

Emergency department physicians spend only 25% of their working time on direct patient care

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ABSTRACT

INTRODUCTION: In modern hospital medicine, there is a growing awareness of the need for efficient and secure patient care. Authorities seek to improve this by adding requirements for documentation, administrative tasks and standardized patient programmes. However, it is rarely investigated how much time physicians spend on these tasks and it is therefore difficult to assess how changes in the system might affect workflow and thus time efficacy. The aim of this study was to investigate how physicians in the emergency department (ED) of a public hospital in Denmark spend their time. Results were stratified for physicians working in the emergency room (ER) and the admission area of our ED.

MATERIAL AND METHODS: We used a work sampling approach and observed nine physicians at three-minute intervals for a total of 137 hours during day shifts. Activities were documented in predefined categories.

RESULTS: Results showed that physicians spent 25% of their time in direct patient contact, 5.8% with indirect patient care, 24% communicating with other staff, 31% documenting their work and 6% on transport. Personal time accounted for 5% and other activities for 3%. Interestingly, no differences in main categories were observed between physicians admitting patients and physicians working in the fast track of the ER.

CONCLUSION: Our results confirm earlier studies. Furthermore, they suggest that the specialty, the severity of disease and the nature of the contact (in-patient versus out-patient) have only a minor influence on the time spent on various tasks. We speculate whether it is really administrative systems and IT-solutions that influence time distribution in physicians' work.

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Modern health care is increasingly complex with the growing demand of multidisciplinary care and the demand for high efficiency, but also for high quality and timely patient treatment. At the same time, numbers of malpractice claims are rising and the costs of malpractice trials are increasing [1], which leads to a growing need of detailed documentation and administrative tasks for physicians. This means less time for direct patient care and it is one of the major causes of physician discontent [2].

So far only a few studies have evaluated how physicians spend their time and no meta-analyses have been performed in this field. In a recent review [3], Tipping et al stated that there is a lack of standardization of methods and detailed definitions of work categories, which would enable comparison of different studies. In their review of the existing literature, they concluded that physicians spent an average of 23% of their time on direct patient care.

While the time spent on different tasks partly depends on the level of training of the physician [4], no significant difference in time spent during day versus night shifts was reported [5]. To our knowledge, no direct comparison has ever been made of the time distribution in different clinical functions, i.e. admitting physicians versus physicians working in wards or in fast tracks.

The aim of this study was to investigate how physicians in the emergency department of a public non-university hospital in Denmark spent their time during day shifts. We were also interested in whether there was a difference in the distribution of time used for different tasks when working in the admission area compared with the emergency room.

MATERIAL AND METHODS

The study was conducted at the Emergency Department (ED) of the community hospital in Kolding, Denmark. This hospital is a non-university hospital that trains physicians at various stages of their postgraduate career and frequently has medical students as interns. It has a total of 360 beds, 52 in the ED.

Structurally, the ED is made up of an admission area and an emergency room (ER). Patients are referred to the admission area from the primary healthcare sector or other hospitals with medical, surgical or vascular surgical conditions. In the ER patients are self-referred without any pre-hospital visitation, primarily with orthopaedic complaints and trauma, but medical and other surgical emergencies are also seen. Patients who require admission are transferred from the admission area or ER after initial examination to the bed area of the ED for further investigation and treatment.

On average, 30 patients are admitted every day, 2% of whom require intensive care and 70% are discharged to home within 48 hours. In the ER, about 80 patients

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 TABLE 1

Classification of physician activities.

