

Documenting Patient Interaction: Emergency Medical Services Report Reader Expectations and Improvements for Providers

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ABSTRACT

Introduction: Patient care reports contain critical elements related to interventions rendered and medical decision-making. Yet, little consensus exists around reader expectations, leaving emergency medical services (EMS) providers unaware of critical content.

Objectives: This 2-phase study aimed to answer the questions “What do EMS providers know about report readers?” and “What do report readers expect from reports?” through surveys and interviews. In doing so, this study gauged EMS providers’ audience awareness of report readership and determined what readers expected from reports.

Methods: A prospective survey was conducted with 57 EMS providers to gauge their level of audience awareness or how often they thought of specific report reader groups when writing reports. Interviews were conducted with 14 report readers following retrospective think-aloud protocol, where participants verbalized their questions, comments, and concerns about reports while reading.

Results: Surveys indicate participants lacked a full, accurate sense of audience awareness. When writing reports, they thought of audiences, such as patients, who do not regularly read reports, while reporting not thinking of actual report readers—such as billing specialists—often or at all. Interview analysis indicated that report readers looked for 21 elements in high-quality, effective report narratives.

Conclusions: These data formalize and reinforce what a high-quality narrative should include, with “high-quality” meaning the narrative allows readers to do their jobs without follow-up or an amendment needed to the report.

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INTRODUCTION

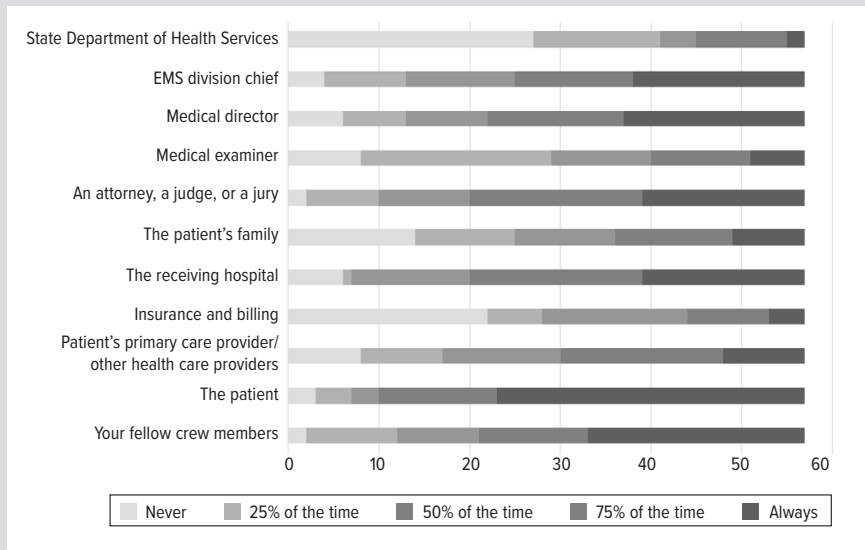
Patient care reports contain critical elements related to interventions rendered and medical decision-making. In the hospital setting, multiple reports from a variety of health experts help to paint this picture. However, in the prehospital setting, a single report often accounts for the entire clinical experience, and this single report is used to inform medical, financial, and legal decisions. Much can be garnered from these emergency medical services (EMS) reports, and much is demanded from them by their readers. Yet, little consensus exists around reader expectations, leaving EMS providers unaware of critical content report readers require.

EMS reports have 2 sections: dropdown sections that contain short text boxes where providers input quantitative information, such as a patient’s vital signs or medical condition, and the narrative section, a free-text entry box where providers type their decision-making and observations. The narrative section contextualizes quantitative information in the dropdown

menus because it requires EMS providers to capture details and intricacies the dropdown section cannot. Unlike the dropdown sections that have detailed prompts like “primary assessment,” the narrative section often lacks clear instruction for what EMS providers should document. Our study aimed to raise awareness of what report readers need and why.

