

*What Is the Value of "Control"?*

Physicians are divided on the value of attempts to achieve an approximation of normal glucose metabolism in the hope that this will influence the development or progression of the late complications. (It is symptomatic of the state of the field that measures to modify other demonstrable abnormalities, such as hyperlipoproteinemias, have received minimal consideration.) Much of the present controversy over the value of "control" is nonsense. The players in this philosophical sport are trapped by the definitions and unstated assumptions that constitute the rules of this game. In the treatment of adult-onset diabetics, convenience is the overriding consideration in the minds of most physicians, which may be understandable since the value of treatment in asymptomatic patients is disputed. The effort and expense required to achieve and to document an approximation of normal blood glucose concentrations throughout the day preclude this type of treatment for most patients. None of the reported clinical trials designed to evaluate the value of "control" has made a serious attempt to achieve normalization of blood glucose fluctuations. The frequency with which this goal can be achieved in a large population of adult-onset diabetics by presently available means has never been evaluated. In essence we have been subjected to a heated dispute over the value of a form of therapy that is only rarely attempted and even more rarely achieved.

Recent studies suggest that fluctuations in the blood glucose concentration in nondiabetic subjects on a normal diet are restricted to a relatively narrow range. However, when evaluating blood glucose concentrations in adult-onset diabetics, physicians almost invariably apply arbitrary standards that bear little relationship to the levels observed in nondiabetics. In addition, it is commonly assumed that if there were a relationship between the blood glucose level and the pathological processes responsible for complications, it should be apparent from comparisons of groups of patients who have had persistently differing degrees of *abnormal* blood glucose levels. Although the basis of this belief is difficult to perceive, it is rarely questioned. A blood glucose concentration that fluctuates between 110 mg. per cent and 180 mg. per cent in a 39 year old man throughout the day cannot be considered normal, even though most physicians would consider this good or excellent "control."

One of the undisputed aspects of the recent reports of the University Group Diabetes Program (UGDP)<sup>1,2</sup> is the record of the quality of "control" achieved in adult-onset diabetics treated in university medical centers by a variety of therapeutic regimens, most of which are similar to those now commonly employed. None of the treatment groups in the UGDP study had a normal fasting blood glucose at any time during the initial four plus years of the study. Diurnal fluctuations in blood glucose on the patients' usual diet and with their usual physical activity were not assessed. However, at regular intervals the patients were given a 50-gm. oral glucose load one half hour after their morning medication, and the blood glucose was determined one hour later. Although the *lowest* mean blood glucose level at one hour was observed in the patients treated with adjusted insulin dosages, even in this group the mean one-hour value was in excess of 200 mg. per cent in more than half the tests during the initial four plus