Primary	Secondary	Tertiary	Definition
Direct patient care	Admission history Physical exam Communication		Physician explains details of the disease or treatment to patient or relatives
	Procedures		Direct treatment i.e. acute treatment or orthopaedic procedures
Indirect care	Reviewing test results	Reviewing X-ray Reviewing blood sample results Reviewing electrocardiogramme	
	Searching for information		Physician searches for specific information on the patients disease or treatment
	Orders	X-ray order Other orders	Physician places orders for exams by other departments
Communication	Planned conference		Morning conference or other planned conference activities
	Other physician		Physician communicates with other physician in similar position
	Specialist		Physician communicates with medical specialist
	Nurse		Physician communicates with nursing staff
	Radiology department Other department		Communication with radiology department Communication with other department
Documentation	Reading of patients history		Physician reads the patients preexisting electronic history (i.e. from earlier admissions)
	History and physical exam Registration of medicine Registration on patient card/interactive electronic board		In our ward the treating physician records the status of the patient, triage and observation level on a patient card and an interactive electronic board
	Documentation on scheme		Physician fills in one of various paper schemes used in the department (i.e. for sepsis treatment, anticoagulant treatment etc.)
	Diagnose code		Recording of the patients diagnoses
	Logging on/of the computer		
Transportation	Internal		Physician moves from one area of the hospital to the other
	Patient transport		Physician accompanies patient on internal transport or on transport to another hospital
Personal			Breaks and restroom
Miscellaneous			



Danish hospital physicians spend twice as much time communicating with other staff and documenting their work than in direct patient care.

are seen every day by a physician and/or a nurse and are treated as out-patients.

The ED is staffed with 14 young and two to three senior physicians and supported by a range of more experienced physicians and specialists from the other departments of the hospital. In the Danish hospital system, the young physicians are primarily residents and are in charge of triage, admissions and the primary care. After admission, the details of the patient's condition are communicated by the admitting physician to a more experienced physician, often a specialist and always a doctor with at least one year's training within the specialty in question. The more experienced physician is obliged to come to the ED and review the patient and to initiate further investigations or treatment if necessary.

To evaluate the time physicians spent on different tasks during a dayshift, we chose a work sampling (WS) approach. Three physicians were observed every three minutes and their activity was registered in a predefined classification system (Table 1). Classification was tested in a pilot study and followed the categories suggested by Tipping et al with subcategories adjusted to our ED [3]. One exception was that communication with patients and relatives was considered part of direct patient care in this study. The observers generally attempted to minimize interruption of the physicians' work by not entering the exam room if they were able to hear what task the physician was performing through the door. For this reason, the physicians were asked to leave the door ajar when possible during the course of this study.

Data collection

Three trained observers (two secretaries and the 1st author) observed nine residents during dayshifts from 20 to 24 February 2012. Dayshifts for admitting doctors were from 8 a.m. to 6 p.m., while the physician primarily responsible for minor orthopaedic traumas in the ER worked from 8 a.m. to 4 p.m. (fast track). The three resi-

dents on duty each day were observed simultaneously at an interval of three minutes. This interval had previously been determined by a pilot study conducted to determine the number of observations needed to obtain the desired accuracy [6]. We targeted an accuracy of $2\sigma \leq 2\%$ for the overall results and a $2\sigma \leq 3\%$ for the stratified results.

For each category, the number of observations and the relative frequency expressed in percentage and 95% confidence interval (95% CI) was calculated. Statistical differences in the distribution of observations between the admission group and the emergency room group were tested by χ^2 -test for the major categories.

Since it is well known that the distribution of work changes around shift changes [7], the physicians were observed for a full workday each day including any additional hours used to finish the work.

Trial registration: ClinicalTrials.gov: NCT01722721.

RESULTS

We observed nine physicians at three-minute intervals for a total of 137 hours during dayshifts of a normal week at the ED with 2,748 observation points distributed over six predefined main categories and 27 subcategories.

The overall results are summarized in **Table 2** and **Figure 1**: physicians spent 24.8% of their time with direct patient contact, 5.8% with indirect patient care, 23.8% communicating with other staff, 31.4% documenting their work and 5.9% on transport. Personal time accounted for 4.8% and other activities for the remaining 3.5%.

The data were analyzed separately for the ER physicians (fast track) and the physicians of the admitting area (admission track). Even though there were differences in the subcategories, no significant differences were found between the observation frequencies in the primary category groups ($p = 0.26$, χ^2 -test).

