

for reaching HbA<sub>1c</sub> target; the results were similar for individual counseling categories (**Table**). Duplicate counseling was not associated with faster HbA<sub>1c</sub> control.

**Comment.** In this large retrospective study of copied documentation of lifestyle counseling in patients with diabetes, we have demonstrated that, unlike original records, copied documentation of lifestyle counseling was not associated with improvement in glucose control. In fact, its effect on HbA<sub>1c</sub> was undistinguishable from no counseling at all. These findings were consistent for all 3 types of lifestyle counseling we analyzed—diet, exercise, and weight loss. These results lead us to question whether copied electronic documentation is a reliable representation of patient care. If it is not, it could be either an honest mistake or deliberate falsification. In the latter case, copied documentation that does not reflect the actual events is a serious breach of medical ethics. In either case, it carries a significant financial and legal risk.<sup>8</sup>

Efforts must therefore be made to decrease the incidence of inappropriately copied electronic documentation. These could include training and education of health care providers as well as technical solutions, such as software that automatically detects overly similar notes or their components. In order for EMRs to benefit patients, we must make sure the information they contain is meaningful.

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## LESS IS MORE

### Utility of Clinical Examination in the Diagnosis of Emergency Department Patients Admitted to the Department of Medicine of an Academic Hospital

**T**he claim that high-quality history and physical examination are diagnostic for most patients is based on old studies and ambulatory patients.<sup>1,2</sup> We examined in a prospective study the utility of basic clinical information available on admission for the diagnosis of adult patients admitted to the department of medicine.

*See also page 1396*

**Methods.** All consecutive patients newly admitted from the emergency department (ED) to 1 academic department of medicine over 53 days were prospectively included in the study. Planned admissions or readmissions were excluded. A senior resident (SR) with 4 years' training (L.P.) examined all patients within 24 hours of admission, including a full history taking, physical examination, and review of ancillary test findings done at the ED (basic hematology and chemistry tests, urinalysis, electrocardiography [ECG], and chest radiography [CXR]). Additional tests (troponin, C-reactive protein, and international normalized ratio) and computed tomography or ultrasonography (when preformed), medical charts from previous admissions, and all medications and vital signs were also reviewed. The SR then determined her main diagnosis at the highest degree of resolution possible (eg, syncope due to orthostatic hypotension) and identified the modalities that were most helpful in making the diagnosis (eg, history + ECG). Once determined, the diagnosis was sealed and unknown to others. A hospital physician (HP) then repeated the same procedure, with no other data, and did not communicate the results. Participating HPs were active hospital-

ists and medical educators with 20 years' experience or more and were not involved in the care of the study patients. At least 1 month after discharge, the SR verified the patient's final diagnosis for the index admission by checking discharge summaries and records of any further hospital visits and called the patient's primary physician. These data were collected by the SR without being aware of her own or the HP diagnosis. The main diagnosis of the SR or HP compared with the final diagnosis constituted the primary outcome. Secondary outcomes included the value of different elements (history, physical examination, and basic tests) for the diagnosis and the prevalence and impact of imaging studies performed in the ED (other than CXR) on diagnosis. An experienced statistician analyzed the results.

**Results.** Altogether, 442 eligible admitted patients (mean [SD] age, 66.9 [17.7] years; 51.4% male) were evaluated. Previous comorbidities were common (mean [SD] number, 1.8 [1.4]; 100 of 442 had none) including hypertension (57%), diabetes mellitus (34%), coronary disease (26%), stroke (16%), renal dysfunction (estimated glomerular filtration rate <60) (35%), and chronic lung disease (14%). Mean (SD) length of hospital stay was 4.5 (7.2) days. All patients had basic blood and urine tests performed in the ED, but only 15.5% had an ancillary test other than ECG and CXR (computed tomography, 11.8%; ultrasonography, 3.7%). The SR examined all patients within mean 14 hours of admission, spending approximately 40 minutes per patient (HP, ≤25 minutes). Follow-up and final diagnoses were obtained at a mean (SD) 2.0 (0.7) months after discharge and included a wide, diverse spectrum of illnesses typical of a department of general internal medicine. The SR was correct in 354 of 442 diagnoses (80.1%). The HPs made correct diagnoses in 373 patients (84.4%). They made identical correct diagnoses in 327 cases (73.9%); both were wrong in 42 patients (9.5%) ( $P=.04$ ). The modalities considered to have been most useful in establishing the diagnosis were similar for both (**Table**). The patient's history emerged as the key element in formulating diagnosis either alone (approximately 20% of all diagnoses), in combination with the patient's examination (another 40%, approximately), or in addition to the basic tests with or without the physical examination (33%). The examination or basic tests alone were very seldom helpful. Used in conjunction, the physical examination doubled the diagnostic power of the history (19.5% to 39.0%; **Table**). The basic tests added a further 33%. Imaging was infrequently used in the ED (mainly head computed tomography) and had added little to determining diagnoses, being considered valuable in approximately 1 in 3 patients who had computed tomography performed.

**Comment.** Research continues to support the enduring value of the history and physical examination in diagnosis<sup>3-5</sup> and in deciphering problems with multiple diagnostic alternatives.<sup>6-8</sup> However, our study was the first to our knowledge to examine prospectively the value of the basic clinical methods for the diagnosis of the whole heterogeneous population of patients requiring an emergency admission to a general department of medicine.

