

# Is There Time for Management of Patients With Chronic Diseases in Primary Care?

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## ABSTRACT

**PURPOSE** Despite the availability of national practice guidelines, many patients fail to receive recommended chronic disease care. Physician time constraints in primary care are likely one cause.

**METHODS** We applied guideline recommendations for 10 common chronic diseases to a panel of 2,500 primary care patients with an age-sex distribution and chronic disease prevalences similar to those of the general population, and estimated the minimum physician time required to deliver high-quality care for these conditions. The result was compared with time available for patient care for the average primary care physician.

**RESULTS** Eight hundred twenty-eight hours per year, or 3.5 hours a day, were required to provide care for the top 10 chronic diseases, provided the disease is stable and in good control. We recalculated this estimate based on increased time requirements for uncontrolled disease. Estimated time required increased by a factor of 3. Applying this factor to all 10 diseases, time demands increased to 2,484 hours, or 10.6 hours a day.

**CONCLUSIONS** Current practice guidelines for only 10 chronic illnesses require more time than primary care physicians have available for patient care overall. Streamlined guidelines and alternative methods of service delivery are needed to meet recommended standards for quality health care.

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## INTRODUCTION

Many Americans are not receiving recommended health care services. Despite the existence of established clinical guidelines, which are expected to facilitate more consistent and effective medical practice and improve health outcomes, Americans receive only about one half of the applicable services for acute, preventive, and chronic disease care.<sup>1</sup> Chronic disease care is of particular concern, as chronic diseases have become more widespread and are often poorly controlled.

For instance, hypertension affects approximately 50 million Americans and will become more common as the population ages; however, only 34% of the population with hypertension has blood pressures in the recommended range.<sup>2</sup> Control of diabetes mellitus is also elusive: only 37% of patients with diabetes have glycosylated hemoglobin (HbA<sub>1c</sub>) values at or below the recommended level.<sup>3</sup> The human costs are substantial: poor blood pressure control contributes to more than 68,000 preventable deaths annually,<sup>4</sup> and strict blood glucose control can decrease the risk of complications in patients with diabetes by 25%.<sup>5,6</sup>

Barriers to chronic care delivery include a limited orientation to disease monitoring and lack of office systems for chronic disease care.<sup>7</sup> Time constraints in primary care have been shown to limit the delivery of preventive services<sup>8</sup> and likely also limit the delivery of care for chronic disease.

It is difficult, if not impossible, to measure the exact amount of time

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a physician should spend managing chronic diseases because of variability among patients in their disease processes, responses to medication, and lifestyle and social issues. It is, however, possible to estimate the minimum time required for primary care physicians to deliver high-quality medical management of chronic disease to their patients according to nationally accepted guidelines.

**METHODS**

To estimate the time required to manage chronic disease, we considered 3 elements: (1) the most common chronic diseases in the general US population, (2) the

number of patients with these conditions in a representative primary care practice, and (3) the recommendations of national guidelines for high-quality clinical care of the chosen conditions. For comparison, we considered the average amount of time family physicians currently spend in direct patient care.

**Chronic Diseases**

We chose chronic diseases that (1) are the most commonly occurring and with the highest morbidity and mortality, and, among these, diseases that (2) do not typically have a specialist as the primary physician (eg, cancer, pediatric diabetes), (3) have available measures of national prevalence (in the general population), and (4) have published clinical guidelines. A list of the most common and burdensome chronic diseases was created from a combination of the main causes of death and chronic disease burden in the United States<sup>9,10</sup> and the most common diagnoses in primary care.<sup>11,12</sup>

**Number of Patients With the Chronic Diseases**

We created a theoretical, representative American primary care practice. We set our panel to 2,500 patients, a panel size referred to in the literature.<sup>13,14</sup> We used Census Bureau figures from 2001<sup>15</sup> to model the panel with an age distribution similar to that of the US population, including children (Table 1). We applied age-specific disease rates in the general population<sup>16-23</sup> to our model primary care panel to derive the number of patients with each condition. Reliable estimates of comorbidity among the 10 selected diseases, however, were unavailable. As a result, patients with more than one of the diseases appear in Table 2 more than once

(see allowance for comorbidities below). It may be helpful to think of our model practice as a solo family medicine practice, with an age distribution and with chronic disease prevalences similar to that of the US population, in which the family physician is completely adhering to available guidelines for a panel of 2,500 patients.

