



ARAŞTIRMA MAKALESİ  
RESEARCH ARTICLE

CBU-SBED, 2024, 11 (3): 474-480

## Evaluation Of Patient Hospitalization By Emergency Physician Authorization: A Single Center-Retrospective Study

### Acil servis hekimi tarafından yetki kullanılarak yapılan hasta yatışlarının değerlendirilmesi: Tek merkezli retrospektif bir çalışma

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Gönderim Tarihi / Received: 25.06.2024

Kabul Tarihi / Accepted: 21.08.2024

DOI: 10.34087/cbusbed.1504964

#### Öz

**Giriş ve Amaç:** Acil servis doğası gereği 7/24 hizmet sunmaktadır ve acil servislerin rahatlatılmaya çalışılması global bir amaçtır. Bu amaçla yatması gereken ancak acil serviste kalmaya devam eden hastaların yatışı için acil hekimlerine verilen yatış yetkisi uygulamasının hasta sonlanımı üzerine etkisini ve uygunluğunu araştırmak amaçlandı.

**Gereç ve Yöntem:** Tek merkezli retrospektif bir çalışmadır. 01.05.2023-31.12.2023 tarihleri arasında Türkiye’de üçüncü basamak bir akademik acil serviste, acil servis hekimi insiyatifi kullanılarak servislere yatışı yapılan hastalarla çalışıldı.

**Bulgular:** Çalışma süresince acil servisten hastaneye yatan hasta sayısı 11927 olarak bulunuldu. Bu hastalar arasında yatış kararı acil tıp uzmanı tarafından insiyatif olarak belirlenen hasta sayısının yatan hastalara oranı yaklaşık olarak %1’dir (n=119/11927). İnsiyatifle yatırılan hastaların yaş medianı (IQR) 75 (65-83) olup, %47,9’u (n=57) erkekti. En sık yatış tanısı Pnömoni %16,8 (n=20), en sık konsültasyon yapılan bölüm enfeksiyon hastalıkları %47,9 (n=57), ve en sık yatış yapılan bölüm iç hastalıkları %23,5 (n=28) idi. Çalışmadaki tüm hastaların ortalama hastanede kalış süresi (OHKS) yedi gün idi. Yatışından sonra bölüm değiştiren hastaların OHKS otuz gün idi (p=0.004)

**Sonuç:** Acil servisin kalabalığını önlemek için ülkemizde acil hekiminin hasta yatırma yetkisi vardır. Tüm yatan hastaların yaklaşık %1 oranında bu yetkiye ihtiyaç duyulmaktadır. Yetki kullanılarak yatan hastaların hastane kalış sürelerinin uzunluğu göz önüne alındığında yatışların doğru ve uygun amaçlarla yapıldığı görülmektedir.

**Anahtar Kelimeler:** Acil Servis, kalabalık, insiyatif, hastaneye yatış

#### Abstract

**Background:** By its very nature, the emergency department provides a 24/7 service, and it is a global goal to try to relieve the burden on emergency departments. To this end, we aimed to investigate the impact and appropriateness of the practice of giving emergency physicians authorization to hospitalize patients who require hospitalization but remain in the emergency department on patient outcomes.

**Methods:** This is a single center retrospective study. The study was conducted in a tertiary academic emergency department in Turkey between 01/05/2023 and 31/12/2023, with patients admitted to the wards on the initiative of the emergency physician.

**Results:** The number of patients admitted from the emergency department during the study period was 11927. Among these patients, the ratio of patients whose admission decision was made by the emergency physician was approximately 1% (n=119/11927). The median (IQR) age of patients admitted by initiative was 75 years (65-83) and 47.9% (n=57) were male. The most common admission diagnosis was pneumonia 16.8% (n=20), the most common department consulted was infectious diseases 47.9% (n=57), and the most common department admitted was internal medicine 23.5% (n=28). The mean length of hospital stay (LOHS) for all patients in the study was seven days. The mean length of stay for patients who transferred departments after admission was thirty days (p=0.004).

