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Original Article

What should be the appropriate minimal duration for patient examination and evaluation in pulmonary outpatient clinics?

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Abstract:

INTRODUCTION: Patient examinations performed in a limited time period may lead to impairment in patient and physician relationship, defective and erroneous diagnosis, inappropriate prescriptions, less common use of preventive medicine practices, poor patient satisfaction, and increased violent acts against health-care staff.

OBJECTIVE: This study aimed to determine the appropriate minimal duration of patient examination in the pulmonary practice.

METHODS: A total of 49 researchers from ten different study groups of the Turkish Thoracic Society participated in the study. The researchers were asked to examine patients in an almost ideal manner, without time constraint under available conditions.

RESULTS: A total of 1680 patient examinations were reviewed. The mean duration of patient examination in ideal conditions was determined to be 20.4 ± 9.6 min. Among all steps of patient examination, the longest time was spent for "taking medical history." The total time spent for patient examination was statistically significantly longer in the university hospitals than in the governmental hospitals and training and research hospitals ($P < 0.001$). Among different patient categories, the patients with a chronic disorder presenting for the first time and were referred from primary or secondary to tertiary care for further evaluation have required the longest time for patient examination.

CONCLUSION: According to our study, the appropriate minimal duration for patient examination is 20 min. It has been observed that in university hospitals and in patients with chronic pulmonary diseases, this duration has been increased to above 25 min. The durations in clinical practice should be planned accordingly.

Keywords:

Outpatient clinics, patient examination, suggested duration

The *sine qua non* of the art of medicine is an intimate relationship between patients and physicians. This is a key element which will be possible only on the condition that physicians allocate sufficient time for their patients. Patient examinations performed in a limited time period may lead to impaired communication between patients and physicians, deficient or erroneous diagnosis, inappropriate prescriptions, less frequent use of preventive medicine measures, reduced patient satisfaction, and acts of violence against health-care staff.[1-6] Patients usually feel unsatisfied by examinations lasting for 5 min, while feeling satisfied after examinations lasting for more than 15 min.[7,8]

In our country, the number of patients consulting to a physician has been increased gradually for the past 20 years. The number of medical consultation for each person was 1.5 in 1993 and 3.2 in 2002, whereas it has increased to 8.2 in 2012.[9] As a consequence of this, the

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duration for physicians they allocate for each patient has been gradually decreased. In Turkish health system, 89% of patients of pulmonary clinics are referring to government hospitals. Moreover, in those hospitals, appointments are given automatically for every 7.5 min in average. It is mostly seen that this duration is reduced to 2 min and the physicians had to examine over 200 patients. It is expected from physicians to complete some procedures such as taking history, doing physical examination, ordering other examinations or consultations if needed, evaluating present examinations, recording the findings to national database over internet, prescribing e-receipts, and telling the possible side effects of medicines and follow-up protocol to patients in this duration.

Although it might change due to the different working conditions in different centers, no study so far aimed to determine the appropriate minimal duration of patient examination in pulmonary clinical practice. Hence, we aimed to evaluate it in our daily practice.

Methods

To enroll patients diagnosed with a variety of pulmonary diseases, ten different study groups of Turkish Thoracic Society actively working in pulmonology (asthma and allergy, lung and pleural malignancies, environmental and occupational pulmonary disorders, clinical problems, chronic obstructive pulmonary disease, respiratory system infections, diagnostic methods, tuberculosis, tobacco control, and sleep disorders) from different levels of hospital groups (government hospitals, training and research hospitals, and university hospitals) were asked to name researcher physicians. All researchers were pulmonology specialists who were actively working. The researchers were required to enroll ten patients from each of the patient groups divided into eight subcategories specified in Table 1, aiming to determine the appropriate minimal duration of patient examination for patient groups from different diagnostic groups with different properties (acute, chronic, newly presenting patients, and patients under follow-up) cared at institutions of different stages (secondary care, tertiary care). The study was performed according to the principles of the Helsinki Declaration. The study protocol was approved by the Turkish Thoracic Society Scientific Committee.

