

# The Clinical Significance of the Emergency Green Channel in the Treatment of Patients with Acute Chest Pain

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**Abstract:** *Objective:* To analyze the clinical significance of the emergency green channel in the treatment of patients with acute chest pain. *Methods:* Sixty patients with acute chest pain treated between September 2022 and July 2024 were selected as the subjects of this study. They were divided into groups based on the order of treatment: the first 30 patients were included in the Green Channel group, where the emergency green channel was employed, while the remaining 30 patients were placed in the Regular Emergency group, receiving standard emergency treatment. The rescue time, hospitalization time, pain scores, incidence of adverse reactions, and quality of life between the Green Channel group and the Regular Emergency group were compared. *Results:* The rescue time and hospitalization time of the Green Channel group were shorter than those of the Regular Emergency group, with statistical significance ( $P < 0.05$ ). The pain scores at 30, 60, 120, and 240 minutes after rescue in the Green Channel group were lower than those in the Regular Emergency group, with statistical significance ( $P < 0.05$ ). The incidence of adverse reactions such as recurrent acute attacks, arrhythmia, heart failure, stroke, and shock in the Green Channel group was lower than that in the Regular Emergency group, with statistical significance ( $P < 0.05$ ). The treatment satisfaction rate and success rate in the Green Channel group were 93.33% and 93.33%, respectively, while those in the Regular Emergency group were 73.33% and 73.33%. Both the satisfaction and success rates in the Green Channel group were higher than those in the Regular Emergency group, with statistical significance ( $P < 0.05$ ). The quality of life in the Green Channel group was also higher than that in the Regular Emergency group, with statistical significance ( $P < 0.05$ ). *Conclusion:* The emergency green channel plays a significant role in the treatment of patients with acute chest pain and is worthy of widespread clinical application.

**Keywords:** Emergency green channel; Patients with acute chest pain; Rescue time; Hospitalization time; Pain score; Incidence of adverse reactions

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## 1. Introduction

Acute chest pain is characterized by a sudden onset and unknown etiology, affecting the physical and mental health

of patients while potentially threatening their lives <sup>[1]</sup>. To promptly determine the cause and assess the severity of the condition, ensuring the patient receives successful treatment, the emergency green channel was introduced. Recent reports indicate that the emergency green channel has notable clinical significance in the treatment of patients with acute chest pain <sup>[2]</sup>. It can shorten rescue times, reduce mortality rates, and ensure the patient's safety <sup>[3]</sup>. To verify this report, this study selected 60 patients with acute chest pain treated between September 2023 and July 2024 as the subjects of analysis, comparing the outcomes of the emergency green channel and regular emergency treatments, including rescue time, hospitalization time, pain scores, incidence of adverse reactions, and quality of life.

## 2. Materials and methods

### 2.1. General information

Sixty patients with acute chest pain treated between September 2022 and July 2024 were selected as subjects for this study. The patients were grouped based on the order of treatment: the first 30 patients were included in the Green Channel group, where the emergency green channel was employed, and the remaining 30 patients were placed in the Regular Emergency group, receiving standard emergency treatment. In the Green Channel group, the ages ranged from 42 to 79 years, with a mean age of  $(62.65 \pm 4.27)$  years, consisting of 16 males and 14 females. In the Regular Emergency group, the ages ranged from 43 to 81 years, with a mean age of  $(63.31 \pm 5.66)$  years, consisting of 17 males and 13 females. The basic data of the study subjects showed no significant differences and were comparable ( $P > 0.05$ ).

**Inclusion criteria:** This study was approved by the Ethics Committee. All subjects voluntarily participated in the experiment, were diagnosed in accordance with the criteria for treating acute chest pain, were informed of the study content, and agreed to cooperate with the experimental procedures.

**Exclusion criteria:** Patients with heart, liver, or kidney dysfunction; those with mental disorders; uncooperative individuals; and those with unclear consciousness were excluded <sup>[4-5]</sup>.

### 2.2. Methods

Patients in the Regular Emergency group with acute chest pain underwent standard emergency procedures, which included reception, hospitalization, diagnosis, and treatment.

Patients in the Green Channel group with acute chest pain followed the emergency Green Channel procedure: First, after the reception, triage was immediately performed, and the nurse guided the patient to the chest pain center. The doctor was informed in advance of the patient's symptoms and specific manifestations via internal phone communication. Second, during the waiting period, a preliminary evaluation of the patient's condition was conducted by considering pulse, blood pressure, body temperature, heart rate, and facial color, to determine the presence of arrhythmias, hypotension, or dyspnea, aiding further diagnosis and treatment. Additionally, the severity of the patient's condition was assessed and classified using red, yellow, and blue indicators: yellow indicated critical emergency patients whose condition was life-threatening, red indicated severe emergency patients whose condition was serious but not immediately life-threatening, and blue indicated ordinary emergency patients whose condition was stable and not life-threatening, allowing for a reasonable arrangement of rescue operations. Finally, blood and secretion samples were collected, and the laboratory department was contacted for urgent testing. Communication with the physician during patient transfer included whether to establish an intravenous line in advance and implement relevant interventions, such as administering cardiotoxic drugs and

angiotensin. Furthermore, patients and their families were settled appropriately, and the number of personnel in the green channel area was controlled to ensure unobstructed passage.

