

Dealing With The Unexpected in Prehospital Patientcare: The Lived Experience Of EMS Clinicians

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Abstract

Background In prehospital patient care, numerous patients are examined, treated, and transported. Some are acutely seriously ill, while others, though not acutely ill, necessitate ambulance transport due to their inability to do so independently. Among the latter group, patients may be sicker than initially estimated.

Objective This study aims to delineate the course of action for EMS clinicians during ordered transport, particularly in recognizing acutely ill patients within this context. It investigates the clinician's response to unexpected situations and the associated learning process, encompassing both formal and informal aspects.

Method Employing a phenomenology-based approach, a detailed description of the lived experiences of EMS clinicians was constructed.

Conclusion The lived experiences of EMS clinicians reveal a dynamic and resilient process when confronted with patients appearing sicker than initially reported. They employ strategic preparations and tools like the Patient Assessment Triangle to identify discrepancies. Coping involves continuous adaptation, relying on critical thinking amidst various influencing factors. Assessment of critically ill patients emphasizes flexibility and constant treatment plan adjustments. Acknowledging the complexity of pre-hospital care, adaptive decision-making and intuition play a crucial role in uncertain scenarios. EMS clinicians prioritize patient safety, integrating it into their daily practice. Despite limited explicit references to "patient safety," it's a fundamental aspect. Their resilience in navigating unforeseen challenges underscores their dedication to providing optimal care. This resilience, often overlooked amidst a focus on errors, is a significant attribute worth learning from. Through daily practice, EMS clinicians consistently strive to deliver the best and safest care to their patients, exemplifying commitment and adaptability in the face of complexity.

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Contents

Introduction	6
Existing literature.....	8
Complexity and (prehospital) healthcare.....	8
Dealing with complexity – resilience and resilience engineering	9
Dealing with complexity – Resilience in healthcare	10
Human factors in EMS	12
Methods	16
Methodology and analytical perspective.	16
Participant observation	16
Interviews.....	17
Analytical strategy	18
Description and selection of participants.....	19
Research ethics	21
Validity and reliability	21
Limitations.....	24
Results	26
Normal performance	26
Dealing with the unexpected.....	28
Performance influencing factors.....	33
Learning and expertise.....	36
Rich descriptions.....	39
Standing procedure for ordered transport	39
Discussion.....	44
Conclusion	50
References.....	51

Table of Figures

Table 1 Participants interviews	20
Table 2 Participants observations	20
Table 3 Member check interviews	22
Table 4 Member check fieldnotes observations	23
Table 5 Member check findings	23
Table 6 Performance influencing factors	46
Table 7 Informal learning	48
Figure 1 Steps for the qualitative research	11
Figure 2 Model of recognition-primed decision making	13
Figure 3 Universal model of clinical reasoning	14
Figure 4 Steps for the qualitative research	16
Figure 5 Analytical process	18
Figure 6 Primary and secondary survey	30

Introduction

This research is about the action, response, and adaptation by Emergency Medical Service (EMS) clinician in the context of pre-hospital health care. A phenomenology-based approach is employed to examine the lived experiences of EMS clinicians, including their cognitive processes and decision-making in managing evolving patient conditions. To make sense of this topic, a broader, empirical, and theoretical framework is outlined within this study. By integrating different perspectives, both from theory as well as practise, this research aims to deepen the understanding of how EMS clinicians navigate and respond to patients presenting with worsening health conditions, ultimately contributing to improved patient care and safety.

In practice on an Advanced Life Support ambulance (ALS), the EMS clinician is engaged in providing patient care on a daily basis. The care provided has a broad scope, encompassing the complete care process for a diverse group of patients, ranging from infants to geriatric patients. Prehospital patient care is complex (Misasi & Keebler, 2017, p.1), no patient or situation is identical. This context creates constantly changing variables. The complexity of prehospital care necessitates that EMS clinicians remain constantly vigilant for changes and unexpected, extraordinary situations. For example, treating a patient who is trapped in a car lying upside down in a trench. In the aforementioned situation and in other situations where the patient is critically injured or ill, the EMS clinician is prepared for changes. He expects changes and will be focused on changes in patient, and in the environment.

In addition to treating urgent, sick, or critically injured patients, the EMS clinician also attend to patients who may not be acutely critically sick but are still very ill. This category of patients is not transported urgently or under time pressure. The transports (mostly) have a predetermined time and are being done without any form of urgency. This category is called ordered transport.

Ordered transport refers to ambulance transport in which patients are transported from point A to B without medical urgency or time pressure because they are not acutely critically sick. Examples of ordered transport include patients presented by the GP at the hospital or patients travelling from home to outpatient appointments, undergoing radiation therapy, chemotherapy or kidney dialysis. These people are bedridden or too sick to use personal transport. On average, EMS Flevoland en Gooi & Vechtstreek performs 9,932 ordered transports annually (Ambulancezorg Nederland, 2022).

While this category of patients is typically not life-threateningly ill, what if the patient turns out to be sicker than initially reported? How is this recognized, and when recognized, how is the follow-up? What mechanisms ensure recognition of a sick patient when not expected, what are the

barriers and enablers? Of a total of 9,932 ordered transports (Ambulancezorg Nederland, 2022), an average of 89 patients¹ (0.90%) shift from a non-urgent indication (ordered transport) to an emergency indication and are registered in the patient data system. This is reflected in the patient registration database of the EMS service Flevoland and Gooi & Vechtstreek.

The phenomenon of recognizing and reacting to unexpected changes is familiar to every EMS clinician. How do EMS clinicians recognize these specific situations? How do they react, adapt and learn from it? How do they experience these situations? Is it something they are always vigilant for? Are there different ways of dealing with these unexpected and extraordinary situations? There are different ways worldwide of organizing pre-hospital patient care. In the Netherlands, a nurse-driven system is employed. In international literature, ambulance staff are referred to as EMS clinicians. Therefore, in this thesis, the term EMS clinician is adopted. Most of the literature on medical work focusses on staff-patient interaction. Rather than staff-patient work this thesis focusses on exploring the lived experience of EMS clinicians. Exploring the possibilities, understandings, and wisdom of the practitioners when it comes to recognising, reacting, and adapting to unexpected situations.

The aim of this research is to acquire insight and understanding in the role EMS clinicians play in upholding prehospital patient safety. The research revolves around the central question:

Based on the lived experience of EMS clinicians what does an EMS clinician do when a patient appears to be sicker than was indicated in the initial call?

¹ Measured over the year 2022. It includes ambulance rides issued by the dispatch centre as ordered transport (B) and changed to an A1 by the ALS team

Existing literature

Complexity and (prehospital) healthcare

'Healthcare' is a very broad term. This is motivated by the fact that healthcare consists of many different components. There are components that provide preventive care, such as social medicine and public healthcare. Different parts of the healthcare system provide direct care, such as the general practitioner, dentist, pharmacy, and ambulance care. In the Netherlands, there is also specialist care available which can only be consulted after a referral from, for example, a general practitioner. The number of agents that interact and adapt to each other within the same context means that healthcare can be seen as a complex system (Braithwaite et al., 2017; Braithwaite et al., 2018; Gomersall, 2018; Khan et al., 2018; Ratnapalan & Lang, 2019).

Complexity shows itself across the different layers of healthcare, macro, meso as well as on a micro level. Not only healthcare as at all levels as systems within a system (macro), but also pre-hospital emergency care (meso) and ultimately the work performed at the patient (micro) can be defined as being complex (Misasi & Keebler, 2017, p.1). The term complexity is very difficult to define (Hollnagel, 2012). The meaning of the term has changed over the years due to the exponential increase of technology and technological capabilities. For this reason, multiple definitions can be found to describe complexity. Hollnagel (2012) provides a useful definition for complexity as "a measure of the number of possible states a system can take, or as the condition of a system, situation, or organization that is integrated with some degree of order, but with too many elements and relationships to be understood in simple analytic or logical ways (p.200). In addition to not being able to entirely understand a complex system logically or analytically, it is very difficult, if not impossible, to be able to predict what will happen within a complex system (Hollnagel, 2012). This characteristic necessitates new ways of dealing with and adapting to this change, variability, and uncertainty. One way to deal with complexity in practice is resilience engineering (RE). This topic will be discussed later.

Complex systems are difficult to control; the more complex, the harder they will be to control. In industrial safety Perrow (1999, p. 332) even argues that it is impossible to control complex systems that are tightly coupled. Major failure is waiting to happen; this is because complex systems have a nature to be inherently hazardous in and of themselves (Cook, 2000). There are multiple ways in which a complex system can fail. Woods & Branlat (2011) identified three patterns for complex systems to fail: First, a system can decompensate and therefore lose the ability to adapt to challenges. Second, the roles within the system can be locally adaptive but be maladaptive on a global scale. Third, a complex system can stick too long with old, outdated behaviour. Complex systems are prone to failure and therefore require constant adapting, adjusting, and re-focusing. There are several

different views on how to deal with complexity, one of which is to create resilience as a system property through resilience engineering (RE), which will be discussed below.

Dealing with complexity – resilience and resilience engineering

The challenges of complexity and how to cope with increasing complexity is a long-standing problem (Rasmussen & Lind, 1981; Woods, 1988). During the period 1980's-1990's the problem of complexity in a socio-technical environment began to be addressed by a group of scientists with a “new” view on safety. Hollnagel, Rasmussen, Woods and others started Cognitive Systems Engineering (CSE). CSE focuses on understanding how people interact with technology and how to design systems that improve human performance, safety, and satisfaction. This approach recognizes that people are an integral part of any system, and that the design of the system must take into account human capabilities, limitations, and expectations. CSE also emphasizes considering the context in which the system will be used, including the physical, social, and organizational environment (Smith & Hoffman, 2018). The idea for Resilience Engineering (RE) is derived from CSE and can therefore be seen as a continuation of the general ideas of cognitive systems engineering (Le Coze, 2022).

RE is a relatively new research field. In 2004, the first Resilience Engineering Association Symposium was held in Soderkoping. The aim of that symposium was to reconsider risk and safety in a fast-changing socio-technical world. A world which is becoming increasingly complex (Patriarca, 2021). The belief was that a different view of safety was necessary to achieve safety. “In a world of finite resources, of irreducible uncertainty, and of multiple conflicting goals, safety is created through proactive resilience processes rather than through reactive barriers and defences” (Hollnagel et al., 2006, p. 3) a new focus that now can be seen as a paradigm shift (Patriarca et al., 2018).

One of the foundations of RE is based on ‘the idea that safety lies in the capacity of people, teams, and organizations to make things go right – even under varying circumstances..... therefore we need to learn why things go right and find out what we can do to make it even better. Safety is not about the absence of negatives; it is about the presence of capacities’ (Dekker, 2019, p. 392). Traditionally, the attention and focus of safety science was on failure and incidents, Hollnagel (2014) calls this focus safety-I. It is much more interesting to look why work goes well so often. The origin of a successful outcome can be often the same as that of an undesirable outcome. In hindsight, failure is easy to recognize, the reality of everyday work, the adjustments needed to make a system safe, are much more difficult to see (Hollnagel, 2014). This different way of looking at safety is what Hollnagel calls safety-II. Safety-II has another focus, it looks at both failure and incidents and at capacities of performance. Safety-II does not replace Safety-I.

“The object of resilience then becomes the capacity to adapt to such emerging risks in order to guarantee the success of the inherently risky system” (Bergström et al., 2015, p. 131). Resilience

offers an optimistic perspective for the sharp-end operator to create safety by adapting to risk (Bergström et al., 2015). Resilience is not only present at the individual level, Bergström & Dekker (2014) constructed resilience at 4 different scales: micro (human), meso (organization), macro (societal), and cross-scale (social-ecological). They suggest that the resilient subject can be studied within a model of complex adaptive systems, with resilience as an emergent system property. As a system property resilience can come in different forms. Woods (2015) describes four concepts for resilience: robustness, rebound to equilibrium, graceful extensibility, sustained adaptability. Hollnagel (2018) identified four potentials to create resilient performance. (1). The potential to react, to know what to do and how to react to changes, deviations, or opportunities. (2). The potential to monitor, to know what to look for to monitor the organization's performance, both the organization itself and the environment. (3). The potential to learn, learning from what is going on in the organization and learning from daily practice. (4). The potential to anticipate. Knowing what to expect and being able to anticipate future developments. The research field of RE is young and facing challenges. One of those is that the field of RE is strong in building theory, however, the empirical proving of those theories is often lacking (Righi et al., 2015). Also operationalizing RE brings its own challenges in how to operate and design resilient operations (Lay et al., 2015).