There is a lack of research regarding EMS report writing, with the current data being outdated, emphasizing effectiveness

Figure. The Frequency That Providers Thought of Each Audience Segment When Writing Reports



Abbreviation: EMS, emergency medical services.

of documentation platforms instead of quality itself, or drawing from hospital settings.¹⁻⁴ Furthermore, much knowledge about report writing is based on anecdotes and expert opinion^{5,6} rather than peer-reviewed research.^{7,8} A recent review found that allied health reports are not written in ways that readers find accessible, and more research is needed to determine how reports can be improved.⁹ In response to these gaps, this study aimed to answer the questions “What do EMS providers know about report readers?” and “What do report readers expect from reports?” through surveys and interviews.

METHODS

This was a prospective survey and structured interview study with 2 phases. This research project was approved July 30, 2019, through the Marquette University Institutional Review Board, protocol number HR-1903029221. All participants signed an informed consent form. Because our study aimed to capture the EMS report lifecycle, we started with the report writers—EMS providers—in Phase 1 to gauge their knowledge about how reports are used. Then, in Phase 2, we focused on the people who read reports to learn about what they need from writers. These 2 phases, then, put report writer and reader perspectives in conversation with each other.

Phase 1: EMS Provider Knowledge About Readership

To answer our first research question, “What do EMS providers know about report readers?”, a prospective survey for internal assessment was deployed through Qualtrics to emergency medical technicians (EMT) and paramedics at a Midwest suburban fire-based EMS department. Part of the survey asked department members about their understanding of who read reports and the frequency that readers use their reports (Appendix 1).

Phase 2: Report Reader Interviews

To answer our second research question, “What do report readers expect from reports?”, think-aloud protocol interviews were used—a method used in human computer interaction,¹⁰ clinical decision-making,¹¹ and literacy studies.¹² People who utilize completed EMS run reports in their daily work read a patient care report while verbalizing their answers to the following interview questions (Appendix 2): “Why and when would you use this report?”, “What information do you look for?”, “What information do you use?”, and “What questions does this report leave you with?” This method provided insight into decision-making and reading practices that cannot otherwise be made visible.

Twelve interviews were conducted with 14 participants; interviews lasted 45 to 90 minutes and were recorded. Participants held a range of roles in emergency medicine and EMS: 1 EMS coordinator, 1 billing specialist, 1 city attorney, 1 medical examiner, 5 EMS medical directors (2 critical care flight medical directors, 3 ground transport medical directors who are “medical directors A, B, C”), 1 organ procurement coordinator supervisor, 1 prosecuting attorney, a manager for a trauma program, and a team of emergency department (ED) providers. This ED team included the ED manager, trauma coordinator, health information management supervisor, and a physician who also worked as a medical director but was speaking from his role as an ED physician. Participants worked in the same region of the state, were recruited directly by the division chief of EMS and author 1, and were recruited because they read and used EMS reports as part of their role in health care. This controlled for a few variables, eg, the attorneys were licensed in the same state and the medical directors worked in the same county under the same system medical director. Attempts were made to have at least 2 participants from each audience group, but participation depended on participants’ willingness and availability to be interviewed.

During the think-aloud portion of interviews, participants read 2 to 3 real EMS reports. They had not read these reports prior to the interview. Reports were selected by the fire department’s division chief of EMS and were selected based on the participants’ occupations so that they would read a report that they would use, instead of using a hypothetical situation or a fictional report. For example, the organ procurement specialist read reports from patients who died from cardiac arrest and were organ donors, and the medical examiner read reports of patients who were pronounced dead on scene. Participants who were in the same reader group, such as medical directors and attorneys, read the same reports to learn what similarities and differences

