

## About TIVAManager

TIVAManager is the professional tool for anesthesiologist. The app contains information about pharmacological properties of intravenous medications which usually used to provide general anesthesia during surgery. The app may be used not only during total intravenous anesthesia (TIVA) but in combination with volatile anesthetics.

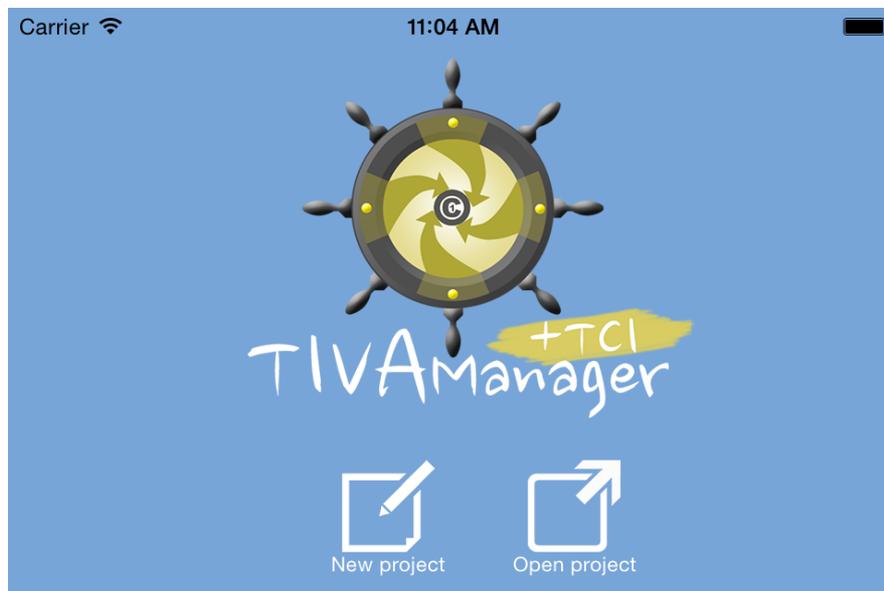
User can calculate current drug concentration in blood plasma ( $C_p$ ) and effect site concentration ( $C_e$ ) and also its dynamics after bolus or during infusion the drug. Due to proper usage the app anesthesiologists is able to maintain stable deep of anesthesia during surgery and to forecast awakening of its patient.

But concentration value does not mean a level of deep of anesthesia. In the app most of drugs have green zone of optimal drug plasma concentration. But the level of target concentration should be selected by anesthesiologist. We strongly recommend to use feedback like EEG-derivative monitors, TOF and stress indexes to assess level of nociception and antinociception protection of the patient.

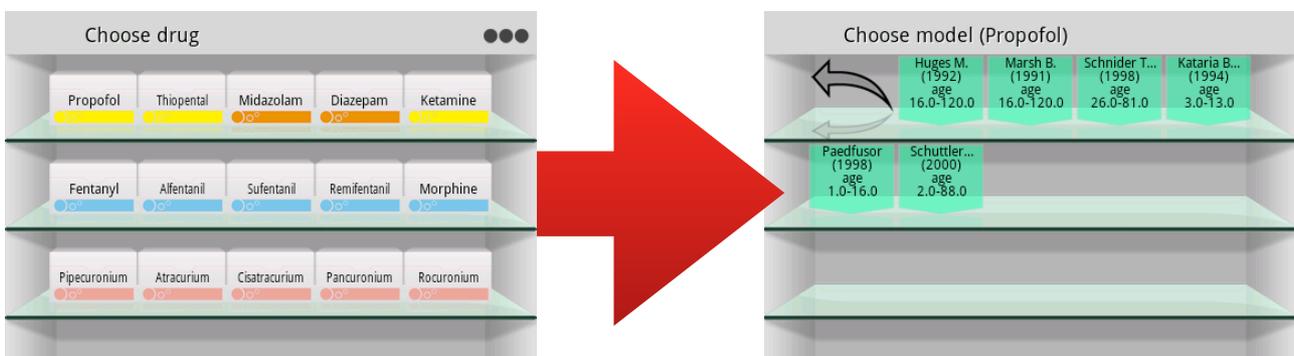
TIVAManager contains large database of pharmacological models (PK/PD models) of drugs for IV anesthesia. Each model is based on blood tests of specific group of patients. So each model works most correctly only with patient which parameters (age, height, weight, gender) are the same as group of patients in a research. Some models use only one parameter like weight to calculate a drug concentration in blood plasma. But most of them use two or more parameters of a patient. It is important not only for practical usage of the app but also in scientific purposes. Additional information of PK/PD-models you can find in on web-site ANAESTHSOFTWARE.