**Guidelines for Chronic Disease Care**

For each illness, we reviewed a number of guidelines and recommendations from a range of sources.<sup>24</sup> These showed considerable variation in scope and in level of detail and supporting documentation. Consistent with recent evaluations of the quality

**Table 1. Estimated Patient Populations in the Model Practice, Based on US Census Data (2002)**

Age-groups	US Population	Patients
< 18 y	72,894,483	632
18-24 y	28,341,732	246
25-29 y	18,971,891	164
30-34 y	20,956,412	182
35-39 y	21,914,882	190
40-44 y	23,001,724	199
45-49 y	21,302,064	185
50-54 y	18,781,873	163
55-59 y	14,990,542	130
60-64 y	11,611,184	101
65-69 y	9,580,927	83
70-74 y	8,693,288	75
75 y +	17,327,696	150
Total	288,368,698	2,500

From: United States Census Bureau.<sup>15</sup>

**Table 2. Summary of Primary Care Time Requirements for 10 Chronic Diseases, Assuming the Disease is Stable and in Good Control**

Disease	Number of Cases	Visits Per Year	Minutes Per Visit	Minutes Per Disease Per Year	Hours Per Year
Hyperlipidemia	511	2	10	20	170
Hypertension	472	2	10	20	157
Depression	118	4	10	40	92
Asthma	183	2	10	20	61
Diabetes	145	2	10	20	48
Arthritis	381	2	10	20	127
Anxiety	279	2	10	20	107
Osteoporosis	140	1	10	10	23
COPD	131	1	10	10	22
CAD	120	1	10	10	20
Total hours per year					828
Total hours per work day					3.5

Note: Patients with more than 1 of the 10 diseases appear more than once. Summary of time assuming that the disease is "stable," "in control," "at goal," or "in maintenance phase."

COPD = chronic obstructive pulmonary disease; CAD = coronary artery disease.

**Table 3. Effect of Disease Control Status on Time Requirements for 5 Chronic Diseases**

Disease	Total Cases	No. (%) of Cases		Number of Visits		Minutes per Visit	Hours Per Year
		Uncontrolled	Controlled	Uncontrolled	Controlled		
Hyperlipidemia	511	417 (81.6)	94 (18.4)	8	2	10	587
Hypertension	472	312 (66)	160 (34)	12	2	10	704
Depression	118	58 (49)	60 (51)	12	4	10	156
Asthma	183	62 (33.6)	121 (66.3)	4	2	10	82
Diabetes	145	91 (63)	54 (37)	4	2	10	79
Total hours per year							1,581
Total hours per work day							6.7

of clinical practice guidelines,<sup>25</sup> our order of preference for selection was (1) national, governmental agencies, (2) national disease-specific organizations, and (3) nonprofit organizations. We required guidelines that included explicit recommendations for the time necessary to provide the recommended care.<sup>2,26-34</sup>

Based on the prevalence and guideline criteria outlined, the following chronic diseases were included: hyperlipidemia, hypertension, depression, asthma, diabetes, arthritis, anxiety, chronic obstructive pulmonary disease (COPD), osteoporosis, and coronary artery disease (CAD).

### Time Required per Chronic Disease

All guideline recommendations were in the form of a defined number of visits per year, as opposed to a recommended amount of time or visit length. Frequently, a range was given, based on such characteristics as severity, stability, or control of illness. To ensure that our estimates represented the minimal time required, we initially chose the number of visits at the lowest end of a given range, and only chose ranges recommended for patients whose illness was "stable," "in control," "at goal," or in the "maintenance phase."