Dealing with complexity – Resilience in healthcare

As discussed earlier, healthcare is a complex system. Dekker et al. (2012) argue that in complex systems the traditional compliance-based approaches may not be suitable. In complex systems, order emerges from diverse responses rather than strict compliance with one best method. The study suggests that efforts to improve patient safety and quality in healthcare should embrace and celebrate diversity, acknowledging the contextual and contingent nature of clinical work. The authors caution against rigid adherence to universal rules in complex systems and advocate for recognizing the importance of local rationality and the constantly changing circumstances of healthcare work.

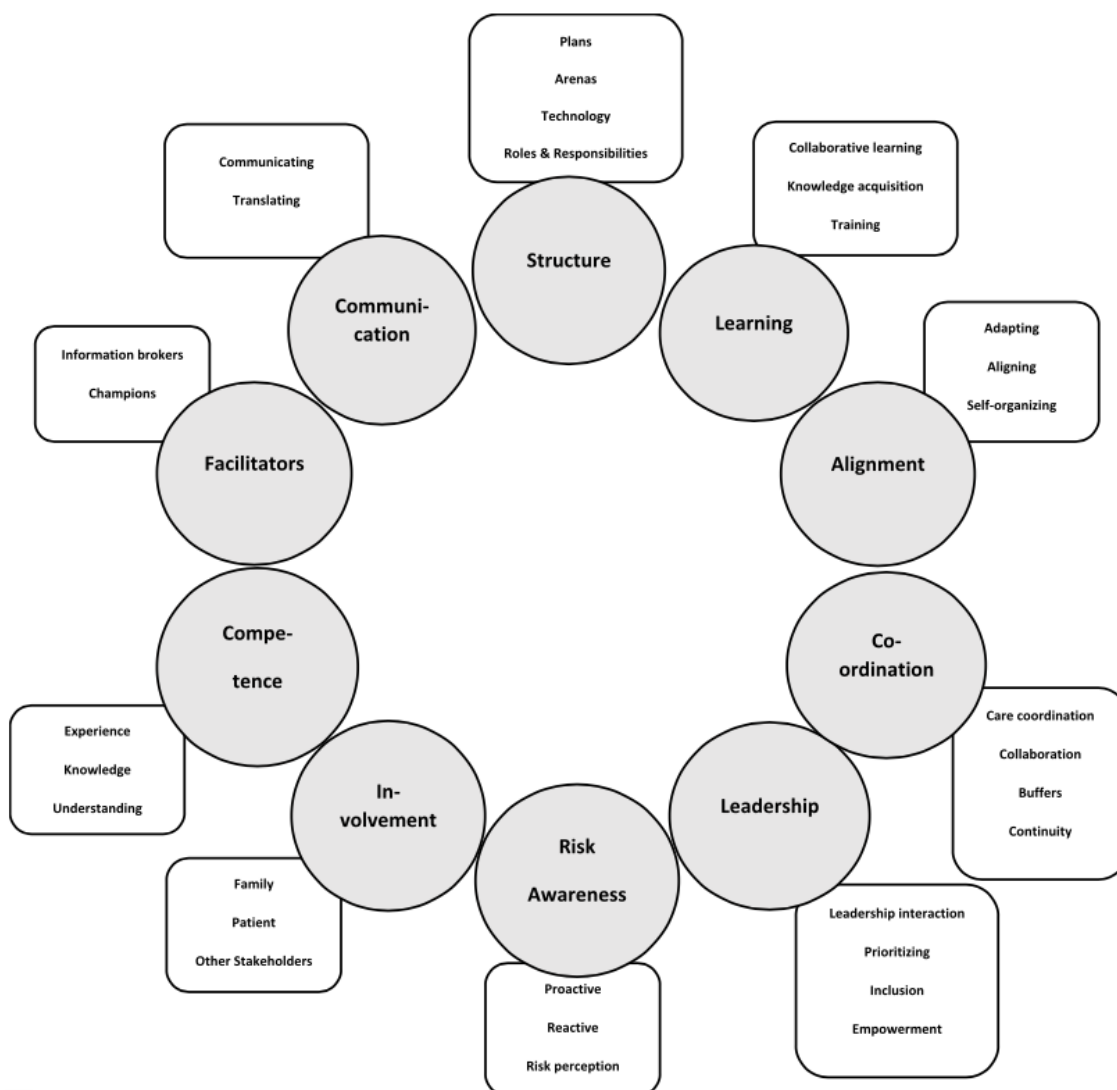
There is a natural tendency within healthcare to focus on failure and incidents (Safety-I). Braithwaite et al (2015) identify Safety-I as the current model and suggest moving forward to embrace the Safety-II approach, together with Safety-I. They argue that there is a lot of resilience going on in healthcare, the problem is that it is not seen, because of this Safety-I focus. To become resilient, there is a need to learn to appreciate what is already going on. To embrace complexity, work with performance variability and appreciation for the success in things that are going right. The understanding of resilience makes the difference between those organisations who miss signals of increasing risks and those that can manage high-hazard processes well (Nemeth, et al, 2008).

This 'new and different' focus is known as resilient healthcare (RHC). RHC can be defined as "the ability of the health care system (a clinic, a ward, a hospital, a country) to adjust its functioning prior to, during, or following events (changes, disturbances, and opportunities), and thereby sustain

required operations under both expected and unexpected conditions” (Wears et al., 2015, p.26). In a systematic review done by Iflaifel et al., (2020) on resilient healthcare (RHC) they found that most studies that conceptualize RHC are based on Hollnagel’s (2018) potentials to create resilient performance. However, they argue that other capabilities such as robustness, trade-offs, and flexibility should be considered to conceptualize RHC.

Lyng et al (2022) done a qualitative study to identify different resilient capacities. They made a conceptual framework (see figure 3, Lyng, et al., 2022, p.5) in which the identified ten capacities. These capacities can give insights on how to intervene on the different capacities. The research on factors that may influence patient safety in a prehospital setting are almost non-existent (Hesselink et al., 2016). Jeppesen & Wiig (2020) emphasize this and suggest empirical research to build resilient systems and processes in a prehospital setting. This by identifying factors that promote resilience on all different levels (individual, team, and system).

Figure 1 Steps for the qualitative research



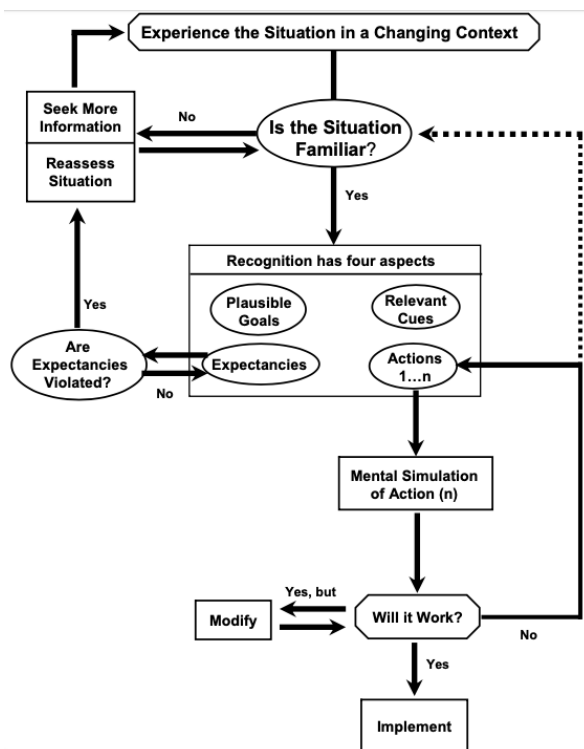
Human factors in EMS

As mentioned earlier, patient safety operates on various levels. On a systemic level, one must inquire about how a system responds to disruptions and what measures can be taken to enhance safety. This involves examining safety -I adjustments, such as implementing additional barriers like training, protocols, or working arrangements, or adopting a safety-II approach by cultivating resilience at different levels in patient care. Regardless of the chosen system approach to safety, it is ultimately the ambulance workers, who work, day in and day out with patients to provide the best possible and safest care. This next section focuses on the care provided at the sharp end. In the upcoming chapter, various human factors, such as the process of escalation, decision-making (DM) and the role of expertise, are detailed within the context of prehospital patient care.

Escalating process of crisis. A patient in crisis is a crucial aspect of working in pre-hospital patient care. A crisis in patient care is defined as 'the point in the course of a disease at which a decisive change occurs leading either to recovery or to death' (Runciman, 2005). This crisis is characterized, among other things, by an escalating situation, from a normal event to eventually a state of emergency. The situation can demand additional ambulance teams, or competences (see expertise) beyond what the EMT clinician can provide. The patient in crisis necessitates treatment either at a hospital or on-site when it's not possible to get them to a clinic in time. During this process, a shift in power dynamics occurs as actors other than the EMT clinician come into play, such as a colleague EMT clinician, a medical specialist in the hospital, a general practitioner or a trauma doctor arriving on-site. According to Bergström et al. (2012), redefine these actors the escalating situation, creating alternatives to local practice. They argue that the process of escalation is inherently complex and social, strongly linking coordination and cognitive activity such as decision making.

Decision-making (DM). The context in which EMS clinicians do their work determines how DM takes place. Prehospital patient care takes place under difficult conditions; under time pressure, changing conditions, high stakes, incomplete information, conflicting priorities, and the fact that no two patients are alike. These characteristics are consistent with naturalistic decision-making (NDM) settings (Orasanu & Connolly, 1993, p.7). Klein's recognition-primed decision (RPD) model (1993, 2008) depicts on how practitioners make decisions in the real world (see figure 4, Klein, 2008, p.459). Besides context, which has an important role in decision making in the wild, the RPD model emphasizes the importance of experience and intuition.

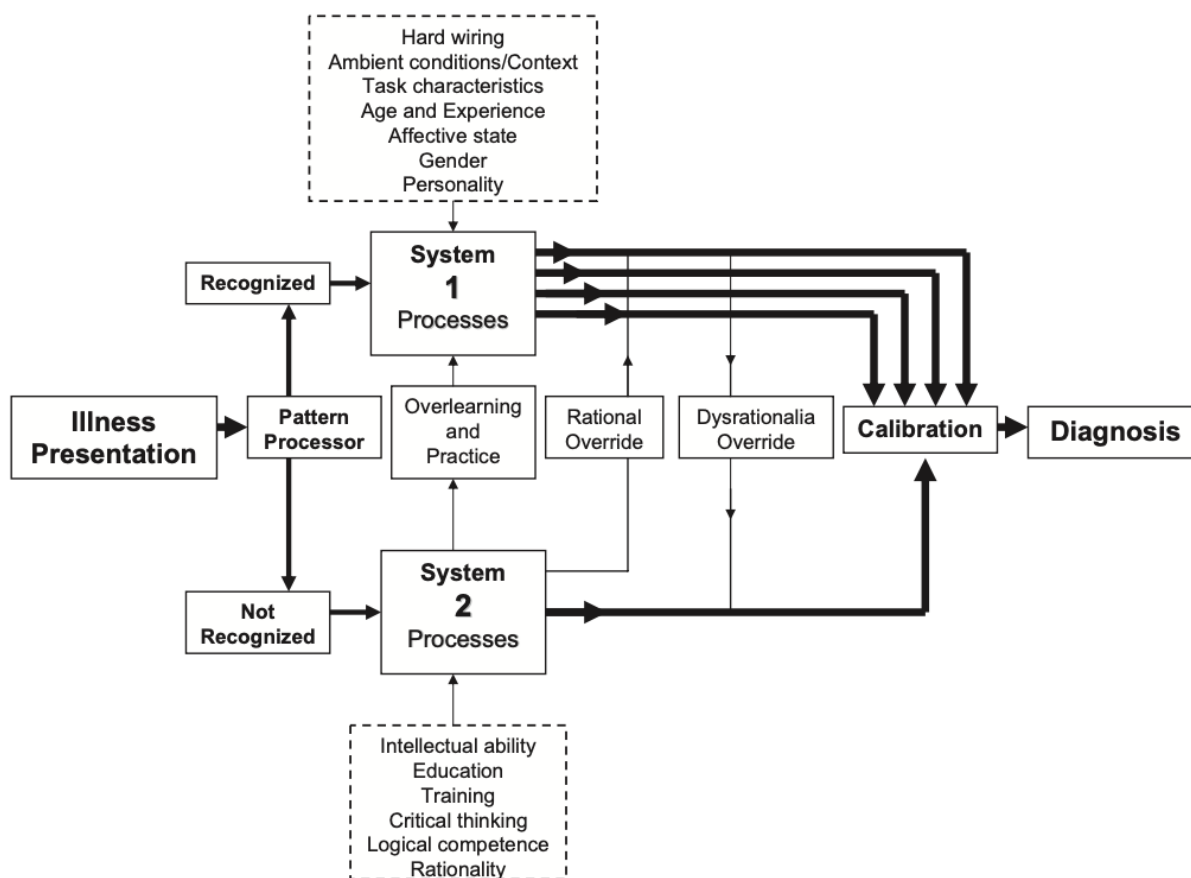
Figure 2 *Model of recognition-primed decision making*



Within health care, most research has focused on physicians' DM processes. Croskerry has researched DM by physicians in emergency care. The universal model of diagnostic reasoning (Croskerry, 2009) combines a system 1, intuitive approach with a system 2, systematic, analytical approach to decision-making, figure 5 depict the model (Croskerry, 2009, p.1024). The model considers the presence of heuristics, mental shortcuts when making judgments under uncertainty which can lead to biases as part of the system 1 approach to DM (Tversky & Kahneman, 1974).