### 2.3. Evaluation criteria

- (1) Record the rescue time and hospitalization time of patients with acute chest pain.
- (2) The degree of pain at 30, 60, 120, and 240 minutes after rescue in patients with acute chest pain was assessed using the Visual Analog Scale (VAS) pain score, with a total score of 10 points. Scores of 1–3 indicated mild pain, 4–6 indicated moderate pain, and 6–10 indicated severe pain <sup>[6]</sup>.
- (3) The incidence of adverse reactions (such as recurrent acute attacks, arrhythmia, heart failure, stroke, and shock) in patients with acute chest pain was observed and recorded. Incidence rate = number of cases of occurrence / total number of cases × 100% <sup>[7]</sup>.
- (4) The satisfaction with the treatment among patients with acute chest pain was surveyed using a questionnaire filled out by the patients themselves. The total score was 100 points, with scores above 70 indicating satisfaction, scores below 30 indicating dissatisfaction, and scores in between indicating moderate satisfaction. Overall satisfaction rate = (number of satisfied + moderately satisfied patients) / total number of cases × 100%. The number of successful treatments was also recorded, with the success rate calculated as = number of successful treatments / total number of cases × 100% <sup>[8]</sup>.
- (5) The quality of life of patients with acute chest pain was assessed using the SF-36 scale, which includes eight dimensions. Each dimension is scored out of 100, with higher scores indicating better quality of life <sup>[9]</sup>.

### 2.4. Statistical analysis

Statistical analysis was conducted using SPSS 26.0. Count data were expressed as [*n* (%)], and the chi-squared test ( $\chi^2$  test) was used. Measurement data were expressed as mean ± standard deviation (SD), and the *t*-test was used. Statistical significance was set at  $P < 0.05$ .

## 3. Results

### 3.1. Comparison of rescue time and hospitalization time between the Green Channel group and the Regular Emergency group in acute chest pain patients

As shown in **Table 1**, the rescue time and hospitalization time of patients in the Green Channel group were shorter than those in the Regular Emergency group, with statistically significant differences ( $P < 0.05$ ).

**Table 1.** Comparison of rescue time and hospitalization time between the Green Channel group and the Regular Emergency group (mean ± SD)

Group ( <i>n</i> )	Rescue time (min)	Hospitalization time (days)
Green Channel Group ( <i>n</i> = 30)	36.17 ± 1.69	11.64 ± 3.14
Regular Emergency Group ( <i>n</i> = 30)	62.38 ± 3.58	15.59 ± 3.16
<i>t</i> -value	35.174	4.182
<i>P</i> -value	0.000	0.000

### 3.2. Comparison of pain scores between the Green Channel group and the Regular Emergency group in acute chest pain patients

**Table 2** shows that the pain scores of patients in the Green Channel group at 30 min, 60 min, 120 min, and 240 min after rescue were lower than those in the Regular Emergency group, with statistically significant differences ( $P < 0.05$ ).

**Table 2.** Comparison of pain scores between the Green Channel group and the Regular Emergency group (mean  $\pm$  SD, points)

Group (n)	30 min after rescue	60 min after rescue	120 min after rescue	240 min after rescue
Green Channel Group (n = 30)	2.04 $\pm$ 2.62	2.17 $\pm$ 1.57	1.47 $\pm$ 0.53	0.67 $\pm$ 0.38
Regular Emergency Group (n = 30)	4.16 $\pm$ 1.33	4.47 $\pm$ 1.28	3.56 $\pm$ 0.72	2.16 $\pm$ 0.44
t-value	4.274	6.056	12.156	22.814
P-value	0.000	0.000	0.000	0.000

### 3.3. Comparison of adverse reaction incidence between the Green Channel group and the Regular Emergency group in acute chest pain patients

**Table 3** shows that the incidence of adverse reactions, such as recurrent acute episodes, arrhythmias, heart failure, stroke, and shock, was lower in the Green Channel group than in the Regular Emergency group, with statistically significant differences ( $P < 0.05$ ).

**Table 3.** Comparison of adverse reaction incidence between the Green Channel group and the Regular Emergency group [n (%)]

Group (n)	Recurrent acute episode	Arrhythmia	Heart failure	Stroke	Shock
Green Channel Group (n = 30)	2 (6.67)	2 (6.67)	1 (3.33)	1 (3.33)	2 (6.67)
Regular Emergency Group (n = 30)	8 (26.67)	9 (30.00)	8 (26.67)	9 (30.00)	8 (26.67)
$\chi^2$ -value	4.258	5.277	4.841	7.674	4.341
P-value	0.032	0.018	0.011	0.004	0.036

### 3.4. Comparison of treatment satisfaction and success rates between the Green Channel group and the Regular Emergency group in acute chest pain patients

The treatment satisfaction and success rates of patients in the Green Channel group were 93.33% and 93.33%, respectively, while those in the Regular Emergency group were 73.33% and 73.33%. The Green Channel group had higher treatment satisfaction and success rates than the Regular Emergency group, with statistically significant differences ( $P < 0.05$ ). See **Table 4**.