**Table. The Diagnostic Modalities Considered by the Senior Resident or Hospitalist to Have Been Most Useful in Patients Who Were Correctly Diagnosed Based on Initial Clinical Data Available on Admission**

Modality	Correct Diagnoses, No. (%)	
	Senior Resident (n=354)	Hospitalist (n=373)
History alone	70 (19.8)	72 (19.3)
Physical examination alone	3 (0.8)	2 (0.5)
Basic tests alone	4 (1.1)	5 (1.3)
History and physical examination	140 (39.5)	144 (38.6)
History and basic tests <sup>a</sup>	52 (14.7)	55 (14.7)
History, physical examination, and basic tests	60 (16.9)	69 (18.5)
Role of imaging on admission <sup>b</sup>	23 (6.5)	23 (6.1)
<b>Total<sup>c</sup></b>	<b>352 (99.3)</b>	<b>370 (99.0)</b>

<sup>a</sup>Basic tests include electrocardiography, chest radiography, and laboratory tests (routine blood tests, urinalysis, and few additional tests). See "Methods" section.

<sup>b</sup>All imaging other than chest radiography performed through the emergency department and judged as contributing to the main clinical diagnosis. In most of these patients, the history also played an essential role. Physical examination played a role in about half of these patients.

<sup>c</sup>Two patients' diagnoses were based on a combination of physical examination and basic tests.

We found that more than 80% of newly admitted internal medicine patients could be correctly diagnosed on admission and that basic clinical skills remain a powerful tool, sufficient for achieving an accurate diagnosis in most cases. Notwithstanding the great clinical diversity, 90% of all correct diagnoses were accomplished on presentation through a combination of the history, physical examination, and basic tests (excluding imaging studies) (**Table**). The use of this combination correctly diagnosed 3 of 4 admitted patients (329 [SR] and 347 [HP] of 442 consecutive admissions were properly diagnosed by the history, physical examination, and basic tests alone, or in combination [**Table**]). History was the most potent single tool identified. Its combination with physical examination of the patient alone was diagnostic in 60% of all admissions. Integrating the results of basic laboratory tests further increased the diagnostic yield (**Table**). The fact that a relatively small number of patients had ancillary investigations beyond ECG and CXR had no adverse effects on clinicians' performance. In contrast, the incorporation of the basic test results in the diagnostic considerations was found to be crucial because they were implicated in a third of all diagnoses. The SR performed nearly as well as the HPs, possibly owing to her 4 years' experience in the same department. One in 10 patients was misdiagnosed by both the SR and HPs, but diagnosis was achieved either during admission (for the majority of the patients) or after discharge and no patient harm occurred. Our results do not mean that sophisticated studies need not be used after admission, but they do suggest that their choice should be guided by the clinical data on presentation.<sup>5,9</sup> In conclusion, 4 of 5 of internal medicine inpatients could be accurately diagnosed close to their admission on the basis of little other than the traditional clinical information. Physicians may

count more on their clinical faculties when making decisions about patients.

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## EDITOR'S NOTE

### The Value of History Taking in Diagnosis

The research letter by Paley et al reminds us of the value of lower-tech ways of making a diagnosis of patients seen in the emergency department (ED), as technology increases in availability and complexity and because ED health professionals now routinely order imaging tests, not uncommonly without even examining patients. The authors found that patient history was the key element in formulating a correct diagnosis and, along with physical examination and basic tests, established most diagnoses.

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## INVITED COMMENTARY

### Medical Technology—Still an Adjunct to Clinical Skills in Making a Diagnosis

The main responsibility of the physician to a patient is to make an accurate diagnosis so that appropriate treatment can be instigated. For centuries the physician had only the history and physical examination as the instruments to use in making a diagnosis of the patient's illness. Gradually, basic laboratory tests were added, and at the beginning of the 20th century, radiography and later electrocardiography were developed. Most patients with symptoms sufficient for them to appear in an emergency department (ED) have a wide variety of illnesses, many of which are readily diagnosed without sophisticated imaging techniques. So how important in arriving at a correct diagnosis are these modern (and expensive) imaging devices for the usual spectrum of diseases seen in the ED?

Over the years there have been many previous studies<sup>1-3</sup> performed on ambulatory patients supporting the major contribution of the history and physical examination in making the correct diagnosis in patients with medical diseases, with laboratory studies important in the minority of cases. The study by Paley et al<sup>4</sup> appears to be the first prospective study done on patients sick enough to be admitted to the hospital that convincingly shows that a physician with 4 years' experience in the ED can make a correct diagnosis in the ED 80% and the senior hospitalist 84% of the time, using mainly the history, physical examination, and basic laboratory tests without the use of the modern imaging techniques. The history alone was most valuable approximately 20% of the time, and although the physical examination alone was most valuable less than 1% of the time, when used in conjunction with the history, the physical examination doubled its diagnostic power to almost 40%. Less than 10% of the time both missed the correct diagnosis. Computed tomography was used 12% of the time, mostly for head examination, and ultrasonography, I assume including echocardiography, was used less than 4% of the time.

It would be helpful to know how many hospitalists took part in the study. The more physicians involved, the less likely that we are dealing with exceptionally talented clinicians and the more generalizable the findings become. It would also be helpful if the diagnoses that were made in these 442 patients, as well as the 10% of diagnoses missed by both the ED physician and the hospitalist, would be listed in a table. The high diagnostic accuracy using predominantly the traditional tools of history, physical examination, and basic laboratory tests would be less exciting if the majority of the patients had asthma, upper respiratory tract infections, urinary tract infections, or psychological problems.

Having been an internal medicine resident and cardiology fellow in the 1950s and practiced for the first 12 years in the era before echocardiography, I can attest that our experienced cardiologists could make an accurate diagnosis with these basic diagnostic tools most of the time.