

# Investigation of Rotations in Emergency Resident Education Programs by Emergency Physicians

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## Abstract

**Objective:** In our study, we wanted emergency medicine physicians who were working in several cities in our country to investigate the number, time, variety, and content of compulsory rotations of emergency medicine physician student (EMPS) education. We aimed to find out the beneficial factors about rotations in EMPS education.

**Material and Methods:** A questionnaire form (28 questions) was applied to emergency physicians about rotations of EMPS.

**Results:** We included 294 physicians into the study. We found that time period of all rotations except cardiology and radiology should stay the same; the time period of these two rotations should be longer. When we asked if 'this rotation should be removed or elective?', participants' answers were chest disease, neurology, gynecology, surgery, and anesthesiology consecutively.

**Conclusion:** For reaching the real aims of rotations, suitable rotations should be provided to emergency residents, and they should be able to improve themselves at the educational point. (*JAEM 2014; 13: 75-81*)

**Key words:** Emergency medicine, rotation, cardiology

## Introduction

Emergency medicine is a medical specialty in which the time is critical, and it is based on knowledge and experience, which requires the ability to provide the determination, treatment, and management of initial needs of patients in initially critical care-requiring situations, such as physical and behavioral pathologies, diseases/injuries/intoxications of all age groups, and natural disasters in which patient admissions are much more than the current capacity, and to prevent further diseases and disability (1).

Emergency medicine residents (EMRs) have to improve their knowledge and ability in sufficient levels during their education time period in symptom and physical examination findings of organ dysfunctions based on several etiopathogenesis, rapid diagnosis-treatment, and management of patients who admit to the emergency department. So, an important part of educational targets of EMRs during the education time period should be completed with theoretical/practical education and standard courses (advanced cardiac life support course (ACLS), advanced trauma life support course (ATLS), pediatric advanced cardiac/trauma support course, emergency ultrasound (USG) courses, toxicology course, and EMR school for new residents for orientation and res-

idents" symposium, which are organized by emergency societies), but another part is provided by rotations in other clinics (2).

In our country, emergency medicine was first accepted as a medical department in the Official Newspaper on April, 30 1993, and half of the 3-year residency time length (18 months) was accepted for completing the rotations (3). According to the 2002 'Specialty in Medicine rules' (SMR), residency time length was changed to 5 years and rotation time length remained the same (18 months) (4). In the 2009 SMR, rotation time length decreased to 13 months (4). According to the 6225th legislation on April 26, 2011, emergency medicine education time length was shortened to 4 years (5). At least, 4 years was determined as the emergency medicine education time length and 13 months was determined for rotation time (4, 5).

In this study, we aim to obtain knowledge to contribute to EMR education for future by emergency physicians from different parts of Turkey (medical faculties, research and education hospitals, private hospitals) who were educated under different conditions/facilities via considering both their current working conditions and their experiences during residency.

For that aim, we wanted emergency physicians to investigate the number, time length, variety, and contents of compulsory rotations



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**Table 1.** Physicians' years of experience in specialty according to their emergency residency foundation and current foundation

		Specialty year time length						Total	
		0-5 years		6-10 years		>10 years			
		n	%	n	%	n	%	n	%
Current foundation	Medical faculty	38	19.9	38	45.8	14	70.0	90	30.6
	Research and education hospital	73	38.2	21	25.3	2	10.0	96	32.7
	Government hospital	75	39.3	12	14.5	3	15.0	90	30.6
	Private hospital	5	2.6	12	14.5	1	5.0	18	6.1
Emergency Residency foundation	Medical faculty	136	71.2	80	96.4	20	100.0	236	80.3
	Research and education hospital	54	28.3	2	2.4	-	-	56	19.0
	Other	1	0.5	1	1.2	-	-	2	0.7
	Total	191	65.0	83	28.2	20	6.8	294	100.0

in EMRs' education. Investigation of rotations that could be selective or are thought to be selective was considered, too, and with these results, we aim to determine the beneficial factors in EMR education.

