

Evaluation of Emergency Interhospital Patient Transfers from Province of Mardin to Out-of-Province Hospitals in a Year

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Abstract

Objective: This study aimed to assess patients who were transferred from emergency services throughout the province of Mardin to out-of-province hospitals by ambulance in a year.

Material and Methods: In this study, all patients transferred from emergency services in the province of Mardin to out-of-province hospitals via ambulances by the Patient Referral Assessment Committee, founded under the Provincial Directorate of Health, between the dates of December 31, 2010 and December 31, 2011 were evaluated retrospectively. No exclusion criteria were used. Patients were grouped and analyzed according to their demographic characteristics, transport properties, and reasons for referral.

Results: The total number of the patients included in the study was 1518 (55.8% males, 41±27 mean age). Of all, 621 patients (40.9%) were transferred from the center of Mardin province, and the other patients were transferred from 8 district hospitals and two private hospitals. It was found that the patients were transferred to 37 hospitals in 8 provinces, and a total of 562 patients (37%) were transferred to private hospitals. Cardiology (23.3%), pediatrics (11.5%), and obstetrics and gynecology (8.8%) departments were the first three clinics that patients were transferred to frequently, respectively. In total, 274 patients (18.1%) were transferred inappropriately. There was a statistically significant difference between patients' transfer hospitals (state hospital/private hospital) and the age of the patients (younger than 18 years/18 years or older) ($p<0.001$). In addition, the rate of adult patients' transfers to tertiary healthcare centers was significantly higher ($p<0.001$).

Conclusion: In Mardin, cardiology, pediatrics and obstetrics and gynecology patients are the most common group of emergency patients transferred by 112 ambulances to out-of-province hospitals. Approximately 40% of the patients were transferred to private hospitals. Inappropriate patient transfers seem to be a major problem in this study, as in other studies conducted in Turkey. (*JAEM 2014; 13: 62-6*)

Key words: Ambulance, patient transfer, emergency medicine (MeSH Database)

Introduction

Even in countries having a highly developed health system, interhospital patient transfers are often made. Especially, patients who are undiagnosed, who have increasing complaints, and who have life-threatening health status are transferred from centers below standards in terms of intervention conditions to more appropriate centers.

Emergency interhospital patient transfer is an important issue in our country as well; however, the number of studies in the Turkish literature is quite limited. The population of the province of Mardin is 773,026 according to the Turkish Statistical Institute data in 2012. The province neighbors Syria to the south, Şanlıurfa to the west, Di-

yarbakır and Batman to the north, and Şırnak to the West. Ten public and 2 private hospitals in the province have 1438 beds (470 quality beds) in total.

When the study was conducted, 245 specialists and 134 practitioners, including those serving at provincial ambulance command control centers and emergency health service stations, were working at the hospitals in Mardin. Almost 40% of the specialists were working at the hospitals located in the center of the city. Mardin is a province that does not have a tertiary hospital.

In this study, we aimed to examine the annual out-of-province emergency transfers of a province the total number of whose doctors were given, except those working at family and community health centers.



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Material and Methods

In our study, the patients transferred from emergency services in the province of Mardin to out-of-province hospitals by ambulances between the dates of December 31, 2010 and December 31, 2011 were evaluated retrospectively. For the study, a patient referral assessment committee was founded under the Provincial Directorate of Health in May 2012.

The committee involved the Public Health Services Department Director, 4 emergency medicine specialists, the Emergency Health Services Department Director, and a 112 emergency service head physician. Through the committee, it was officially reached to the provincial health directorates of 8 provinces, and epicrisis and files of all patients transferred out of the province by ambulances between the dates of December 31, 2010 and December 31, 2011 were obtained.

These files and epicrisis were examined by the committee members, who met twice a week between May and October 2012. No exclusion criteria were used in the study. The patients' demographic features (age, gender, and health insurance), transport properties (the health centers to which they were transferred, the referring departments), and reasons for referral were recorded.

The patients were evaluated in 7 groups according to the reasons for referral (Figure 1). The Declaration of Code of Practice of Emergency Health Services at Health Facilities provisions (1) and The American College of Emergency Physicians (ACEP) interhospital appropriate patient transfer recommendations (2) were used as "Inappropriate Referral" criteria.

