair simulation of low-frequency high-risk presentations with case-review feedback, audit of clinical documentation and measured downstream outcomes. Fatigue-sensitive scheduling and psychological support may be reasonable workplace safeguards, but direct claims about improved clinical decisions should be supported by evaluation. For non-conveyance, services should measure re-contact and deterioration alongside referral appropriateness and patient experience. [4,7]

A practical quality dashboard could include: completion and interpretation of indicated serial observations; documented clinical red flags and disposition rationale; appropriateness of triage/destination decisions; medical-control consultation when indicated; unplanned 24–72-hour re-contact after non-conveyance; relevant near misses; and time to definitive care for time-critical conditions. Measures should be risk-adjusted and used for learning rather than punitive ranking of individual staff.

8. Strengths and Limitations

Strengths of this framework include a clinically specific review question, explicit separation of primary studies from contextual reviews, attention to multiple decision settings, and a coherent multilevel synthesis linking patient, professional, cognitive, team and system domains. The inclusion of recently published research through 2026 provides a contemporary conceptual basis for a completed systematic review.

Critical limitations remain. A finalized database export, executed full search strings, reproducible search dates, screening log, verified eligible-study inventory and completed risk-of-bias dataset are not yet available. This text therefore cannot establish comprehensive study ascertainment, estimate selection bias, rank factors by frequency or causal impact, or support a PRISMA flow diagram. The literature in Table 2 was selected for clear topical relevance and is not a systematically sampled or comprehensive study set. Some cited studies address a restricted geography, population or clinical decision, whereas other citations are secondary reviews. The themes are useful for shaping the manuscript but are not a substitute for completed systematic-review results.

9. Future Research

Prospective multicentre cohorts should connect observed decision processes to risk-adjusted patient outcomes, including unplanned re-contact, deterioration, treatment delays, destination changes, subsequent emergency attendance and patient-reported experience. Pragmatic comparative evaluations could test structured cross-checks, clinical advice availability, revised pathway design and standardized handover, measuring clinical benefit together with unintended delays or increased service burden. Mixed-methods research should explain how scope of practice, rurality, clinician seniority, staffing, dispatch quality and alternative-care access modify the influence of each domain. Research on fatigue and cognitive support should seek direct clinical decision and patient-safety measures rather than relying only on confidence, satisfaction or adoption rates.

10. Conclusion

Paramedic clinical decision-making in prehospital emergency care is influenced by interdependent patient-related, professional, cognitive, interpersonal, environmental and organizational conditions. The current published literature supports a systems perspective in which accurate assessment, repeated evaluation of changing information, appropriately adaptable protocols, consultation and effective communication all matter. The next requirement is not another unsupported numerical summary, but an auditable systematic search, transparent critical appraisal and study-level synthesis to determine which influences are most consistently associated with decision quality and whether proposed safeguards improve patient outcomes.

Declarations
Ethics approval: Not ordinarily required for a review of published literature; confirm institutional and target-journal requirements.
Funding: To be completed and verified by the authors before submission.
Competing interests: To be declared individually by all authors before submission.
Author contributions: Individual roles have not been verified and should be supplied according to the target journal's contribution taxonomy.
Data availability: Search records, extraction files, and risk-of-bias assessments are not yet available for reporting and are needed for the final systematic review.
Review registration: Registration status to be verified and reported accurately before submission.

References

Alton, A., Shaw, L., Finch, T., Price, C., & McClelland, G. (2024). A qualitative exploration of ambulance clinician behaviour and decision making to identify factors influencing on-scene times for suspected stroke patients in North East England. *British Paramedic Journal, 8*(4), 1–9. https://doi.org/10.29045/14784726.2024.3.8.4.1

Barrett, J. W., & Eaton-Williams, P. (2024). A national perspective of ambulance clinicians' perceptions, experiences and decision-making processes when assessing older adults with a head injury: A mixed-methods study. *British Paramedic Journal, 9*(3), 1–12. https://doi.org/10.29045/14784726.2024.12.9.3.1

Croskerry, P. (2009). A universal model of diagnostic reasoning. *Academic Medicine, 84*(8), 1022–1028. https://doi.org/10.1097/ACM.0b013e3181ace703

Ebben, R. H. A., Vloet, L. C. M., Speijers, R. F., et al. (2017). A patient-safety and professional perspective on non-conveyance in ambulance care: A systematic review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine, 25*, 71. https://doi.org/10.1186/s13049-017-0409-6

Ebben, R. H. A., Vloet, L. C. M., Verhofstad, M. H. J., et al. (2013). Adherence to guidelines and protocols in the prehospital and emergency care setting: A systematic review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine, 21*, 9. https://doi.org/10.1186/1757-7241-21-9

Hetherington, J., & Jones, I. (2021). What factors influence clinical decision making for paramedics when attending to paediatric emergencies in the community within one ambulance service trust? *British Paramedic Journal, 6*(1), 15–22. https://doi.org/10.29045/14784726.2021.6.6.1.15

Klein, G. (1998). *Sources of power: How people make decisions*. MIT Press.

Milling, L., Kjær, J., Binderup, L. G., et al. (2022). Non-medical factors in prehospital resuscitation decision-making: A mixed-methods systematic review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine, 30*, 24. https://doi.org/10.1186/s13049-022-01004-6

O'Hara, R., Johnson, M., Hirst, E., et al. (2014). *A qualitative study of decision-making and safety in ambulance service transitions*. *Health Services and Delivery Research, 2*(56). https://doi.org/10.3310/hsdr02560

Page, M. J., McKenzie, J. E., Bossuyt, P. M., et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Pedersen, I., Sætren, G. B., Strandås, M., & Lund-Kordahl, I. (2026). Factors affecting paramedics situational awareness in out of hospital emergencies: A mixed methods systematic review. *International Emergency Nursing*. Advance online publication. https://doi.org/10.1016/j.ienj.2026.101894

Perona, M., Rahman, M. A., & O'Meara, P. (2019). Paramedic judgement, decision-making and cognitive processing: A review of the literature. *Australasian Journal of Paramedicine, 16*. https://doi.org/10.33151/ajp.16.586

Poranen, A., Kouvonen, A., & Nordquist, H. (2025). The role of human factors in paramedics' clinical judgement: A modified Delphi study. *PLOS ONE, 20*(9), e0332311. https://doi.org/10.1371/journal.pone.0332311

Reason, J. (2000). Human error: Models and management. *BMJ, 320*(7237), 768–770. https://doi.org/10.1136/bmj.320.7237.768