



# Completeness of Patient Care Report (PCR) by Paramedics

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## Abstract

This study evaluated the completeness of patient care report (PCR). A retrospective quality analysis was conducted using raw data of 122,140 EMS activity reports prepared by paramedics in Gyeonggi-do from April 1 to May 31, 2021. In all, 67,830 cases of normal transfers were statistically analyzed using IBM SPSS Statistics version 22, and statistical significance was set at  $p < 0.5$ . The 119EMT\_2 certificate was omitted in 50,037 (73.8%) cases, followed by time-related items in 1,227 (1.8%) cases. In the primary assessment of vital signs, systolic blood pressure was omitted and erroneous in 1,218 (1.9%) and 1,129 (1.8%) cases, respectively. In the secondary assessment, the completeness of all vital sign items was approximately 70%. Advanced emergency care and online medical control (OLMC) reporting showed discrepancies in all items. As the severity of the patient's condition increased, the errors in the Patient care report (PCR) also increased, at a significant level ( $p = .00$ ). Paramedics must be aware of the importance of completing the activity report.

**Index Terms:** Emergency medical system, Patient care report, paramedic, Patient transport

## I. INTRODUCTION

The Prehospital Care Report (PCR) is a document that systematically and factually records events that occur in prehospital emergency medical care [1]. In the Republic of Korea (hereafter Korea), in accordance with Article 49 of the Emergency Medical Services Act, emergency responders are obliged to record the dispatch and treatment details, and in accordance with Article 22 of the Rescue and First Aid Act, the head of the Fire Department must record and retain the report of rescue and first aid activities. Therefore, the 119 emergency service in Korea prepares logs of emergency medical service (EMS) activities and a detailed table of patients with four major emergencies: cardiac arrest, cardio-cerebrovascular diseases, and major trauma. 119 also records patient's personal information, vital signs, severity

classification, first aid treatment, and destination hospital in the EMS activity reports. In addition, for patients of cardiac arrest, a detailed first aid table is prepared to record patient evaluations and treatment for follow-up research. These records are used as reference materials for patient evaluation by paramedics, evaluation of emergency treatment adequacy, basic data necessary to establish emergency policies, civil complaints, policymaking, and media responses [2-4].

Well-written PCRs provide the medical staff with data on patient information, prehospital evaluation, and treatment provided that can help prevent duplicate treatment and damage [2]. In a study by Dann et al. [5], the risk of mortality was increased by more than 2-fold in patients with missing EMS PCR vital signs, showing that accurate documentation is important for systematic patient management.

Therefore, PCRs must be accurate and complete without


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omission of any item and must be easy to read and understand [6]. Direct citing and recording of statements by patients, guardians, and medical staff is another way to reduce liability in medical litigations [2]. In the PCR form, there is a section requiring descriptive data and another section with statements that can be answered with a yes or no. The consistency between the two sections should be checked to prevent further problems.

However, there are many difficulties in completing the PCR in prehospital emergency situations. The small number of paramedics, the urgency of the situation, and limited time and space lead to difficulties in communication with the patient. The guardians may be helpful; however, in certain cases, the guardians also hinder the quality of service, which leads to poor PCRs. Recently, the installation of surveillance cameras in ambulances or the use of wearable cameras for paramedics has been suggested to assist in the preparation of PCRs and increase the accuracy of information [7,8].

The Fire Department investigates and reports the completeness of PCRs in its emergency service quality management report. However, this report only evaluates basic items such as ambulance classification; patient's age, sex, date of birth, and address; destination institution; paramedic qualification; dispatch time; and site arrival time. Items such as patient evaluation and emergency treatment that are related to the prognosis of emergency patients are only assessed for implementation; thus, the completeness of PCRs is not fully evaluated. There are many studies on records prepared by medical personnel [8-10]; however, there is a lack of studies on the completeness of PCRs prepared by paramedics who provide prehospital emergency medical care. Therefore, instead of a quantitative evaluation that simply looks at the presence or absence of records, this study assessed the compliance of paramedics with the guidelines for PCR based on the "on-site first aid guidelines for 119 paramedics" published by the Fire Department.