According to this, situations, such as inability to improve the patient status (referral from a secondary center to another secondary center), lack of necessary stabilization, and transfer of the patients in spite of having necessary conditions for examination, intervention, care, and treatment procedures required by the patients (although patients were transferred for intensive care hospitalization, they were evaluated at outpatient services, or although the patients were transferred for immediate surgical treatment, they were taken under medical supervision), were evaluated as "inappropriate referrals."

For patients for whom the members of the referral committee had difficulty in deciding or disagreed with each other, the specialists of the related departments were invited to the committee meetings to decide whether the transfer was appropriate or not. The study was conducted with the approval of the Mardin Governorship and Provincial Directorate of Health. Since the patient files were evaluated retrospectively, patient consent was not obtained.

Statistical Analysis

The data obtained were analyzed by using Statistical Package for Social Sciences 15.0 (SPSS Inc., Chicago, IL, USA) software. Descriptive statistics were identified as mean±standard deviation or median (minimum-maximum) for continuous variables and as number of cases and percentage (%) for nominal variables. The relationship between nominal variables was evaluated by using Pearson chi-square test, and a value of $p < 0.001$ was accepted as significant.

Results

The total number of admissions to the emergency departments in the province of Mardin and its districts was found to be 633,468 for 12 months between the dates of December 31, 2010 and Decem-

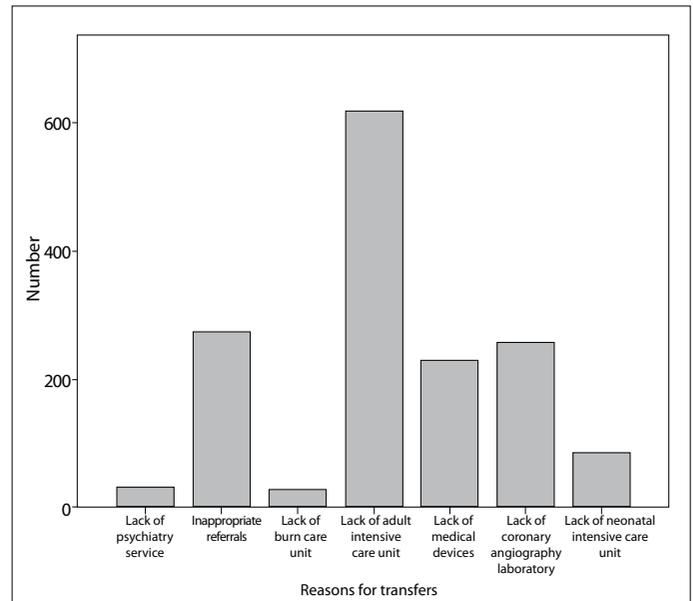


Figure 1. Distribution of patients according to the reasons for transfer

ber 31, 2011. For the same dates, the number of patients transferred from the emergency departments in the province of Mardin to out-of-province hospitals was 1518 (847 males, 55.8%). The mean age of these transferred patients was 41 ± 27 years (range 0-104 years). The number of patients younger than 1 year was 107 (7%), and the number of patients older than 65 years was 392 (25.8%). When the health centers that transferred the patients were examined, it was determined that 621 patients (40.9%) were transferred from the center of Mardin province (public hospital and obstetrics and gynecology, and children's hospital), and the other patients were transferred from 8 district hospitals and two private hospitals. In terms of the health centers to which the patients were referred, it was found that the patients were transferred to 37 hospitals in 8 provinces (Figure 2). A multiple trauma patient and a mushroom poisoning case who might have needed liver transplantation were referred to Ankara and Kayseri, which were the furthest provinces in the referral list. The first three departments to which the patients were transferred most frequently were cardiology (23.3%), pediatrics (11.5%), and obstetrics and gynecology (8.8%), respectively (Figure 3). When the reasons for patient transfer were assessed, it was identified that 274 patients (18.1%) were transferred inappropriately. Of the patients, 348 (22.9%) were younger than 18 years, and in total, 842 patients (55.5%) were transferred to tertiary healthcare centers. In terms of the health centers where the patients were transferred, it was seen that 562 patients (37%) were referred to private hospitals. When patients younger and older than 18 years were compared in terms of being transferred to public hospitals or private hospitals, a statistically significant difference was found between the two groups ($p < 0.001$). In addition, the rate of adult patient transfers to tertiary healthcare centers was significantly higher ($p < 0.001$) (Table 1). On the other hand, when the transfers were evaluated considering the months and health insurance, no significant difference was found.