## Materials and Methods

Bozyaka Research and Education Hospital is one of 5 hospitals in İzmir that give emergency resident education, and its emergency department is at the third step. During this study period, the number of emergency physicians in our emergency department was 7. Emergency physicians in Turkey were included in our study between March 2012-May 2012 after our hospital's ethics committee approval (04.04.2012-350).

Our study was a survey study, and consent forms were received from the participants. In the questionnaire form, which comprised 28 questions, we asked in which clinics should rotations be performed and the content and time length of our country's EMRs education program.

According to our emergency medicine societies' data, there were 673 emergency physicians in March 2012 in our country. We could communicate to 593 of these and sent them the survey. Transmission of survey forms was made by face to face, cargo, and email. Some of the participants were given information about the survey via phone call.

Participants who did not want to answer the questionnaire form and who we could not reach with emails were excluded from the study.

## Statistical Analysis

Statistical Package for Social Sciences (SPSS Inc, New York) 15.00 for Windows was used for statistical evaluation in 95% confidence. Chi-square test was used for comparison of categorical data between groups, and independent samples t-test was used for comparison of continuous variables between groups.  $p < 0.05$  was accepted as the significance value.

## Results

In our study, 593 (88%) of 673 emergency physicians received the questionnaire form from all over Turkey, and 302 (50%) physicians completed the form. Two hundred ninety-four surveys were included into our study according to consistency among the answers.

Two hundred fourteen (72.8%) of 294 were males and 80 (27.2%) were females. Mean age was  $36.7 \pm 4.0$  in males and  $35.8 \pm 3.5$  in females. There were no significant differences between males and females according to mean age ( $p > 0.05$ ).

Two hundred thirty-six (80.3%) physicians' residency foundations were medical faculties, 56 (19%) physicians' were research and education hospitals, and 2 (0.7%) physicians' were from the other group. Ninety (30.6%) physicians were currently working at a medical faculty, 96 (32.7%) physicians were working at a research and education hospital, 90 (30.6%) physicians were working at a government hospital, and 18 (6.1%) were in a private hospital.

We considered some answers according to physicians' years of experience in specialty; 0-5 years (65%), 6-10 years (28.2%), and >10 years (6.8%). Physicians' years of experience in specialty according to their residency foundation are given in Table 1.

Table 2 shows the answers for each rotation (time length should be increased/should be same/should be decreased/should be selective/should be removed). The 'time length should be same' answer was taken from participants except cardiology and radiology rotations. 'Time length should be increased' was taken from physicians for cardiology and radiology. Chest diseases, neurology, obstetrics and gynecology, general surgery, and anesthesiology answers had high ratios for the question 'This rotation should be removed or should be selective' (Table 2).

The answer 'Yes' to the question 'Should residents absolutely go to this rotation' was high (>80%) for pediatrics, cardiology, radiology, internal medicine, and orthopedics. High ratios for 'No' to the same question were determined in chest diseases, general surgery, neurology, obstetrics and gynecology, and anesthesiology. High ratios of 'It should be selective' for this question were determined for chest diseases, neurology, obstetrics and gynecology, general surgery, and anesthesiology (Table 2).

There was a significant difference between 'internal medicine rotation' and 'neurology rotation' according to years of experience in specialty to the question 'Should residents absolutely go to this rotation' ( $p < 0.05$ ). There were no significant differences for other rotation clinics ( $p > 0.05$ ). We found a significant difference for internal medicine rotation for the question 'Should residents absolutely go to this rotation' according to residency foundation of the physicians ( $p < 0.05$ ). The answer 'yes' was significantly higher than 'no' and 'should be selective' in all three groups. We could not find a significant difference for other rotations according to residency foundation ( $p > 0.05$ ).