As part of the study design, a total of 49 researchers from ten separate study groups of the Turkish Thoracic Society were included in the study. Patients in the study were evaluated without adhering to the duration that was determined by the appointment system. The researchers were asked to examine their patients in an almost ideal manner, without a time constraint. The case registry forms included patients' age, gender, and groups [Table 1]. The researchers were asked to determine the time required to complete each examination step provided in the form by means of a chronometer. Examination steps were as follows: taking medical history; physical examination; ordering tests and informing patients about them; entering patient data into the national database; evaluating test results; prescribing medications or devices (through electronic media or manually); informing and educating patients about the treatment; informing patients about the follow-up protocol; answering patients' additional questions; and patients' departure. All researchers were then asked to send the completed registry forms through E-mail to the study coordinator.

The study was aimed to determine the total duration of patient examination; durations for each examination step, duration of examination of each patient group; and duration of examination of each level of care. No information revealing patients' identities was included in the registry forms, and no data were interrogated about their medical conditions.

Statistical analysis

All statistical analyses were performed with IBM SPSS 21 software package (2029 Stierlin Court Mountain View, CA 94043, USA). The numerical variables were expressed as mean and standard deviation. The study groups were compared using Student's *t*-test and one-sided ANOVA test with Tukey's honest significant difference *post hoc* test. Statistical significance was set at $P < 0.05$.

Results

Among the 49 researchers enrolled in this study, 7 (14%) researchers were from government hospitals, 16 (33%) from training and research hospitals, and 26 (53%) from university hospitals. A total of 1680 patients' data were recorded. The study patients had a mean age of 52 ± 17 years, and 51.4% were female.

The mean appropriate minimal duration of patient examination was determined to be 20.4 ± 9.6 min (minimum 1.9 min, maximum 91.5 min). Duration of patient examination was shorter than 5, 10, 15, and 20 min in 1.7, 10.1, 30.8, and 52.4% of patients, respectively. On the other hand, it was longer than 25, 30, 35, 40, and 60 min in 25.5, 13.4, 6.5, 3, and 0.5% of the patients, respectively. Among all examination steps, medical history taking step had the longest duration as 5.0 ± 3.6 min (minimum: 0.25, maximum: 36.6 min) [Table 2].

The durations of all examination steps except for physical examination were significantly longer in the university hospitals than the government and training and research hospitals ($P < 0.001$ for each) [Table 3].

There was no significant difference among gender ($P > 0.05$) and also between patients over 65 and 80 years with respect to the total duration of patient examination ($P > 0.05$). However, the duration needed for physical examination component was significantly longer in patients older than 65 years ($P = 0.001$) [Table 3].

Patient category-based analysis of the mean total duration of patient examination revealed that "patients with records kept at the same unit who present for routine control" where their medical records were kept had the shortest duration of patient examination (17.8 ± 8.6 min). On the other hand, the patients presenting for the first time with a chronic disorder (for at least 6 months) and referred from secondary to tertiary care (25.9 ± 10.4 min) and the patients presenting for the first time with a chronic disorder (for at least 6 months) and referred from primary to tertiary care (25.9 ± 9.2 min) had the longest durations [Table 4].

Discussion

There is no definite information as to the ideal duration of patient examination. Although there are studies, albeit in

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Table 1: Patient categories

Patients presenting for the first time with acute-onset symptoms
Patients presenting for the first time with a chronic disorder (for at least 6 months)
Patients presenting for the first time with acute-onset symptoms who were referred from primary care or other provinces to secondary care for further evaluation
Patients presenting for the first time with acute-onset symptoms who were referred from secondary care to tertiary care for further evaluation (this group of patients will only be sampled by physicians from tertiary care centers)
Patients presenting for the first time with a chronic disorder (for at least 6 months) who were referred from primary care or other provinces to tertiary care for further evaluation
Patients presenting for the first time with a chronic disorder (for at least 6 months) who were referred from secondary care to tertiary care for further evaluation (this group of patients will only be sampled by physicians from tertiary care centers)
Patients with records kept at the same unit and refer for routine control (patients who make an additional appointment to show their results will be included in this group)
Patients with records kept at the same unit and refer for an acute exacerbation other than routine visits

Table 2: Duration of each patient examination step

Examination step	Mean±SD (min)
Taking medical history	5.0±3.6
Physical examination	2.8±1.3
Ordering tests and informing patients about them	1.9±1.5
Entering patient data into Medulla database	2.5±2.0
Evaluating test results	3.5±3.1
Prescribing an e-prescription	1.5±1.0
Informing patients about the treatment	2.3±1.8
Informing patients about the follow-up protocol	1.6±1.3
Answering patients' additional questions	1.6±1.4