## II. METHOD

Quality analysis was conducted using the raw data of the PCR prepared by Gyeonggi-do paramedics from April 1, 2021 to May 31, 2021. The analysis evaluated whether the paramedics followed the PCR guidelines based on the on-site first aid standard guidelines. The basic statistics of emergency activity status, patient evaluation, advanced emergency care, and online medical control (OLMC) was analyzed through frequency analysis and descriptive statistics. Chi-square test was conducted for comparison of differences in the omission of records according to region, qualification, and severity of patient condition.  $P < 0.5$  was considered statistically significant, and IBM SPSS Statistics version 22 was used for all statistical analyses.

## III. RESULTS

### A. General Information

A total of 122,140 PCRs were prepared by paramedics from April 1 to May 31, 2021. Among them, 67,830 reports under normal emergency rescue and transfer classifications, excluding 26 reports that were misreported, were included in the final analysis. Figure 1 shows the number of normal dispatches per 10,000 population based on the 2020 population. High numbers of dispatches were reported in the following cities: 136.3 cases in Yeoncheon-gun, followed by 118.8 cases in Gapyeong-gun, 97.1 cases in Pocheon-si, 92.8 cases in Yangpyeong-gun, and 79.3 cases in Yeosu-si. Low numbers of dispatches were recorded in Yongin-si at 38.2 cases and in Hwaseong-si at 35.8 cases. The numbers of dispatches in Suwon-si and Yongin-si, with the largest population, were 36.9 and 38.2 cases, respectively.

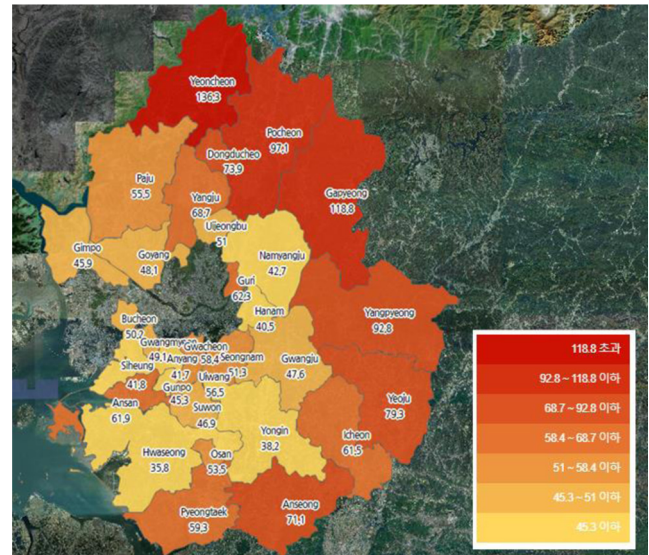


Fig. 1. Number of normal dispatches.

### B. Completeness of Required Items in PCR

The following items are evaluated for completeness in the Fire Department's emergency service quality management reports: patient's age, sex, date of birth, and location; destination institution; paramedic qualification; dispatch time; and site arrival time (Table 1). The rate of completeness of records for age, sex, and medical institution was 100%. The rates of completeness for date of birth, patient location, and 119 EMT\_1 certificate were 99.7, 99.7, and 99.8%, respectively. The following time-related items were analyzed: report time, dispatch time, site arrival time, patient contact time, site departure time, and hospital arrival time. The dis-

**Table 1.** Rates of completeness of required items in PCRs

	Normal		Omitted		Contained errors	
	N	%	N	%	N	%
Name	67,828	100.0	0	0.0	2	0.0
Age	67,830	100.0	0	0.0	0	0.0
Sex	67,828	100.0	0	0.0	2	0.0
Date of birth	67,649	99.7	331	0.5	0	0.0
Location	67,644	99.7	186	0.3	0	0.0
Hospital grade	67,828	100.0	2	0.0	0	0.0
Certificate 119EMT_1	67,708	99.8	122	0.2	0	0.0
Certificate 119EMT_2	17,793	26.2	50,037	73.8	0	0.0
Time	66,602	98.2	1	0.0	1,227	1.8