The ambulance process in the Netherlands has been mapped by Dercksen et al (2021). From this study, ten different phases that make up prehospital patient care were described: Start, Situation, Prologue, Presentation, Anamnesis, Assessment, Reasoning, Resolution, Treatment, and Transfer (SPART). Different ways of reasoning emerge (and can even overlap) in the different phases. The first two phases “start” and “situation” consist mainly of System 1, intuitive reasoning. In the other phases, a systematic analytical way of reasoning is indicated. The SPART model (Dercksen et al, 2021) facilitates both of these ways of reasoning.

Figure 3 *Universal model of clinical reasoning*



Reay et al (2018) argue that no DM theory or model can fully capture the complexity of prehospital patient care, because the DM process is highly contextual and dynamic. Besides local factors, systemic factors also play a role in the decision-making process of EMS clinicians (O'Hara et al., 2015). This may consist of decisions made by colleagues or a hospital that refuses a patient due to crowding. Andersson et al (2019) found that there are three main themes that have great influence the clinical reasoning in EMS. To adjust for perceived control in situations that are unpredictable the EMS clinician needs to maintain a holistic view of the patient, they have to keep an open mind and improve true criticism.

The DM process of EMS clinicians is prone to errors and biases (Dercksen et al., 2021; Ryan & Halliwell, 2012; Perona et al., 2019). The two approaches mentioned, naturalistic decision making and that of heuristics and biases (HB) appear to be opposites, but do not necessarily contain in practice contradictions. Both recognize that in intuitive DM some professionals are impressively adept while other professionals demonstrate flaws. Both communities have a different focus, the HB community focusses on flaws in human cognitive performance while the NDM community looks to skill and expertise (Kahneman & Klein, 2009). The role of expertise in the DM process will be discussed next.

Expertise. An EMS clinician in the Netherlands masters 438 ambulance-specific competences. These consist of 278 diagnostic competences, 131 therapeutic and 29 clinical judgment competences (van Schuppen & Bierens, 2011). Mastering these competences is a prerequisite for being able and allowed to work as an EMS clinician in the Netherlands, but does mastering these competences also makes one an expert? This next section deals with the complex topic of expertise.

There is not a single universally accepted definition for expertise or on how to understand expertise (Farrington-Darby & Wilson, 2006). The interpretation of expertise is very loose in fact and varies between different scientific disciplines. For this literature review, the author limits himself to NDM research. Within NDM research, the most common method of defining expertise is to rely on peer assessment. The peer group has the best insight into the successful performance of the practitioners and by comparing practitioners can define the standard (Kahneman & Klein, 2009). "Experts are operationally defined as those who have been recognized within their profession as having the necessary skills and abilities to perform at the highest level" (Shanteau, 1992, p.255). In addition to expertise being recognised by peers, years of experience within a job are also used to identify expertise. Farrington-Darby & Wilson (2006) concludes from a literature review that expertise develops with practice and over time.

There are a number of characteristics of expertise. Experts are better at adapting to exceptions (Farrington-Darby & Wilson, 2006). Experts have a comprehensive, up-to-date domain-specific knowledge and skills, experts can simplify complex problems, they are self-aware in decision-making and adapt their DM strategy to changing task conditions (Shanteau, 1992). Carbonell et al. (2014) looked at adaptive expertise. How do experts deal with situations that are new to them? They argue that dealing with complexity requires not only expertise but also adaptive skill. Therefore adaptive skill can be seen as an essential ingredient of expertise. Pre-hospital patient care is becoming increasingly complex and subject to constant change. "As the work environment becomes more volatile there is a need for experts who not only possess the required domain expertise as traditionally defined, but who can also quickly adapt to situational change" (Ward et al., 2018, p. 37).

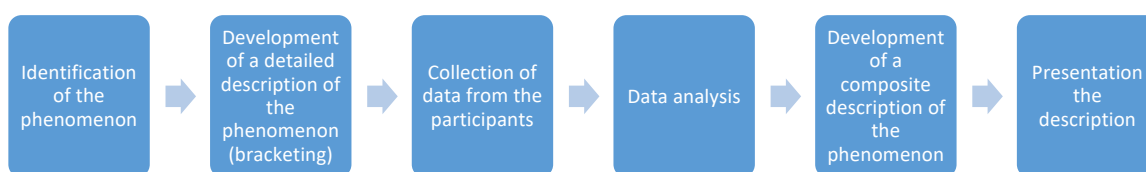
While expertise is generally good for resilience, individual expertise can also carry risks such as complacency, fixedness, tunnel vision and fixation error (Havinga et al., 2020, p.1113). These risks do not outweigh the benefits of expertise, in fact these authors argue that at the frontline worker level, more expertise almost always leads to more resilience (p.1125).

Methods

Methodology and analytical perspective.

For this qualitative research, a methodology is employed that draws upon an interpretative phenomenological approach. This approach provides the opportunity 'to make sense of the 'lived experiences' of the research participants and also allows the research study to explore the phenomenon that the research is investigating' (Alase, 2017, p.11). Figure 1 illustrates the steps followed in the research and depicts the study's flow.

Figure 4 Steps for the qualitative research



For qualitative research rooted in interpretative phenomenology, interviews are often the preferred method (Khan, 2014; Creswell & Creswell, 2018). The interviews aim to gain insights here into the lived experiences of EMS clinicians and to understand what a clinician does when a patient appears to be sicker than indicated in the initial call. However, as Hycner (1985, p. 294) points out, “the phenomenon dictates the method (not vice versa), including even the type of participants”. To investigate exceptions, a baseline normal situation is first established. To achieve this, the researcher accompanies clinicians during their ambulance rides, emergencies, and patient care, observing their performance under relatively typical circumstances. The second rationale for participant observations is the familiarity of clinicians with the phenomenon of adapting to unexpected situations. This familiarity, especially among more experienced clinicians, can make naming and describing these situations challenging but also presents an opportunity for this research.

Participant observation

Participant observation, a form of fieldwork combining observation and interviewing (Seal et al., 2007), allows the researcher to observe participants in their natural working environment. The objective is to observe the behaviour, actions, and decision-making processes of clinicians during their routine activities. When the phenomenon of recognizing and responding to a changing patient situation occurred, the researcher seized the opportunity to describe the situation and immediately question the clinician about their lived experience. This approach establishes a strong connection between normal work, the lived phenomenon, and the participant's experience, which can contribute to the validity of the study. A prerequisite for conducting participant observation is trust among the participants toward the researcher (Seal et al., 2007). Rapport is established through the researcher's position and

experience within the field, having worked as a clinician for ten years. This natural rapport is complemented by openness and transparency, as when the researcher explained the research objective before the observation began. The researcher joined clinicians for two eight-hour shifts, following an observation protocol with a predefined procedure.

Overall, the observation provided context to normal work behaviour, actions, and decision-making processes of clinicians. The data obtained is used for comparison with observations made during unexpected situations or emergencies, helping identify deviations from normal work behaviour or decision-making. This data provides insights into how clinicians recognize and respond to unexpected situations.

Interviews

To obtain in-depth information on the lived phenomenon, semi-structured interviews were conducted. The topics and questions for the interviews were predetermined approached flexibly. In preparation, a pilot interview was conducted to assess whether the question set, and topics effectively addressed the phenomenon. Following this interview, two questions (1. How have you been taught to recognize situations like this? 2. What qualities do you need as a clinician to recognize this situation?) were added, as the researcher believed they would contribute valuable insights to the dataset.

During the interviews, participants were given the space to express themselves and their 'lived experience' stories the way they see fit without any distortion and/or prosecution' (Alase, 2017, p.9). Providing this latitude allowed the interviewees to open up, establishing an interpersonal bond between the interviewer and interviewee. This bond helped foster confidence, enabling a collaborative exploration and analysis of the lived experience of the phenomenon. The average duration of the interviews was 49.56 minutes, with the shortest lasting 41.18 minutes and the longest extending to 69.46 minutes. Each participant underwent a single interview, and the date, time, and place were determined collaboratively between the participant and researcher. Confidentiality was discussed, and informed consent was obtained prior to each interview.

The interviews were recorded, and detailed notes were taken. Subsequently, the researcher manually transcribed the interviews. All interviews were conducted and transcribed in Dutch. From there, the researcher started translating the transcriptions into English. This process tried to translate the original meaning of what was said as literally as possible. A correct English translation is not possible for every Dutch word. It should be noted that this process involves a degree of interpretation. The original transcripts are not attached to this document, however available if requested.

Analytical strategy

The study was conducted in an exploratory manner, as no existing theory in the context of prehospital patient safety was available. During the analysis of the research data, the study engaged directly with the data to draw interpretations and conclusions. This process aimed to proceed from the data and daily practice rather than commencing with pre-existing theories. The primary objective was to uncover the lived experiences of the participants and to comprehend their narratives, extracting findings directly from the data. To achieve this, an inductive approach was employed. As articulated by Thomas (2006, p. 238), "The primary goal of the inductive approach is to allow research findings to emerge from the frequent, dominant, or significant themes inherent in the raw data, without the constraints imposed by structured methodologies."

To conduct the analysis of the data, the researcher followed an approach inspired on the 4-step approach by Moustakas (1994, p. 100). Figure 2 illustrates the steps taken, commencing with the transcription of the interviews and the development of field notes made during the observations.

Figure 5 *Analytical process*



The analysis process is iterative and begins with data collection. The initial step involves transcribing interviews and manually reviewing observations to gain an initial understanding of the data. After transcription, a comprehensive review of the data takes place, marking the initiation of the first stage of analysis. This is followed by another round of careful reading, where categorization and preliminary grouping occur to generate initial labels and codes. Saldana (2016, p. 4) defines labels and codes as concise expressions summarizing essential features of language-based or visual data segments. The coding process entails identifying recurring themes, patterns, similarities, and relationships in the data. Subsequently, a reduction and elimination phase is implemented to critically examine different codes for redundancy, vagueness, potential overlaps, or omissions.

Upon completion of this process, codes are organized into a hierarchical framework, forming main and subcategories. This results in the development of a matrix analysis per theme, paving the way for the final phase of analysis: validation. During validation, thorough checks are conducted to verify the consistency of constituents and accompanying themes against the entirety of the research participant's contributions. Once validation is successfully completed, the code tree is constructed. Ultimately, the researcher constructs a framework to clarify the interrelationships between the identified themes. This framework also serves to guide the format of the presentation of the results,

providing a clear narrative of how the interpretation evolved from the initial transcriptions to this final written report.

Description and selection of participants

The participants in this study are all affiliated with the Emergency Medical Service (EMS) Flevoland en Gooi & Vechtstreek, a medium-sized ambulance service located in central Netherlands, characterized by the following features (Sectorkompas, 2022).