SD = Standard deviation

limited number, on the current durations of examination in various specialties such as family medicine, internal medicine, geriatrics, and oncology, no similar study has been performed in the pulmonary specialty to this date.[10-14] Our study determined a mean duration of patient examination in ideal conditions as 20.4 ± 9.6 min (minimum: 1.9, maximum: 91.5 min) per patient in pulmonary outpatient clinic. Among various studies investigating the duration of patient examination, Lo *et al*. reported a duration of 17.9 ± 18.5 min; Hu and Reuben reported 19.2 min; Blumenthal *et al*. reported 16.3 min; and Migongo *et al*. reported 14.5 min. Guy and Richardson, on the other hand, reported that it may be extended to 22.9 min and be even as long as 24.7 min.[12-16] The mean appropriate minimal duration of patient examination of 20.4 min determined by our study is longer than the durations reported elsewhere, except for that reported by Guy and Richardson.[14]

The frequent use of inhalers as treatment in pulmonary diseases, educating patients about the use of these medicines, and controlling their proper use may be the reasons of longer examination durations in comparison to other clinics. In addition, evaluating the thoracic computerized tomography (CT) which is being used in the diagnosis of many chronic pulmonary diseases and comparing them with previous CT examinations also lengthen the duration.

The need for a translator to cooperate with patients because of the use of spoken languages other than native language in some parts of our country is one of the reasons that lengthens the duration of patient examination in those areas. The fact that over three million Syrian immigrants were included in our health system recently and the need for translators to communicate with them should be taken into consideration as related to the subject.

Independently from the conditions in our country, today, many of the patients are consulting to the physicians with the apocryphal information they got from internet search. When the fact that the physician separates an important amount of time to correct this incorrect or missing information, it can be thought that this should be one of the main differences of our study in comparison to older studies.

Although a mean duration of patient examination of 20.4 min was determined by our study, a much longer duration was needed in a majority of patients, with 13.4% of patients having needed at least 30 min, 3% at least 40 min, and 0.5% at least 60 min. In Turkey, hospitals run by the Ministry of Health give doctor appointments for every 7.5 min. Our study found the duration of patient examination longer than 7.5 min in 95.2% of patients.

In the study that Lin *et al*. compared patient satisfaction with respect to duration of patient examination categorized into durations shorter than 10 min, 10–20 min, and longer than 20 min, they reported patient satisfaction levels of 57%, 63%, and 71%, respectively. This indicates better patient satisfaction with durations exceeding 20 min.[6]

Morrell *et al*. compared durations of 5, 7.5, and 10 min for consultation examinations. They reported that physician stress was significantly reduced (23%, 6%, and 2%, respectively) and patient satisfaction increased (90%, 91%, and 93%, respectively) as patient examination became longer.[7] Similar to the studies mentioned above, Gross *et al*. reported that patient satisfaction was greater after examinations lasting for longer than 15 min.[8]

Although there are no data about patient satisfaction in our study, these results preoccupy the positive reflection of 20 min as the appropriate minimal duration for patient examination to patient satisfaction.

In our study, taking medical history (5.0 ± 3.6 min) was the longest step of patient examination. In agreement with our results, a study by Yawn *et al*., which compared acute and chronic patients with/without diabetes mellitus, showed that taking medical history (>5 min) took more than 55% of the total examination time; another study reported similar results.[10,11] Our results also showed that duration of 10 min or longer were needed in 10.1% of patients. Considering that taking medical history is the most important step in the art of medicine, it is clearly evident that the possibility of making an accurate diagnosis and applying correct treatment in an appointment system allocating durations as short as 2 min for the whole patient examination would be low.

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Table 3: Comparison of the duration of examination steps between government, training and research and university hospitals and also comparison between patients aged ≤65 years and >65 years

