



Is Emergency Medicine as a New Specialty Cost Effective: Our Experience after 19 Years?

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Abstract

Background: On 2001, we have Emergency Medicine as a new specialty, following the Anglo-American Model. Because of shortage Emergency Physicians (EPs), EPs run our ED only in the morning shift, and in the rest of the day, the ED residents from other Departments run the ED, as before. Until these days, we do not know if EM specialty rendered our ED more efficient.

Objectives: To compare the consultation use and evaluation time done by EPs vs. non-EPs staff, working in the same ED, and suggest ideas for improvement.

Materials and Methods: Using the data from the Business Intelligence system, we compared the consultations consumption and the length of evaluation time, using the Chi square test and the T-test respectively.

Results: For 99,020 admitted patients, 68,681 consultations were invited (1.392 per patient), 49.82% of the 99,020 (49,331) underwent at least one consultation. The rate of consultations per patient used by EPs vs. non-EPs (1.366 vs. 1.406), and evaluation time (M=4.43, SD=3.82 vs. M=5.07, SD=3.22), are significantly lower among EPs (P=0.017 and P=0.011) respectively.

Discussion: It seems that EPs are more efficient. However, we have to consider that half of them are senior physicians in comparison to resident in the evening shift. We assume that, if consultants are not part of the ED staff, EPs will become more self-dependent. A policy of self-dependence by writing criteria for consultations need should be implemented, and EPs should run the ED 24/7.

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Introduction

In the Western world, there are two main systems of Emergency Medicine (EM): The Franco-German system, which is grounded in the idea of "Stay and Play", where the Emergency Physician (EP) treats the patient in the pre-hospital set, and the transported patients are usually admitted directly to hospital wards, bypassing the Emergency Department (ED). However, those who need further investigation before decision-making are sent directly to the specific field specialist in the Emergency Department. The role of the EP is triage or first evaluation before sending the patient to the specialist, according to the patient's complains [1]. In the other hand, there is the Anglo-American system which is grounded in the idea of "Scoop and Run" approach, where the paramedics stabilize the patient in the pre-hospital set and evacuate him as soon as possible for treatment in the ED by residents and specialists in EM. Consultants in other fields are called either to approve the admission to the specific department, or for recommendations for treatment or discharge [2]. However, there are still other different EM systems in the world and there are some EDs who function somewhere between these two systems [3,4]. There are some like us, who want to adopt the Anglo-American system, due its self-dependence, but have difficulties in the transfer from the old system to the new one. In an historical review of the evolution of EM, Sakr & Wardrope mentioned that EM became a distinctive specialty in medicine in the UK only in 1972 [5]. In the USA, EM started as a new specialty about 50 years ago [6]. In both countries in the early stages, the "Emergency Room" (ER) staffing patterns used residents, interns, general practitioners, surgeons and orthopedists, or rotating on-call duty, of all specialties. Until 1999, our ER functioned closer to the Anglo-American system. Patients referred to the ED by the community physicians, the paramedics, and by their own, were admitted to the ER. The ER physicians like in the Anglo-

American system did a full workup [7,8]. Like in the USA and the UK before the start of EM, as a new specialty, general practitioners, internal medicine specialists, a surgeon, and an orthopedics ran the ER during the day shift (7:00 AM to 3:00 PM). In the rest of the day, three residents from each Department (internal medicine, surgery and orthopedics), ran the ER. Consultants from other Departments were invited as needed in both shifts. To reduce the burden over other specialties, later on in our hospital, a specialist in neurology, urology, psychiatry and gynecology were added in partial time during the day shift, not as primary physicians, but rather as consultants, as part of the ER organic staff.