**Table 2.** Physicians' opinions for current rotations

	Should emergency residents absolutely go to this rotation?										
	Yes			No			Should be selective			Total	
	n	% (line)	% (colon)	n	% (line)	% (colon)	n	% (line)	% (colon)	n	% (colon)
<b>Pediatrics (3 months)</b>											
Time length should be increased	54	100.0	19.3	-	-	-	-	-	-	54	18.4
Time length should be increased	53	93.0	18.9	2	3.5	33.3	2	3.5	25.0	57	19.4
Time length should be increased	173	96.1	61.8	3	1.7	50.0	4	2.2	50.0	180	61.2
This rotation should be selective or removed	-	-	-	1	33.3	16.7	2	66.7	25.0	3	1.0
<b>Total</b>	<b>280</b>	<b>95.2</b>	<b>100.0</b>	<b>6</b>	<b>2.0</b>	<b>100.0</b>	<b>8</b>	<b>2.7</b>	<b>100.0</b>	<b>294</b>	<b>100.0</b>
<b>Internal Medicine (2 months)</b>											
Time length should be increased	44	100.0	18.0	-	-	-	-	-	-	44	15.0
Time length should be increased	35	67.3	14.3	9	17.3	34.6	8	15.4	34.8	52	17.7
Time length should be increased	166	90.2	67.8	9	4.9	34.6	9	4.9	39.1	184	62.6
This rotation should be selective or removed	-	-	-	8	57.1	30.8	6	42.9	26.1	14	4.8
<b>Total</b>	<b>245</b>	<b>83.3</b>	<b>100.0</b>	<b>26</b>	<b>8.8</b>	<b>100.0</b>	<b>23</b>	<b>7.8</b>	<b>100.0</b>	<b>294</b>	<b>100.0</b>
<b>Cardiology (1 month)</b>											
Time length should be increased	158	98.8	56.8	2	1.3	15	-	-	-	160	54.4
Time length should be increased	2	100.0	0.7	-	-	-	-	-	-	2	0.7
Time length should be increased	118	93.7	42.4	6	4.8	46.2	2	1.6	66.7	126	42.9
This rotation should be selective or removed	0	0.0	0.0	5	83.3	38.5	1	16.7	33.3	6	2.0
<b>Total</b>	<b>278</b>	<b>94.6</b>	<b>100.0</b>	<b>13</b>	<b>4.4</b>	<b>100.0</b>	<b>3</b>	<b>1.0</b>	<b>100.0</b>	<b>294</b>	<b>100.0</b>
<b>Anesthesiology (1 month)</b>											
Time length should be increased	52	100.0	24.8	-	-	-	-	-	-	52	17.7
Time length should be increased	1	20.0	0.5	1	20.0	2.9	3	60.0	6.1	5	1.7
Time length should be increased	157	79.7	74.8	14	7.1	40.0	26	13.2	53.1	197	67.0
This rotation should be selective or removed	-	-	-	20	50.0	57.1	20	50.0	40.8	40	13.6
<b>Total</b>	<b>210</b>	<b>71.4</b>	<b>100.0</b>	<b>35</b>	<b>11.9</b>	<b>100.0</b>	<b>49</b>	<b>16.7</b>	<b>100.0</b>	<b>294</b>	<b>100.0</b>
<b>Obstetrics &amp; gynecology (1 month)</b>											
Time length should be increased	19	95.0	10.6	1	5.0	2	-	-	-	20	6.8
Time length should be increased	3	37.5	1.7	3	37.5	6.3	2	25.0	3.0	8	2.7
Time length should be increased	158	77.8	87.8	15	7.4	31.3	30	14.8	45.5	203	69.0
This rotation should be selective or removed	-	-	-	29	46.0	60.4	34	54.0	51.5	63	21.4
<b>Total</b>	<b>180</b>	<b>61.2</b>	<b>100.0</b>	<b>48</b>	<b>16.3</b>	<b>100.0</b>	<b>66</b>	<b>22.4</b>	<b>100.0</b>	<b>294</b>	<b>100.0</b>
<b>General surgery (1 month)</b>											
Time length should be increased	49	96.1	26.6	2	3.9	4	-	-	-	51	17.3
Time length should be increased	2	50.0	1.1	1	25.0	1.8	1	25.0	1.8	4	1.4
Time length should be increased	131	72.4	71.2	28	15.5	50.9	22	12.2	40.0	181	61.6
This rotation should be selective or removed	2	3.4	1.1	24	41.4	43.6	32	55.2	58.2	58	19.7
<b>Total</b>	<b>184</b>	<b>62.6</b>	<b>100.0</b>	<b>55</b>	<b>18.7</b>	<b>100.0</b>	<b>55</b>	<b>18.7</b>	<b>100.0</b>	<b>294</b>	<b>100.0</b>