**Table 2.** Completeness of patient evaluation record

		Normal		Omitted		Contained errors		Unable to measure	
		N	%	N	%	N	%	N	%
	MT	67,786	99.9	44	0.1	0	0.0	0	0.0
1st. Vital Sign	SBP	56,698	90.8	1,218	1.9	1,129	1.8	3,421	5.5
	DBP	68,082	93.0	326	0.5	637	1.0	3,421	5.5
	HR	61,070	97.8	120	0.2	1,008	1.6	268	0.4
	RR	61,233	98.0	105	0.2	1,010	1.6	118	0.2
	BT	62,041	99.3	210	0.3	70	0.1	145	0.2
	SPO2	60,917	97.5	351	0.6	549	0.9	649	1.0
2nd. Vital Sign	SBP	39,064	71.4	13,094	23.9	528	1.0	2,036	3.7
	DBP	40,076	73.2	12,398	22.7	258	0.5	1,990	3.6
	HR	41,920	76.6	12,275	22.4	414	0.8	113	0.2
	RR	41,912	76.6	12,346	22.6	423	0.8	41	0.1
	BT	41,799	76.4	12,800	23.4	23	0.0	100	0.2
	SPO2	41,835	76.5	12,366	22.6	204	0.4	317	0.6

patch time was earlier than the report time, the interval from arrival at the site to that at the hospital was 0 minutes, and patient contact time was earlier than the site arrival time in 1,227 cases (1.8%). The most common omission was for the 119 EMT\_2 certification, with 50,037 cases (73.8%).

**C. Completeness of Patient Evaluation Record**

Table 2 shows the rates of completeness of the patient evaluation records according to the standard guidelines on on-site first aid for 119 paramedics.

Consciousness and primary vital signs are evaluated for all transferred patients. However, if the patient refuses or measurement is not feasible due to unavoidable circumstances, the paramedics must indicate on the record sheet “measurement unfeasible” or “rejected.” Thus, the other omitted cases excluding these cases were considered to have inadequate records. Secondary vital signs must be evaluated when the transfer time is longer than 5 minutes.

Consciousness was omitted in 44 (0.1%) cases. For the

primary vital signs, systolic blood pressure was normally recorded in 56,698 cases with a 90.8% rate of completeness, was omitted in 1,218 (1.9%) cases, and contained errors in 1,129 cases (1.8%). Diastolic blood pressure was recorded adequately in 68,082 cases (93.0%), was omitted in 326 cases (0.5%), contained errors in 637 cases (1.0%), and could not be measured in 3,421 cases (5.5%). Oxygen saturation was recorded adequately in 60,917 cases (97.5%), was omitted in 351 cases (0.6%), contained errors in 549 cases (0.9%), and could not be measured in 649 cases (1.0%). Pulse rate was recorded adequately in 61,070 cases (97.8%), was omitted in 120 cases (0.2%), contained errors in 1,008 cases (1.6%), and could not be measured in 268 cases (0.4%). Respiration rate was recorded adequately in 61,233 cases (98.0%), was omitted in 105 cases (0.2%), contained errors in 1,010 cases (1.6%), and could not be measured in 118 cases (0.2%). The temperature was recorded adequately in 62,041 cases (99.3%), was omitted in 210 cases (0.3%), contained errors in 70 cases (0.1%), and could not be measured in 145 cases (0.2%).