## Lets start...

A new case of an anesthesia is a new project in TIVAManager. After launch the app you can create a New project or Open previously saved project.



After selection the New project button you will see the next screen - **Drugs Menu**. On this screen you can add medications (IV anesthetics and NMBA) to your project. Choose a drug, then a PK/PD-model of the selected drug. Each model named as an author of it and year of publication of an article with model's parameters. The labels of PK/PD-models contains also age of the patient's group in a research.



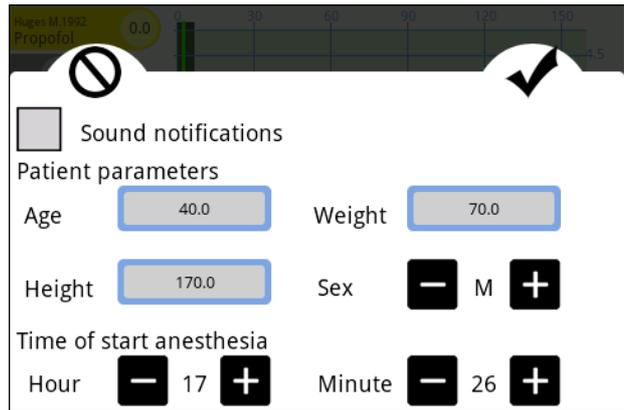
## Patient parameters

In this window you can set up weight, height, age and sex of your patient. It makes the app able to calculate correct concentrations of selected drugs.

You can set up a time of start anesthesia. It's useful if you have no time to run the app before emergency surgery but you want to calculate current blood plasma concentration of drugs.

You can also retrospectively calculate drug concentration after completed surgery to assess quality of an anesthesia.

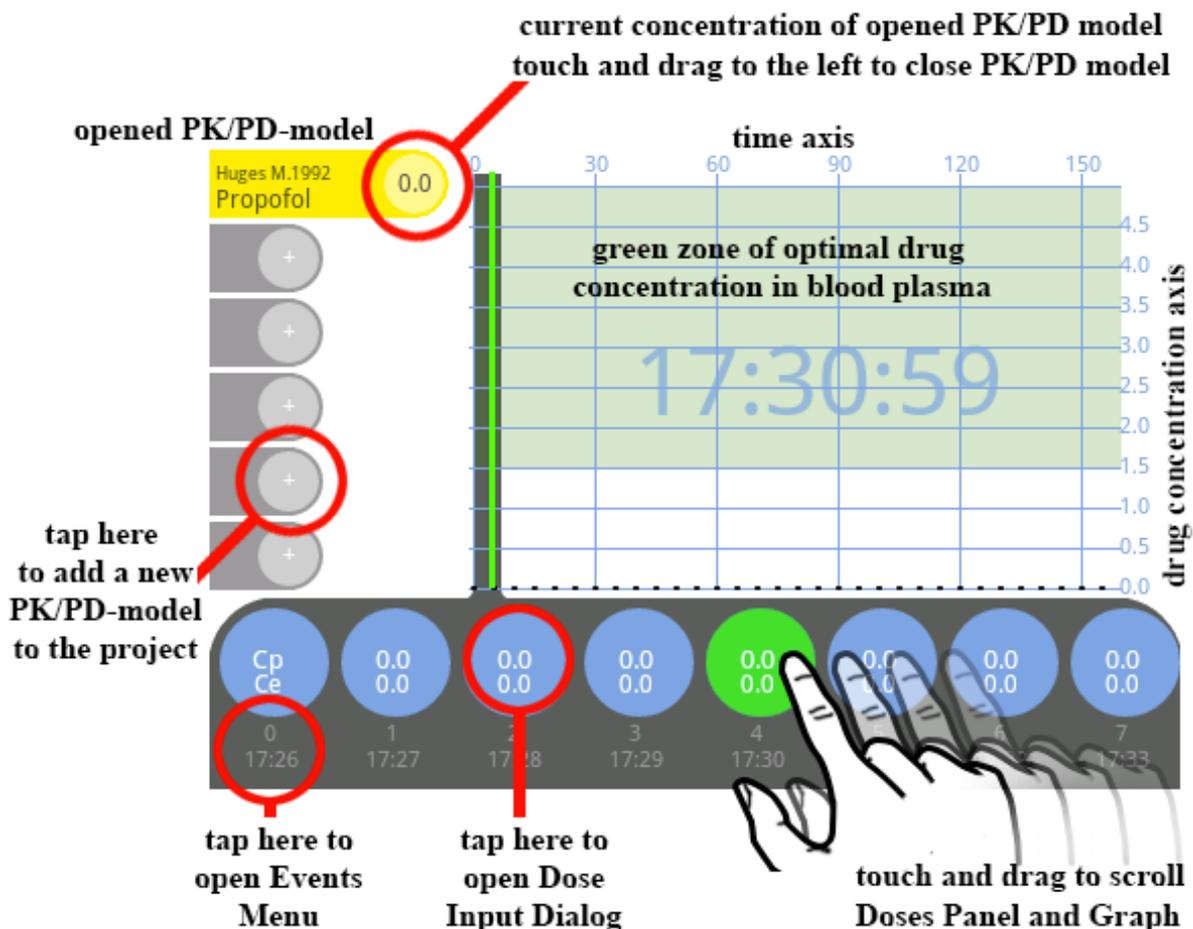
In this window you can switch on/off sound notifications of changes infusion rates and boluses online during surgery.