We provided multiple answers to the question 'Which rotations should be added to current rotations'. Clinical toxicology followed by chest surgery, forensic medicine, and 112 emergency medical services (EMS) answers had high rates. Detailed answers for this question are given in Table 3.

Among the answers given to the question "Which one is more appropriate in deciding the content and duration of education rota-

tions that should be included in the curriculum of emergency medicine education?", the answer "a separate schedule should be identified as basic and elective education rotations; while participation to the basic education rotation is mandatory, elective education rotations should be the preference of emergency medicine residents" had the highest rate. The answer "none of the education rotations should be mandatory and the suitable education rotation with ap-

**Table 2.** Physicians' opinions for current rotations (continuation)

	Should emergency residents absolutely go to this rotation?										
	Yes			No			Should be selective			Total	
	n	% (line)	% (colon)	n	% (line)	% (colon)	n	% (line)	% (colon)	n	% (colon)
Orthopedics and traumatology (1 month)											
Time length should be increased	57	96.6	23.8	2	3.4	7	-	-	-	59	20.1
Time length should be increased	1	100.0	0.4	0	0.0	0.0	-	-	-	1	0.3
Time length should be increased	181	83.8	75.7	18	8.3	58.1	17	7.9	70.8	216	73.5
This rotation should be selective or removed	-	-	-	11	61.1	35.5	7	38.9	29.2	18	6.1
Total	239	81.3	100.0	31	10.5	100.0	24	8.2	100.0	294	100.0
Chest diseases (1 month)											
Time length should be increased	18	100.0	12.0	-	-	-	-	-	-	18	6.1
Time length should be increased	1	20.0	0.7	3	60.0	4.8	1	20.0	1.2	5	1.7
Time length should be increased	131	73.6	87.3	22	12.4	34.9	25	14.0	30.9	178	60.5
This rotation should be selective or removed	-	-	-	38	40.9	60.3	55	59.1	67.9	93	31.6
Total	150	51.0	100.0	63	21.4	100.0	81	27.6	100.0	294	100.0
Neurology (1 month)											
					Time length should be increased						
Time length should be increased	16	94.1	9.5	-	-	-	1.0	6	1.3	17	5.8
Time length should be increased	5	45.5	3.0	2	18.2	4.1	4	36.4	5.2	11	3.7
This rotation should be selective or removed	147	78.6	87.5	16	8.6	32.7	24	12.8	31.2	187	63.6
Total	0	0.0	0.0	31	39.2	63.3	48	60.8	62.3	79	26.9
Time length should be increased	168	57.1	100.0	49	16.7	100.0	77	26.2	100.0	294	100.0
Radiology (1 month)											
Time length should be increased	134	97.8	53.4	-	-	-	3.0	2	10.7	137	46.6
Time length should be increased	3	75.0	1.2	1	25.0	6.7	-	-	-	4	1.4
Time length should be increased	114	85.7	45.4	8	6.0	53.3	11	8.3	39.3	133	45.2
This rotation should be selective or removed	-	-	-	6	30.0	40.0	14	70.0	50.0	20	6.8
Total	251	85.4	100.0	15	5.1	100.0	28	9.5	100.0	294	100.0

appropriate duration decided by the person in charge of education for each unit (medical faculty, RTH) should be participated." given to the same question had the lowest rate.

Consideration of the question 'Which factors may be deterministic for not going to a rotation?' according to physicians' years of experience in specialty and residency foundation was not significantly different between groups ( $p>0.05$ ) (Table 4, 5).