**Table 4.** Comparison of treatment satisfaction and success rates between the Green Channel group and the Regular Emergency group [*n* (%)]

Group ( <i>n</i> )	Satisfied	Moderately satisfied	Dissatisfied	Total satisfaction rate	Treatment success rate
Green Channel Group ( <i>n</i> = 30)	12 (40.00)	16 (53.33)	1 (3.33)	28 (93.33)	28 (93.33)
Regular Emergency Group ( <i>n</i> = 30)	10 (33.33)	12 (40.00)	8 (26.67)	22 (73.33)	22 (73.33)
$\chi^2$ -value				8.541	8.541
<i>P</i> -value				< 0.05	< 0.05

### 3.5. Comparison of quality of life between the Green Channel group and the Regular Emergency group in acute chest pain patients

**Table 5** shows that the Green Channel group had higher scores in mental health (MH), emotional role (RE), social functioning (SF), vitality (VT), bodily pain (BP), role-physical (RP), physical functioning (PF), and general health (CH) compared to the Regular Emergency group, with statistically significant differences ( $P < 0.05$ ).

**Table 5.** Comparison of quality of life between the Green Channel group and the Regular Emergency group (mean  $\pm$  SD, points)

Group ( <i>n</i> )	MH	RE	SF	VT	BP	RP	PF	CH
Green Channel Group ( <i>n</i> = 30)	93.12 $\pm$ 3.45	95.03 $\pm$ 3.18	92.47 $\pm$ 3.28	93.47 $\pm$ 3.28	92.22 $\pm$ 3.65	92.04 $\pm$ 3.17	93.46 $\pm$ 3.71	95.67 $\pm$ 3.33
Regular Emergency Group ( <i>n</i> = 30)	84.05 $\pm$ 2.47	84.22 $\pm$ 2.44	84.38 $\pm$ 2.28	84.55 $\pm$ 2.57	85.63 $\pm$ 2.47	85.25 $\pm$ 2.54	84.56 $\pm$ 2.67	86.17 $\pm$ 2.54
<i>t</i> -value	9.185	11.295	9.142	10.286	9.596	9.097	11.295	9.142
<i>P</i> -value	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

## 4. Discussion

Acute chest pain is one of the common symptoms of cardiovascular diseases. Due to its complex manifestations, the severity can vary, making it essential to accurately assess the type of chest pain, such as distending pain, dull pain, oppressive pain, stabbing pain, or burning pain, in order to implement targeted treatment and improve rescue efficiency<sup>[10-11]</sup>.

The Green Channel is an important system in emergency departments. Though its treatment process is more complex and involves more steps compared to conventional emergency care, it does not prolong rescue time but instead enhances rescue efficiency and reduces mortality rates. The application of the Green Channel in the rescue of acute chest pain patients can accelerate the reception process, facilitate diagnosis and condition assessment, and aid in the swift triage and information transfer of patients. After receiving the patient, basic rescue measures such as oxygen therapy are administered, which helps prevent deterioration of the condition and sudden death. Intravenous access is established and blood samples are obtained, which benefits subsequent examinations and treatment<sup>[12]</sup>.

Transportation is a critical part of the process. Since unstable vehicle movement may exacerbate the patient's condition, enhancing monitoring during transport is crucial. Upon arrival at the hospital, the Green Channel is utilized to quickly move the patient to the resuscitation room, where the emergency department is already prepared for rescue based on the patient's pre-received information. The patient can be treated immediately, and admission procedures are completed after the rescue. Based on this approach, the use of the Green Channel significantly reduces rescue time and improves efficiency.

The results of this experiment show that the Green Channel group had shorter rescue and hospitalization times compared to the Regular Emergency group. The pain scores at 30, 60, 120, and 240 minutes after rescue were lower in the Green Channel group than in the Regular Emergency group. The incidence of adverse reactions such as recurrent acute episodes, arrhythmias, heart failure, stroke, and shock was lower in the Green Channel group. The satisfaction and success rates of treatment in the Green Channel group were 93.33%, compared to 73.33% in the Regular Emergency group. These findings are consistent with those of previous scholars<sup>[13-15]</sup>, fully validating the clinical significance of the Green Channel in the treatment of acute chest pain patients, as well as confirming the research value of this experiment.

## 5. Conclusion

In conclusion, the Green Channel in emergency departments has significant clinical importance in the treatment of acute chest pain patients. It reduces the incidence of adverse reactions, shortens rescue and hospitalization times, improves quality of life, and promotes early recovery, making it suitable for widespread implementation.

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## Disclosure statement

The authors declare no conflict of interest.

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