Table 1. Taxonomy of Report Reader Expectations

Category	Code: Element Readers Expect in Narratives	Definition	Example
Scene details: Elements outside of and around patient, elements included in initial scene arrival and scene size-up	Environmental surroundings	Weather, other units on scene, location, initial scene descriptions	“We got on scene, PD said they were giving CPR. They put an AED on. They did all these kinds of things before we got there.” — <i>Medical Director C</i>
	People/bystanders and their (3rd-person) statements	People on scene who were not the patient, such as other units, family members, and witnesses	“But you get on the scene and a family’s saying oh, well they have this, this, and this, you have to go by what they say, obviously.” — <i>Organ Procurement Specialist</i>
	Initial patient position	What patient looked like upon arrival, not during assessment	“Patient was found down on the ground in their own mess.” — <i>EMS Coordinator</i>
	Times	Timestamps or time of events. Refs to medication times or times taken during certain interventions, like CPR, were coded under “interventions” bc times are part of intervention protocol.	“So you arrived at 2:28, so you were with them for 14 minutes.” — <i>Billing Specialist</i>
Patient details: Information about patients themselves, patient-EMS interaction, and info EMS gathers during a response; info that leads to care details and treatment plan, patient details lead to refusal decision by patient; refers to patient-EMS interaction only, not bystanders, which are captured under “scene details”	Assessment	Medical, trauma, primary, or secondary assessments and signs and symptoms	“53-year-old female with chief complaint of smoke inhalation.” — <i>Prosecutor</i>
	Patient history	Patient’s medical history, medications, last oral intake, allergies. If bystanders added information germane and directly related to these elements, these refs were coded as part of patient history.	“Her history is renal failure.” — <i>Billing Specialist</i>
	Vitals	Taking of vital signs and vital signs themselves. Heart rate, blood pressure, blood glucose, respiratory rate, oxygenation, pulse, temperature, Glasgow coma scale.	If you notice it [the narrative] says something about blood “pressure, heart rate, regular at 18, normal 88, at room air 116.” — <i>EMS Coordinator</i>
	Patient statements	Statements articulated by patient unrelated to patient history, such as description leading up to event and refusal decisions. These were separated bc some statements were not related to patient history and bc anecdotes that inform current report writing practices instruct providers to include direct patient statements.	“Child denied any pain or loss of consciousness.” — <i>Medical Director B</i>
Care details: Actions, decisions taken by EMS crews as part of patient care, movement, transport	Interventions	Actions taken to follow and deviate from treatment plans and protocols. Times that medications were administered or specific actions were performed were included under interventions.	“The medications are actually listed in a couple places. So it shows the 500 mL bolus, it shows the epi. Looks like epi was given twice.” — <i>Organ Procurement Specialist</i>
	Moving patient	Moving patient to stretcher, from initial location to the ambulance, and extrication details	“Because it looks like they didn’t even attempt resuscitation” — <i>Medical Director A</i>
	Transport information	Scene to hospital or interfacility transport	“They, the paramedics, then removed the patient from the hazard and placed him in that position on the ground.” — <i>Medical Examiner</i>
	Handoff information	EMS-hospital staff interaction during patient transfer of care	“We move the patient to the back of the ambulance.” — <i>Medical Director A</i> “List provided to ED.” — <i>CC Flight Medical Directors</i>
Report quality: Elements of a report that helped participants determine if a report or provider was credible. These elements were less tangible than the other refs in that coders deliberated more about these codes than others	Accuracy/inaccuracy		“Where they can try to be more accurate at the documentation for especially the first 5 minutes where there’s a lot of things going on.” — <i>Medical Director C</i>
	Pertinent/nonpertinent information		“Because I’ve also seen very long reports that really don’t tell me anything.” — <i>Medical Director A</i>
	Consistent/inconsistent information		“We want to make sure everything’s consistent bc sometimes the history we’re given doesn’t always match what’s in the medical records.” — <i>Medical Examiner</i>
	Spelling/misused abbreviations Grammar/mechanics		“One thing, the ‘OA,’ that’s not a typical appropriate abbreviation.” — <i>ED Team</i> “Grammatical errors that make it hard to read.” — <i>CC Flight Team</i> “I don’t know that that has to be in quotes.” — <i>City Attorney</i>
Clarity		“I think you should use that narrative part and assessment part to paint a picture and tell a story. So that someone who reads that report or history can clearly... it forms a picture in their mind of the patient and what’s happening and what’s going on.” — <i>Medical Director A</i> “It’s just a very nondescriptive term.” — <i>Medical Director C</i>	

Abbreviations: EMS, emergency medical services; CPR, cardiopulmonary resuscitation; refs, references; bc, because; w, with.