**Conclusion:** In order to prevent overcrowding in emergency departments, emergency physicians in our country are authorized to admit patients. This authorization is needed for about 1% of all hospitalized patients. If we look at the length of stay of patients admitted with this authorization, we can see that they are admitted for the right and appropriate purposes.

**Keywords:** Emergency department, crowding, initiative, hospitalization

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## 1. Introduction

Emergency department (ED)s are open 24 hours a day, 7 days a week, and continuity of service is essential. For this reason, in order to ensure continuity of service in overcrowded emergency departments, some government policies have been developed and emergency doctors have been authorized to admit patients to hospital. In our country, the Regulation on the Implementation Procedures and Principles of Emergency Services in Inpatient Healthcare Facilities is intended to prevent long stays in emergency departments. This regulation includes the following definition "It is essential that patients' stay in emergency departments should not exceed 8 hours. Patients must be transferred to the appropriate clinic within 8 hours. Patients for whom a definitive diagnosis cannot be made within this period, or who are referred to more than one clinic, will be assessed by the doctor in charge of the emergency department and, if deemed necessary, will be admitted to hospital on behalf of the clinic or doctor with the most appropriate specialization for their condition". (1). This article is applied in all hospitals affiliated to the Ministry of Health.

Emergency department crowding is a global public health problem and is clearly an important patient safety issue (2-6). Studies have extensively demonstrated that emergency department crowding also delays the diagnostic process and the time to start treatment, creating a vicious cycle (7-13). Emergency department crowding can be caused by the number of patients waiting to be seen (entry), by delays in the assessment or treatment of patients already in the emergency department (flow), or by factors that prevent patients from leaving the emergency department when their care is complete (exit) (14). One of the major causes of emergency department crowding is prolonged stay in the emergency department (15-18). Prolonged stay in the ED is due to inadequate staffing, delayed response to ED advice, repeated ED visits (including inappropriate use) and hospital-specific factors (such as size and location, lack of appropriate beds) (19). Prolonged stay in the ED is considered to be one of

the reasons for the increase in health-related violence (20). The flow of patients through the emergency department should be managed without creating crowds. Studies in many parts of the world have shown that patient mortality increases with crowding (21-23).

In this study, we aimed to investigate the length of hospital stay, which department patients stayed in the longest and whether they were admitted to the most appropriate department, as well as the mortality rates of patients admitted on the initiative of emergency physicians. In our review of the literature, we did not find a similar study that had been done before. To our knowledge, this will be the first study in the literature on this topic.

## 2. Methods

### 2.1 Study design and setting

The study was approved by the Hitit University Non-Interventional Ethics Committee on 04.03.2024 under number 2024-13. The study followed the tenets of the Declaration of Helsinki. Patients who presented to the Emergency Department of Hitit University Çorum Erol Olçok Training and Research Hospital between 01.05.2023 and 31.12.2023; who were undecided between departments in the diagnostic phase of hospitalization; whose hospitalization was not planned by the relevant department, but whose discharge was not considered appropriate by the emergency physician and who were admitted to the relevant department; those whose diagnosis was not clear and who spent more than 8 hours in the emergency department and required hospitalization and were admitted to the required department; patients who were decided to be admitted to hospital but were admitted to the department that did not plan hospitalization although it was the most appropriate department for the patient were included in the study.

### 2.2 Participants selection

All patient records over the age of 18 years and trauma patient records under the age of 18 years where the initiative was taken by the emergency physician were included. A total of 119 patient records that met the inclusion criteria were included

in the study. Age, sex, pre-diagnosis at presentation to the emergency department, final diagnosis, type of hospitalization (ward, intensive care unit), length of stay and mortality were obtained from the electronic files in the hospital automation system.

### 2.3 Statistical analysis

In this study, descriptive continuous variables that fit the normal distribution are presented as "mean  $\pm$  standard deviation" and those that do not fit the normal distribution are presented as "median (interquartile range 25-75)". Data for categorical variables are presented as "n (%)". The Pearson chi-squared test was used for independent categorical variables, and the Fischer exact test was used when the expected number was less than 5. Bonferroni correction was applied to subgroup analyses and  $p < 0.016$  was considered significant. Student t test was used to compare independent numerical variables between two groups with normal distribution. The Mann-Whitney U test was used to compare independent two-group numerical variables that did not have a normal distribution. Participants' data were analyzed using IBM Statistical Package for Social Sciences (SPSS) version v.22.

