

# A Day in the Life . . .

## Diabetes: A personal and professional challenge



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Originally filed in the Chattanooga Times News Free Press

Sunday, May 28, 2006, at 12:00 a.m.

*In a four-part blog series, Dr Huffman discusses a typical work day. Patients in this installment represent composite profiles to protect their personal information. No resemblance to particular patients is implied.*

### Part II: Afternoon in the office

**1:00 p.m.**

A 28-year-old woman with insulin-dependent diabetes since her teens is seen in the 22nd week of her first pregnancy. She is worried that her blood glucose levels have been rising during the past two days, and her mealtime and corrective insulin doses seem not to be correcting her sugars fully. She knows that insulin requirements normally increase as pregnancy progresses, and we discuss appropriate changes in the insulin rates and formulas programmed in her insulin pump. She will continue checking her glucose levels seven to 10 times daily, and fax her glucose readings to us daily.

Elevated blood glucose is the leading preventable cause of birth defects. Fifty years ago some physicians recommended hysterectomy for their IDDM patients to avoid the high maternal and fetal mortality associated with pregnancy and diabetes. Since then research has shown that keeping blood glucose at low normal levels throughout pregnancy eliminates most of the risk. Today diabetes means that pregnancy should be preceded and accompanied by excellent diabetes management. Accordingly, we see pregnant women very frequently. Insulin needs may double or triple by the end of pregnancy.

Next I find myself in a scholarly discussion regarding pizza with a 40-year-old man with long-term Type 1 Diabetes on an insulin pump. He's noticed that the insulin dose he programs for pizza may work well at times, but sometimes his glucose levels still rise. We debate the relative caloric content of various commercial pizzas, consult a fast food nutrition guide, and consider how to evaluate cheese depth. He contends that when the cheese completely hides the pepperoni, he'll need half again as much insulin to handle it. We settle on programming his pump to deliver half the

mealtime insulin dose immediately before eating, and the remainder over two hours to handle the fat in the cheese.

A young woman on multiple insulin injections reports that her work schedule is about to change; instead of working a second shift she'll be working "swing shift" beginning next week. She'll rotate weekly among first, second and third shifts. The money is better, she says, but she needs help with scheduling her insulin.

People who work swing shifts typically lose their normal circadian rhythm of insulin sensitivity. A day-shift worker will usually require more insulin in the morning and less at night, because the body secretes several stress hormones in a 24-hour cycle. A swing shift means that stress hormone levels are likely to be higher at all hours of the day.

We discuss this. She'll take her long-acting bedtime insulin at her bedtime, regardless of what clock time it may be, and monitor blood glucose closely so we can make any needed changes in her meal doses for each portion of her shift cycle.

Controlling her diabetes will still be more difficult on her new schedule. Fortunately this type of work schedule seems to be fading from the American workplace.

Today the afternoon is busy, and I'm moving quickly between rooms. Pausing to check my glucose level returns a value of 74 mg/dl. This value is low normal, but if this pace continues I'll become hypoglycemic within the hour. I chew twelve dried cherries, which experience has taught me will raise my blood glucose by about 25 mg/dl.

Physical activity typically lowers the blood glucose and reduces insulin requirements, but this effect lasts only a few hours for isolated exercise. People who maintain an exercise program sufficient to increase their fitness level (usually three or more workouts weekly) maintain lower insulin requirements and have less rise in blood glucose after meals. For people wishing to lose weight by exercising, we assist them in reducing their doses of insulin or oral agents at the proper times; otherwise their exercise might cause hypoglycemia, requiring extra food and sabotaging potential weight loss.

People with diabetes must be ready to change their diabetes treatment because of other illnesses and stresses. Examples in today's schedule include a young child with nausea and diarrhea due to a virus who will require less insulin because he cannot keep food down. The stress of the illness can cause ketoacidosis unless blood glucose levels are monitored and corrected with small doses of insulin as needed.

An adolescent girl has begun menstruating, and her insulin needs are changing with her levels of female hormones.

An elderly man has been given a steroid injection for back pain, which is likely to increase his blood sugars for the next three days.

In all of these situations, the patients must make final decisions and treat themselves based upon their understanding of their own needs. Our recommendations work best when patients and families have received thorough diabetes education.

### **6:00 p.m.**

In the office: My own glucose returns at 92 mg/dl. I review patient calls, blood glucose reports, and confer with a diabetes educator and dietitian regarding their patient encounters.

Two patients are ready to begin insulin pump therapy. We calculate initial formulas for meal doses and correction of high blood glucose levels and create basal (baseline) insulin infusion schedules, which they will program into their pumps during education sessions. We'll work with them until they're expert at determining insulin doses for any situation.

### **7:30 p.m.**

Memorial consult rounds. A 52-year-old man with adult-onset diabetes discovered three years ago came to the emergency room with a sore throat and shortness of breath. Because many people with diabetes may not have chest pain with heart problems, he underwent cardiac screening and several coronary arteries showed blockages. He'll have surgery tomorrow, and tonight I order intravenous insulin to bring his sugar into the normal range before the surgery. Aggressive management of glucose levels reduces surgical risk and postoperative infections.

### **9:00 p.m.**

Sandwich, sprouts and cheese: 6.0 unit bolus. Glucose is 118; 0.6 units correction bolus. 10 units pramlintide. Family (and computer) time.

### **Midnight**

Glucose 125, but anticipating a slight fall in the fourth hour after dinner. I would not be able to sleep without knowing my blood glucose level and correcting with food or insulin to prevent my glucose from dropping to dangerous levels during the night. But the satisfaction from making these efforts is a fine soporific.

*Dr Huffman attended North Carolina State University and received his BS in Chemistry and Biology in 1977 and a MS in Biochemistry in 1979. He received his MD from the University of North Carolina at Chapel Hill in 1982, and completed his Medical Externship in Medical Service at John Umstead Hospital in Butner North Carolina in 1983. His Internal Medicine Internship, Residency, and Fellowship were completed at Baylor Affiliated Hospitals in Houston TX, and in 1989 he moved to Chattanooga TN, with his wife Dr. Terry Melvin. He was diagnosed with Type 1 Diabetes at the age of 12.*