We provided multiple answer choices for the question 'Which factors may be deterministic for not going to a rotation?' The highest 'yes' ratio for this question was 'It would be appropriate to go to rotations in which we can improve our invasive procedures'. The lowest yes ratio was determined for the answer 'going to a rotation in which the emergency resident's clinical experience would be sufficient; it can not go further than ease of workload by the emergency resident in that clinic'.

## Discussion

Details of emergency residency education are a national and international discussion topic (6). These details' main target is to pro-

**Table 3.** Physicians' answers for the question 'Which rotations should be added to the current rotations?'

	Total	
	n	%
Chest surgery	111	37.8
Neurosurgery	58	19.7
Eye diseases	50	17.0
Ear, nose, and throat	63	21.4
Psychiatry	45	15.3
Clinical toxicology	150	51.0
Urology	2	0.7
Infectious diseases	29	9.9
112 EMS	99	33.7
Forensic medicine	110	37.4

**Table 4.** Physicians opinions' distribution for the question according to their years of experience in specialty 'Which factors may be deterministic for not going to a rotation?'

		Year of specialty						Total		p
		0-5 years		6-10 years		>10 years				
		n	%	n	%	n	%	n	%	
Which factors may be deterministic for not going to a rotation?	Standards should be determined	48	25.1	21	25.3	3	15.0	72	24.5	0.528
	All of the rotations should not be mandatory	17	8.9	8	9.6	0	0.0	25	8.5	
	It should be mandatory to go to basic rotations but selective rotations should be selected by the resident	106	55.5	49	59.0	15	75.0	170	57.8	
	Education period should be completed in the emergency department without rotations	20	10.5	5	6.0	2	10.0	27	9.2	

**Table 5.** Physicians opinions' distribution for the question according to their residency foundation 'Which factors may be deterministic for time length and content of rotations for emergency residents' rotations?'

		Residency founding						Total		p
		Medical Faculty		Research and Education hospital		Other				
		n	%	n	%	n	%	n	%	
Which factors may be deterministic for time length and content of rotations for emergency residents' rotations?	Standards should be determined	55	23.3	16	28.6	1	50.0	72	24.5	0.998
	All of the rotations should not be mandatory	23	9.7	2	3.6	0	0.0	25	8.5	
	It should be mandatory to go to basic rotations but selective rotations should be selected by the resident	140	59.3	29	51.8	1	50.0	170	57.8	
	Education period should be completed in the emergency department without rotations	18	7.6	9	16.1	0	0.0	27	9.2	

vide knowledge and experience to the resident in the initial care of emergency patients via using the appropriate time (7). Emergency medicine education programs have tried to improve in several countries for this target (8, 9).

Although 4 years was determined for the education time length of emergency residency, there is no time limit for this issue; emergency doctors should improve and renew themselves in medical knowledge, experience, and gear, which are changing fast. It has been reported that an insufficient emergency doctor is a potential threat for patient security, so emergency doctors should undergo continuous education (10).

One of the main targets of the rotations that keep an important place in EMR education is to improve the residents' knowledge and experience. Acquisitions based on this experience is related with the number and kinds of patients admitted to the emergency service. In emergency services in which a multidisciplinary approach is required for most of the patients, a new arrangement in the determination of appropriate rotations on this current education plan is required. Recently, studies have been done for querying the emergency residents' rotations. Aksay et al. reported that emergency residents' rotations are insufficient in their study, which was performed in 201 emergency residents (11). Similarly, in another study, 37% of the res-

idents declared that the emergency residents' rotation program was insufficient (12).

In our study, most of the participants were male, and this shows that emergency medicine is preferred mostly by males. There was no homogeneity in our study group for years of experience in specialty; so, some answers mostly reflected the 0-5 years of experience group.

Clinical toxicology, chest surgery, forensic medicine, and 112 EMS rotations were the most wanted rotations for adding the current rotations. Similar to ours, in a national study, this sequencing was: an emergency department abroad, chest surgery, and 112 EMS consecutively (13).

Pediatrics department rotation was found to be mandatory in our study. The pediatric population differs from adult populations with its own properties, and we think that the approach to these patients can be provided by working in that clinic.