DISCUSSION

In this study, we showed that physicians working with the primary contact with patients at a middle-sized public hospital in Denmark spent 25% of their time during day shifts with direct patient contact. An almost equal amount of time was spent on communicating with other staff, while indirect care took a lesser share of their time. Most time was spent on documentation (31%).

Our data confirm previous findings [3] which showed that physicians do not spend more than about a fourth of their time in direct contact with their patients. We stratified our observations to investigate whether the overall distribution of time differed with different tasks. In this respect, physicians working on the fast track have substantially different tasks as they rarely ad-



TABLE 2

Overall and stratified results for fast track and admission track including number of observations, % and 95% confidence intervals (CI)^a.

Category	Overall			Fast track		Admission track	
	n	%	95% CI, %	n	%	n	%
<i>Direct patient care</i>	682	24.8	23.2-26.4	202	23.7	480	25.3
Admission history	271	9.9		55	6.4	216	11.4
Physical exam	172	6.3		56	6.6	116	6.1
Communication	175	6.4		59	6.9	116	6.1
Procedures	64	2.3		32	3.7	32	1.7
<i>Indirect care</i>	159	5.8	4.9-6.7	56	6.6	103	5.4
Reviewing X-ray	25	0.9		18	2.1	7	0.4
Reviewing blood sample results	20	0.7		1	0.1	19	1.0
Reviewing electrocardiogramme	20	0.7		0	0.0	20	1.1
Searching for information	44	1.6		14	1.6	30	1.6
X-ray order	39	1.4		19	2.2	20	1.1
Other orders	11	0.4		4	0.5	7	0.4
<i>Communication</i>	653	23.8	22.2-25.4	208	2.4	445	23.5
Planned conference	288	10.5		93	1.9	195	10.3
Other physician	190	6.9		61	7.1	129	6.8
Specialist	54	2.0		25	2.9	29	1.5
Nurse	96	3.5		22	2.6	74	3.9
Radiology department	9	0.3		6	0.7	3	0.2
Other department	16	0.6		1	0.1	15	0.8
<i>Documentation</i>	863	31.4	29.6-33.2	256	30.0	607	32.0
Reading of patient's history	108	3.9		20	2.3	88	4.6
History and physical exam	576	21.0		178	20.8	398	21.0
Registration of medicine	41	1.5		8	0.9	33	1.7
Registration on patient card	40	1.5		20	2.3	20	1.1
Documentation on scheme	5	0.2		1	0.1	4	0.2
Diagnosis code	26	0.9		6	0.7	20	1.1
Logging on/off the computer	67	2.4		23	2.7	44	2.3
<i>Transportation</i>	162	5.9	(5.0; 6.8)	48	5.6	114	6.0
Internal	129	4.7		48	5.6	81	4.3
Patient transport	33	1.2		0	0.0	33	1.7
Personal	132	4.8	(4.0; 5.6)	45	5.3	87	4.6
Miscellaneous	97	3.5	(2.8; 4.2)	39	4.6	58	3.1
Total	2,748	100,0		854	100,0	1,894	100,0

a) χ^2 -test for main categories of fast track versus admission track: $p = 0.26$.

mit patients and often treat and discharge them immediately. We therefore hypothesized that time distribution would differ between the two groups. To prove this hypothesis, we calculated 95% CI for the main categories and for subcategories. This hypothesis was, however, rejected as the CI of all main categories overlapped, while there were significant differences between subcategories. χ^2 -tests performed on the main categories confirmed this finding.

The overlap of the main categories was independent of the task and specialty being performed. This could indicate that the structure of the IT and administrative systems which the physicians are working under may have more pronounced influence on the way they work than the work tasks per se. The fact that the distribution of time spent on the subcategories defined in

FIGURE 1

Pie chart of overall results in the primary categories brought up to round numbers.