### 3. Results

The number of patients admitted from the emergency department during the study period was 11927. Among these patients, the ratio of patients whose admission decision was made by the emergency physician is approximately 1% ( $n=119/11927$ ). 47.9% ( $n=57$ ) of the patients were male and the median (IQR) age of the patients was 75 (65-83) years. The diagnoses of the patients were pneumonia 16.8% ( $n=20$ ), urinary tract infection 12.6% ( $n=15$ ), acute renal failure 11.8% ( $n=14$ ). The most common departments consulted were infectious diseases 47.9% ( $n=57$ ), internal medicine 44.5% ( $n=53$ ) and cardiology 31.1% ( $n=37$ ). According to the departments where the patients were hospitalized, internal medicine were 23.5% ( $n=28$ ), infectious diseases 22.7% ( $n=27$ ), pulmonology 19.3% ( $n=23$ ). Hospitalization resulted in mortality in 18.5% ( $n=22$ ) of the patients. 6.8% ( $n=8$ ) of patients were transferred to another department during hospitalization. Among the patients who were transferred to another department, the last departments transferred were internal medicine and general surgery 1.7% ( $n=2$ ); urology, cardiology, anesthesia, thoracic surgery 0.8% ( $n=1$ ) (Table 1).

**Table 1:** Demographic characteristics of patients

Parameters	n(%)=119	
Female	62(52.1)	
Age (median (IQR 25-75))	75(65-83)	
Time to Hospitalization, day (median (IQR 25-75))	7 (4-12)	
<b>Pre-diagnosis/Final diagnosis</b>		
Pneumonia	21 (17.6)	20 (16.8)
Urinary tract infection	16 (13.4)	15 (12.6)
Acute renal failure	14 (11.8)	14(11.8)
Skin and soft tissue infection	10 (8.4)	11 (9.2)
Sepsis	8 (6.7)	9 (7.6)
Anemia	4 (3.4)	4 (3.4)
Electrolyte imbalance	4 (3.4)	4 (3.4)
COPD exacerbation	3 (2.5)	3 (2.5)
Fungal intoxication	3 (2.5)	3 (2.5)
GI bleeding	3 (2.5)	3 (2.5)
Cholecystitis	3 (2.5)	3 (2.5)
Acute gastroenteritis	3 (2.5)	4 (3.4)
Ileus	3 (2.5)	3 (2.5)
Pelvic fracture	3 (2.5)	3 (2.5)
Others	21 (17.6)	20 (16.8)
<b>Consultations</b>		
Internal Medicine	53 (44.5)	
General Surgery	25 (21)	
Infection Disease	57 (47.9)	
Pulmonology	35 (29.4)	
Urology	16 (13.4)	
Cardiology	37 (31.1)	
Gastroenterology	14 (11.8)	
Neurology	14 (11.8)	
Neurosurgery	7 (5.9)	

Nephrology	20 (16.8)
Plastic and reconstructive surgery	2 (1.7)
Pediatric Surgery	2 (1.7)
Orthopedics and Traumatology	8 (6.7)
Cardiovascular Surgery	6 (5)
<b>Combinations of Consultations</b>	
Single Consultation	20 (16.8)
Pulmonology and Cardiology	9 (7.6)
Internal Medicine and Gastroenterology	6 (5)
Internal Medicine and Infection Disease	4 (3.4)
Infection Disease and General Surgery	3 (2.4)
General Surgery and Gastroenterology	3 (2.4)
Internal Medicine, Infection Disease and Pulmonology	3 (2.4)
Other combinations	71 (60)
<b>Hospitalization department</b>	
Internal Medicine	28 (23.5)
Infection Disease	27 (22.7)
General Surgery	10 (8.4)
Pulmonology	23 (19.3)
Urology	7 (5.9)
Gastroenterology	4 (3.4)
Neurology	2 (1.7)
Neurosurgery	1 (0.8)
Nephrology	8 (6.7)
Pediatric Surgery	2 (1.7)
Cardiovascular Surgery	2 (1.7)
Orthopedics and Traumatology	4 (3.4)
Chest Surgery	1 (0.8)