- 9 ambulance stations
- 1 dispatch centre
- 23 ambulances
- Total of 244 employees
 - 112 EMS clinicians (ambulance nurses)
 - 110 EMS drivers
 - 22 nurse dispatchers
- Total number of patient journeys: 53,453
- Total number of ordered transport trips: 9,932 per year?

Ambulance care in the Netherlands is administered by Advanced Life Support (ALS) teams, comprising a specialized ambulance nurse (referred to as EMS clinician) and a trained driver. While the driver manages logistical responsibilities and drives the ambulance, they also assist the EMS clinician in diagnostic and therapeutic tasks. The EMS clinician, typically a nurse with a bachelor's degree in nursing and additional specialization in emergency medicine (EM), intensive care (IC), coronary care (CC), or anaesthesia, undergoes mandatory extra training of 9 months to become qualified as an EMS clinician.

This study aims to explore the lived experiences of clinicians and employs two fieldwork methods: observation and semi-structured interviews (see chapter on data collection and analysis). Participant selection considered their experience with the phenomenon. In practice, all clinicians working on an ALS ambulance share similar responsibilities. Criteria for dispatching patient rides are based on team availability and geographical location. Consequently, all clinicians have roughly the same exposure to the phenomenon under study.

Participants were categorized based on years of experience for two reasons: to investigate potential variations in work behaviour, actions, and decision-making processes associated with experience levels and to explore how the incidence of encountering the phenomenon correlates with years of service. Group allocation differed for the two research methods; Table 1 displays selected informants for interviews, and Table 2 depicts those chosen for observations. Two participants were

selected for the observation phase: one certified EMS clinician with 0-5 years of experience and another with more than 5 years. Interview participants were divided into three groups:

- 3 interviewees certified with 0-5 years of experience;
- 3 interviewees with 5-10 years of experience;
- 3 interviewees certified as clinicians with more than 10 years of experience.

Participants were chosen by the researcher based on three criteria: years of experience as a qualified EMS clinician, availability during the summer period when the study was conducted, and willingness to cooperate.

In addition to ALS ambulances, Medium Care (MC) ambulances are available. However, as MC nurses call ALS teams when encountering critically ill patients, they were excluded as participants from this study.

Table 1 *Participants interviews*

Interviews									
Interviewee (I)	I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9
Years of experience	9 y	30 y	6 y	8 y	1 y	11 y	1 y	1 y	11 y
Background	IC / anaesthesia	EM	IC / EM	IC	IC	IC / EM	EM	EM	CC / EM

Table 2 *Participants observations*

Observations				
Observation (O)	O- 1	O- 1	O- 2	O-2
Participant (P) clinician (C) / driver (D)	P-1 (C)	P-2 (D)	P-3 (C)	P-4 (D)
Years of experience	15 y	13 y	3 y	2 y
Background	Emergency medicine	police	Emergency medicine	Army

Research ethics

Informed consent. In accordance with Lund University's research ethics guidelines (2022), all participants were required to sign a consent form before participating in the interviews. This form delineated the purpose of their involvement, the nature of the research, the measures in place to protect their provided data, the anonymization of their participation, and their right to withdraw from the study at any point.

Confidentiality and privacy. Participants' privacy is safeguarded through the anonymization of all data, with only encodings used in the transcriptions.

Conflicts of interest. The researcher holds dual roles as an employee of RAV Flevoland and Gooi & Vechtstreek and a student at Lund University. Despite this, there are no conflicts of interest to declare.

Role of the researcher during observation. The researcher assumed two roles during the observations. During patient contact, the researcher solely observed without asking any questions or actively interfering with the medical assistance. The researcher positioned themselves during patient contact in a way that did not obstruct the ambulance team but remained within sight and hearing distance. Throughout this process, the researcher took notes, which were later elaborated upon. After the patient contact, the researcher's role shifted from observer to interviewer. Based on the observations, additional and in-depth questions were posed to the ambulance team regarding their actions, thought and decision-making processes, and opinions.

Privacy of the patients. During the observations, the researcher identified themselves as such and verbally sought consent from the patient to conduct the observations. All involved parties provided verbal informed consent for the observations. This research does not focus on the staff-patient relationship but rather on the lived experience of EMS clinicians. For this reason, there is no reference to the patient and their personal information or other individuals present during the emergency assistance in any notes or other data, this to ensure the privacy of the patients.

Validity and reliability

The following part describes how the researcher has worked on validity and reliability in relation to the different sub aspects of the research.

Participant selection. Participants were chosen based on their experience with the phenomenon. All clinicians on ALS ambulances perform similar tasks, with patient assignments determined by availability and location. This results in all clinicians having equivalent exposure to the phenomenon. However, differences in work behaviour, actions, and decision-making may arise due to

varying levels of experience and expertise. Additionally, the frequency of encountering the phenomenon varies, influenced by the clinician's years of experience in ambulance service. To address this, participants were grouped by years of experience. The selection criteria included years of experience as a qualified clinician, availability during the summer period (when the study took place), and willingness to participate in the research.

Rich data collection. Qualitative research in interpretative phenomenology often relies on interviews, as noted by Khan (2014) and Creswell & Creswell (2018). These interviews aim to explore the lived experiences of EMS clinicians when faced with a patient who appears sicker than initially reported.

To investigate exceptions, a baseline of normal situations is established. The researcher accompanies EMS clinicians on ambulance rides, emergencies, and patient care to observe their typical performance. Participant observations served a second purpose: they highlight the phenomenon of adapting to unexpected situations, a familiar experience for every clinician. This familiarity can lead more experienced clinicians to integrate this process into their daily routine, making it seem ordinary. Describing and naming these situations may pose a challenge but also provide an opportunity for this research.

Bracketing assumptions. After identifying and approving the research proposal, the researcher initially described the phenomenon based on personal experience. This involved a critical examination of biases, assumptions, and presuppositions to approach the phenomenon objectively.

Transcription and data management. All data, including recordings, interview transcriptions, and field notes, were securely stored on the researcher's password-protected laptop. No copies were saved online or on any other device. To ensure accuracy, the transcriptions were sent to the participants for feedback (see table 3 and 4). Additionally, a preliminary version of the chapter's existing literature and results was shared with three informants for validation after analysis. This was done to confirm the accuracy and authenticity of the results and to provide an accurate portrayal of the practice. The results of this member check are presented in table 5.

Table 3 *Member check interviews*

Informant	Feedback received	Feedback provided
EMS clinician 1 (I-1)	Yes	No comments or changes
EMS clinician 2 (I-2)	No	
EMS clinician 3 (I-3)	Yes	No comments or changes
EMS clinician 4 (I-4)	Yes	No comments or changes
EMS clinician 5 (I-5)	Yes	No comments or changes
EMS clinician 6 (I-6)	Yes	No comments or changes

EMS clinician 7 (I-7)	Yes	No comments or changes
EMS clinician 8 (I-8)	No	
EMS clinician 9 (I-9)	Yes	No comments or changes

Table 4 Member check fieldnotes observations

Informant	Feedback received	Feedback provided
EMS clinician 1 (O-1)	Yes	No comments or changes
EMS driver 2 (O-1)	Yes	No comments or changes
EMS clinician 3 (O-2)	Yes	Typos
EMS driver 4 (O-2)	Yes	No comments or changes

Table 5 Member check findings

Informant	Feedback received	Feedback provided
EMS clinician 1	Yes	“It took me a little longer to read through everything properly and can tell you that I really enjoyed reading it. I understand the connections and conclusions and I think it is a good read for people working in acute care. With the additions you mention in the literature chapter, you do have the opportunity to integrate the listing of literature involved more into practice. But again, great fun to read and I think you've come a long way”.
EMS clinician 2	Yes	“Attached chapter themes and patterns, with some minor stuff. Read through 2x, I think apart from some muddled quotes it's a nice complete chapter”, “Attached also my other feedback, I have no feedback on the literature review it reads fine, I do not know the subject matter enough to respond substantively in that chapter”.
EMS clinician 3	Yes	Some small comments and textual changes.

Thematic analysis. The analysis process begun alongside data collection, starting with transcribing interviews and reviewing observations manually for an initial grasp of the data. After this initial review, a more in-depth analysis commenced. This involved further careful reading, categorization, and grouping to create initial labels and codes. The coding process identifies recurring themes, patterns, and relationships in the data. Next a phase of reduction and elimination to scrutinize

codes for redundancy, vagueness, potential overlaps, or omissions. These codes are then organized hierarchically into main and subcategories, forming a matrix analysis for each theme. The final analysis phase, validation, involves thorough checks to ensure consistency across the research participants' contributions. Once validated, a code tree and a framework were constructed. This framework illustrates the interrelationships between the identified themes and guides the presentation of results, providing a clear narrative of the interpretation process from initial transcriptions to the final written report.

Triangulation. To increase the reliability of the results multiple sources of data were used to help validate the themes. For this purpose, interviews, participant observation and literature were used to highlight the different perspectives.

Reflexivity. To ensure transparency and rigor in data collection and analysis. The researcher continuously reflected on his own perspectives, biases, and experiences throughout the research process.

Audit trail. The researcher maintained a detailed record of all research activities, decisions, and steps taken throughout the study. This audit trail provides transparency in the process followed.

Contextualization and thick description. A thick description has been made to provide contextual information and detailed descriptions of the research setting, participants, and their experiences. This helps readers understand the context in which the phenomenon of recognising and acting on a sick patient occurred.

Limitations

Potential for research bias. The researcher's background, experiences, and beliefs can influence the way data is collected, analysed, and interpreted. To address this, the researcher employed bracketing.

Bracketing. It became evident that complete freedom from prejudices is not achievable; they inevitably influence perception unconsciously. However, this process heightened the researcher's awareness of these biases, enabling prompt recognition during various research phases, particularly during analysis.

Sample size and generalizability. The study involved an in-depth exploration of individual experiences and included a small number of informants. Consequently, the results may not be easily generalizable to broader populations or contexts.

Lack of control over variables. Parts of the research occurred in a naturalistic setting, limiting the researcher's control over external factors that may influence participants' experiences. This made it challenging to isolate specific variables or factors.

Lack of experience by the informants. In the interviews, some participants with less than five years of work experience expressed difficulty providing direct examples of the requested situation when interviewed. However, they were able to furnish examples of the same phenomenon within a different context, which were included in the data.

Translation. All interviews were conducted and transcribed in Dutch. From there, the researcher started translating the transcriptions into English. This process tried to translate the original meaning of what was said as literally as possible. A correct English translation is not possible for every Dutch word. It should be noted that this process involves a degree of interpretation. The original transcripts are not attached to this document, however available if requested.

Results

This chapter presents the various themes and patterns that emerged during the exploratory phase. The themes are presented in a chronological order, beginning with normal performance, which refers to the standard approach of non-urgent ordered transport. Next, we explore how clinicians cope with the unexpected - how do they recognize a critically ill patient when it was not anticipated from the initial report? It then describes the various performance affecting factors to this phenomenon. What are the challenges in logistics and the environment. How does the patient and his family influence the care given and are the performance influencing factors for the clinician and on teamwork. The chapter ends with strategies for the EMS clinician to learn a discussion about the role of expertise and rich descriptions of the results.

Normal performance

Mindset. How the clinician views and thinks about ordered transport is an important starting point for how well a critically sick patient is recognized. This mindset serves as the foundation for every patient interaction. Several participants refer to ordered transport as an integral aspect of the job, recognizing, and acknowledging that while the patient category may not be acutely life-threatening, it still involves seriously ill individuals.