## Main Screen

Workspace of the Main Screen contains:

1) area with headers of opened PK/PD models with current drug concentrations of selected drugs and notifications. This area allows managing PK/PD-models in your project. To add PK/PD-model tap grey



round button with +. To delete model touch on concentration label in the header of the current drug and slide to the left of device's screen.

2) graph area with concentration curve in the top and the right of the screen.

3) panel with bolus doses, infusion rates and concentrations (concentration in blood plasma - Cp and site-effect concentration - Ce) in the bottom of the screen. In this area you can enter bolus doses and infusion rates, assess concentrations of the drug. Green big circle is the Current Minute. To enter bolus, infusion rate or target concentration in **Dose Input Dialog** you should enter a value and then tap on suitable button.



There are additional buttons on Main Screen in TIVAManager for iOS



Main Menu



Input parameters



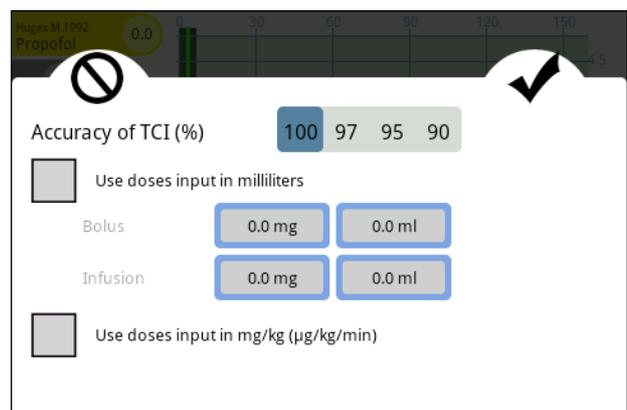
Navigation Screen

## Accuracy of TCI

Function Accuracy of TCI is presented in **Input parameters** window. This function is created to make anesthesiologist's work with combination TIVAManager and infusion pump more comfortably. Less accuracy (90-95%) enlarges time between manual changing infusion rates on infusion pumps.

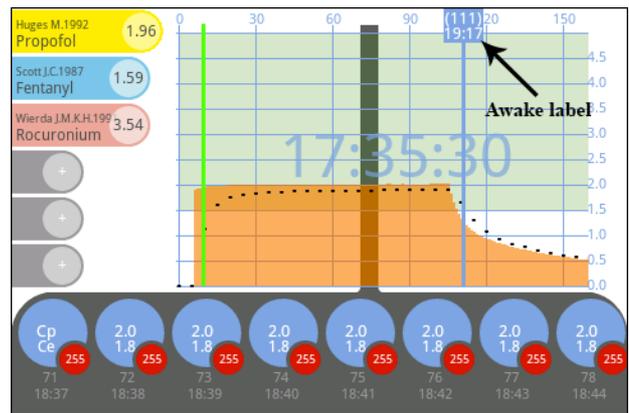
## Input parameters

If you want to enter bolus doses and infusion rates not only in mg (mcg) and mg/h (mcg/h) you can change it to ml and ml/h or mg/kg (mcg/kg) and mg/kg/min (mcg/kg/min). Open main menu and select **Input parameters** or tap suitable button (iOS).