The mean length of hospital stay (LOHS) was calculated as 6 days for patients without mortality and 14 days for patients with mortality ( $p=0.014$ ). The mean length of hospital stay (LOHS) of patients transferred to another department was 30 days, while the mean LOHS of patients not transferred was 6 days ( $p=0.004$ ). LOHS was 4 days for patients admitted to surgical wards and 7 days for patients admitted to medical wards. LOHS was 4 days for patients admitted to the ward and 7.5 days for

**Table 2:** Length of hospitalization

patients admitted to the ICU ( $p<0.001$ ). Twenty patients were not discharged by the emergency physician despite a single consultation and a discharge decision by the consultant. In these twenty patients, the LOHS was found to be three days. In patients with two or more consultations, the LOHS was found to be eight days ( $p<0.001$ ). For all patients in the study, LOHS was seven days. One of these twenty patients died (Table 2).

Parameters	Time to Hospitalization, day Median (IQR 25-75)	p value
<b>Mortality (n)</b> No (97) Yes (22)	6 (3-11) 14 (4.75-32.5)	0.014*
<b>Transferred (n)</b> No (111) Yes (8)	6 (3-12) 30 (10.75-47.25)	0.004*
<b>Surgical-Internal Department (n)</b> Surgical (17) Internal (102)	4 (3-9) 7(4-13)	0.087*

<b>Hospitalization unit (n)</b> Ward Admission (73) Intensive Care (46)	6 (3-10.5) 7.5 (4-14.25)	<0.001*
<b>Consultation (n)</b> Single consultation (20) Multiple consultation (99)	3(2-5.75) 8(4-14)	<0.001*

\*The p value was obtained from the Mann-Whitney U test.

Of the twenty-two patients who died, 5 (22.7%) were transferred to another department, whereas 3 (3.1%) of the patients who did not die were transferred to another department (p=0.005). While 15 (68.2%) of

the patients admitted to the ICU died, 7 (31.8%) of the patients admitted to the ward died (p=0.002) (Table 3).

**Table 3.** Mortality relationship of patients

Parameters	Mortality No	Mortality Yes	p value
<b>Age</b> Mean ± SD	70.29±17.5	77.5±13.3	0.073*
<b>Transferred</b> No Yes	94 (96.9) 3 (3.1)	17 (77.3) 5 (22.7)	0.005**
<b>Surgical-Internal Department</b> Surgical Internal	17 (17.5) 80 (82.5)	0(0) 22 (100)	0.040***
<b>Hospitalization unit</b> Ward Admission Intensive Care	66 (68) 31 (32)	7 (31.8) 15 (68.2)	0.002***

\* The p value was obtained from Student's t test.

\*\* The p value was obtained from Fisher's Exact test.

\*\*\* The p value was obtained from the chi-square test.

Twenty-five (50%) of patients with three or more consultations and 21 (30.4%) of patients with less than three consultations were admitted to the ICU (p=0.187). We found that 12 (24%) of the patients

with three or more consultations and 10 (14.5%) of the patients with less than three consultations resulted in mortality (p=0.031) (Table 4).

**Table 4.** Association of consultation numbers with mortality and intensive care unit admission

	<3 consultations	≥3 consultations	p value
<b>Mortality</b> No Yes Total	59 (85.5) 10 (14.5) 69	38 (76) 12 (24) 50	0.187*
<b>Hospitalization unit</b> Ward Admission Intensive Care Total	48 (69.6) 21 (30.4) 69	25 (50) 25 (50) 50	0.031*

\* The p value was obtained from the chi-square test.