“We all enter this profession with the illusion that we are going to save and prolong lives, and that makes ordered transport part of it, but it is also just ordered transport. Despite the fact that it's a big part of the job and you might find some of the sickest patients there. They are not acutely sick, but they are the most ill.” (I-1)

The mindset of the clinician not only influences how quickly the ride is initiated after receiving the order from the dispatch centre, but also affects how the patient is being approached. This is described as less sharp, less focused. A feeling of doing something less useful. One informant stated, “I'm primarily not here for ordered transport.” (I-5)

“The moment I get an ordered transport on my walkie-talkie, it's different from an emergency call. In general, I choose to take those last few bites of food, go to the toilet, or restock my things. That makes you head for the ambulance with a different feeling and dynamic.” (I-6)

“We do so much urgent rides, somewhere the feeling creeps up on me now, oh yes, those B rides might just be the moments when you think, here we can take it easy for a while. Also, just relax for a while, as if it were a kind of in-between trip.” (I-6)

Pre-Arrival Preparation (PAP). Ordered transport has a number of variants in which different working methods are used. This difference lies mainly in where the origin of the order comes

from and thus whether triage/investigation has already been carried out. When transport is ordered by a hospital or GP and the patient has already been examined or treated, this differs from transporting the patient who has not yet been seen or treated by another care provider. This difference mainly results in a different preparation on the way to the patient, called Pre-Arrival Preparation (PAP). During this standard preparation, the process of recognising an acutely critically ill patient starts by making sense and looking for red flags in the initial order. The PAP is a risk assessment tool used prior to seeing the patient. "Creating a mental framework of the most important differential diagnoses that should be excluded." (I-9)

"If it is an ordered transport, depends on if it is from the general practitioner (GP), then you already have some checks. Then you talk about what can we expect. The PAP, that you think about your differential diagnoses (DD) beforehand. I don't do that with every patient like that, but we always discuss the report, what do we take with us? During ordered transport, the pre-discussion is somewhat abbreviated. The key question is: can we anticipate any potential complications? This often involves pre-existing checks, influencing our approach to the patient." (I-7)

"Pre-Arrival Preparation is pre-discussing what to expect and in acute rides you also discuss pathologies. With an ordered ride, they are usually sent in by an GP with already a working diagnosis, what he is thinking about. Sometimes the story is completely different, that we think, isn't it something completely different from what the GP sent him in for, so let's do that ECG anyway." (I-8)

Patient Assessment Triangle (PAT). The Patient Assessment Triangle (PAT) is crucial. While some initially view ordered transport as less significant, this perception changes upon arrival at the patient. Every patient, urgent or non-urgent, is approached using the same methods and methodology. "Every patient gets the same treatment; I always start with the same methodology" (I-2). "It is difficult to say whether there is a difference between urgent and non-urgent. The moment I enter, I am as inquisitive as ever" (I-9). Upon entry, the clinician conducts a quick assessment, known as the Patient Assessment Triangle (PAT), which involves observing the patient's colour, appearance, and breathing effort. The PAT is the starting point for the clinician to determine whether the patient is sicker than initially reported, what the urgency is and whether additional investigations should be done.

"This is actually how we approach all patients to pick out the acute cases in particular. If someone has a wheeze, that sets off alarm signals. With that, you can differentiate fairly quickly. Based on what we check therein, I am dealing with an acutely critically sick patient or not." (I-3)

“Knowledge and experience converge in our work, which heavily relies on experience. When you've witnessed certain scenarios, that knowledge becomes something you can recall and apply. The moment you come in, that information comes up and then everything falls together. You don't know what's wrong with the patient, but based on what you see, you know that 2 or more organ systems are disturbed.” (I-3)

Comparing. In addition to abnormalities in the PAT, the clinician compares the initial report with the actual situation. This involves looking for discrepancies. If there is a discrepancy between the report and the actual situation, or a discrepancy is visible in the PAT, this is reason for the clinician to examine the patient further. For this, the clinician uses a number of different methods and techniques (see figure 6).

“The moment we come in and patient looks very different from what I would expect from the report, for example because he is very stuffy, I do pronounce out loud, "this is not good, we are going to pick up the pace. I don't name all the details but do express that I judge the situation to be more serious. Then we are on the same page, so he also knows that we are going to work faster. It doesn't matter to me what urgency is attached to this initially, this is the standard.” (I-3)

Standard ordered transport. When the EMS clinician finds no red flags in the initial report, comes across a situation as expected and observes no abnormality in the PAT, there is no reason to subject the patient to further investigation. After this, the transport will continue to the specified destination. Treatment is then focussed on comfort for the patient.

“On the way to the designation, you decide whether it is necessary to monitor someone through parametrics and what interventions are needed during transport. In case of car sickness e.g. anti-emetic, also in that you investigate what is useful to do. Deciding whether family can come along or not?” (I-9)

Dealing with the unexpected

Adapting. When abnormalities are found in the PAT or the PAP, the patient is further examined by the EMS clinician. For the EMS clinician, this means adapting to the new situation. This process of adjustment is a continuous process. Constantly adapting the treatment plan to the observations, measurements, and answers of the anamneses makes it a dynamic process. This requires the EMS clinician not to rigidly stick to the plan that was first made. During adjustment, on-systematic fall back on what was learned during education and additional training.

“If you think in patterns and systems and you are rigid in them..... Then you short-changed yourself and the patient. You cannot have a plan ready before you are somewhere and have

considered the situation. You can have a suggestion of where you want to go roughly, but always have a plan B and C ready. So continuously adapt". (I-1)

ABCDE method. The patient will be examined according to the ABCDE method (see figure 6, primary survey) when there is a reason to take a closer look. The ABCDE method of examining a patient is a method that is on every EMS clinician's spinal cord. With this method, the patient undergoes a systematic assessment, examining vital organ systems including the airway, lungs, respiration, heart, circulation, and neurological status. With the limited diagnostic tools (ECG, SpO₂, blood pressure monitor, stethoscope, thermometer, pupil light) available to the EMS clinician, it can be determined whether the patient is vitally endangered. Furthermore, the ABCDE method is employed to rule out potential diagnoses. It also serves as a reminder that, due to cognitive biases or errors (see error and bias), professionals may overlook certain syndromes or abnormalities (for example hyperventilation, a patient hyperventilating can be a manifestation of underlying pathology but can also be psychogenic triggered). Applying ABCDE systematics reduces the likelihood of missing pathology.

"The burden of proof is still that if that if you work systematically, you can better separate the sense from the nonsense and that will make you work much better pre-hospital." (I-3)

"You scale down from the worst you can think of, to it might not be so bad after all. We do that scaling down according to the ABCDE methodology. I then go back into that completely. I ask my colleague for additional diagnostic equipment, e.g., a monitor or temperature gauge, to bring those in and then we go down the ABCDE. You start, is the airway okay, how is the breathing work and eventually the circulation. That's how you slowly peel off what the patient's condition is." (I-4).

Figure 6 *Primary and secondary survey*

<p>Primary survey</p> <ul style="list-style-type: none"> ▪ Airway <ul style="list-style-type: none"> • colour • Audible? ▪ breathing (audible or not) <ul style="list-style-type: none"> • bilateral thoracic excursions? • auscultate • SpO2 / CO2 ▪ Circulation <ul style="list-style-type: none"> • capillary refill time (CRT) • pulse check (regular? Frequency? Strong or weak?) • 4 leads • blood pressure • ECG (on indication) ▪ Disability <ul style="list-style-type: none"> • blood sugar • temperature • neurological screening • Pupils <p>secondary survey</p> <ul style="list-style-type: none"> ▪ specious history (anamnesis) depending on the abnormalities. ▪ physical examination applied to complaints
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Iterative process. The process of assessment and information gathering by taking a medical history with a patient is an iterative process that continues till the patient is where the definitive treatment can take place. The iterative applies to examination treatment of the patient as well as to the analytical process.

“Re-assessment. Essentially, it involves going through the ABC. In terms of re assessment, I'm not going to look in the mouth again, but do go off.... okay the SpO2 is this, do we still have anything on a capnography. I don't necessarily do those in the first phase. re-listening the lung's, I do that again though, something may change there. A quick ABC though. What are the changes, that helps in reasoning, are you at all right in your DD or because it's not catching on, isn't it something else? (I-8)

“I do this in every case. Any case. I always keep investigating, do I find certain symptoms, or do I find certain abnormalities that I think could fit there or there. Of course, there are always some things playing primary in your mind that you think that must be it, but I always keep investigating. Plus, it's also very often mixed images. This patient will not be the first to have both pneumonia and UWI. Geriatrics is one of the most difficult target groups, which is where we can make a difference.” (I-9)

Analytical process. The analytical process is a combination of sensemaking and deductive reasoning. It begins with considering various differential diagnoses, which are then narrowed down

through checks and by gathering a medical history. This involves looking for patterns and red flags in measurements and making decisions based on the outcomes of the assessment.

“I have a whole pallet of possibilities and knowledge and skills to make sense of my patients.”
(I-1)

“Recognizing patterns can be very useful. It helps in understanding what might be happening and what the next steps should be. Being able to think in scenarios. I do have a talent for it, I think, partly you learn there too, it's the biomedical and pathological knowledge you've gained, but also wisdom from the profession.” (I-9)

Complexity. Giving meaning to information and experiences in order to understand and anticipate the situation, which is often complex, ambiguous, or uncertain, is a common thread in emergency care. The complexity of pre-hospital patientcare can be very high due to the fact that no patient is the same, no situation and context is the same. The implementation of care has been protocolized in a national protocol. However, daily practice is proving more difficult because sometimes protocols are rigid, and patients do not always fit neatly into them.

“We are taught a lot of standards. With the set of symptoms the patient has, you have to think about differential diagnoses (DD). Simple example is a patient with severe abdominal pain and radiation to the back. These are the patients where you have to be apprehensive about a rupture of the abdominal artery. If I am honest, all the patients I have seen recently with this problem there was only 1 who met the standard. The rest were basically all patients with symptoms where you would give off a kidney stone or some other colic pain or the like. But where you're like, that patient, it doesn't feel good, it's not the standard. We do see quite a lot of people with non-specific complaints.” (I-3)

“Realise protocols are square and patients are round. It almost never fits. What you always do? Which protocol fits this patient best and at the same time, this is not blissful, this is contrived. We invented something to avoid missing things. At the same time, this is also just an invented thing. Then you're talking about a grey scale where everything kind of settles. We also do that based on science. With the best conscience. But you always have to realise, possibly this case does not fit 1 to 1 in the protocol.” (I-9)

Gut feeling. Not in all cases, it is clear to the clinician what is going on with the patient. This is when the clinician relies on their gut feeling. When there is a gut feeling, the patient will be checked first. In some cases, the patient is unwell, reports physical complaints, but these are not accompanied by abnormalities in the patient's vital checks. The gut feeling is listened to, when the clinician does not have immediate evidence or acute illness, the patient will be low-key consulted with the GP or

medical specialist at the hospital, or the patient will be presented at the hospital. Listening to gut feeling is considered difficult by clinician just starting with their careers.

“Gut feeling for me is when the patient looks better than he would be clinically. We also see it the other way round sometimes, everything seems OK, but based on the story it is not. 10 minutes later, someone then collapses completely. Then it's more gut feeling because you don't see any immediate abnormalities. Now you see abnormalities and it goes automatically.” (I-3)

“I think it's a kind of alarm that goes off when I recognise things I've encountered in patients before, that I therefore think, this is really not good. It could be a lot of things, but it's often how someone is sitting. Skin colour, breath work. It's not one thing. Sometimes you can't put your finger on it either. It's hard to explain. I never doubt my intuition. I dare to rely on it more and more.” (I-5)

Decision-making. When the clinician encounters a patient who is acutely critically ill, the first decision will be whether there is time to check the patient at home or if they need to go to a hospital quickly. Following that, a choice of which hospital will be made. These are quick decisions based on the initial findings by the clinician. When a patient is not acutely critically sick, the decision-making process is not something the clinician does alone. It is a process that is shared with the GP who is often the client for the ordered transport, the control room dispatcher who takes the call, one's colleague, the driver present at the patient contact, and last but not least the patient and his family. In the end the clinician has the last saying and decides.

“You confirm or disconfirm the DDs and based on that, you decide for yourself initially, what would be the most convenient follow-up for this in my opinion. You then discuss that with the patient and your colleague. That also gives you information and the opportunity to choose a certain strategy. Suppose you think someone should come along and they don't feel like it, it gives you info so you can arrange informed consent in a different way. As an EMS clinician, if someone is seriously threatened, confused, or unable to assess the situation, you are expected to act accordingly. So much for shared decision making. Sometimes you will be a bit more compelling in this than other times.” (I-9)

Performance influencing factors

While working, a lot of challenges come along that the EMS clinician has to deal with or consider, factors that influence the performance. These challenges can be divided into three themes. 1) logistics and environment. 2) patient and family. 3) clinician and team.