**Table 3.** Consistency in vital sign measurement by severity

			Emergency		Urgent		Semi-Urgent		$\chi^2$	p
			N	%	N	%	N	%		
1st. Vital Sign	SBP*	Correct	13,820	23.9	19,255	33.4	24,650	42.7	1525.878	.000
		Incorrect	737	79.8	55	6.0	131	14.2		
	DBP**	Correct	13,445	23.9	18,890	33.5	24,025	42.6	803.734	.000
		Incorrect	1,125	49.8	405	17.9	729	32.3		
	HR	Correct	14,579	24.0	20,142	33.2	25,927	42.7	2386.300	.000
		Incorrect	964	89.0	32	3.0	87	8.0		
	RR	Correct	14,593	24.0	20,194	33.2	26,008	42.8	2558.486	.000
		Incorrect	981	91.7	21	2.0	68	6.4		
	BT	Correct	15,277	24.8	20,213	32.8	26,095	42.4	615.321	.000
		Incorrect	240	91.3	12	4.6	11	4.2		
	SPO2	Correct	14,515	24.0	20,111	33.2	25,887	42.8	1631.679	.000
		Incorrect	722	83.8	34	3.9	106	12.3		
2nd. Vital Sign	SBP*	Correct	10,858	27.2	13,373	33.5	15,679	39.3	504.229	.000
		Incorrect	2,375	19.2	3,863	31.2	6,163	49.7		
	DBP**	Correct	10,580	27.2	13,105	33.7	15,218	39.1	478.941	.000
		Incorrect	2,657	19.9	4,121	30.9	6,580	49.3		
	HR	Correct	11,361	27.2	13,938	33.4	16,445	39.4	440.962	.000
		Incorrect	2,461	19.8	3,862	31.1	6,109	49.1		
	RR	Correct	11,322	27.1	13,965	33.5	16,437	39.4	430.096	.000
		Incorrect	2,504	20.0	3,862	30.9	6,146	49.1		
	BT	Correct	11,388	27.4	13,902	33.4	16,322	39.2	535.802	.000
		Incorrect	2,391	19.0	3,929	31.2	6,257	49.7		
	SPO2	Correct	11,326	27.2	13,931	33.4	16,402	39.4	522.266	.000
		Incorrect	2,323	18.9	3,856	31.3	6,136	49.8		

SBP: Systolic blood pressure, DBP: Diastolic blood pressure, HR: Heart rate, RR: Respiration rate, BT: Body temperature, SPO2: Saturation of percutaneous oxygen

In the secondary vital sign assessment, systolic blood pressure was recorded adequately in 39,064 cases (71.4%), which was the lowest among all items, was omitted in 13,094 cases (23.9%), contained errors in 528 cases (1.0%), and could not be measured in 2,036 cases (3.7%). Diastolic pressure was adequately recorded in 40,076 cases (73.2%), was omitted in 12,398 cases (22.7%), contained errors in 528 cases (1.0%), and could not be measured in 1,990 cases (3.6%). Pulse was recorded adequately in 41,920 cases (76.6%), was omitted in 12,275 cases (22.4%), contained errors in 414 cases (0.8%), and could not be measured in 113 cases (0.2%). Respiration rate recorded adequately in 41,912 cases (76.6%), was omitted in 12,346 cases (22.6%), contained errors in 423 cases (0.8%), and could not be measured in 41 cases (0.1%). Oxygen saturation was adequately recorded in 41,835 cases (76.5%), was omitted in 12,366 cases (22.6%), contained errors in 204 cases (0.4%), and could not be measured in 317 cases (0.6%). Temperature was adequately measured in 41,799 cases (76.4%), was omitted in 12,800 cases (23.4%), contained errors in 23 cases (0.0%), and could not be measured in 100 cases (0.2%).

**D. Consistency of Vital Sign Measurements by Severity**

Table 3 shows the results of our analysis consistency of vital sign measurements in PCRs. Regarding primary vital sign assessment, systolic blood pressure was correctly reported in 24,650 (42.7%), 19,255 (33.4%), and 13,820 (23.9%) cases of emergency, urgent, and semi-urgent patients, respectively. In contrast, systolic blood pressure was incorrectly reported in 737 (79.8%), 131 (14.2%), and 55 (6.0%) cases of emergency, urgent, and semi-urgent patients, respectively, significantly different from the numbers of correctly reported cases (p=.00). Diastolic blood pressure was correctly reported in 24,025 (42.6%), 18,890 (33.5%), and 13,445 (23.9%) cases of emergency, urgent, and semi-urgent patients, respectively, and incorrectly reported in 1,125 (49.8%) emergency patients, 729 (32.3%) urgent patients, and 405 (17.9%) semi-urgent patients, indicating a significant difference (p=.00). Pulse rate was correctly reported in 25,927 (42.7%), 20,142 (33.2%), and 14,579 (24.0%) cases of emergency, urgent, and semi-urgent patients, respectively,