#### 4. Discussion

Emergency department crowding is a common problem. Although many studies have been conducted on the subject, there is still no effective and definitive solution to the problem. Hospitals

implement national health policies to prevent overcrowding (6).

With the implementation of the regulation that the management of emergency department overcrowding is left to the initiative of emergency physicians for patients with a long stay in the

emergency department by the health center management, the decrease in the number of patients in follow-up allowed more time to be allocated to new patients. It can be seen that 93.2% of the departments chosen for admission by the emergency physician were correct, as the patients were not transferred to another department. The remaining half of the patients were transferred to another department because of the need for a surgical department. If we look at the patients admitted from the emergency department, we see that initiative was required in about 1% of the inpatients.

In our study, the mean length of hospital stay was 6 days and 14 days in patients with and without mortality, respectively, which means that it was higher in patients with mortality. In an observational study in Japan, the mean length of stay was 13.3 days (24). In patients who were transferred to another department, the mean length of stay was 30 days. We believe that the increase in this length of hospital stay is related to the poor clinical condition of the patients. Mortality occurred in 62.5% of patients transferred to another department.

When we compared according to the number of consultations, mortality and ICU admission rates were higher in patients with 3 or more consultations compared to those with less than 3 consultations (24% vs 14.5%, 50%, 30%). Half of the patients with 3 or more consultations were admitted to intensive care. We believe that patients with 3 or more consultations had worse clinical conditions.

In our study, the number of patients with a single consultation was 20. In these cases, the consultant did not think that the patient should be admitted to hospital, but the emergency physician decided that the patient should be admitted. We think that the reason for this difference is that the consultation took place after the patient's condition had improved with acute treatment, not at the time of admission, and the consultant saw the patient after the patient's clinical condition had improved. We found that these patients were not discharged immediately after admission to the ward and remained in hospital for an average of about four days. Since we found that patients whose admission was initiated by the emergency physician were not discharged immediately, we can emphasize that the physician who first saw the patient and the clinical condition at the time of initial presentation are more valuable than the assessment of the consultant physician who assessed the patient in a short period of time. The consultant's assessment may have coincided with the patient's short-term or post-treatment well-being. In our study, we observed that the length of hospital stay increased when the number of consultations was two or more. We can hypothesize that as the number of consultations increases, the clinical condition of the patient becomes more complex.

We found that the emergency physician's approval of hospital admission not only reduced emergency

department crowding, but also that patients who were not approved for discharge by the emergency physician could not be discharged immediately, and that the majority of patients benefited from inpatient care.

## 5. Limitations

This study was retrospective in a single center and applies to a regional area with local health authority legislation. Similar studies in larger centers and less busy emergency departments will shed light on the literature.

## 6. Conclusion

In order to avoid overcrowding in the emergency department, the emergency physicians were authorized to admit the patient to the appropriate department. We found that this authorization was used in 1% of cases. We conclude that this authorization was used correctly by the emergency physician because the transfer of inpatients to another department was low according to our study.

## References

1. T.C. Sağlık Bakanlığı. Yataklı Sağlık Tesislerinde Acil Servis Hizmetlerinin Uygulama Usul ve Esasları Hakkında Tebliğ. Resmi Gazete. 2022.
2. Pines JM, Griffey RT. What We Have Learned from a Decade of ED Crowding Research. Vol. 22, Academic Emergency Medicine. 2015.
3. Pines JM, Hilton JA, Weber EJ, Alkemade AJ, Al Shabanah H, Anderson PD, et al. International perspectives on emergency department crowding. Academic Emergency Medicine. 2011;18(12).
4. Moskop JC, Sklar DP, Geiderman JM, Schears RM, Bookman KJ. Emergency Department Crowding, Part 1-Concept, Causes, and Moral Consequences. Ann Emerg Med. 2009;53(5).
5. Hospital-based emergency care: at the breaking point. Choice Reviews Online. 2008;45(05).
6. Hoot NR, Aronsky D. Systematic Review of Emergency Department Crowding: Causes, Effects, and Solutions. Vol. 52, Annals of Emergency Medicine. 2008.
7. Pines JM, Shofer FS, Isserman JA, Abbuhl SB, Mills AM. The effect of emergency department crowding on analgesia in patients with back pain in two hospitals. Academic Emergency Medicine. 2010;17(3).
8. Pines JM, Pollack C V., Diercks DB, Chang AM, Shofer FS, Hollander JE. The association between emergency department crowding and adverse cardiovascular outcomes in patients with chest pain. Academic Emergency Medicine. 2009;16(7).
9. Hong KJ, Shin S Do, Song KJ, Cha WC, Cho JS. Association between ED crowding and delay in resuscitation effort. American Journal of Emergency Medicine. 2013;31(3).
10. Ackroyd-Stolarz S, Read Guernsey J, MacKinnon NJ, Kovacs G. The association between a prolonged stay in the emergency department and adverse events in older patients admitted to hospital: A retrospective cohort study. BMJ Qual Saf. 2011;20(7).
11. Demir MC, Akkas M. Awareness of risks associated with the use of plain X-ray, computed tomography, and magnetic resonance imaging among emergency physicians and comparison with that of other