On 2001, the Israeli EM Association was established and the scientific council of the Israeli Medical Association (IMA) recognized EM as a new specialty. The directors of the ERs were recognized as the founding pill and received retrospectively a specialist degree in EM, although none of them passed EM specialty. Since our system was far from the Franco-German system, we adopted the Anglo-American EM system. One of the main purposes of the new specialty was to give the EPs professionalism and self-dependence, and become very efficient in patients' work-up. Nineteen years have passed since then. Like all other departments in the country, specialists and resident in EM (EPs) run the ED during the day shift only (Nine in average in our ED), with the above-mentioned consultants. However, because of shortage of EPs, residents from other departments still run it in the rest of the day, as part of their specialty syllabus. Today, upon admission of the patient to the ED, the nurse performs the triage process, according to Canadian triage scale [9]. During the day shift, unless the case scenario is very clear and highly specific, the patient is referred to the EP in the medical (general) section of the ED, while in the surgical (minor trauma) part, an EP or a surgeon/orthopedist examines the patient randomly, or according to the complexity of the case. On 2017, the MOH report revealed that the average evaluation time in the EDs in all 30 hospitals in the country was 3.82 h with a median of 2.97 h. Our ED was ranked in the 4th place among the 6 main tertiary hospitals, and in the 23rd place among all other hospitals [10]. This point raised the question, whether the long work-up-time is secondary to the lack of efficacy of the entire department, or because of the non-EPs performance who work during the night calls. In addition, it could be also, due to high consultations consumption by one sector, or may be by both. Following the MOH report, we thought that it would be interesting to investigate the self-dependence of our EPs, through measuring consultation consumption and the net evaluation time, in comparison to non-EPs working in the same department and same conditions.

Objectives

To compare the consultation use and evaluation time done by EPs vs. non-EPs staff, working in the same ED, and suggest ideas for improvement.

Materials and Methods

This is a cross sectional study (January to December 2018) which describes the consultants' use by EPs in the day shift (7:00 AM until 3:00 PM) vs. non-EPs running the ED in the rest of the day. Both sectors work in the same ED under the same conditions. Our patients' chart is fully computerized that launches to the Business Intelligence (BI) system. The BI software can supply data, only about the activity of our ED, in 24 h intervals. We get a weekly report from the BI system, and among other data; it contains the number of visits (cases) to the ED, the detailed evaluation time step by step, and the number

of consultations consumed by shift. It is important to mention that if the same patient visits our ED twice, then it is considered two new cases. The system can give us the data about the number of new consultations each patient needed. If the consultant examined the patient twice or more in order to complete his first consultation, then it is considered one consultant. However, if the consultant finished his consultation, and later on he was invited for a new consultation, then the system counts it as twice. For this study we considered all the visits to the ED except for the Gynecologic and the Obstetric visits, and those cases that were referred by a specialist in the community (like an ENT specialist), directly to a specialist in the same field. However, if the specialist in that field asks for a specific other consultation, then the BI system counts the new consultations. To compare the exact evaluation time by EPs vs. non-EPs (from the first physician contact until discharge) we used the independent unequal variances T-test. To compare the relative number of consultations per patient, invited by EPs vs. non-EPs, we used the Chi Square test. Since this study involves computerized data only, without entering the patients' electronic medical chart, consulting our IRB, Helsinki permission is not needed.

Results

For 99,020 visits (new cases) to the ED in 2018, 68,681 consultations were invited. Since some patients underwent more than one consultation, for 49,333 (49.82%) patients 68,681 consultants were invited and 49,687 patients underwent investigation, without a need for any consultation. During the entire day, 34,340 of the 49,333 patients (69.61%) underwent one consultation each, 10,813 (21.92%) patients had two consultations, 3,083 (6.25%) had three, 754 (1.53%) had four, 217 (0.44%) had five, and 83 (0.17%) had more than five consultations each (a maximum of 11 consultations, a median =1). Of those 49,333 cases who underwent at least one consultation, 36.5% (18,006) cases were examined primarily by EPs (in the day shift: 7:00 AM to 3:00 PM), and 63.5% (31,327) by non-EPs, in the rest of the day. Using the Chi Square test to compare the number of consultations per patient, in the morning shift (EPs) vs. the evening & night shifts (non-EPs), despite the small difference in the ratios (1.366 vs. 1.406), we found that EPs still use significantly fewer consultations than non-EPs. The chi-square statistic with Yates correction is 5.6097. The P-value is 0.017862. Significant at P<0.05 (Table 1). The specialties mostly consulted by the primary physicians (EPs, surgeon and orthopedic) during the morning shift were, the neurology, gynecology, and urology. All of these specialists are part of the EM staff in the morning shift (Figure 1). We compared the average work-up time of 1,471 EPs working in the morning shift (7:00 to 15:00) to