and incorrectly reported in 964 (89.0%), 87 (8.0%), and 32 (3.0%) cases, respectively, indicating a significant difference ( $p = .00$ ). Respiration rate was correctly reported in 26,008 (42.8%), 20,013 (33.2%), and 15,277 (24.0%) cases of emergency, urgent, and semi-urgent patients, respectively, and incorrectly reported in 981 (91.7%), 12 (4.6%), and 11 (4.2%) cases, respectively, indicating a significant difference ( $p = .00$ ). The temperature was correctly reported in 26,095 (42.4%), 20,013 (32.8%), and 15,277 (24.0%) cases of emergency, urgent, and semi-urgent patients, respectively and incorrectly reported in 240 (91.3%), 12 (4.6%), and 11 (4.2%) cases, respectively, indicating a significant difference ( $p = .00$ ). Oxygen saturation was correctly reported in 25,887 (42.8%), 20,111 (33.2%), and 14,515 (24.0%) cases of emergency, urgent, and semi-urgent patients, respectively. Incorrect reports were observed in 722 (83.8%), 106 (12.3%), and 34 (3.9%) cases, respectively, indicating a significant difference ( $p = .00$ ).

Regarding secondary vital sign assessment, there were significant differences in the numbers of correctly and incorrectly items for emergency, urgent, and semi-urgent cases, as in the primary vital sign assessment ( $p = .00$ ).

### E. Consistency Between Advanced Emergency Care and OLMC

The consistency between advanced emergency care and OLMC is shown in Table 4.

Endotracheal intubation, supraglottic airway maintainer, IV access, fluid therapy, and drug administration (nitroglycerin, bronchodilator, epinephrine, and amiodarone) are specialized emergency treatments and can be administered to the patient with OLMC. Incorrect reports included the following aspects: records with data on advanced emergency care but not on OLMC and records with data on online medical care but not on advanced emergency care.

Endotracheal intubation was directed by OLMC physicians in 14 cases, but was performed in 11 cases, with 9 cases (0.0%) of discrepancy. Supraglottic airway maintainer intubation was directed by OLMC in 1,082 cases but was performed in 1,074 cases, with 42 (0.1%) cases of discrepancy.

IV access was medically necessary in 2,461 cases but was performed in 2,395 cases, with a discrepancy rate of 0.3%. In addition, there were 183 (0.3%) cases of discrepancy in fluid therapy. Regarding medication injection, there were 27 cases (0.0%) of discrepancy for nitroglycerin, 15 cases (0.0%), for ventolin inhaler, 7 cases (0.0%), for epinephrine, and 7 cases (0.0%), for amiodarone.

### F. Consistency Between Advanced Emergency Care and OLMC According to Severity

Data on the consistency between advanced emergency care and OLMC according to the severity are presented in Table 5.

**Table 4.** Consistency between advanced emergency care and online medical control (OLMC)

		Online medical control (OLMC)		Provision		Discrepancy	
		N	%	N	%	N	%
Advanced airway	Intubation	14	0.0	11	0.0	9	0.0
	Supraglottic airway	1,082	1.6	1,074	1.6	42	0.1
Medication injection	IV access	2,461	3.6	2,395	3.5	202	0.3
	Fluid therapy	2,452	3.6	2,361	3.5	183	0.3
	Nitroglycerin	200	0.3	187	0.3	27	0.0
	Ventolin inhaler	49	0.1	36	0.1	15	0.0
	Epinephrine	140	0.2	133	0.2	7	0.0
	Amiodarone	26	0.0	18	0.0	8	0.0

**Table 5.** Consistency between advanced emergency care and online medical control (OLMC) according to severity

		Emergency		Urgent		Semi-Urgent		$\chi^2$	p
		N	%	N	%	N	%		
Advanced airway	Correct	1,019	98.4	6	0.6	11	1.1	65.720	.000
	Incorrect	28	70.0	4	10.0	8	20.0		
IV access	Correct	1768	76.4	396	17.1	149	6.4	9.184	.000
	Incorrect	153	76.1	25	12.4	23	11.4		
Fluid therapy	Correct	1736	75.4	408	17.7	158	6.9	4.015	.000
	Incorrect	149	81.4	22	12.0	12	6.6		
Medication injection	Correct	297	85.6	39	11.2	11	3.2	21.356	.000
	Incorrect	25	61.0	9	22.0	7	17.1		