### Comorbidities and Time

In our primary analyses, we allowed 10 minutes per chronic disease per recommended visit. This estimate is low relative to the reported 18 to 21 minutes for office visits for most patients.<sup>11,35</sup> This time allotment, however, allows adjustment for comorbidities, for which we have no reliable prevalences. Each guideline suggests a certain number of visits that could each be assigned 18 to 21 minutes, except that similar services for some comorbid conditions (eg, diet and physical activity counseling for diabetes and hypertension) might be discussed in one visit concurrently. On the other hand, the patient with comorbidities will also have more medications, potential side effects, drug interactions, and compliance issues, and these patients have been found to require more primary care physician visits and time than patients with fewer comorbid conditions.<sup>36-38</sup>

In general, while patients might not need specific separate visits for each comorbid illness, those with comorbidities will require more time than those with only one condition, especially if the care for the diseases does not overlap directly (eg, arthritis and hyperlipidemia). To correct for this issue, we set 10 minutes as the time necessary to deliver all the care as recommended by the guideline for any disease during any office visit for any patient, regardless of the existence of comorbidities. For each disease, there are, of course, a series of more specific patient-monitoring and disease control issues that need attention,<sup>39,40</sup> such as (eg, for the patient with diabetes) home glucose monitoring, laboratory results, foot and eye examinations. We emphasize that our estimates are not based on how much time is currently spent on chronic disease in practice; rather, they are based on how much physician time is required to meet current guideline recommendations.

### Calculation of Time for Chronic Disease Care

We calculated the amount of physician time for each of the 10 chronic diseases as the product of the number of patients in the practice with each illness, the number of visits recommended per year for follow-up of stable disease, and the time per visit (Table 2).

The calculations in Table 2 do not account for severity or control of disease, which are important factors given the known level of uncontrolled chronic illness in the population. We therefore developed more comprehensive time estimates for the 5 conditions (1) for which the guidelines recommended specific numbers of visits by level of control, and (2) for which control-specific prevalences<sup>2,3,41-43</sup> were available (Table 3). For these 5 diseases—hyperlipidemia, hypertension, depression, asthma and diabetes—we calculated the number of patients in the practice by level of control (controlled or uncontrolled), multiplied by the recommended number of annual visits, and again allowed only 10 minutes per visit. The Supplemental Appendix, available online only at <http://www.annfam.org/cgi/content/full/3/3/209/DC1>, using more concise notation, summarizes our analytical approach.

**Table 4. Factors Not Accounted for in Estimates of Time Required for Chronic Disease Management in Primary Care**

1. Other chronic diseases not included in Table 2
2. Initial visits for assessment and diagnosis
3. Initiation of new drug regimen (eg, insulin)
4. Patient ability to comply with instructions
5. Treatment of complications and sequelae

The guidelines also recommended more numerous visits for such factors as the time required for initial evaluation and diagnosis of the disease, and the time needed for the initiation of new medications. We did not include time for these factors in our calculations (Table 4).

### Physician Hours Available for Patient Care

Family physicians currently spend an average of 41.3 hours per week in patient-related service and work an average of 47.2 weeks per year,<sup>44</sup> resulting in 1,949 work hours per physician per year available for patient care.

## RESULTS

Table 1 displays the number of patients in each age-group in a patient panel representative of the general population. Table 2 shows the chronic diseases reviewed and the number of patients in the panel with each disease, according to current age-specific prevalence estimates in the general US population. The recommended number of visits is also listed; long-term management of stable disease is specified most often as "every 6 months." Assuming the conditions are stable and in good control, the time required for long-term management of the 10 diseases is 828 h/y, or based on 1,949 annual physician work hours, 42% of available clinical time. Assuming a 5-day work week (47 wk/y), a physician would need to spend 3.5 hours of every work day providing services for patients with these chronic diseases.

Table 3 displays time estimates for the 5 chronic conditions with level of control considered. For example, the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) guidelines specify that for uncontrolled hypertension, monthly visits are recommended. We calculated the percentage of those with blood pressure in control (34%, as reported in JNC-7) and uncontrolled (the remainder, or 66% of cases). When we calculated the time based on the number of patients whose illness was in control, these 5 diseases required approximately twice as much time (6.7 hours) as all 10 diseases in Table 2 required for long-term monitoring of stable conditions.

For hyperlipidemia, hypertension, depression, dia-

betes, and asthma, the required annual time increased from 528 hours in Table 2 to 1,581 hours in Table 3, or about a factor of 3. If the time for all 10 diseases in Table 2 were similarly increased by a factor of 3, the time required would total 2,484 hours per year, or 10.6 hours per day. This exceeds the annual amount of physician time available for patient care by 27%.

In Table 4 are listed factors not included in the estimate above, but for which the guidelines specifically recommend an increased frequency of patient visits. Because of the lack of supporting data from which to create useful estimates, we can only speculate how much time these factors might add to the results presented above.