Discussion

In the literature in Turkey, no other study about out-of-province emergency transfers of a province for a year is available. When com-

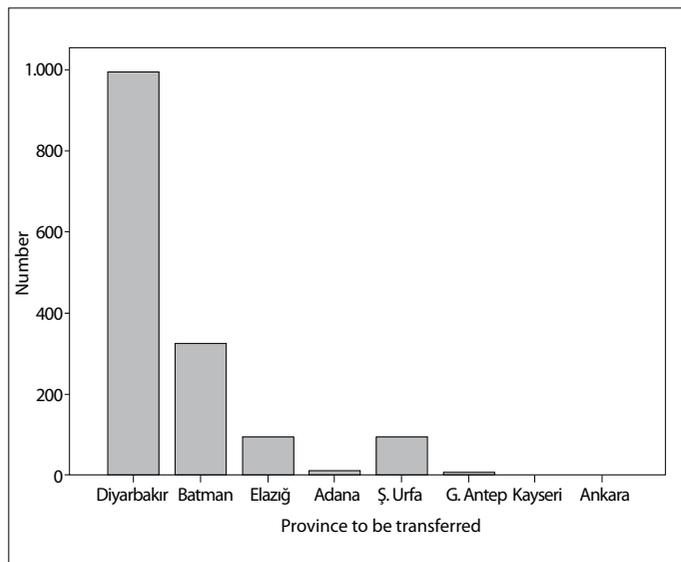


Figure 2. Distribution of patients according to the provinces where they were transferred

Table 1. Comparison of adult and pediatric patients in terms of transfers to public hospitals or private hospitals and secondary healthcare or tertiary healthcare centers

	Adult (n=1170)	Pediatric (n=348)	p value
Public hospital	764	192	
Private hospital	406	156	<0.001
Secondary healthcare center	491	185	
Tertiary healthcare center	679	163	<0.001

pared to the two studies from Turkey, the mean age of our patients was similar to the means in the studies by Ertan et al. (3) and Atilla et al. (4). Most of the referred patients in our study were males, as in the study of Atilla et al. (4), but in the study of Ertan et al. (3), most of the patients were females. In the study by Koval et al. (5), in which they examined trauma patients, it was found that male patients were transferred more frequently compared to females, and pediatric patients were transferred more frequently than geriatric patients. The referrals in the evenings and at night were more frequent than referrals in the mornings and at noon. Also, the frequency rate of referrals for patients with low-income health insurance was higher than for patients with high-income health insurance. Due to the fact that the majority of our patients is transferred to intensive care units and no health insurance or extra price is requested from patients for intensive care treatment in our country, it is likely that there was no correlation found between patient referrals and health insurance. Yet, in another study conducted by Nathens et al. (6) in which trauma patients who were transferred from level 3 or 4 trauma centers to level 1 trauma centers were evaluated, they suggested that male gender, young age, and not having commercial insurance were related to patient referral. In both studies, it was found that geriatric patients were referred less frequently compared to young patients. Moreover, in the study by Utter et al. (7) about patients transferred from nearby hospitals to the closest trauma centers, they reported that the referral of geriatric patients (≥ 65 years) took longer than the referral of

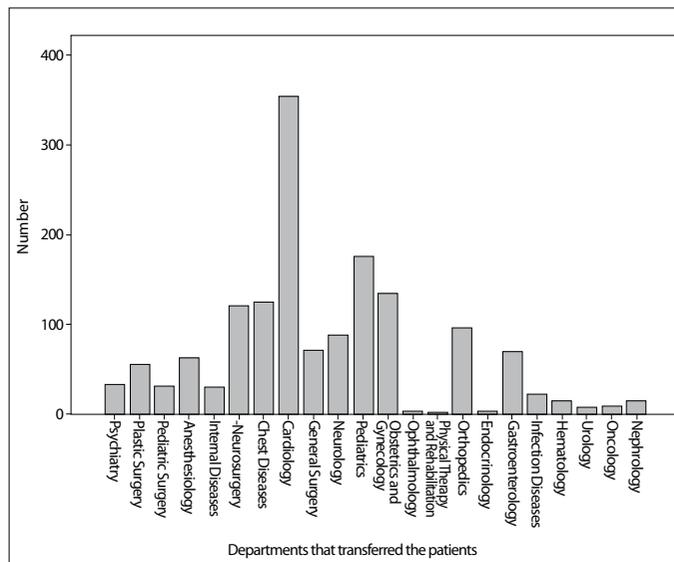


Figure 3. Distribution of patients according to the departments that transferred them