For advanced airway maintenance, incorrect records were observed for 28 (70.0%), 4 (10.0%), and 8 (20.0%) cases of emergency, urgent, and semi-urgent patients, showing a significant difference from correctly recorded cases ( $p = .00$ ). IV access was incorrectly reported in 153 (76.1%), 25 (12.4%), and 23 (11.4%) cases of emergency, urgent, and semi-urgent patients, respectively, showing a significant difference. Fluid therapy was incorrectly reported in 149 (81.4%), 22 (12.0%), and 12 (6.6%) cases of emergency, urgent, and semi-urgent patients, respectively, with a significant differences ( $p = .00$ ). Lastly, medication injection was incorrectly reported in 25 (61.0%) emergency patients, 9 (22.0%) urgent patients, and 7 (17.1%) semi-urgent patients, showing a significant difference ( $p = .00$ ).

#### IV. DISCUSSION

This study investigated the completeness of PCRs prepared by paramedics by qualitative evaluation of their compliance with the guidelines on completing PCRs.

Using the 119 emergency service quality management reports of 2021, the daily average number of dispatches and transfers was assessed per 100,000 individuals by city and province. In Gyeonggi-do, paramedics reported an average daily number of 13.4 dispatches and 7.7 transfers [11]. In this study, the number of normal dispatches of paramedics per 10,000 individuals in 2020 was evaluated. There were 136.3 cases in Yeoncheon-gun, followed by 118.8 cases in Gapyeong-gun, 97.1 cases in Pocheon-si, and 92.8 cases in Yangpyeong-gun. The numbers of dispatches in Suwon-si and Yongin-si, with the largest population, were 36.9 and 38.2 cases, respectively.

The essential items in the PCR include those items related to the patient's personal information, destination institution, and time. In this study, there were omissions and errors related to 119 EMT\_2 certificate in 50,037 (73.8%) and 1,227 (1.8%) cases, respectively. This finding is different from that observed in 2021, in which the completeness rates for all essential items was over 99% [11]. In that report, except for the response time of the emergency team in 20 cases, duration of stay at the emergency scene in six cases, and transfer time in three cases were unknown in the Gyeonggi area; 100% completeness was reported. The time required for emergency services is not only used as a major evaluation index and key index for quality management of emergency services, but also as an important standard in different studies [12-14]. As a result, omission or errors of even one item leads to inaccurate calculation and limits the use of the data. In a previous study by Lee et al. [15], time-related records were omitted in 11.6% (time of arrival at hospital) to 52.5% (time of the report) of the cases. Although the results of our study may have significantly improved over time and

considering that emergency services can affect the survival and prognosis of patients, factors that are mis-recorded must be identified, and strategies to improve the completeness of time records must be sought [16,17].

Regarding patient evaluation items, consciousness was omitted in 44 (0.1%) cases. In the primary assessment of vital signs, the completeness of all items was over 90%; however, in the secondary assessment, the completeness was approximately 70% for all items. Although the 119 emergency service quality management report evaluates the patient evaluation rate, only the primary assessment result is analyzed. In the PCR guidelines, vital signs must be recorded twice if the transfer time is longer than 5 minutes; however, many items were omitted or contained errors. Among patient evaluation items, consciousness and vital signs are indicators that need to be measured more than once. Changes in the patient's condition are reflected by consciousness and vital signs. Consciousness is an indicator that is used to evaluate the severity of the patient's condition, and vital signs play a fundamental role as an objective indicator of physiological function [18]. Therefore, for severely ill patients, periodic re-evaluation of vital signs and consciousness must be conducted to monitor the clinical deterioration of the patient's condition. As PCRs are used in various studies, accurate evaluations must be conducted, and data should not be omitted or contain errors.

