T1D SIMULATOR

• Time-varying T1D subject model

• Diabetic therapy parameters

• Simulated glucose & insulin time courses

• CGM & SMBG models

• In silico population

• In silico population

BACKGROUND AND AIM

Since its acceptance by the U.S. Food and Drug Administration in 2008, the UVA/Padova Type 1 Diabetes (T1D) Simulator has been extensively used for in silico testing of several diabetes treatments, such as Artificial Pancreas controllers, novel insulin compounds and continuous glucose monitoring sensors. A new version of the simulator has been recently developed in order to mimic diurnal glucose variability of T1D subjects, and to be up-to-date with the latest technological advances in insulin delivery and glucose measuring systems. Here we present the new features with respect to the previous simulator version (release. 2013 [1]).

RESULTS

REFERENCES

BACKGROUND AND AIM

The new T1D simulator is equipped with a population of 300 in silico subjects (100 adults, 100 adolescents and 100 children, respectively). In silico subjects have been generated by randomly extracting different realizations of the parameter vector from appropriate joint parameter distributions, and using the same criteria described in [1]. Each in silico subject is equipped with parameters defining diabetic therapy:

• daily pattern of time-varying basal insulin rate, to compensate subject’s intra-day variability of insulin sensitivity and dawn phenomenon

• total daily insulin (TDI) and correction factor (CF), determined as in [1]

The University of Virginia/Padova
Type 1 Diabetes Simulator Goes Single Day

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CONCLUSION

The new version of the UVA/Padova T1D simulator extends the domain of validity of the simulator from “single-meal” to “single-day multiple-meal” scenarios. Such a tool, capable to well resemble T1D subjects in real life, provides a valid framework for the in silico testing of several novel diabetes treatments, e.g. adaptive artificial pancreas prototypes, smart sensors, and new insulin molecules.

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