younger patients. As a reason for this, the authors pointed to the fact that both the prehospital care and intensive care staff expressed a "less impetuous attitude" towards geriatric patients (7). Almost one-fourth of our patients were geriatric patients older than 65 years; however, due to the retrospective characteristic of our study, we do not have any finding to say that these patients' referrals were delayed or took longer compared to younger patients.

Bosk et al. (8) suggest that a patient referral has 4 components: identification of the patient, identification of the center, discussing the referral, and making the transfer. In our study, the last three stages were performed by the 112 ambulance service. There were common protocols made by our cardiologists and the concerned centers about the organization of referral centers available for patients with acute coronary syndrome requiring emergency percutaneous coronary intervention (PCI). Theodore et al. (9) suggested that there are still lots of problems about patient referrals and that the referral rules are not clear. The authors also reported that the majority of studies about patient referrals sought answers to questions, such as which patients should be referred, how the patients should be referred, and whether these referrals corrected the results; however, an important question should be where the patients should be referred (9). Our patients were transferred to 37 different centers in 8 different provinces, and most of these centers were private. This may be due to the fact that private hospitals meet a significant requirement in our region with regard to medical equipment, proper service, and intensive care beds and their initiative-taking approach in patient admission. In the large population-based retrospective cohort study of Newgard et al. (10), in which referred trauma patients were examined, the authors pointed out that the strongest indicator of whether a patient could be referred or not was the initial evaluation done by the first center to which the patient was admitted. The patients involved in our study were those who were transferred from the emergency departments in the province of Mardin by the 112 ambulance service, and referral decisions were taken by the concerned specialist physicians after the evaluation in the emergency units.

In the fourth section of the *Declaration of Code of Practice of Emergency Health Services at Health Facilities*, it is stated that: "In case the

concerned health facility provides the necessary conditions for the required examination, intervention, care, and treatment of the patients' status with regard to specialist, medical equipment, and available beds, the patient should not be referred to another health facility, and the necessary health services should be provided at that health facility" (1). Warren et al. (11) suggested that critical care patients might be referred if additional therapy and care were technically, cognitively, and procedurally insufficient and if the probable benefit was greater than the risk. Improvement of the existing conditions of the patient and prevention of any harm to the patient by taking the medical benefits and probable risks into consideration are involved among the recommendations of the ACEP's appropriate interhospital patient referrals. The referrals that do not fit the guiding recommendations above should be considered inappropriate referrals. Many patients (18.1%) in our study were referred inappropriately. In some studies conducted in our country, it was reported that patient referral rules were not followed adequately, and even most patients were transferred inappropriately (3, 4, 12). Ertan et al. (3) stated that 98.5% of the patients were referred without any pre-evaluation. In the study of Philpot et al. (13), in which they assessed newborn and pediatric patients transferred to tertiary healthcare centers, it was found that 11.5% of the patients were referred inappropriately. In this study, referral cases with inappropriate diagnoses were encountered mostly in trauma patients (13). In a study conducted in Denmark, it was reported that most of the internal medicine clinics did interhospital transfers, and 77.3% of them did not follow the "guide" recommendations while transferring patients (14). A study conducted in Norway revealed that about half of patients with severe head trauma were transferred to local hospitals without any neurosurgical experience, in spite of an improved air ambulance system (15). When physicians have different concerns other than medical indications while referring patients, the possibility of inappropriate referrals increases (5, 6).