Logistics and environment. One challenge can be getting the patient onto the stretcher. When a patient is bedridden and not mobile, a team of two may not be enough to get the patient into the ambulance. Here, the weight (obesity) of the patient, as well as the patient's location (2nd floor) can play an important role. Presence of pets (especially dogs) can pose a threat to the physical safety of the team. Other influencing factors mentioned are a fraught environment or an extremely noisy environment that makes communication difficult or impossible.

“How am I going to solve this, we are short of hands. Where do I start? Often the challenges are logistical. With somatic conditions, I get out of it with the patient, if they are really critically sick, I always find it challenging. What takes priority, what do you do first. That is what the ABC methodology is for, but it is sometimes difficult. You want to move quickly, but that is not always possible.” (I-7)

“I entered, but there was a large dog in front of me. I thought we have to get out of here, this is a scope and run. So, I ask my colleague, can you take that dog away. That dog barking and growling, I thought there we go. That took 5 minutes, which is also a challenge. Then you still have to get the patient out.” (I-7)

Patient and family. One challenge surrounding the patient can be a language barrier between the care recipient and caregiver. Also, cultural differences play an important role in how sickness is experienced. This can cause a situation to be misjudged (see example of cultural difference). To make a correct assessment of the situation, it is important that the clinician gets the right information. Patient and family do not always give the right information, unintentionally or on purpose. It may be incomplete, unclear, or not based on the truth (hypochondria).

“Cultural differences definitely also play a role, especially when you regularly visit people of Moroccan descent in particular, you notice that there is a certain kind of experience in being ill that is sometimes difficult to assess from your perspective as a Westerner. This sometimes leads you to suffer more, especially because your perception is more expressive, whereas we are used to keeping it to ourselves. You worry a little less as long as they can still complain and moan. You worry about the one who lies still. This can be a trap, especially during an illness that is progressive with few symptoms but a lot of general unwellness. Then it does become troublesome. I often share this story with students, drawing from my own experience

to provide a learning opportunity. The moment you think, I can't get my finger behind this, and I am somewhat concerned about someone's well-being, arrange appropriate follow-up. In my opinion, this often leads to presentation. This can be a trap, as can hypochondria. These are pitfalls that make you look at someone through a certain lens.” (I-9).

Example cultural differences:

“We didn't arrive there with bells and whistles, I remember that well because it did with my expectation, I was a young graduate then. We went to see a young boy in his 20s. He was lying on a cot in the room, it was in the night around 2am. We walked up relaxed, the patient did look sick, flush, he was not feeling well. Not seriously threatened, it seemed. There was a whole bunch of family around him as if he was dying. They were all very committed and involved. This was a Muslim boy with very involved family. That does something to your image, especially because of the different perception of illness, than is generally customary in the West. In the end, I decided to present that boy. He had a fairly high temp but didn't actually think it was too bad. It was more like, do I have the impression now that these people are going to follow my follow-up advice or are there risks here? That made me decide to take him with me though. I then chased him down the stairs. Come on, you're a young boy, on your feet, down the stairs, don't whine, just pull yourself together. The next day he died, he turned out to have osteomyelitis of his cervical vertebrae and a severe bacterial infection with an extension to meningitis. That was a f*cked up moment, I chased him down of the stairs in the last 24 hours of his life. In retrospect, I could have been kinder and more empathetic. In the end, it had no consequences in that sense, I fortunately presented him in the right hospital.” (I-9)

EMS clinician and team. The following are named as performance factors for the clinician: complacency, assumptions, sense of success caused by recent experiences, overthinking, exceeded bandwidth, and troubles at home. Additionally, there is the fear of getting into trouble, which stems from complaints and or incidents. "B urgencies are generally taken quite lightly" (I-1), (for more examples see normal performance - mindset) due to this way of thinking, there is a risk of complacency. This reduces the chances of recognising a seriously sick patient because the transport is classified as "just a taxi ride".

“I'm a bit more easy-going on ordered transport anyway, I'll be honest about that. If you get an ordered ride, you go in a bit less sharp, less in the starting blocks, than if you get an emergency call of a patient who has an endangered airway or a resuscitation. Then you are in a different state of mind than with an ordered transport.” (I-4)

Despite the risk of complacency in ordered transport, clinicians prioritize their patients. They are committed and want the best for the patient. “You don't want something to happen to a patient, in that sense, that's the most important thing. That the patient is not left with injuries” (I-2). “First and foremost, you are there for the patient's wellbeing.” (I-3) By doing the job with full attention, as an EMS clinician, you are in a position to make a difference for the patient and his family.

“Do everything with attention. Do what you do with your full attention. Be primarily concerned with what is in front of you in that moment. That at the moment in time, that is also the only thing where you can make a difference.” (I-6)

The moment the clinician recognises a patient requires direct response; it is important to be able to adapt quickly to this new situation. This is described earlier under coping with the unexpected. A pitfall here is to analyse the situation for too long and not go into the then necessary action mode.

“What can arise, and this is not strange to me either, is that you overthink situations too much. Not everything, especially when you have a hang-up and don't recognize all the patterns. This can sometimes lead to continuously searching for patterns, which may result in acting symptomatically and making a safe choice for follow-up. This is the standard approach with someone under serious threat. Initially treat what you encounter. Suppose you find yourself in a B situation, and at some point, you realize that the patient is sicker than you initially expected. In such cases, it becomes crucial to stop overthinking and start taking action. Life consists of pitfalls. In general, when you have certain qualities, there is always a more negative side to them. People who are focused on structure and factual matters sometimes lack communication. Someone who is focused on the more social issues has the harder skills. In my case, I tend to go overboard with my reasoning and postpone my final decision.” (I-9)

Workload is experienced differently by everyone and has a different effect on action. A heavy workload can affect communication, resulting in a lack of communication with the patient. A limiting factor on experiencing workload is something wrong at home or at work. As a professional, be aware that this can affect your thinking and share this with your immediate colleague. Make use of the fact you work in a team.

“If it is a clear story and the patient is stable, then there is room in my head to make a chat. If it is a clear story, but the patient is not stable, then it depends on how well the case progresses. You then have time for a chat but are mainly explaining how the follow-up is. That also makes a difference. Is a patient bad and I can't get a drip in with an awake patient and I'm in doubt about whether to put in a bone drill? Then you have a lot of considerations.... what medication should go in, am I going to do this to him. Then I am busy with that and don't have time or free space in my head to talk to the patient.” (I-8)

“Limiting factor is misery at home or work. Service with many transition moments at an earlier stage makes thinking more rigid. It is good to bring your colleague into that, where he also keeps an eye on things. Where you do keep in mind that he has other blind spots and not a shared reference in terms of medical knowledge.” (I-6)

Working in a team has two sides. The data and observations highlight the synergy that emerges from collaborative efforts. This involves a clear division of tasks, where each team member has complementary tasks and unique qualities. The novice clinician involves the driver in decision-making and often relies on the experience his colleague has. However, teamwork also comes with its

pitfalls. The colleague's opinion may be seen as influential, potentially leading to tunnel vision. Furthermore, the dynamics of the shift are often influenced by who you work with. Is the driver socially skilled, empathetic, a subject matter expert, and proactive in supporting the clinician?

“Additionally, it's important to heed your colleague's insights. There have been instances when they expressed doubt about a patient, while I felt more confident. In such cases, I make it clear to myself that we should proceed to the hospital, and I convey my concerns about the situation. That opinion weighs heavily for me because they don't say it easily. Twice I have been told, 'I think the patient is bad, I don't trust it.' In hindsight, I think I could explain the situations. In one situation, the colleague said, 'I think it's not quite right.' Then I think, 'Fine, then they'll go and see all those vague complaints in the hospital.’” (I-8)

“A challenge is that it very much matters who you work with. That is the benefit of your whole service that you work with someone who is socially skilled, empathetic, just knows the subject matter well. How educated are you, how well do you know the car and the chain. And how facilitative are you to your nurse. Of course, this also applies vice versa. Those three components, if they don't match up then you have a challenge the whole shift.” (I-4)

Learning and expertise

Learning. Learning in the ambulance setting can be divided into two categories. Formal learning and informal learning. The first category consists of learning offered to the clinician through the employer. This starts with attending the initial training as a clinician. During the training, the different methods are taught to recognize sick patients and how to act on them. This is the foundation on which the clinician can build his career. During the remainder of his or her career, the clinician is offered a wide range of formal schooling to keep him or her competent. The schooling programme includes exercises, simulation teaching and e-learning. During both initial training and subsequent education, there is little or no focus on ordered transport, possibly contributing to seeing ordered transport as something that just comes with the territory, a necessary evil, while as I-1 pointed out, “these are possibly the sickest patients”. The fact that ordered transport is seen as something that just comes with the territory also affects informal learning. Informal learning takes place, among other things, in the conversations and discussions that the professionals have with each other. During these conversations they exchange stories and narratives. It involves mostly acute situations in which you see that "extensive discussion of this kind of cases where no heroism is involved happens very little." (I-1)

“Coffee table talk is about patients who are vitally endangered, preferably with as much blood and misery as possible. That I what makes the coffee table. Lifting off a patient is nothing

special. The moment something big happens, before I'm back on post, everyone knows about it and wants to know what was going on. But usually not substantive either, what considerations or choices were made. Just of, bit the tough story. The transport ordered usually doesn't make it to the after-action discussions. Unless it's an emotionally charged casuistry, which are sometimes shared with each other. Then people do ask how you are doing. This is then about your experience and not about the technical execution or growing so that other colleagues can benefit." (I-1)

By discussing cases with each other in an informal way and questioning each other on working methods and peculiarities, they learn from each other and from unique situations. Besides the coffee-table discussions, the EMS clinicians also actively solicit feedback, debriefing with the driver and with colleagues from a second ambulance present. They also ask for feedback in the ER. Here, the EMS clinician looks at the final diagnosis established and compares it with the differential diagnoses he has named. Were my findings correct?

"With the driver, I discuss all acute situations, could we have done things differently. I also have a number of colleagues here at the post with whom I engage in conversation and present the case to discuss." (I-7)

"I learn from the feedback I receive from the ER." (I-1)

Informal learning, in addition to the above strategies, includes building expertise through experience. Learning by seeing a lot of patients and starting to recognize situations. "I learned this by seeing a lot of people and checking the things you see. So, whether it's a B ride or an emergency ride, you check and learn" (I-2). Learning, besides building experience, can also be found in sorting out information that is not clear or not yet known, so that it can be taken to the next patient contact. "Experiences go along in the backpack. Sometimes you ask something, and you think I never thought about that. Then you read up further and know how to ask more questions for the next anamnesis." (I-8)

"Building expertise, but also keeping expertise up to date. If I don't see anyone with abdominal complaints for 10 weeks or more.....things you don't deal with, you forget. The key is to keep yourself educated. From a e-learning comes a page with all the red flags. I took a picture of this. This is in a folder on my phone containing all kinds of background information that I regularly access. Even when I'm on my way to a patient, for instance if I have to go to a report I've never attended before. What risks can I expect? The advantage is that we have some time to sort things out on the way." (I-3)

Seeing and treating many different patients broadens your view but can also bias your thinking. "Experience makes you think, we had this last time, and it went well then, let's try it again. Therein lies the rub." (I-1) Learning from mistakes you have made or things you have overlooked is also seen as a powerful tool for learning. This requires an appropriate learning strategy and a professional who is reflective.

"Yes, there are still cases where I think I should have done things differently, and you learn from that. It also keeps you focused, "From now on I'll do this differently". That is a learning process that you always keep. Nobody is perfect and sometimes you don't think of something. And neither does your colleague. You take that with you from the previous case. I really do, if I think this could have been done better, I try to take along in future cases." (I-7)

Several learning strategies are identified. Visualising to make choices in advance and to keep on low-profile cases in mind. Reflecting on your own actions, viewing yourself critically as a professional, but also as a human being.

