CHIEF COMPLAINT
AF presents for his annual checkup for diabetes.

PRESENT ILLNESS
His fasting blood sugar levels at home range from 110 to 140 mg/dL; occasionally, afternoon blood sugar levels increase to 170 to 180 mg/dL.

MEDICAL HISTORY
AF is a 60-year-old white male with a 3-year history of type 2 diabetes with no other known disease. Recent dilated eye examination showed mild diabetic retinopathy with a few microaneurysms not involving macula. He was 240 lbs at the time of diagnosis; his best weight since diagnosis was 210 lbs.

MEDICATIONS
Medications include: metformin 500 mg twice a day; glipizide 10 mg/day; pioglitazone 30 mg/day; atorvastatin 40 mg/day; lisinopril 20 mg/day; hydrochlorothiazide 25 mg/day; and acetylsalicylic acid 81 mg/day.

FAMILY HISTORY
AF’s father had diabetes and died from a myocardial infarction at age 55. His mother is 82 years old and has mild chronic heart failure. AF has 2 younger siblings and both are healthy.

SOCIAL HISTORY
He does not smoke and occasionally drinks alcohol. AF works for a computer manufacturer as a project manager and travels frequently for his job.

PHYSICAL EXAMINATION
AF is 5’10” and weighs 245 lbs. Waist circumference, 45 in; blood pressure, 128/78 mm Hg; and pulse, 68 bpm. Examination was normal except to note decreased vibratory sensation in both feet. The 10-gm monofilament test was normal.

LABORATORY RESULTS
Glycosylated hemoglobin (HbA1c), 8.4%; complete blood count, normal; SMAC 12, normal; cholesterol, 130 mg/dL; triglycerides, 245 mg/dL; low-density lipoprotein (LDL), 70 mg/dL; high-density lipoprotein (HDL), 42 mg/dL; and urine microalbumin, 30 µg/mg creatinine.

ASSESSMENT
The patient initially started on diet and exercise when he was diagnosed 3 years ago. He only met with the dietitian this past year. He indicated his wife was cooking healthier meals, but his job required him to eat at restaurants frequently. He exercises, but not regularly, stating that his business travel schedule makes it difficult to maintain a regular exercise routine. AF also did not seem to understand the seriousness of having diabetes or his responsibility in controlling it. He did not know what his target HbA1c should be, measured his blood glucose only intermittently (ie, when he remembered), and had not made diabetes management a priority. After further discussion with AF, I also discovered he drank coffee with cream and sugar the morning of his blood test; thus, I had to reiterate the definition of fasting to obtain an accurate lipid profile.

For his medications, I stopped the pioglitazone because it may have been impeding his weight loss.
CASE STUDY

Efforts. However, to better control his diabetes, I doubled the doses of metformin (to 1000 mg twice daily) and glipizide (to 20 mg/day). I also spent some time reinforcing the message that diabetes is a serious disease, especially because he was showing signs of peripheral neuropathy and diabetic retinopathy.

Follow-up at 3 Months

AF had lost 15 lbs. His HbA1c was 7.7% and fasting blood glucose levels were around 110 mg/dL. When asked how he was able to achieve these changes, AF described the heart-to-heart talk he had with his wife about the changes they would need to make as a family (ie, allowing him time to exercise [the entire family joined a health club] and eating healthier meals that are more in line with the nutritional recommendations of the American Diabetes Association [ADA]). In fact, he met with the dietitian again, and she explained how AF could continue with healthy eating in restaurants. AF said he had not experienced any symptoms of hypoglycemia and felt enthusiastic about the positive changes in how he felt and the measures of diabetes. I congratulated AF on his achievements in glucose control and lifestyle modifications and encouraged him to continue. I also asked to see him again in 6 months, with a visit in between to the nurse or nutritionist, and to see the diabetes educator as soon as possible.

Discussion

AF represents the most common type of patient with type 2 diabetes. He is an overweight adult who has developed diabetes by not paying attention to his lifestyle choices, including diet and exercise. He also is reluctant to fully grasp the seriousness of having diabetes and his role in controlling the disease.

