

SYSTEM DYNAMICS MODELS FOR CLINICAL ANESTHESIA (ON THE EXAMPLE OF PROPOFOL)

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Introduction

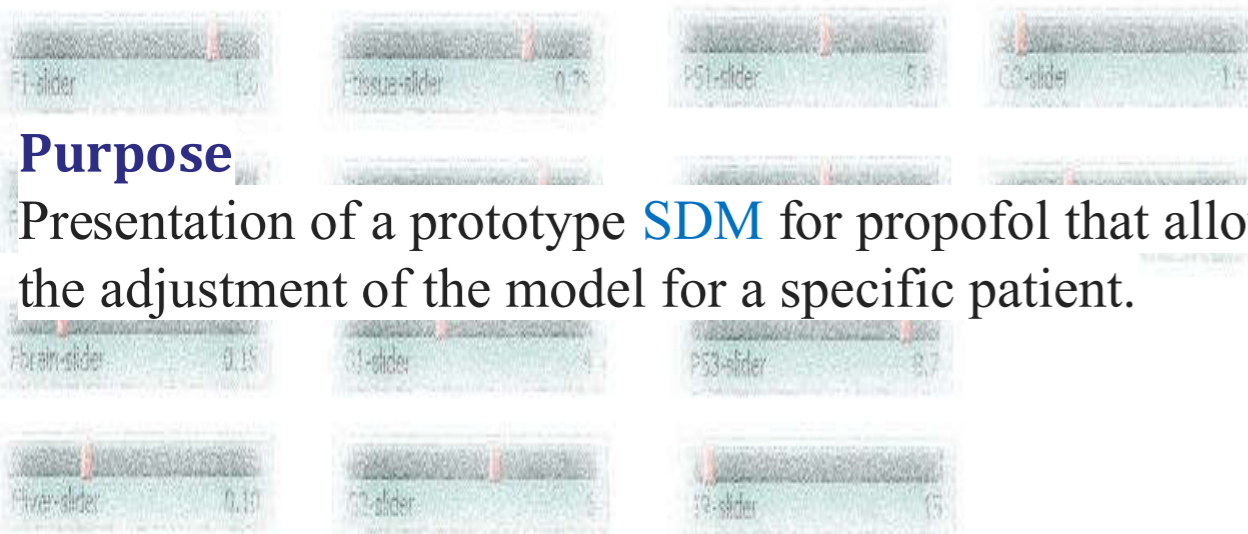
Systemic dynamics models (SDMs) describing the pharmacokinetics and pharmacodynamics of the anesthetic have been used for some time. Most of these models are standard models, which, at best, can be adjusted to a specific clinical case/patient only partially. In a clinical setting there is a need for more “personalized” models.

Keywords

general intravenous anesthesia, propofol, dynamic systemic model, customized model

Purpose

Presentation of a prototype SDM for propofol that allows the adjustment of the model for a specific patient.

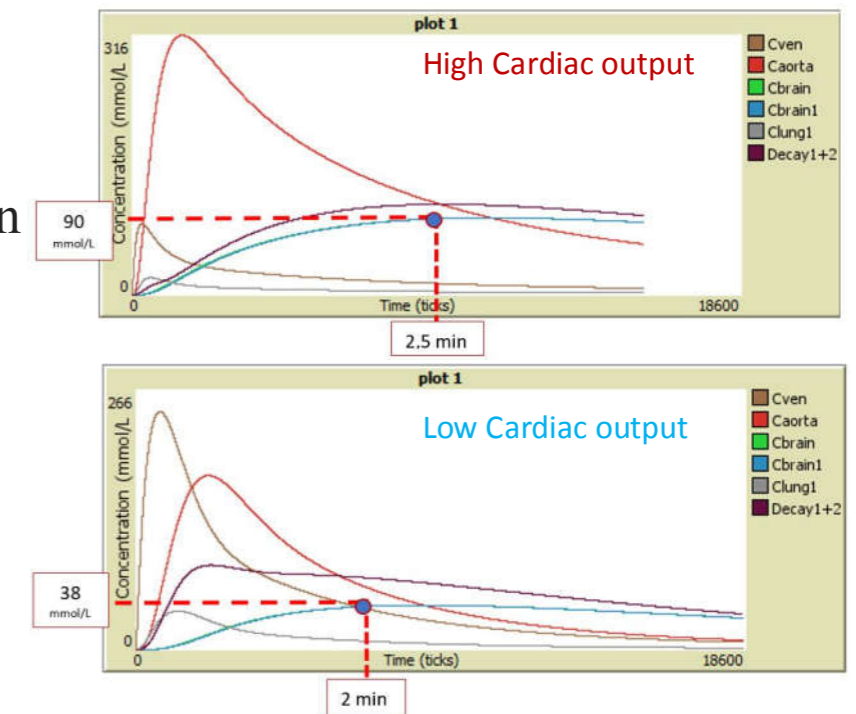


Material and methods

The NetLogo programming language and standard data on the pharmacokinetics and pharmacodynamics of propofol is used to create MSDs.

Results

Using the NetLogo programming language, an SDM was created that allows personalization of the model for a specific patient, using patient data (body mass, height, heart rate, etc.). This can facilitate the choice of optimal dose of propofol (continuous bolus and infusion) for the patient.



Conclusions

The proposed model after its clinical calibration can improve the management of intravenous anesthesia with propofol in a specific patient by customizing the model for that patient.