In our study, we also analyzed the consistency between advanced emergency care and OLMC. A discrepancy was observed in 202 cases (0.3%) for IV access and 183 cases (0.3%) for fluid therapy. Advanced emergency care may greatly contribute to the treatment of emergency patients; however, inadequate performance of such treatment may be fatal to the patients. Therefore, in principle, advanced emergency care must be performed by physicians. In special circumstances such as prehospital settings, emergency medical technicians may render advanced emergency care with OLMC guidance as stipulated in the Emergency Medical Act; this reduces the risk of errors and medical error. Emergency treatment that is not recorded on the PCRs is considered to have not been conducted and may be interpreted as the paramedics arbitrarily violating the relevant laws and regulations without OLMC or not providing the emergency treatment for unknown reasons, despite receiving OLMC. These errors may negatively affect the paramedics if legal problems such as lawsuits arise in the future. Performing advanced emergency care without OLMC guidance and/or failing to document the treatments rendered by EMS in the patient care report is a violation of the Emergency Medical Service Act. In such cases, EMS personnel may lead to disciplinary action, be charged for negligence, and/or be subject to civil and criminal liability. Therefore, paramedics must be aware of the importance of not only providing the emergency treatment but also completing the PCR to avoid omis-

sions or errors.

Analyzing the completeness of PCRs, we found correlation between increased rates of errors in documentation and severity of patients; when patients were severely ill or injured, PCRs had a tendency to increase errors in vital signs as well as disagreement between rendered advanced emergency care and OLMC guidance. Among the items of vital sign assessment, there were significantly high proportions of incorrectly reported systolic blood pressure, diastolic blood pressure, pulse, respiration, body temperature, and oxygen saturation. In addition, high severity of the patient's condition led to increased errors in the reporting of items of advanced airway maintenance, IV access, fluid therapy, and medication injection with statistically significant differences. It has previously been reported that 47.7 and 14.7% of paramedics complete the PCR in the emergency room and general affairs department, respectively. These are not suitable places for the paramedics to complete the PCR [19]. Upon returning to the fire station, a hand-written PCR is re-entered into computer systems. A detailed table is additionally prepared for severely ill patients. The detailed table allows the user to add the missing data for each disease of the PCR; however, there are also many overlapping contents. This may lead to recording the same information on a different report and omission of information. Additionally, the urgency of the emergency scene may cause the paramedics to become excited or nervous, leading to errors in memories and mistakes. The optimal strategy to minimize omissions or erroneous records would be completing the form immediately after patient evaluation, advanced emergency care, and OLMC. Moreover, reducing the number of records and eliminating repeated checks or records of the same content may help prevent errors and omissions. In a previous study by Kim, it was reported that the current PCR is limited in accurately reflecting the on-site emergency activities [17]. The PCR contains basic data necessary for studies on the quality and improvement of the prehospital EMS. This report not only serves the purpose of recording prehospital emergency situations but also facilitates adequate patient evaluation and emergency treatment.

While the 119 Emergency Service Quality Management Report is published every year, the completeness of the records is merely assessed by evaluating the existence of the records. As the collection of essential items is more relevant to gathering administrative data rather than medical evaluation, it is necessary to review the appropriateness of the direction and method of emergency service quality management.

Several limitations must be considered in interpretation of this study's findings. First, data were limited to Gyeonggi-do and collected for a short period of time. Thus, the findings cannot be generalized. Second, in this study, the specific reasons for erroneous records and omissions of the items in the

PCR could not be identified. In future studies, it would be necessary to understand the general characteristics of the paramedics who record the PCR and assess the opinions of paramedics.

## V. CONCLUSION

This study qualitatively evaluated the completeness of PCRs. Among the essential items of the PCR, the highest omission was observed for the 119 EMT\_2 certificate, followed by time-related items. For patient evaluation items, the rate of completeness of all secondary evaluation items was approximately 70%. In particular, the increased severity of the patient's condition led to increased rates of errors in the reports. As accurate documentation of the records is associated with systematic management of patients, it is important to establish adequate environmental conditions to ensure the completeness of the records. In addition, regular training on PCR guidelines must be provided to enhance the staff's awareness on the importance of the records.

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