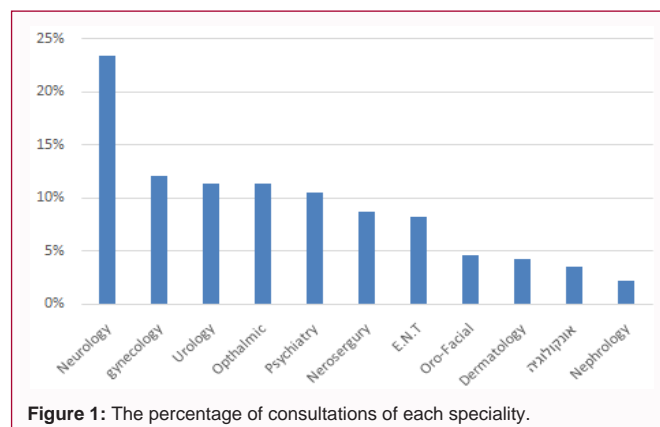


Figure 1: The percentage of consultations of each speciality.

Table 1: Number of consultations ordered per patient and by working shift (EP and non-EP).

Shift	No. of visits	No of consultations	No. of consultations per Visit			
			Average	Median	Minimum	Maximum
Morning	22964	31919	1.392	1	0	11
Evening	19437	27406	1.41	1	0	10
Night	6931	9356	1.35	1	0	7
Total	49,332	68,681	1.392	1	0	11

the average work-up time of 2,322 non-EPs working in the evening and night shifts (15:00 to 7:00), during 30 days, chosen randomly during 2018. Applying the independent unequal variances T-test, we found that EPs evaluation time (M=4.43, SD=3.82) compared to the non-EPs evaluation time (M=5.07, SD=3.22) demonstrated significantly a better EPs performance, $t(3792) = 2.67$, CI 95% [0.170 to 1.112], $p=0.011$.

Discussion

Our study indicates that EPs are more efficient than non-EPs in the evaluation time and consultations consumption. Although the difference in the evaluation time seems small, using big numbers of cases, the difference is very significant. In addition, although the rate of consultations use per patient is very close (1.366 vs. 1.406); again, considering the big number of visits, EPs seem more self-dependent than non-EPs. However, our entire ED consumes more consultations in comparison to 12 tertiary hospitals, in the Northern of America, and the UK, where EPs run the ED 24/7 (49.82% vs. 20% to 40%) [11-13]. Lee RS et al. in a systematic review of the literature, dealt with consultation "consumption" in the ED setting mainly in Northern of America, where the ED is run by EPs at all times. At the end of their review, they wondered what the pattern of consultation services is like in a country without a full EM specialty [14,15]. Unfortunately, we cannot answer this question because of unavailability of detailed data from their study; however, it seems that we consume more consultations than departments with full EM staff. This could be explained partially, by lower efficiency of non-EPs in the patients' assessment process. In our study, we expected that EPs would consume fewer consultations per patient than we found in our study, as they are trained to be more self-dependent. However, we think, as long as consultants are part of the organic ED staff in the morning shift, the shallower the primary investigation of the EP is, and the more the consultants will be called upon, as Çikrikler et al. [16] showed in their study. Furthermore, we believe that by implementing criteria to when a consultant should be called, we may further reduce the consumption of consultants, as Choi et al. [17] had shown in their study, without a negative effect on mortality or hospital LOS.

Conclusion

In summary, in light of the benefits of EM specialty that we have shown, we think there is a need to change the thinking patterns of hospitals and departments administrators, about the need for ED independence, and its disengagement from the rest of the hospital departments in the context of 24/7 departmental self-dependence. However, other specialties that need EM rotations as part of their specialization syllabus will be an addition to the organic EPs staff rather than instead of it. Among other things, we hope this work may

encourage other veteran countries in EM, share their experience, how they managed to overcome the challenges during this transitional period. In addition, we hope this study will encourage other countries start EM as a new specialty, due of its benefits.

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