

affinity columns in biochemical experiments and be used to isolate insulin receptors. On the other hand, circulating complexed insulin is always assumed to be biologically active. Vaughan et al.¹ suggest that the antibody might serve as a reservoir for the liberation of free insulin and be beneficial, although Bolli et al.² note that the delay in recovery from hypoglycemia might also be due to free insulin released from insulin-antibody binding. It may be that the patient we reported was unique and had widely disparate circulating binding activities that contributed to the hyperglycemia and hypoglycemia. It may also be that insulin bound to her low-affinity antibody maintained biologic activity. We were not successful in our first attempt at developing an in vitro assay for evaluating the biologic activity of the bound insulin. We were able to measure biologic activity in the patient herself.

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Insulin Wastage

On reading the article entitled "Insulin Wastage in Ambulant Practice," which appeared in the July-August issue of *DIABETES CARE*,¹ I was struck with amazement and incredulity. The authors compared the amount of insulin purchased by insulin-dependent diabetic patients over the course of 2 yr with the amount they should have used based on their recommended dosage. They found an excess of the amount purchased over the amount prescribed, which they termed "wastage." The authors discuss a variety of reasons for this "wastage" focusing entirely on the type of syringe used, and the technique of insulin withdrawal from the vial.

The amazement and incredulity derive from the apparent belief of the authors that the subjects never deliberately deviated from the prescribed amount of insulin. As both an insulin-dependent diabetic person and a psychologist, it seems obvious to me that most people could not possibly follow exactly, over the course of 2 yr, the rigid regimen prescribed for diabetic individuals. This is certainly true with regard to diet.² Deviations in the direction of undereating are not significant since the penalty (insulin reaction) forces a remediation. But deviations in the direction of overeating are

often compensated for by the administration of extra insulin. Thus, I would urge the authors to consider that the "wastage" they discovered may in part be due to their subjects "covering" additional food. I call this the "chocolate cake factor."

I also caution that acknowledgment of this behavior might be difficult to obtain without guarantees of anonymity. The medical profession reacts with such disapprobation to such admissions on the part of patients, that patients are loath to disillusion the professionals.

After years of being a diabetic patient and encountering a variety of diabetologists, I continue to be amazed at the idealism of these professionals. An assumption seems to be made that patients will do whatever is prescribed, regardless of its rigor or interminability. The reality is that diabetic patients are also people with habits and needs who are vulnerable to many more influences and pressures than this one aspect of their lives, however important this condition may be. Isn't it time that professionals recognize this truth and deal with their patients/subjects in a realistic rather than an idealistic manner?

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Insulin Wastage: A Reply

We fully agree with Dr. Damaser's statement that a realistic attitude rather than an idealistic one is the best basis for our role as advisors to diabetic patients. During diabetic summer camps we have had the opportunity to share the daily life of young adult diabetic patients, which has helped us to gain some insight into what insulin-dependent diabetic patients can do and can be motivated to do. Adjustments of life-style to a diabetic regimen are particularly complicated for young people. One minor aspect of this is the difficulty to abstain from extra carbohydrate, the so called "chocolate cake factor."

However, the calculations from our study (*DIABETES CARE* 1984; 7:343-46), based on a practical test of insulin withdrawal carried out by 101 patients, show that technical factors rather than taking extra insulin account for most of the discrepancy between purchased and injected insulin, i.e., the "insulin wastage." The daily wastage was found to be 16.9 U of insulin (U40). Using a syringe with a separate needle (large dead space) and adjusting the insulin dose by injecting surplus insulin into the air leads to a daily measured loss of 11.6 U of U40 insulin for patients on a two-dose regimen. The figure