"I am doing a lot of visualising. Visualising is really just training. E.g., a child CPR, we don't do those very often, fortunately. I regularly visualise such a situation. What can you encounter, different situations, I visualise different case histories." (I-3)

"It brings into focus the fallibility of yourself as a human being. Realising that not everything is what it seems, a situation can change over time. It also changes you, that has to do with mood, it can drift towards uncertainty, because by definition situations are going to arise in your career where you miss things. On the other hand, if you realise that is a given, then you will have to put everything in place to avoid that. We have that system, resources, and materials. It is a professionalised industry. The mind does determine the perspective." (I-6)

Expertise. The more you learn and experience you gain as an EMS clinician, the greater your expertise becomes. Expertise builds up over time and grows as you energise it. Expertise within the ambulance service does not only consist of the number of years you have worked as a clinician, but certainly also the work experience you have done before the ambulance. What specialisation (IC/CCU/ER/anaesthesiology) have you done and how many specialisations have you done. In other words, how broad is your clinical view. The work as a clinician covers all possible types of patients, across the board, from paediatrics to geriatrics and everything in between. This makes it a difficult profession that demands a lot from the clinician.

"This profession is so tricky is mainly in the multiplicity of things. There are so many possible scenarios imaginable. It is not so easy to come up with a flowchart for that, if this, then that. It comes down to intuition and flexibility of the person and at the same time. That is perhaps still

the most difficult component, what I look for during job applications, that on the one hand you have to deal with people who have to be able to position themselves in such a way that they know how to take control of the whole situation in no time, a train accident with multiple victims. That nobody passes them by. And at the same time, it has to be someone who is prepared to deal with that person where there is not so much going on, but where the social safety net is an issue. This is not only about knowledge and skills, but also about the social aspect and social action.” (I-9).

Rich descriptions

The process of what an EMS clinician does when a patient appears to be sicker than indicated in the initial call cannot be solely captured in a single moment, skill, degree of experience or in any other identifiable or measurable fact. The phenomenon of recognition and acting on an unexpected situation is a combination of factors located in different subfields such as the context of the patient order, knowledge, and experience of the professional, working method, teamwork and mindset and attitude of the clinician. A combination of factors that cannot be captured in a number but become clear through the stories of the participants and observations by the researcher. This part describes these rich and lived experience of the phenomenon, starting with the standing process for ordered transport.

Standing procedure for ordered transport.

The mindset of an EMS clinician is fundamental to their interactions during ordered transport. It serves as the guiding principle for every patient encounter. In this field, ordered transport is seen as an essential duty, acknowledging that even though the patients may not be in immediate danger, they may still face serious health concerns.

Ordered transport takes different forms, each requiring specific approaches. The crucial factor is where the order originates and whether any prior assessment has occurred. When a hospital or GP initiates the transport and the patient has received some level of examination or treatment, the approach differs from transporting a patient yet to be seen or treated. This leads to a unique preparatory phase known as Pre-Arrival Preparation (PAP). During this standard procedure, a clinician scrutinizes the initial order, seeking out potential signs of critical illness, conducting a risk assessment before seeing the patient.

The Patient Assessment Triangle (PAT) plays a pivotal role in this process. Some may initially perceive ordered transport as less urgent, but this perception changes upon arrival. For every patient, regardless of urgency, the approach is standardized. One practitioner (I-2) aptly puts it, "Every patient gets the same treatment; I always start with the same methodology." Upon entering the scenario, the EMS clinician swiftly engages in a PAT assessment, observing the patient's general

appearance, colour, and work of breathing. This forms the starting point from which the clinician can deduce whether the patient's condition is more severe than initially indicated, thus determining urgency and need for further investigation.

Beyond the PAT assessment, the clinician delves into a comparison of the initial report with the actual situation. This process includes looking for disparities or irregularities. If such discrepancies surface, it becomes the impetus for the clinician to conduct a deeper examination. Here, they draw upon a diverse array of methods and techniques.

In cases where no red flags emerge from the initial report, and the situation aligns with expectations, the patient proceeds to their specified destination. The focus shifts to providing comfort for the patient and communicate with the patient, reassure, small talk and educate about what is going to happen. This process underscores the essence of a clinician's work during ordered transport. It's a series of assessments, discernment, and compassionate gestures, all designed to ensure the well-being of their patients.

What does an EMS clinician do when a patient appears to be sicker than indicated in the initial call?

When anomalies, or red flags are detected within the Pre-Arrival Preparation (PAP) or the Patient Assessment Triangle (PAT), the EMS clinician conducts a supplementary examination. For the EMS clinician, this necessitates a responsive adaptation to the evolving clinical scenario. This process of adaptation is iterative and demands constant adjustments to the treatment plan based on observations, measurements, and patient history. This dynamic approach emphasizes the necessity for the EMS clinician to remain flexible and not rigidly adhere to the initial plan.

The patient undergoes an examination based on the ABCDE assessment when there is a discernible need for closer scrutiny. The ABCDE assessment constitutes an integral aspect of every EMS clinician's core proficiency. This method entails a systematic assessment of vital organ systems, encompassing airway, breathing, circulation, and neurological status, with the aid of limited diagnostic tools such as ECG, SpO₂ monitor, blood pressure monitor, stethoscope, thermometer, and pupil light. This systematic assessment helps determine the patient's vital status and helps rule out potential (mis)diagnoses, thereby mitigating the risk of overlooking significant pathologies due to cognitive biases or errors.

During the examination process, the clinician may make the decision to enhance capacity for treatment. Creating adaptive capacity may be crucial to providing the necessary care for the patient. This capacity can be augmented by calling for a second ambulance, consulting with a GP or another medical specialist, or mobilizing the Mobile Medical Team (MMT) to the scene, which can bring additional expertise from a doctor.

The process of assessment and data collection for acutely critically ill patients is an iterative endeavour, persisting until the patient reaches a setting where definitive treatment can be administered. This iterative approach pertains not only to the examination and treatment phases but also encompasses the analytical process. The latter involves a combination of sensemaking and deductive reasoning, commencing with the consideration of various differential diagnoses that are subsequently refined through systematic checks and the acquisition of medical history.

Ascribing meaning to information and experiences, particularly within the context of pre-hospital emergency care, is a recurrent theme given the inherently intricate, ambiguous, or uncertain nature of the situations often encountered. The complexity of pre-hospital patient care is amplified by the individualized nature of each patient presentation, with no two cases or contexts being identical. While standardized protocols serve as a guide, their strict adherence can prove challenging in real-world practice, where patients may not neatly conform to predetermined pathways.

In situations where the clinical picture remains unclear, relying on intuition becomes imperative for the clinician. When confronted with equivocal findings, the clinician grants precedence to their intuition, prompting a comprehensive assessment. This may entail consulting with a general practitioner or hospital-based specialist before presentation, or directly presenting the patient at the hospital. However, it is acknowledged that exercising this intuitive faculty is considered a nuanced skill.

Upon encountering a patient in acute distress, the initial determination centres on whether there is sufficient time to conduct an in-home assessment or if expedient hospital transfer is warranted. Subsequently, the choice of hospital is deliberated. These decisions hinge on the initial findings of the EMS clinician. In scenarios where the patient is not critically ill, decision-making transforms into a collaborative process, involving input from the referring general practitioner, the dispatch control room, the immediate colleague, the accompanying driver, and, significantly, the patient and their family. Ultimately, the EMS clinician wields the ultimate authority in decision-making.

The landscape of pre-hospital emergency care encompasses a spectrum of challenges that impact the performance of the clinician, categorized under three domains: logistics and environment, patient and family dynamics, and clinician and team dynamics. Navigating logistical challenges, such as transferring non-ambulatory patients, particularly in cases of obesity or in multistorey buildings, poses formidable hurdles. The presence of animals, notably aggressive dogs, introduces an additional layer of physical risk. Furthermore, high-stress or acoustically dense environments impede effective communication, potentially compromising patient care.

Cultural and linguistic differences present a challenge in obtaining accurate and pertinent information from the patient and their family. These variations can influence the perception and reporting of symptoms, potentially leading to misinterpretation. Ensuring accurate information

acquisition is crucial for sound clinical judgment, yet patients and their families may inadvertently or intentionally provide incomplete, unclear, or inaccurate information.

Performance-affecting factors for the clinician include complacency, presumptions, overconfidence stemming from recent successful experiences, cognitive overload, and personal challenges outside of the clinical setting. Additionally, the apprehension of facing complaints or incidents may also impact clinical decision-making. Due to the categorization of ordered transports as less urgent, there is a risk of complacency, potentially compromising the recognition of severely ill patients. Despite this risk, clinicians prioritize patient well-being, demonstrating their commitment to providing the best possible care. This dedication underscores the profound impact that clinicians have on patients and their families.

In summary, the process of what an EMS clinician does when a patient appears to be sicker than indicated in the initial call is a multifaceted endeavour that demands continuous adaptation, analytical prowess, and effective teamwork. It encompasses a wide array of challenges, ranging from logistical considerations to cultural and linguistic nuances. The ability to navigate these complexities while maintaining a patient-centric focus is a testament to the skill and dedication of clinicians in providing high-quality pre-hospital care.

How do EMS clinicians learn from changing situations?

Learning within the ambulance setting encompasses two distinct dimensions: formal and informal learning. The former pertains to structured educational initiatives provided by the employer, commencing with the foundational training of a clinician. This comprehensive training program equips clinicians with diverse methodologies for recognizing critical conditions and formulating appropriate interventions, constituting the bedrock upon which their professional careers are built. Throughout their careers, clinicians are presented with a diverse array of formal educational opportunities, including practical exercises, simulated scenarios, and e-learning modules, ensuring the perpetuation and augmentation of their competence. Notably, there is little emphasis on ordered transport within both initial training and subsequent education, potentially contributing to a perception of it as an inherent, albeit obligatory aspect of the role and one that can be handled relatively easily. This view, as articulated by some, posits ordered transport as a necessary yet potentially overlooked domain, despite it potentially involving the most critically ill patients.

Concurrently, informal learning transpires through dialogues and discussions among professionals, fostering an environment conducive to the exchange of narratives and experiences. Primarily centred on acute scenarios, it is noteworthy that extensive casuistic discussions, devoid of heroism, are infrequent. This informal milieu also encompasses active solicitation of feedback, including debriefing sessions with the driver and colleagues from a second ambulance, as well as post-

case reflection at the ER. Here, the clinician scrutinizes the final diagnosis against their previously established differential diagnoses, fostering a reflective learning process.

In addition to these strategies, informal learning encompasses accruing expertise through experiential exposure to a diverse patient population. This process entails observing numerous cases and developing the ability to discern distinct clinical scenarios. Furthermore, the process of clarifying ambiguous or previously unknown information enhances learning, enabling clinicians to approach subsequent patient encounters with heightened precision.

It is imperative to acknowledge that while exposure to a wide array of patients expands clinical acumen, it also carries the potential for cognitive biases and assumptions. Learning from errors or omissions is underscored as a potent avenue for professional growth, contingent upon a robust reflective practice and a receptive attitude towards self-improvement.

Various different additional learning strategies emerge from the data. These include visualizing scenarios to anticipate decision-making and engaging in low-profile case practice. Additionally, self-reflection, encompassing a critical appraisal of one's professional actions and personal identity, is pivotal.

As an EMS clinician accrues knowledge and experience, their expertise accrues, contingent upon sustained dedication and intellectual investment. Expertise within the ambulance service extends beyond time on the job alone, encompassing pre-ambulance work experiences and specializations such as IC/CCU/ER/anaesthesiology. This multidimensional perspective significantly enriches clinical acumen. Given the diverse patient demographic encountered, spanning from paediatrics to geriatrics, the role of a clinician is inherently demanding, necessitating a high level of proficiency and adaptability in order to be successful as a clinician.

Discussion

This chapter discusses the findings with the aim of answering the research question, based on the lived experience of EMS clinicians what does an EMS clinician do when a patient appears to be sicker than was indicated in the initial call? As in the results chapter, the findings are described in the same order starting with normal performance, coping with the unexpected, performance influencing factors and concluding with learning and expertise.

Normal performance. While performing an ordered transport, the clinician is vigilant of patients who are sicker than reported in the initial rapport. To identify this category of patients, several strategies are deployed from the time the assignment is given. The first strategy is the preparation done while driving to the patient, the so-called Pre-Arrival Preparation (PAP). The approach to ordered transport differs based on whether the patient has already received care from another provider. This variance necessitates a distinct pre-arrival preparation (PAP) process. PAP serves as a risk assessment, focusing on identifying potential complications and excluding critical differential diagnoses. This form of pattern recognition by the clinician corresponds to the model of recognition-primed decision-making (Klein, 1993), in which the importance of experience and intuition is emphasized.