Examination step	Mean±SD (min)			*P*	Mean±SD (min)		*P*
	Government Hospital	TRH	University Hospital		>65 years	≤65 years	
Total duration of patient examination	17.9±10.31	17.4±6.5	23.3±10.0	<0.001	20.2±9.6	21.0±9.6	NS
Taking medical history	3.8±2.4	4.1±2.9	6.1±4.1	<0.001	5.1±3.8	5.0±3.6	NS
Physical examination	2.8±1.5	2.9±1.3	2.7±1.1	NS	3.0±1.4	2.7±1.2	NS
Ordering tests and informing patients about them	2.1±1.5	1.4±1.1	2.2±1.6	<0.001	2.1±1.7	1.9±1.4	NS
Entering patient data into Medulla database	2.5±2.0	2.0±1.2	2.8±2.4	<0.001	2.5±2.1	2.5±2.0	NS
Evaluating test results	2.9±2.3	2.9±1.6	4.1±3.9	<0.001	3.7±3.3	3.4±3.0	<0.001
Prescribing an e-prescription	1.2±0.6	1.2±0.8	1.9±1.3	<0.001	1.5±1.1	1.4±1.0	NS
Informing patients about the treatment	1.6±1.3	2.2±1.5	2.8±2.1	<0.001	2.2±1.4	2.4±2.0	NS
Informing patients about the follow-up protocol	1.2±1.0	1.3±0.9	2.0±1.6	<0.001	1.7±1.5	1.6±1.3	NS
Answering patients' additional questions	1.4±1.1	1.2±0.9	2.0±1.7	<0.001	1.6±1.3	1.6±1.5	NS

NS = Nonsignificant, TRH = Training and Research Hospitals, SD = Standard deviation

Table 4: Mean total duration of patient examination by patient category

Patient category	Total duration of patient examination, mean±SD (min)
Patients presenting for the first time with acute-onset symptoms	19.0±8.9
Patients presenting for the first time with a chronic disorder (for at least 6 months)	22.0±10.8
Patients presenting for the first time with acute-onset symptoms who were referred from primary care or other provinces to secondary care for further evaluation	19.0±10.1
Patients presenting for the first time with acute-onset symptoms who were referred from secondary care to tertiary care for further evaluation	23.1±7.6
Patients presenting for the first time with a chronic disorder (for at least 6 months) who were referred from primary care or other provinces to tertiary care for further evaluation	25.9±9.2
Patients presenting for the first time with a chronic disorder (for at least 6 months) who were referred from secondary care to tertiary care for further evaluation (this group of patients will only be sampled by physicians from tertiary care centers)	25.9±10.4
Patients with records kept at the same unit who present for routine control	17.8±8.6
Patients with records kept at the same unit who present for acute exacerbation other than routine visits	18.8±8.3

SD = Standard deviation

The longest step of patient examination after medical history taking was evaluating test results. Physical examination took the third place which may be due to the reduced time allocated to physical examination in comparison to the increased consultation to complex tests. In our opinion, this result points to the change in the nature of medical practice.

Our study did not reveal any significant difference for patients over 65 and 80 years of age with respect to total duration of patient examination. In line with our results, a study by Hu and Reuben, which explored factors affecting the duration of patient examination among geriatric patients (>65 years), found that age (>80 years) was not a significant determinant.[13] Similarly, Migongo *et al*. reported that age did not alter the duration of patient examination.[16] A study that compared three age groups, namely, 45–64 years, 65–74 years, and ≥75 years, to explore the effect of age on duration of patient examination, failed to show any significant difference.[12] Our study demonstrated that the only step that was significantly longer among patients aged over 65 years was the physical examination step. This may be due to a longer time needed for the elderly to get ready for the physical examination or due to the need for general examination because of increased incidence of accompanying diseases.

In our study, there was not any significant gender difference with regard to the duration of patient examination. Migongo *et al*. also reported that sex was not a determinant of duration of patient examination.[16] Furthermore, in another study, a similar result was reported for patients with cancer.[14]

According to our results, the time allocated for all examination steps except for physical examination was significantly longer in university hospitals than in government and training and research hospitals. This may be due to the fact that patients with chronic and more complicated conditions who were previously evaluated and treated at other centers present to university hospitals more often. The mean duration of patient examination in university hospitals was 30% longer in average than secondary care institutions (17.9 min vs. 23.3 min). While 8.2% of patients in secondary care institutions required duration of more than 30 min for patient examination, that proportion rose to 21.1% in university hospitals.

Among patient categories, the longest duration of patient examination was required for patients presenting for the first time with a chronic disorder (for at least 6 months) and referred

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from secondary care to tertiary care. Similarly, Yawn *et al*. found that duration of patient examination was significantly longer when patients had chronic disorders.[11] Migongo *et al*., on the other hand, examined possible factors affecting duration of patient examination and reported that patients with multiple morbidities and chronic/multiple complaints who were examined by other physician(s) had a longer duration of patient examination, which may have been up to 41 min.[16]

Our study revealed the mean duration of patient examination in almost ideal conditions as 20.4 ± 9.6 in the pulmonary practice, a figure that was greater than figures previously reported in literature. It should be noted, however, that previous studies did not investigate the appropriate minimal duration of patient examination but only recorded durations spent in routine practice. Our study also determined that this figure was not adequate for most patients as a mean duration of examination, either. Rather, it was determined that much longer durations are required for patients referred from primary or secondary care to university hospitals. Patient appointment system should thus be re-designed accordingly.