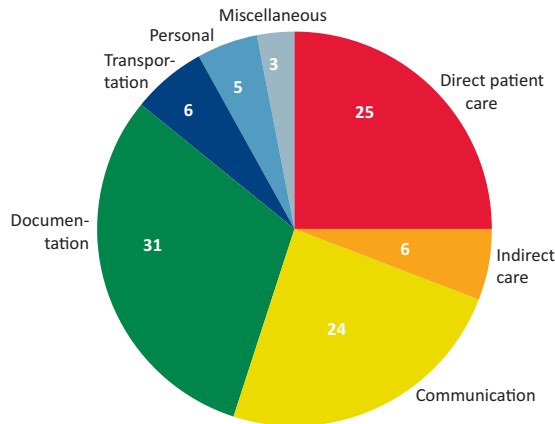


Table 1 was significantly different between the two groups of physicians illustrates that the tasks being performed were, indeed, different: The physicians in the ER spent twice the time on procedures (3.7% versus 1.7% of their total work day) and only half the time on taking admission histories (6.4% versus 11.4%) compared with their colleagues who worked primarily with admitting patients, although all physicians in total spent the same amount of time on direct patient care.

Strengths and weaknesses

There are different methods to approach the question of how physicians distribute their time. We chose a WS method as described by Sittig in 1992 [8] as opposed to the equally used time motion studies described by Tippet in the 1930s [9]. This was because time-motion studies involve a 1:1 ratio between observer and physician, which has the disadvantage of potentially introducing stronger observer bias and also biasing the physicians work. On the other hand, very accurate timing figures are obtained by this technique. WS has the advantage that one observer can observe several physicians, in our case three at a time. It is less invasive and is therefore expected to introduce less bias. The number of observations in our study was sufficient to achieve the targeted accuracy calculated from our pilot study.

We observed three physicians at a time during day shifts of a normal week (Monday-Friday) at our hospital. We did not observe night shifts or weekend shifts, which may introduce a bias although a previous study has shown that work distribution does not change significantly during night time [5]. Another weakness of our study is that three different observers collected the data, which, in theory, could introduce inter-observer

bias. However, all observers were acquainted with the IT systems and the facilities of the hospital and had received training prior to this study. To further minimize the bias, precise definitions of the observation categories were noted on the observation scheme.

It is a subject of debate how the optimal time distribution for physicians' work should be. Physicians often themselves think that they spend too little time on direct patient care because of documentation requirements. However, it remains a question whether this is a new development. There is a need for further studies to investigate this and to establish how the time spent changes. To the best of our knowledge, all time studies evaluating physicians in hospitals have been conducted in Europe, Australia or the US. It would be interesting to see a time study from a part of the world with a different healthcare system with less dependency on IT systems or documentation requirements.

We were surprised at how much time physicians in our study spent on discussing their patients with other staff and on documentation. Since this was independent of whether the physician was working in the fast track or admission track, we speculate that this may be due to the organization of the Danish hospital system, where the same physician rarely visits a patient twice. Physicians may therefore feel the need to document and communicate every detail with other staff such as the nurses in the acute ward or the physician taking over charge. In a system with more continuity between treating staff and patient, less time would probably be spent on these categories. These thoughts lead us to hypothesize that the strongest determinants for time distribution may be the administrative and IT systems of the hospital, and that variations in time of day or weekday are of minor importance. In a time where treatment and diagnostics become more time-consuming and specialized and with a relative lack of physicians, authorities might consider rethinking their approach towards improving safety and efficacy as this may have a large impact on workflow and on the time available for direct patient care.

CONCLUSION

We found that physicians spent 25% of their time on direct patient care, including communicating with the patients. More than twice this time (55%) was spent on communicating with other staff and documentation of their work. No significant differences in these proportions were found between physicians admitting or treating in the fast track. We therefore hypothesize that the administrative system including IT solutions may have much influence on how physicians spend their time, which indicates that this is a vital area on which to focus when implementing measures to improve the efficiency of hospital medicine.

The lack of physicians with advanced experience in many industrialized countries stresses the need for solutions that simplify documentation and allow more time for direct patient care.

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