

Abstract Submitted
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Exercise, Insulin Absorption Rates, and Artificial Pancreas Control SPENCER FRANK, Univ of California - Berkeley, LING HINSHAW, RITA BASU, ANANDA BASU, Division of Endocrinology, Mayo Clinic, ANDREW J. SZERI, Univ of California - Berkeley — Type 1 Diabetes is characterized by an inability of a person to endogenously produce the hormone insulin. Because of this, insulin must be injected – usually subcutaneously. The size of the injected dose and the rate at which the dose reaches the circulatory system have a profound effect on the ability to control glucose excursions, and therefore control of diabetes. However, insulin absorption rates via subcutaneous injection are variable and depend on a number of factors including tissue perfusion, physical activity (vasodilation, increased capillary throughput), and other tissue geometric and physical properties. Exercise may also have a sizeable effect on the rate of insulin absorption, which can potentially lead to dangerous glucose levels. Insulin-dosing algorithms, as implemented in an artificial pancreas controller, should account accurately for absorption rate variability and exercise effects on insulin absorption. The aforementioned factors affecting insulin absorption will be discussed within the context of both fluid mechanics and data driven modeling approaches.

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