Our study is the first to explore the appropriate minimal duration of patient examination in the pulmonology specialty. Its strengths include the prospective design and including a large number of different patient groups and different categories of hospitals. Its limitation is the physician dependence on the duration of patient examination so that too slow or too fast patient examinations may have affected the time of patient examination. However, this limitation can be considered acceptable since it reflects the real-life conditions.

Conclusion

According to the present study, almost the appropriate time for patient examination was determined to be 20 min on an average for the pulmonary practice. This duration exceeded 25 min in university hospitals and for patients with chronic lung disorders. Considering that the duration of patient examination may well exceed 30 min in approximately one in every seven patients, patient appointment system should be re-designed on the basis of patient characteristics. We believe that this is a must for the sake of the *sine qua non* of the art of medicine.

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Conflicts of interest
There are no conflicts of interest.

References

1. Dorr Goold S, Lipkin M Jr. The doctor-patient relationship: Challenges, opportunities, and strategies. J Gen Intern Med 1999;14 Suppl 1:S26-33.
2. Wilkin D, Metcalfe DH. List size and patient contact in general medical practice. Br Med J (Clin Res Ed) 1984;289:1501-5.
3. Howie JG, Porter AM, Forbes JF. Quality and the use of time in general practice: Widening the discussion. BMJ 1989;298:1008-10.
4. Tamblyn R, Berkson L, Dauphinee WD, Gayton D, Grad R, Huang A, *et al*. Unnecessary prescribing of NSAIDs and the management of NSAID-related gastropathy in medical practice. Ann Intern Med 1997;127:429-38.
5. Nowalk MP, Bardella IJ, Zimmerman RK, Shen S. The physician's office: Can it influence adult immunization rates? Am J Manag Care 2004;10:13-9.
6. Lin CT, Albertson GA, Schilling LM, Cyran EM, Anderson SN, Ware L, *et al*. Is patients' perception of time spent with the physician a determinant of ambulatory patient satisfaction? Arch Intern Med 2001;161:1437-42.
7. Morrell DC, Evans ME, Morris RW, Roland MO. The "five minute" consultation: Effect of time constraint on clinical content and patient satisfaction. Br Med J (Clin Res Ed) 1986;292:870-3.
8. Gross DA, Zyzanski SJ, Borawski EA, Cebul RD, Stange KC. Patient satisfaction with time spent with their physician. J Fam Pract 1998;47:133-7.
9. Available from: http://www.rekabet.gov.tr/File/?path=ROOT%2f1%2fDocuments%2fSekt%C3%B6r+Raporu%2filacrapor.pdf. [Last accessed on 2016 Oct 04].
10. Yawn B, Zyzanski SJ, Goodwin MA, Gotler RS, Stange KC. Is diabetes treated as an acute or chronic illness in community family practice? Diabetes Care 2001;24:1390-6.
11. Yawn B, Goodwin MA, Zyzanski SJ, Stange KC. Time use during acute and chronic illness visits to a family physician. Fam Pract 2003;20:474-7.
12. Lo A, Ryder K, Shorr RI. Relationship between patient age and duration of physician visit in ambulatory setting: Does one size fit all? J Am Geriatr Soc 2005;53:1162-7.
13. Hu P, Reuben DB. Effects of managed care on the length of time that elderly patients spend with physicians during ambulatory visits: National Ambulatory Medical Care Survey. Med Care 2002;40:606-13.
14. Guy GP Jr., Richardson LC. Visit duration for outpatient physician office visits among patients with cancer. Am J Manag Care 2012;18:SP49-56.
15. Blumenthal D, Causino N, Chang YC, Culpepper L, Marder W, Saglam D, *et al*. The duration of ambulatory visits to physicians. J Fam Pract 1999;48:264-71.
16. Migongo AW, Charnigo R, Love MM, Kryscio R, Fleming ST, Pearce KA. Factors relating to patient visit time with a physician. Med Decis Making 2012;32:93-104.

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