Algorithm for Diabetes Management and Control

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BACKGROUND

With the increase of diabetes around the globe, the need for automated and accurate administration of insulin to patients with type 1 diabetes is also increasing. Continuous glucose monitoring (CGM) systems track blood sugar levels by using a small sensor inserted under the skin to provide real-time glucose readings, trends, and alerts. The CGM market is expected to grow, as the number of people diagnosed with type 1 diabetes continues to rise. Safe and efficient software for CGM and artificial pancreas systems is crucial for the success of this field.

DESCRIPTION

Researchers at the University of California, Santa Barbara have developed several technologies that optimize the process of managing blood glucose and administering insulin. These technologies comprise control algorithms for use in artificial pancreas devices. The algorithms respond to continuous glucose measurements to keep the patient's glucose at a safe level automatically, without manual intervention.

Strategy for Adaptive Tuning of a Zone-Based Model Predictive Control (MPC)

UC Case No. 2016-315

MPC performance depends on the accuracy of the prediction models implemented for the controller. However, current model predictions of glucose concentration are unreliable. This adaptive strategy for monitoring accurate glucose predictions provides safe and effective glucose management and results in a significant reduction of hypoglycemia events. The strategy showed better glucose control than the conservative counterpart, while producing less hypoglycemic episodes. No abnormal insulin delivery profiles were observed upon the application of the adaptive strategy. Learn more.

Fully Automatic Control Strategy for Insulin Delivery

UC Case No. 2013-384

A crucial element of any fully automated artificial pancreas is a strategy to perform safe and effective insulin dosing. This innovative MPC strategy prevents nocturnal hypoglycemic events using an artificial pancreas. The advantage of this MPC is that it employs periodic time-dependent target zones and insulin input constraints. This allows the safe operation of glycaemia controllers while the patient is sleeping and not able to intake glucose in the event of a

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OTHER INFORMATION

KEYWORDS

indpharma, diabetes, insulin, blood sugar, blood glucose, Artificial Pancreas, health monitoring

CATEGORIZED AS

- Medical
  - Other

RELATED CASES

2016-315-0

hypoglycemic risk. Learn more.

ADVANTAGES

- Enables automatic glucose regulation
- Reduces hypoglycemic events
- Provides better glucose control
- Allows glucose control while patients are asleep

APPLICATIONS

- Diabetes management

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,878,964	12/29/2020	2016-315

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