The majority of our patients was transferred to the province of Diyarbakır (Figure 2), the nearest city, with a distance of 90 km to Mardin. In addition, some patients were transferred to further places. In the study of Poddutoor et al. (16) about the evaluation of 220 newborns transferred to out-of-province hospitals and 795 newborns transferred to hospitals in the province, long referral time and distance were compared to short referral time and distance, and no statistically significant difference was found between the groups in terms of biochemical and metabolic variables and mortality rate within first 24 hours. The authors state that long distance is also possible in neonatal referrals (16). In our study, most of the patients were transferred by the Department of Cardiology. The most important factor for this is that PCI is not performed in the province of Mardin. All transfers by Cardiology were done to health centers in the province of Diyarbakır. In the study of Iwashyna et al. (17), in which they evaluated 71,336 patients with acute myocardial infarction (AMI) who were admitted to hospitals without a revascularization facility, more than 40% of the patients were transferred to hospitals with this facility; average transfer distance was identified as 26.7 miles (about 42 km), and it was reported that 96.1% was referred to a health center 100 miles (about 160 km) away. Current guidelines recommend primary PCI as the reperfusion method if there is an experienced and available team for STEMI patients (18). It is pointed out that it takes a maximum of 120 minutes to transfer patients from health centers without this capacity or facility to ones with the capacity of PCI, and

it is suggested that even patients receiving fibrinolytic therapy be transferred to health centers with a PCI facility within the first 24 hours (18). Miedema et al. (19) investigated delays in transfers and related mortality rates for transferred STEMI patients in their study of 2034 diseases, and they found that for patients with door-balloon contact after 120 minutes, the in-hospital mortality rate was higher compared to patients with door-balloon contact before 120 minutes. Accordingly, the transfer of AMI patients seems to be a medicolegal obligation for the province of Mardin. The only way to prevent such transfers is to develop PCI facilities in light of the current knowledge in this province and to make them usable for patients. Besides, delays in referrals are sometimes experienced. In the study above, the authors reported that delays in referral were seen more frequently in referring hospitals (64%) and then in PCI centers (15.7%) and during transfer (12.6%), respectively (19). In another study, considering the direct admissions to a PCI center, the door-balloon time was found to be longer in transferred STEMI patients (20). Also, some problems may occur in patients during transfers (21, 22). Based on all of these findings, it is thought that cardiovascular intervention facilities need to be improved in the province of Mardin.

In our study, it was found that pediatric patients were transferred to private hospitals more frequently than adult patients, which was statistically significant. It can be suggested that in this area, it is necessary to develop public hospitals that can provide advanced medical care to newborn and pediatric patients and that have intensive care units with enough beds and to enhance the conditions of present hospitals.

Conclusion

Although interhospital out-of-province emergency transfers from the province of Mardin by 112 ambulances constitute a small part of total admissions to the emergency department, the cardiology and pediatrics departments' being ranked first shows that cardiovascular intervention facilities should be improved and that the equipment of coronary intensive care units and pediatrics departments should be enhanced. In addition, by making the psychiatric department and burn care centers, which are closed now, usable, the number of out-of-province emergency transfers may decrease. As in other studies conducted in our country, inappropriate transfers seem to be an important issue in our study. Interhospital transfers performed according to standardized rules can decrease the rate of inappropriate referrals.

Ethics Committee Approval: Due to the retrospective nature of the study, ethics committee approval was waived.

Informed Consent: Informed consent was obtained from the Mardin Provincial Directorate of Health.

Peer-review: Externally peer-reviewed.

