SKABELON
Foredragskonkurrence

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Forfatter/Kontakt person: Ulrike Pielmeier
Adresse: Center for Model-based Medical Decision Support (MMDS), Aalborg University, Fredrik-
         Bajers-Vej 7, E4-215, 9220 Aalborg
Tlf. nr.: 9635-7458
E-mail: upiel@hst.aau.dk

Skriv abstrakt i testruden: Alle forfattere skal anføres; foredragsholderen skal understreges, max 200 ord:

Ulrike Pielmeier[1], Steen Andreassen[1], J. Geoffrey Chase[2], Pernille Haure[3], Geoffrey M. Shaw[4]

[1]Center for Model-based Medical Decision Support, Aalborg Universitet
[2]Center for Bio-Engineering, Canterbury University, Christchurch, NZ
[3]Neuro- and Trauma Intensive Care Unit, Aalborg Hospital
[4]Dept of Intensive Care Medicine, Christchurch Hospital, Christchurch, NZ

REGULATION OF BLOOD SUGAR IN INTENSIVE CARE PATIENTS

High blood sugar levels are frequent in intensive care patients, resulting in higher mortality and morbidity, and longer stay. GlucoSafe, a computer decision support system, is developed to assist clinicians in regulating blood sugar. The system uses a physiological model of sugar metabolism, including insulin production and action, and intestinal uptake of nutrients. However, efficacy will depend on how accurately it can predict future blood glucose levels (BG) after a glycemic control intervention, based on previously measured BG values.

1-10 hour forward predictions were made using GlucoSafe (GS) and a clinically tested model (CC) from New Zealand for 11 hyperglycemic patients, 6 from New Zealand and 5 from Denmark. As expected, relative RMS prediction error increases with prediction interval for both models and cohorts. Fig. 1 shows similar predictive power for GS and CC up to 3-5 hours. GS outperforms CC for predictions beyond 5 hours. A CC-based protocol has been successfully applied for glycemic control in Christchurch. Therefore, GlucoSafe is expected to be a safe, effective tool for blood sugar regulation in intensive care.
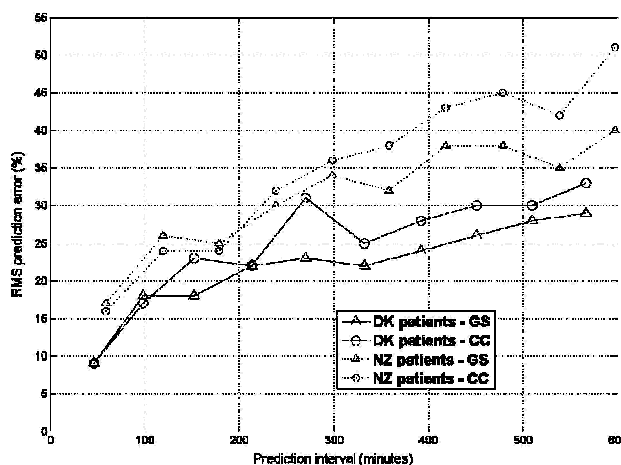
Fig. 1: RMS glucose prediction error (%) vs. prediction interval.