## DISCUSSION

We calculated that comprehensive high-quality management of 10 common chronic diseases require more time than primary care physicians have available for all patient care. Similarly excessive time requirements have recently been shown for preventive service delivery.<sup>8</sup> Acute problems require time as well. A study of family medicine clinics found that 58% (or 4.6 hours per day) of all visits were for acute problems and their follow-up care.<sup>12</sup> Acute care cannot be deferred and customarily takes precedence over both prevention and chronic disease management. Taken together, the time needed to meet preventive, chronic, and acute care requirements vastly exceeds the total time physicians have available for patient care. Our data show that the time requirements of current guidelines are a fundamental obstacle to the delivery of appropriate and recommended chronic disease care.

Our study was limited by the lack of guidelines for some common illnesses that included time recommendations (eg, gastroesophageal reflux disease, allergic rhinitis, congestive heart failure). We also could not use some preferred guidelines for included diseases, because the guidelines lacked specific time recommendations.<sup>45,46</sup> In addition, we were unable to find prevalence rates by level of disease control except for hyperlipidemia, hypertension, depression, asthma, and diabetes. Reasonable population estimates of comorbidity prevalences among the 10 diseases were also not available. Furthermore, we did not attempt to include the additional time often required for patient education and for addressing complications of treatment (eg, medication side effects) or psychological and social issues.

The guidelines did not provide direct time recommendations, only the recommended number of visits per year. It is possible that our choice of 10 minutes per recommended visit could overestimate the time required. In a time study of interactions between patients with diabetes and their physicians,<sup>39</sup> however, 5 minutes were not sufficient to address all relevant

diabetes concerns; in that study, HgA<sub>1c</sub> levels were discussed in only 40% of visits. It is hard to envision effective and comprehensive primary care medicine, in which patient-centered communication is an essential component,<sup>47</sup> permitting shorter visits given the chronic diseases in question. Regardless, even if we set this time to only 5 minutes, ie, overestimated the time required by as much as 100%, the final conclusion remains unchanged: it is not feasible for primary care physicians to dedicate 5 hours of each day solely to the management of 10 chronic diseases.

One conclusion of this study is to caution guideline developers to consider carefully the time required to follow recommendations. There are several initiatives to improve the quality of clinical guidelines, including the AGREE Project.<sup>48</sup> AGREE proposes 6 main criteria of high-quality clinical practice guidelines: scope and purpose; stakeholder involvement; rigor of development; clarity of presentation; and maybe most important from our standpoint, applicability, which subsumes time cost implications. The guidelines may be reasonable when considered one by one, but they can be impossibly burdensome in aggregate. What may be helpful in the family medicine setting is for guidelines to be written collaboratively, ie, to include diseases that are highly correlated in the same comprehensive primary care guideline. Refocusing the organization of disease management toward comorbid illnesses as opposed to single-disease interventions has been supported by others<sup>37,40,49</sup> and may better reflect the nature of primary care, in which multiple problems are often dealt with in the course of a single visit.<sup>40</sup>

Other solutions to the underlying time problem include patient education by print, video, and the Internet. Self-care, especially if combined with professional care, can empower patients and be quite effective.<sup>50,51</sup> Similarly, the group office visit, which has been shown to be a tool for improving patient understanding and outcomes, can complement the efforts of the clinician.<sup>52</sup> Lack of insurance reimbursement limits the growth of these alternatives.

Another promising solution is to develop models of care management that require less time of primary care physicians. By taking on the time-consuming tasks of patient education and follow-up of protocols and guidelines, physician assistants, nurse practitioners, and professional health educators can provide much-needed and much-appreciated education, counseling, and guidance.<sup>53</sup> Community-based resources, including neighborhood health educators and social workers, can also be effective (though rarely reimbursed) vehicles for chronic disease education and management.<sup>54,55</sup>

Our data show that there is not enough time for primary care physicians to deliver the services cur-

rently recommended for chronic disease management. Developers of guidelines, as well as insurance system and health care system policy makers, need to be more aware of the problem of time, and they need to provide options for chronic disease management and primary health care that include alternative models of health service delivery.

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**Key words:** Time factors; chronic disease; practice guidelines; primary health care; delivery of health care; health services research

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