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References

1. Yataklı Sağlık Tesislerinde Acil Servis Hizmetlerinin Uygulama Usul ve Esasları Hakkında Tebliğ. Sağlık Bakanlığı'ndan, Yayımlandığı Resmi Gazete Tarihi: 16/10/2009, Yayımlandığı Resmi Gazete No: 27378.
2. American College of Emergency Physicians. Appropriate interhospital patient transfer. *Ann Emerg Med* 2009; 54: 141. [\[CrossRef\]](#)
3. Ertan C, Akgün FS, Yücel N. Evaluation of patient transfers to the emergency department of a university hospital. *Turk J Emerg Med* 2010; 10: 65-70.
4. Atilla ÖD, Oray D, Akın Ş, Acar K, Bilge A. An Emergency Department perspective: Ambulance transfers and referral consents of the patients. *Turk J Emerg Med* 2010; 10: 175-80.
5. Koval KJ, Tingey CW, Spratt KF. Are patients being transferred to level-I trauma centers for reasons other than medical necessity? *J Bone Joint Surg Am* 2006; 88: 2124-32. [\[CrossRef\]](#)
6. Nathens AB, Maier RV, Copass MK, Jurkovich GJ. Payer status: the unspoken triage criterion. *J Trauma* 2001; 50: 776-83. [\[CrossRef\]](#)
7. Utter GH, Victorino GP, Wisner DH. Interhospital transfer occurs more slowly for elderly acute trauma patients. *J Emerg Med* 2008; 35: 415-20. [\[CrossRef\]](#)
8. Bosk EA, Veinot T, Iwashyna TJ. Which patients and where: a qualitative study of patient transfers from community hospitals. *Med Care* 2011; 49: 592-8. [\[CrossRef\]](#)
9. Iwashyna TJ, Courey AJ. Guided transfer of critically ill patients: where patients are transferred can be an informed choice. *Curr Opin Crit Care* 2011; 17: 641-7. [\[CrossRef\]](#)
10. Newgard CD, McConnell KJ, Hedges JR. Variability of trauma transfer practices among non-tertiary care hospital emergency departments. *Acad Emerg Med* 2006; 13: 746-54.
11. Warren J, Fromm RE Jr, Orr RA, Rotello LC, Horst HM. Guidelines for the inter- and intrahospital transport of critically ill patients. *Crit Care Med* 2004; 32: 256-62. [\[CrossRef\]](#)
12. Armağan E, Akköse Ş, Çebişi H, Engindeniz Z, Tokyay R. Do emergency departments comply with the rules of patient transportation? *Ulus Travma Acil Cerrahi Derg* 2001; 7: 13-6.
13. Philpot C, Day S, Marcdante K, Gorelick M. Pediatric interhospital transport: diagnostic discordance and hospital mortality. *Pediatr Crit Care Med* 2008; 9: 15-9. [\[CrossRef\]](#)
14. Hallas P, Folkestad L, Brabrand M. Level of training and experience in physicians performing interhospital transfers of adult patients in the internal medicine department. *Emerg Med J* 2009; 26: 743-4. [\[CrossRef\]](#)
15. Moen KG, Klepstad P, Skandsen T, Fredriksli OA, Vik A. Direct transport versus interhospital transfer of patients with severe head injury in Norway. *Eur J Emerg Med* 2008; 15: 249-55. [\[CrossRef\]](#)
16. Kumar PP, Kumar CD, Shaik FA, Ghanta SB, Venkatalakshmi A. Prolonged neonatal interhospital transport on road: relevance for developing countries. *Indian J Pediatr* 2010; 77: 151-4. [\[CrossRef\]](#)
17. Iwashyna TJ, Kahn JM, Hayward RA, Nallamothu BK. Interhospital transfers among Medicare beneficiaries admitted for acute myocardial infarction at nonrevascularization hospitals. *Circ Cardiovasc Qual Outcomes* 2010; 3: 468-75. [\[CrossRef\]](#)
18. O'Gara PT, Kushner FG, Ascheim DD, Casey DE Jr, Chung MK, de Lemos JA, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2013; 127: 362-425. [\[CrossRef\]](#)
19. Miedema MD, Newell MC, Duval S, Garberich RF, Handran CB, Larson DM, et al. Causes of delay and associated mortality in patients transferred with ST-segment-elevation myocardial infarction. *Circulation* 2011; 124: 1636-44. [\[CrossRef\]](#)
20. Wang TY, Peterson ED, Ou FS, Nallamothu BK, Rumsfeld JS, Roe MT. Door-to-balloon times for patients with ST-segment elevation myocardial infarction requiring interhospital transfer for primary percutaneous coronary intervention: a report from the national cardiovascular data registry. *Am Heart J* 2011; 161: 76-83. [\[CrossRef\]](#)
21. Santry HP, Janjua S, Chang Y, Petrovick L, Velmahos GC. Interhospital transfers of acute care surgery patients: should care for nontraumatic surgical emergencies be regionalized? *World J Surg* 2011; 35: 2660-7. [\[CrossRef\]](#)
22. Markakis C, Dalezios M, Chatzicostas C, Chalkiadaki A, Politi K, Agouridakis PJ. Evaluation of a risk score for interhospital transport of critically ill patients. *Emerg Med J* 2006; 23: 313-7. [\[CrossRef\]](#)