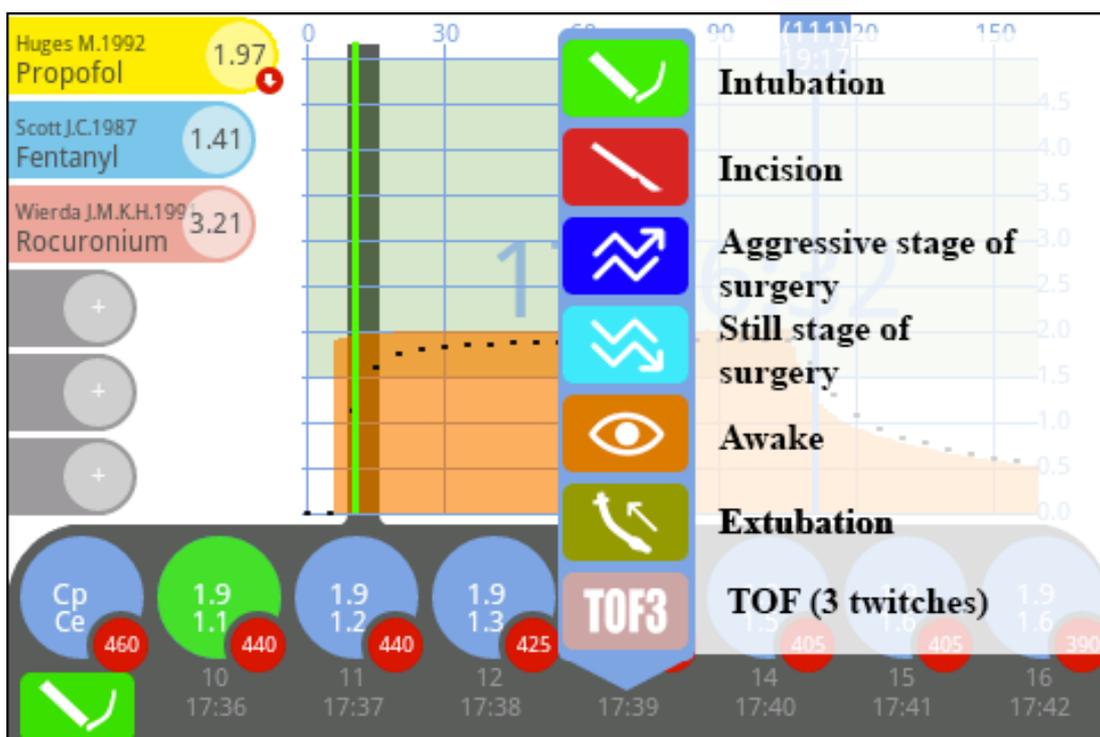
## Predicted patient awake

If you want to wake up your patient at specific minute tap required minute on panel with doses and set up the target concentration as zero. The app automatically calculates a moment to stop infusion of selected drugs. If it's not possible TIVAManager shows possible predicted awake time.



## Events...

Every minute you can mark the event. It's useful to restore in memory all reasons for changes boluses, infusion rates and drug concentrations. Tap the time line on the bottom of the screen and select the event in showed menu to mark the event. You can unmark the minute: tap the event in the bottom of the screen, then tap any area out of the event's menu. All Events are presented on the picture below. There are Intubation, Incision, Aggressive and Still stages of a surgery, patients Awake, Extubation and 3 twitches of TOF.



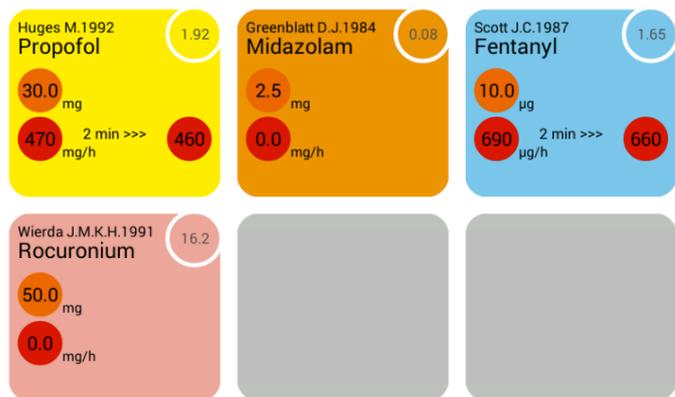
## Notifications

On headers of PK/PD-models you can see blinking circles. It means that you should change infusion rate on your pump (red circle) or/and make a bolus (orange circle) to follow your anesthesia plan. Tap on the header of PK/PD-model to mute sound beep (it sound notifications is switched on) and hide notifications for selected model for a current minute.



## Navigation screen

You can tap back button (Android) or Navigation Screen button (iOS) to show this screen. The screen shows current drug concentration in blood plasma, current and next bolus doses and infusion rates and also VTBI for current infusion rate. Navigation screen works like notifications: new boluses and changes infusion rates are blinking with beep sound. Tap the screen to switch off blinking and sound for a current minute.



# **ANAESTHSOFTWARE**

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