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Table 1. Taxonomy of Report Reader Expectations (continued from page 287)

Category	Code: Element Readers Expect in Narratives	Definition	Example
Report quality (cont'd)	Completeness and specificity		<p>"So for me, I don't know if the blood pressure, if they even attempted to take it or they just didn't because it's blank. So blank, to me, is either not done or not documented, but I can't tell." — <i>Trauma Nurse</i></p> <p>"I would expect a little bit more description on the exam." — <i>Medical Director B</i></p> <p>"Don't leave any piece out from the moment you have contact w the patient until you transfer them over, we need your entire care, your entire visual report transposed onto the EPCR." — <i>Billing Specialist</i></p>
	Concise/succinct		<p>"A lot of times, you can see here, documentation that has very redundant information. It tells you a whole lot of things that we already know from other places in the chart." — <i>ED Team</i></p> <p>"The narrative is really overly wordy and I find that you have to read it a couple of times. I think it probably has double the number of words that it needs to get across." — <i>CC Flight Medical Directors</i></p>
	Justification/rationale		<p>"But there's decent justification that the patient's able to make a sound, mental decision." — <i>Medical Director C</i></p>

Abbreviations: w, with; EPCR, electronic patient care record; ED, emergency department; CC, critical care.

existed within these groups. Participants were presented the entire report, which included electrocardiogram printouts, the narrative, and information completed in dropdown menus and text entry boxes, so that the researchers could observe their reading habits and actions.

Analysis of interview transcripts involved grounded theory where researchers build a theory from repeated themes across data that inform a coding structure to analyze results.¹³ In this iterative process, 3 raters reviewed the transcripts using Nvivo (QSR International, Burlington, Massachusetts), a qualitative data analysis program used for unstructured data. Raters read transcripts for common themes and patterns and then met to discuss their findings for commonalities and differences. Codes were developed from this discussion and then were used in subsequent rounds to analyze the transcripts. Data saturation was met when no new codes or patterns emerged across transcripts. The raters' coding patterns were then analyzed for agreement and disagreement, as well as the frequency of the codes used. To ensure coding fidelity, the raters discussed each individual reference throughout all transcripts, totaling 1932 unique references.

RESULTS

Of the 150 EMS providers invited to take the Phase 1 survey, 57 EMS providers completed it (Figure). Respondents had 0.5 to 38 years of experience in EMS working with their current or other departments. Of note, 60% of respondents reported that they "always" think of the "patient" audience group when writing their narrative. Conversely, for the audience group "insurance and billing," 38% of respondents reported that they "never" think of this audience group. Likewise, 42% of respondents report that they always think of their crew members when writing reports.

In Phase 2, grounded theory analysis of the interview transcripts generated a coding taxonomy of 4 categories that held 21 codes total (Table 1). Using Cohen's Kappa for interrater reliability, an average kappa score of 0.65 was attained across transcripts, suggesting "substantial reliability." The generated codes represented the 21 elements readers expected to see in report narratives. The top 3 most-referenced codes were completeness/details, assessments, and interventions, which occurred concurrently (Tables 2 and 3). The 3 least-referenced codes were grammar, handoff information, and moving the patient. All report readers referenced environmental surroundings, scene times, and patient history to some degree, although some referenced them more than others.

DISCUSSION

Results from this study offer insight into provider audience awareness and report readers expectations.

EMS providers lack a full picture of who reads reports: Findings from Phase 1 indicated a disconnect between who EMS providers think read reports and who report readers are. At this agency, insurance and billing specialists read nearly all reports, yet 38% of respondents reported "never" thinking of this audience. Conversely, 60% of respondents reported "always" thinking of the patient audience group; however, out of 12,336 reports written in 2021, fewer than 10 reports were requested by patients or their family members. This disconnect was striking—if a provider is unaware of who reads reports, their ability to write effective reports is compromised.

Readers value completion over concision. Our findings suggest that readers do not value concise writing. In fact, that element was one of the lowest across all codes in all categories, with

only 17 codes across all interviews. During interviews, participants stated, “I don’t know what that means” when reading narratives that were considered “concise” but lacked necessary information about scene details, patient details, and interventions. We anticipated that “concise” would be one of the highest referenced codes given the frequency with which EMS providers are told to not overwrite.^{5,6,14} Questions like “I don’t know what that means” are signs of unclear writing and indicate the writer did not properly anticipate readers’ questions.¹⁵ Interviews showed that participants relied heavily on narratives to guide their own decisions and actions regarding patient care, legal action, insurance claims, and financial reimbursement. When reading reports, they skimmed over information they did not need, but they could not fill in information that was not included in a narrative.