One of the required prominent properties of an emergency resident is his approach to cardiologic events, such as life-threatening arrhythmias, acute coronary syndromes, and other cardiologic emergency diseases. The emergency resident should master and manage these acute cardiologic events as good as a cardiologist. So, it would be better to lengthen the cardiology rotation time length from 1 month to much more.

Most of the participants declared that they had not gone to a gynecology and obstetrics rotation or completed it just on the official paper. But, it cannot be a realistic approach to say that it is not an unnecessary rotation clinic for the future, even if residents had not gone there. Gynecology and obstetrics involves both females and babies, and we suggest that this rotation clinic may be beneficial for residents in repeating the knowledge and experiences, and it would be an appropriate basic rotation clinic.

Chest diseases were an unnecessary clinic for rotation, although it exists in the current education plan. So, if a program will be prepared for mandatory and selective rotations, chest diseases can be evaluated in selective ones.

Neurology rotation necessity was arising with years of experience in specialty in our study group. This can be explained with the participants' residency education period; they had not gone to this clinic for a rotation according to their education program or old physicians' needs in emerging imaging and thrombolytic treatment in neurologic emergencies.

### Study Limitations

We sent the questionnaire forms to emergency physicians by cargo and email. None of the physicians replied to the email, so we sent it three more times to their email addresses.

Low participation ratio may be a result of failure by email or cargo. On the other hand, the physicians might not check their emails or not to reply it. But, we think that the data reflect the opinion of emergency physicians all over Turkey with these feedbacks.

Emergency medicine department of a medical faculty graduation ratio was high in our study, so homogeneity could not be provided. This may be a result of graduations from emergency residents of education and research hospitals beginning just 1 year ago. So, some questions' answer rates were higher in participants who graduated from a university hospital. In the future, a new study may be planned to make healthier decisions after the increment of research and education hospital-graduating physicians.

Besides, the ratio of 0-5 year-experienced physicians was 65%, 28.2% for 6-19 years, and 6.8% for >10 years. Because of this heterogeneity, some questions' answer ratio was higher in 0-5 year-experienced physicians.

### Conclusion

Emergency medicine specialty should have a wide spectrum of rotation plans to keep with a wide spectrum, such as diseases, injury, intoxications, and disasters, which is a flourishing specialty all over the world. Even these rotations' time length and content should vary according to a country's conditions. Emergency medicine residents' rotations' time length and variety have been re-arranged several times since the emergency department existed in our country. The last published rotation plan according to standardization with a law may require interrogation again for its aim and content. According to our participants, selective rotations should be added to the plan, and residents may choose his/her own selective rotation except mandatory rotations. The rotations suggested by our study group for being added to the rotation plan (clinical toxicology, 112 EMS, forensic medicine, etc) may be added to man-

datory (basic) rotations, and less necessary rotations (chest diseases, general surgery, gynecology and obstetrics, neurology, etc) may be selective rotations. Besides, it may be more appropriate to go to rotation clinics in which we can improve our invasive procedure experiences and with whom we have consultation relations in high ratios. Even if it is difficult to apply, time to rotation to certain clinics should be determined and standardized according to residency year, and also, it should be determined whether the rotation reaches the educational target (ie, report card of the rotation resident should be fulfilled by both his/her own lecturer and rotation clinic lecturer). For reaching the main targets, rotations should not be allowed to be completed just on official papers.

If we think that most of our study group graduated from medical faculties, one-third of these physicians are still working in university hospitals' emergency services, one-third in education and research hospitals, and the other one-third is working in government hospitals in different cities in Turkey, we still have to serve a small group of patients admitting to emergency services during 24 hours. So, to perform a similar study when the number of research and education hospitals' emergency medicine physician graduations increases may give reliable results. We hope that our study will be a guide for the arrangement of mandatory and selective rotations of emergency medicine residency education plans for contributing to emergency medicine residents' education.

**Ethics Committee Approval:** Bozyaka Research and Education Hospital Ethics Committee approved this study.

**Informed Consent:** All participants signed the consent form.

**Peer-review:** Externally peer-reviewed.

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