Because diabetes is an independent risk factor for heart disease, I was initially most concerned about AF’s triglycerides and HDL cholesterol, although his LDL cholesterol was well within the target range. The table summarizes the recommended lipid profile and glycemic control measures for people with diabetes.1 Note the target levels are strict. Given AF’s lipid profile, his excess weight, and hyperglycemia, he may have had the metabolic syndrome. (Of note, obtaining a fasting lipid profile is important. Whereas the cholesterol level is not likely to increase much with food intake within the previous 8–10 hours, the triglyceride value will be markedly affected, as it was with AF because of the cream in his morning coffee.)

AF’s glucose level is not well controlled. The ADA recommends that the HbA1c be less than 7% (Table) based on risk of progressive diabetic retinopathy shown in the Diabetes Control and Complications Trial.2 Importantly, the risk is not removed with HbA1c levels of less than 7%; levels of 6.5% or 6% are preferable.

Getting the Patient’s Attention

Patients need to understand the link between heart disease and diabetes. Therefore, patient education is the most important part of diabetes management. Patients should understand what diabetes is, the effects of diabetes, how to control diabetes, the rationale behind each medication and the necessary lifestyle changes, and the feelings of hyperglycemia and hypoglycemia. All of these points require diabetes self-man-

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<th>Table. Summary of Recommendations for Adults with Diabetes</th>
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<td>Preprandial capillary plasma glucose</td>
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| Lipids‡                                                    |     |
| LDL                                                       | <100 mg/dL (<2.6 mmol/L) |
| Triglycerides                                             | <150 mg/dL (<1.7 mmol/L) |
| HDL                                                       | >40 mg/dL (>1.1 mmol/L)§ |

*Referenced to a nondiabetic range of 4% to 6% using a DCCT-based assay.
†Postprandial glucose measurements should be made 1 to 2 hours after the beginning of the meal, generally peak levels in patients with diabetes.
‡Current NCEP/ATP III guidelines suggest that in patients with triglycerides ≥200 mg/dL, the “non-HDL cholesterol” (total cholesterol minus HDL) be utilized. The goal is ≤130 mg/dL.
§For women, it has been suggested that the HDL goal be increased by 10 mg/dL.
DCCT = Diabetes Control and Complications Trial; HbA1c = glycated hemoglobin; HDL = high-density lipoprotein; LDL = low-density lipoprotein; NCEP/ATP III = Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults.
Adapted with permission from American Diabetes Association. Diabetes Care. 2006;29:S4-S42.
agement training, for which certified diabetes educators (CDE) can be invaluable. CDEs can perform individual or group education and create individualized, targeted care plans.

Each clinician has his or her own approach to patients; I try to adapt my approach to each patient, taking my cues from the patient in terms of body language and adherence. During his initial visit, AF appeared to be more concerned about what time it was than his diabetes, and he put forth half-hearted attempts at exercise and offered excuses for not eating well. AF needed a wake-up call.

The main challenge was to convince AF to change his lifestyle. Showing empathy was important—conveying to him that I understood the hard work required for changing diet (especially when traveling) and increasing exercise. I also emphasized that the chance of diabetes control is much greater when both exercise and healthy diet are adopted.

AF needed to understand his behaviors were going to affect his risk for coronary heart disease and the nerve damage he was beginning to experience. He also needed to realize the nerve damage is permanent, potentially disabling, and a glucose-dependent complication of diabetes. Indeed, some studies show evidence of diabetic peripheral neuropathy (DPN) with only mild hyperglycemia. In fact, some patients who present with idiopathic peripheral neuropathy have only mild hyperglycemia. Larger studies have shown a direct correlation between hyperglycemia and DPN.

**TREATMENT CHOICES**

AF is only 60 years old. He is not elderly and should not be “throwing in the towel” on his health. He has many years of productivity ahead of him and, therefore, should be treated aggressively. He had many therapeutic options. I chose to discontinue the pioglitazone, because it was impeding his weight loss efforts, and increase the glipizide and metformin doses. I would not consider insulin or an incretin mimetic until I exhausted all options with oral agents (although I would hold this option in reserve). Because incretin mimetics are the newest agents, we are not completely familiar with their side effects. They also are given by injection, which may not be acceptable to some patients. Also, in terms of optimizing treatment, AF can do more with his lifestyle changes, and it is important that these changes are permanent.

**REFERENCES**