Job role was partially indicative of what readers look for but did not account for variance among same group members, especially among medical directors. In some cases, lack of references to codes could be attributed to the participant’s purpose for reading the report. For example, the organ donation specialist referenced “interventions” most, because the interventions EMS providers performed directly affected her job.

Notably, within the medical directors, there was little variance in reference frequency regarding “assessment,” “vitals,” “consistency,” and “patient details.” However, variability was prominent in report quality. Within the larger category, reference totals ranged from 47 to 147. For “spelling/misused abbreviations” and “grammar/mechanics,” the critical care flight medical directors had the greatest number of references to this element (8 and 4, respectively), while the other 3 medical directors interviewed had zero references to these elements. Within “justification” and “rationale,” 1 medical director referred to it 45 times, while 2 others referred to it only twice.

These findings can guide curriculum enhancement and training programs and better prepare EMS providers to meet readers’ expectations. The importance of audience and the effective devel-

opment of a writer’s sense of audience awareness is well documented in writing studies.¹⁶⁻¹⁹ A core component of effective written communication, audience awareness can help EMS providers both respond to and relate to whom they are communicating. Because written reports are read asynchronously, EMS providers are responsible for anticipating and answering readers’ questions in a format that is clear, well organized, persuasive, and accurate;^{15,20}

Table 2. Total Number of Code References and the Readers Who Referred to Each Code the Most and Least

Category/ Code	Refs	Interviews With Most Refs: Participant/s — No. of Refs	Interviews With Least Refs: Participant/s — No. of Refs
Scene details			
Times	102	Organ Donation Specialist — 26	Medical Director A — 1
Environmental surroundings	81	Prosecutor — 18	Medical Directors A, B, C — 1 each
People/bystanders and their (3rd-person) statements	28	EMS Coordinator — 5	Billing Specialist, CC Flight Medical Directors, Medical Director A, Trauma Nurse — 0
Initial patient position	22	Medical Examiner — 9	City Attorney, CC Flight Medical Directors, Medical Directors B, C — 0
Patient details			
Assessment	301	Prosecutor — 41	City Attorney — 4
Patient history	125	CC Flight Medical Directors — 20	Medical Director A, City Attorney — 1
Patient statements	95	Medical Director C, Prosecutor — 16 each	Organ Donation Specialist — 0
Vitals	78	Billing Specialist — 12	City Attorney, ME — 0
Care details			
Interventions	173	Organ Donation Specialist — 43	City Attorney — 0
Moving patient	14	Billing Specialist, ME — 6 each	City Attorney, EMS Coordinator, Medical Director C, Organ Donation, Prosecutor, Trauma Nurse — 0
Transport info	18	Medical Director A — 5	City Attorney, EMS Coordinator, ME, Organ Donation, Prosecutor — 0
Handoff info	10	Billing Specialist, ED Manager — 3 each	City Attorney, ME, Prosecutor, Medical Directors A, B, C — 0
Report quality			
Completeness/specificity	451	Medical Director C — 78	ME — 19
Justification/rationale	150	Medical Director C — 45	City Attorney — 0
Clarity	82	Medical Director C — 18	ME — 0
Pertinent/nonpertinent information	73	City Attorney, ED Team — 19 each	Medical Director C, Trauma Nurse — 0
Consistent/inconsistent information	58	Organ Donation Specialist — 11	Billing Specialist — 0
Accuracy/inaccuracy	29	Prosecutor — 6	Medical Director A, Billing Specialist, City Attorney — 0
Spelling/misused abbreviations	18	CC Flight Medical Directors — 8	Billing Specialist, City Attorney, ED Team, EMS Coordinator, Medical Directors A, B, C, Organ Donation Specialist, Trauma Nurse — 0
Concise/succinct	17	ED Team — 9	Billing Specialist, City Attorney, EMS Coordinator, Medical Directors B, C, ME, Organ Donation Specialist, Prosecutor, Trauma Nurse — 0
Grammar/mechanics	7	CC Flight Medical Directors — 8	Billing Specialist, ED Team, EMS Coordinator, Medical Directors A,B, C, Organ Donation Specialist, Trauma Nurse — 0

Abbreviations: ME, medical examiner; ED, emergency department; EMS, emergency medical services; CC, critical care.

