Complexity of Risks and Benefits

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Readers familiar with this journal have seen us cover a variety of clinical topics related to diabetes over the years. Although we have gone to significant efforts to stress the importance of diabetes care beyond glucose control, it is not surprising that a common theme of this journal has been the benefits of glucose control across settings and populations. From the benefits of inpatient glucose control (p. 3) to preconception care of woman with type 2 diabetes, (p. 10), this theme is again highlighted in this issue.

Yet good clinicians understand that costs frequently accompany benefits of care. When speaking to a medical student who was simultaneously earning her Masters in Business Administration degree, I likened the benefits of health care (with glucose control, those benefits include reductions in microvascular complications) to a "top-line" evaluation. It is essential, however, to have a "bottom-line" evaluation as well. Bottom-line evaluations would involve subtracting the costs (with glucose control, those costs may

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include hypoglycemia and weight gain) from the benefits to arrive at the net benefit, or cost, to patients. Even when we assign dollars values to human experiences, this is remarkably difficult.

In this issue of *Clinical Diabetes* (p. 36), Michael J. Fowler, MD, reviews hypoglycemia as part of our *Diabetes Foundation* series for physicians in training. Whether it is understanding the mechanisms underlying hypoglycemic events or prevention of future events, Fowler provides a nice synopsis for caregivers who are looking to better grasp this exceedingly undesirable consequence of glucose control.

Although more prevalent in individuals with type 1 diabetes who pursue rigorous glucose control, this consequence of diabetes control may be found across the spectrum of individuals with diabetes. Hypoglycemic events present as a spectrum of patient experiences that range from a simple jittery feeling to complete loss of consciousness with seizures. Rarely do I get a more visceral response from patients than when they describe a "bad low." Most, if not all, *hate* the loss of control that can accompany such events and the sense of being "off" for hours after one occurs.

In my practice, a desire to avoid hypoglycemia is a common reason my insulin-using patients fail to achieve glycemic targets that we had a priori decided were desirable. It is not surprising that many new pharmaceuticals for glycemic control no longer pursue an advantage in reducing glucose but a reduction in the frequency of hypoglycemia.

It can be challenging to get a handle on the bottom line when pursuing a strategy of ameliorating glucose control. Fortunately, many recent advances make the decision less gray than it may initially appear. The likelihood of hypoglycemia has been reduced with newer medications so that a more modern approach to glycemic control is likely to yield fewer events. Advances in our understanding of basic physiology have yielded a more prudent approach to preventing events, especially in the setting of a recent hypoglycemic event. A more structured assessment of patients' recognition of hypoglycemia allows us to formulate different glycemic goals for those with diminished hypoglycemic awareness. Finally, proper education on the effects of nutrition and physical activity are absolutely essential. Too often, we provide this information only in the context of how poor nutrition and inactivity lead to hyperglycemia, and we fail to provide the other side of the story, thinking that it will be intuitive. It is not.

When I was a young physician, a philosophy professor with a more than 20-year history of type 1 diabetes explained to me why he would not pursue a strategy of intensified glucose control. After explaining to me that parts of the Declaration of Independence were "lifted" from the English philosopher John Locke, he proceeded to provide a perspective on our "unalienable rights." The famous "life, liberty, and the pursuit of happiness" were not equal to him. He could not, would not, tolerate the loss of liberty that hypoglycemia wrought. He would rather have the complications, or even loss of life, that can result from hyperglycemia. When I countered that blindness, dialysis, and amputations are also associated with loss of liberty, he wondered how I could value a distant outcome in a comparable manner to a present-day event.

We settled on an A1C in the mid-7s.