

# HOSPITAL PHYSICIAN®

## ENDOCRINOLOGY BOARD REVIEW MANUAL

### STATEMENT OF EDITORIAL PURPOSE

The *Hospital Physician Endocrinology Board Review Manual* is a study guide for fellows and practicing physicians preparing for board examinations in endocrinology. Each manual reviews a topic essential to the current practice of endocrinology.

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## Early Intervention to Prevent and Treat Type 2 Diabetes

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## Table of Contents

Introduction .....	2
Case 1: A Patient with Prediabetes .....	2
Case 2: A Patient with Newly Diagnosed Type 2 Diabetes .....	7
Conclusion .....	11
References .....	11

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# Early Intervention to Prevent and Treat Type 2 Diabetes

Shilpa H. Jain, MD, and Annaswamy Raji, MD, MMSc

## INTRODUCTION

Diabetes mellitus is a global epidemic and a growing public health problem. The worldwide prevalence of diabetes is projected to increase from an estimated 171 million (2.8%) in 2002 to 366 million (4.4%) in 2030.<sup>1</sup> The proportion of the U.S. population affected by diabetes is even greater. Based on data from the 1999–2002 National Health and Nutrition Examination Survey (NHANES), 9.3% of those aged 20 years or older (19.3 million, 2002 U.S. population) had diagnosed or undiagnosed diabetes, and an additional 20.6% had impaired fasting glucose (IFG).<sup>2</sup>

Diabetes was the sixth leading cause of death in the United States in 2002.<sup>3</sup> The complications of the disease—including heart disease, hypertension, stroke, blindness, renal disease, and peripheral neuropathy—contribute significantly to the morbidity and mortality associated with diabetes. The risk of death is roughly double in people with versus without diabetes.<sup>3</sup> The economic impact of diabetes also is enormous, with total (direct and indirect) costs estimated at \$132 billion in 2002.<sup>4</sup>

In response to the clinical and economic burden of the diabetes epidemic, national guidelines call for strategies to prevent diabetes whenever possible and to intervene aggressively with treatment for those who develop the disease. This manual uses 2 case examples to examine the rationale for early, aggressive action on behalf of patients at risk for diabetes and its complications. Although this manual refers to “prevention” of diabetes, it is important to acknowledge that diabetes prevention trials have shown that most interventions *delay* rather than prevent diabetes or reverse its pathophysiology.

## CASE 1: A PATIENT WITH PREDIABETES

### CASE PRESENTATION



A 45-year-old Hispanic woman is referred by her family physician to an endocrinologist for

evaluation of prediabetes. The referral was prompted by a recent set of blood tests that revealed a fasting blood glucose level of 95 mg/dL.

The patient has a history of gestational diabetes, and both her parents have type 2 diabetes. Since the delivery of her last child, the patient has been unable to lose weight. Her primary care physician had recommended decreasing the carbohydrate content in her meals and increasing her physical activity. However, she has been unsuccessful in making significant changes over the past year. Because of the family’s tight budget, rice and beans are the staple diet. Also, after working a full day at her desk job, doing household chores, and taking care of her children, the patient cannot find time for exercise. On the weekends, she tries to walk in her neighborhood. Currently, she takes no medication and does not drink alcohol or smoke.

The patient is obese, with a body mass index (BMI) of 36 kg/m<sup>2</sup>. She has central adiposity. Blood pressure is 125/80 mm Hg, and heart rate is 72 bpm. Acanthosis nigricans is noted at the back of the neck and in the axilla. Cardiovascular examination is normal. The remainder of the physical examination is unremarkable.

An oral glucose tolerance test (OGTT) and fasting lipid profile are ordered and reveal the following:

- Fasting glucose, 98 mg/dL (normal, 55–100 mg/dL)
- Glucose at 2 hours, 160 mg/dL (normal, < 140 mg/dL)
- Total cholesterol, 194 mg/dL (normal, 140–199 mg/dL)
- Low-density lipoprotein (LDL) cholesterol, 120 mg/dL (normal, 50–129 mg/dL)
- High-density lipoprotein (HDL) cholesterol, 38 mg/dL (normal, 40–60 mg/dL)
- Triglycerides, 180 mg/dL (normal, 35–150 mg/dL)

**Do these findings warrant concern? Is aggressive intervention indicated?**

This patient is at high risk for developing type 2 diabetes. She meets criteria for the diagnosis of impaired glucose tolerance (IGT), which indicates a state of declining pancreatic beta cell function. In addition, she has