- physicians: A survey from Turkey. *Medical Science Monitor*. 2019;25.
12. Ilhan B, Kunt MM, Damarsoy FF, Demir MC, Aksu NM. NEDOCs: Is it really useful for detecting emergency department overcrowding today? *Medicine (United States)*. 2020;99(28).
  13. Demir Mc, Ađaçkırın İ, Özdamar Y, Bođan M. The pandemic's effect on discharge against medical advice from the emergency department. *Journal of Surgery and Medicine*. 2021;5(5).
  14. Asplin BR, Magid DJ, Rhodes K V., Solberg LI, Lurie N, Camargo CA. A conceptual model of emergency department crowding. *Ann Emerg Med*. 2003;42(2).
  15. Gilligan P, Winder S, Singh I, Gupta V, Kelly PO, Hegarty D. The Boarder in the Emergency Department (BED) study. *Emergency Medicine Journal*. 2008;25(5).
  16. FitzGerald G, Jelinek GA, Scott D, Gerdtz MF. Emergency department triage revisited. Vol. 27, *Emergency Medicine Journal*. 2010.
  17. van der Linden MC, Meester BEAM, van der Linden N. Emergency department crowding affects triage processes. *Int Emerg Nurs*. 2016;29.
  18. Göransson KE, Ehrenberg A, Marklund B, Ehnfors M. Emergency department triage: Is there a link between nurses' personal characteristics and accuracy in triage decisions? *Accid Emerg Nurs*. 2006;14(2).
  19. Erenler AK, Akbulut S, Guzel M, Cetinkaya H, Karaca A, Turkoz B, et al. Reasons for overcrowding in the emergency department: Experiences and suggestions of an education and research hospital. *Turkiye Acil Tip Dergisi*. 2014;14(2).
  20. Ađaçkırın M, Avsarogullari L, Şenol V. Factors Associated With Reasons, Characteristics And Frequency Of Workplace Violence Towards Emergency Department Staff. *Turkish Journal of Health Science and Life*. 2023;6(3).
  21. Richardson DB. Increase in patient mortality at 10 days associated with emergency department overcrowding. *Medical Journal of Australia*. 2006;184(5).
  22. Savioli G, Ceresa IF, Gri N, Piccini GB, Longhitano Y, Zanza C, et al. Emergency Department Overcrowding: Understanding the Factors to Find Corresponding Solutions. Vol. 12, *Journal of Personalized Medicine*. 2022.
  23. Cha WC, Shin S Do, Cho JS, Song KJ, Singer AJ, Kwak YH. The Association Between Crowding and Mortality in Admitted Pediatric Patients From Mixed Adult-Pediatric Emergency Departments in Korea. *Pediatr Emerg Care*. 2011;27(12).
  24. Kurihara M, Kamata K, Tokuda Y. Impact of the hospitalist system on inpatient mortality and length of hospital stay in a teaching hospital in Japan: a retrospective observational study. *BMJ Open*. 2022;12(4).

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