Table 3. Code References by Participants

Participants	Scene Details	Patient Details	Care Details	Report Quality	Total Refs/ Transcript
Billing Specialist	12	68	15	57	152
City Attorney	14	11	0	65	90
Emergency Department Team	19	60	30	134	243
Emergency Medical Services Coordinator	36	62	21	38	157
Critical Care Flight Medical Directors	6	54	6	71	137
Medical Director A	4	45	12	93	154
Medical Director B	11	57	7	48	123
Medical Director C	28	70	18	147	263
Medical Examiner	27	25	14	31	97
Organ Donation	35	27	44	71	177
Prosecutor	24	69	26	76	195
Trauma Nurse	17	51	22	54	144
Total refs/category	233	599	215	885	1932

Abbreviations: refs, references.

a report writer with a highly developed sense of audience awareness can do that.

Findings from our study support a key tenet of writing studies research—that audience is not generalizable, but rather a more complex combination of readers with varying roles and expectations.¹⁶ To prepare EMS providers to manage these conflicts and expectations, they need to develop strategies to meet them. One strategy that can meet audience expectations is to help EMS providers understand the relationship among the elements they are writing in the narrative, not only the elements themselves. For example, participants noted that narratives should have “justification,” and they expected references to assessments and interventions to be followed by explanations and rationales for those actions. Narratives that merely listed assessments and interventions were less effective for readers; the value was in the justification EMS providers included in the narratives.

One challenge in training EMS providers is the lack of report writing standards and pedagogical resources in the field. Current approaches to report writing training are not informed by pedagogical research or best practices in teaching writing, leaving EMS educators to rely on anecdotes, their own experience, and, potentially, their own ineffective writing habits. Furthermore, our study confirms that variability exists in how people read reports, and provider awareness does not reflect reality about report readership, which, to date, has not been confirmed or integrated into training. Results suggest the field needs a standardized, research-informed way to evaluate narratives, much in the same way cardiopulmonary resuscitation and intubation skills are assessed in skills labs. In addition to report elements, effective writing standards should reflect the actual, real-life context in which writing is used.^{21–23} The current 2021 EMS Standards document moves in this direction. Although a stark departure from the 1998 standards that focused on spelling and grammar,²⁴ the 2021 EMS Standards

does not go far enough in its recommendations. In part, they reinforce what participants noted was the least useful—a listing of findings for the emergency medical responder training level—while adding decision-making for EMT levels.²⁵ To more accurately reflect the real contexts in which reports are used, report writing standards should include explicit criteria about how information should be synthesized and organized so that the document is usable for intended audiences.

Limitations and Future Directions

This study has limitations in that a small sample size of interviewees from 1 particular region of the United States was inter-

viewed. There is utility in repeating this study on a broader scale to learn if report reader expectations vary across jurisdictions. Further study also may be needed by focusing more on individual audience groups, especially medical directors and attorneys. Furthermore, some interviews had multiple participants being interviewed and, therefore, coding was only done on the collective interview and not by the specific participant in these cases. We believe the Kappa was lowest in the ED team due to the poor quality of audio recording and, thus, transcription; we chose to include findings from this interview, though, because of the novel nature of this study and the insights gleaned from the interview itself.

The power of grounded theory lies in multiple iterations to refine the coding scheme and results. By adding more interviews and applying this or a revised coding scheme, future researchers could refine the results even further and develop a more specific taxonomy. It is also important to note that further research may develop other coding schemes and identify different concepts of narrative writing.

CONCLUSIONS

Ultimately, this is the first study of its kind in this field and offers a framework for further investigation and, we hope, advance the profession. These data formalize and reinforce what a high-quality narrative should include, with high-quality meaning the narrative allows the reader to do their job without follow-up or an amendment needed to the report. Initial training and continuing education need to be modified to account for these findings, thus better preparing EMS providers to write a usable, complete narrative.

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Appendix: Available at wmjonline.org

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