The first thing an EMS clinician will do upon entering the patient's room is to observe a patient. This brief observation is called the Patient Assessment Triangle (PAT). The PAT is a pivotal tool in evaluating every patient, regardless of the urgency of their condition. It involves a rapid assessment of the patient's colour, appearance, and breathing effort. The PAT serves as the starting point for determining the patient's actual condition and the urgency of required interventions. After assessing the PAT, the clinician conducts a comparative analysis between the initial report and the actual situation. Discrepancies between the two or abnormalities in the PAT serve as triggers for further examination and intervention.

In cases where no red flags are identified in the initial report, the situation aligns with expectations, and there are no abnormalities in the PAT, standard ordered transport is started. Treatment in these cases is primarily focused on ensuring patient comfort, with interventions limited to necessary measures for the patient's well-being during transport.

Ordered transport of non-urgent ill patients is part of the clinician's remit. The EMS clinician's mindset significantly influences their approach to ordered transport. While some may initially perceive it as a routine aspect of their job, the realization of potentially encountering critically ill patients shifts their perspective. When abnormalities are detected in the PAP or the PAT, the EMS clinician engages in a continuous process of adaptation which will be discussed next. This shift underscores the importance of recognizing the severity of patients' conditions especially in non-emergency ordered transport.

Dealing with the unexpected. Prehospital emergency care is characterized by high complexity, often involving situations that are ambiguous, uncertain, or challenging. Protocols and standardized procedures may not always align perfectly with the circumstances of each patient, necessitating deviation from the established protocols. This requires resilient performance, adaptability, and critical thinking from the clinician. Attention to local rationality and context is crucial to understand that adjustments to the protocol are necessary. These findings align with Dekker et al.'s (2012) caution against rigid adherence to universal rules in complex systems and emphasize the need to pay attention to the constantly changing circumstances of healthcare work.

The assessment of an acutely critically ill patient is an ongoing, iterative process. It continues until the patient reaches a definitive treatment setting. This iterative approach applies not only to the physical examination and treatment but also to the analytical process. The analytical process involves sensemaking and deductive reasoning, beginning with considering various differential diagnoses (DD). This process relies on the integration of knowledge, skills, and experience to make informed decisions regarding patient care.

To make informed decisions the EMS clinician examines all the patient's vital signs. He does this using the ABCDE method. The ABCDE method serves as a cornerstone in examining acutely critically ill patients. It involves a systematic assessment of vital organ systems, ensuring a comprehensive evaluation to identify potential life-threatening conditions. Based on the sum of measurements and DD formation, decisions are made.

The clinician must make rapid decisions regarding whether to treat the patient at the scene or transport them to a hospital. The escalating disease course of the patient creates a multiplicity of decision moments. The decision-making process is influenced by initial findings, patient preferences, and shared decision-making with other stakeholders, including amongst others the medical specialist in the hospital, the GP, control room dispatcher, immediate colleagues, and the patient and their family. Reay et al. (2018) argument that no DM theory or model can fully capture the complexity of prehospital patient care is reflected in these findings which show that the variables are infinite and therefore complex. The different stakeholders not only influence the DM process but also create a shifting power dynamic which can create alternatives to local rationality (Bergström et al., 2012). This aligns with the argument of Bergström et al. (2012) that the process of escalation is inherently complex and social, strongly linking coordination and cognitive activity such as decision making.

The diagnosis is not always clear and measured vital signs do not always give a reason to present a patient to the ER. In cases where the diagnosis or condition is not immediately clear, clinicians often rely on their gut feeling or intuition. This instinctual response can prompt further examination or lead to a decision to seek additional medical advice or present the patient at a hospital.

A holistic view of the patient an open mind and a critical eye (Andersson et al., 2019) is what helps the clinician to treat these patients.

Factors that influence performance. Various challenges arise during pre-hospital patient care that potentially influence performance. These challenges encompass logistical and environmental factors, the role of power, language barriers, cultural differences, and incomplete or unclear information from patients and family's factors that all can impact the assessment and care provided. The clinician's performance and decision making can potentially be influenced by factors such as complacency, assumptions, recent successful experiences, overthinking, exceeding one's bandwidth, and personal troubles. There is also the fear of facing consequences, particularly from complaints or incidents.

Table 6 *Performance influencing factors*

Environment	
Logistics	Getting a patient into the ambulance can be challenging. A multitude of factors play a role. The location of the patient, the weight of the patient and the presence of dogs can complicate logistics.
The role of power	Power is used to force transport when not indicated. By presenting the story or complaints in such a way that the dispatcher has no choice but to send an ambulance. This form of powerplay can be commenced by patients, their families or by the GP.
Cultural differences	Illness perception and expression of symptoms varies by culture. This makes estimating the severity of the situation, here there is a risk of underestimation by the EMS clinician
Language barriers	Obtaining an anamnesis is complicated when the patient (and his family) and the EMS clinician do not speak the same language. This can result in an incomplete or incorrect picture of the patient's situation.
Incomplete unclear information	Patients and their families may not be well informed about their own disease history, forget to communicate important aspects or make an assessment that under/overestimates the real situation. This gives a distorted picture of the real situation and thus affects the EMS clinician's decision-making process
Team	
Team dynamics	Working in a team provides synergy, but it is essential to be aware of potential pitfalls. The opinion of a colleague can be influential, potentially leading to tunnel vision. The dynamic of the shift is affected by the social skills, empathy, expertise, and proactive support of the colleague.

Utilizing colleague's Experience	EMS clinicians value the experience of their colleagues (driver), often involving them in decision-making. Trusting the judgment of experienced colleagues is critical in acute patient care.
Assessing team strength	It is crucial to assess the strengths and working styles of colleagues. This influences decisions such as whether to request a second ambulance or rely on the existing team's capabilities.
Practitioner	
Mindset	EMS clinicians may approach ordered transport with less urgency compared to emergency calls. This mindset, while common, carries a risk of complacency, potentially leading one to overlooking seriously ill patients. Although Havinga et al. (2020) indicates that complacency is a risk in individual expertise, the results show that particularly the group with experience between 1 - 5 years indicates experiencing this less urgent mindset. The remaining groups are more aware of the possibility of encountering a critically ill patient during ordered transport. Despite potential pitfalls like complacency, EMS clinicians are committed to prioritizing patient wellbeing. Their primary concern is ensuring the safety and health of the patient.
Overanalysing	Recognizing the need for immediate action is crucial when a patient requires acute intervention. Overanalysing a situation may lead to delayed response, particularly in critical situations.
Workload	Increased workload can affect communication with the patient and the driver, especially in urgent situations.
Personal issues	Personal troubles at home or work can influence thinking and decision-making. Recognizing these factors and discussing them with colleagues is important.
Complaints or incidents	The fear of facing consequences influences the decision-making of the EMS clinician. In particular, this can play a role in the decision to transport a patient that is not entitled to ambulance transport, or when the clinician doubts the truth of the story or the seriousness of the situation. If in any doubt, the patient will be taken to the hospital. These fear-driven decisions paralyse the ambulance process by transporting patients unnecessarily. Further down the chain (ER), this also causes crowding. According to Dekker (2009), the organisation can work on reducing this fear by normalising incidents and start seeing them as a learning opportunity.

Learning and expertise. Learning in the ambulance setting can be categorized into formal and informal. Formal learning is provided by the employer and includes initial training and ongoing education. This lays the foundation for an EMS clinician's career. During initial training and ongoing education, the focus is on treating the acutely sick patient. However, the challenges that ordered transport can present are covered little to not at all. This stems from a tendency to view ordered transport as routine, potentially leading to underestimation of its clinical significance for patients. The ways in which informal learning takes place are shown in table 7.

Table 7 *Informal learning*

Informal learning	
Conversations and discussions	These exchanges mainly revolve around acute cases, with limited extensive discussions on non-heroic casuistry, such as ordered transport.
Feedback and debriefing	EMS clinicians actively seek feedback through discussions with colleagues, debriefing with drivers, and post-ER visit reflections. They aim to verify their diagnoses and actions, emphasizing a commitment to continuous learning.
Experience as a learning tool	Building expertise through exposure to various cases is a crucial aspect of learning. Reflecting on past cases, both successes and mistakes, contributes to professional growth.
Learning strategies	Strategies include visualizing scenarios, reflecting on actions, and seeking feedback. These tools help EMS clinicians refine their decision-making and clinical skills.
Expertise and demands of the profession	Expertise in EMS is not solely based on years of experience but also on previous specializations and the breadth of clinical knowledge. The profession demands adaptability, prioritization, empathy, communication skills, and critical thinking. Adaptive skill is an essential ingredient of expertise (Ward et al., 2018) and must be seen as a vital skill for work in a complex environment. EMS clinicians should not only be domain experts but also be capable of quickly adapting to situational changes and risk. By managing risk adaptively, clinicians contribute to creating patient safety (Bergström et al., 2015)
Personal standards and commitment	Many EMS clinicians hold themselves to high standards and prioritize patient well-being. They view their role as demanding excellence and continuous improvement

Key characteristics for EMS clinicians	<p>From the data, several characteristics emerged that are important to perform the profession as an EMS clinician.</p> <ul style="list-style-type: none">▪ Adaptive and creative ability▪ Ability to prioritise▪ Ability to set your ego aside▪ Ability to show authority and give confidence▪ To be alert, involved, helpfulness and empathic▪ Good communication skills▪ self-aware and critical▪ Critical thinking▪ Open mind▪ Being curious and not provoking closure prematurely
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When learning only from errors, the opportunities for learning are limited, after all, percentage of errors is very small compared to the whole. Research over 2018 shows that out of 45,000 patient-related journeys, 99.4% were incident-free (Home, 2019). Hollnagel (2014) argues, why do we only learn from things that go wrong? This is only a small percentage of the whole. Why not learn from the thing that go well? learning from everyday practice, according to Hollnagel, has a much greater reach than learning from mistakes alone. Yet it seems difficult to do so. Spectacular rescues and mistakes are much easier to recognise and find favour with colleagues, which means there is less room for stories about everyday work. Work that almost always goes well, but where there is also always room to learn.

Conclusion

In conclusion, the lived experiences of EMS clinicians reveal a dynamic and multifaceted process when faced with a patient appearing sicker than indicated in the initial call. Beginning with normal performance, the EMS clinician employs strategic pre-arrival preparations and utilizes tools like the Patient Assessment Triangle to identify potential discrepancies. Coping with the unexpected involves a continuous process of adaptation, where the clinician navigates through challenges, relying on critical thinking and adaptability in the absence of standardized procedures. Various factors, including environmental, team dynamics, and personal issues, influence performance, emphasizing the need for flexibility in decision-making.

The assessment and data collection for acutely critically ill patients follow an iterative process, emphasizing the necessity for flexibility and constant adjustments to the treatment plan. The complexity of pre-hospital emergency care is acknowledged, with the recognition that intuition becomes crucial in situations where clinical pictures remain unclear. The EMS clinician, ensuring the delivery of high-quality, pre-hospital care and upholding patient safety.

The process of what an EMS clinician does when a patient appears to be sicker than indicated in the initial call is a multifaceted endeavour that demands continuous adaptation, analytical prowess, and effective teamwork. It encompasses a wide array of challenges, arising from the complexity of the work context. The ability to navigate these complexities while maintaining a patient-centric focus is a testament to the skill and dedication of clinicians in ensuring the safety of their patients. Patient safety is a central theme in the clinician's working experience. Although only a few EMS clinicians explicitly refer to the term "patient safety," it is not considered a by-product of the work they do; instead, safety is integrated into the vocabulary and the daily practice of the EMS clinician.

EMS clinicians demonstrate daily that by adapting as sharp-end operators to risk and unforeseen situations, they create safety for their patients. Braithwaite et al (2015) indicate that there is a tendency in healthcare to focus on errors. As a result, resilience that is already present is not sufficiently seen. Resilience which is plentiful in the daily practice of the EMS clinician, acting on unexpected situations and patients who are much sicker in practise than indicated in the initial call. This resilience is something worth noticing and worth learned from. Learning from daily practice in which challenges and complexity are great. A daily practice in which EMS clinicians are working daily to provide the best and safest care for their patients.

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