

# MMTIVA PC Version User Manual

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Terms and Disclaimer revised: October 21, 2026

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## Introduction

This software is a PC-based development of the Android MMTIVA created in 2016 by Yohei Tozen (formerly Nakajima) with Kenichi Masui (Yokohama City University Graduate School of Medicine, Department of Anesthesiology).

**By using this software, you are deemed to have agreed to the following Terms of Use and Disclaimer.**

## Terms of Use

MMTIVA (the Software) is intended for education, research, and proof of concept.

The Software must not be used to determine doses for actual patients, manage anesthesia, control TCI pumps, or make diagnostic or treatment decisions.

Please also consult the terms published on the Microsoft Store product page for the conditions governing use and redistribution.

## Research Use

Before using the Software for research, contact [y.tozen@t-tech.tokyo](mailto:y.tozen@t-tech.tokyo). Collaborative research is required in principle. In some cases, acknowledging the use of MMTIVA in a presentation may be sufficient. Please confirm the applicable conditions before starting the research.

## Disclaimer

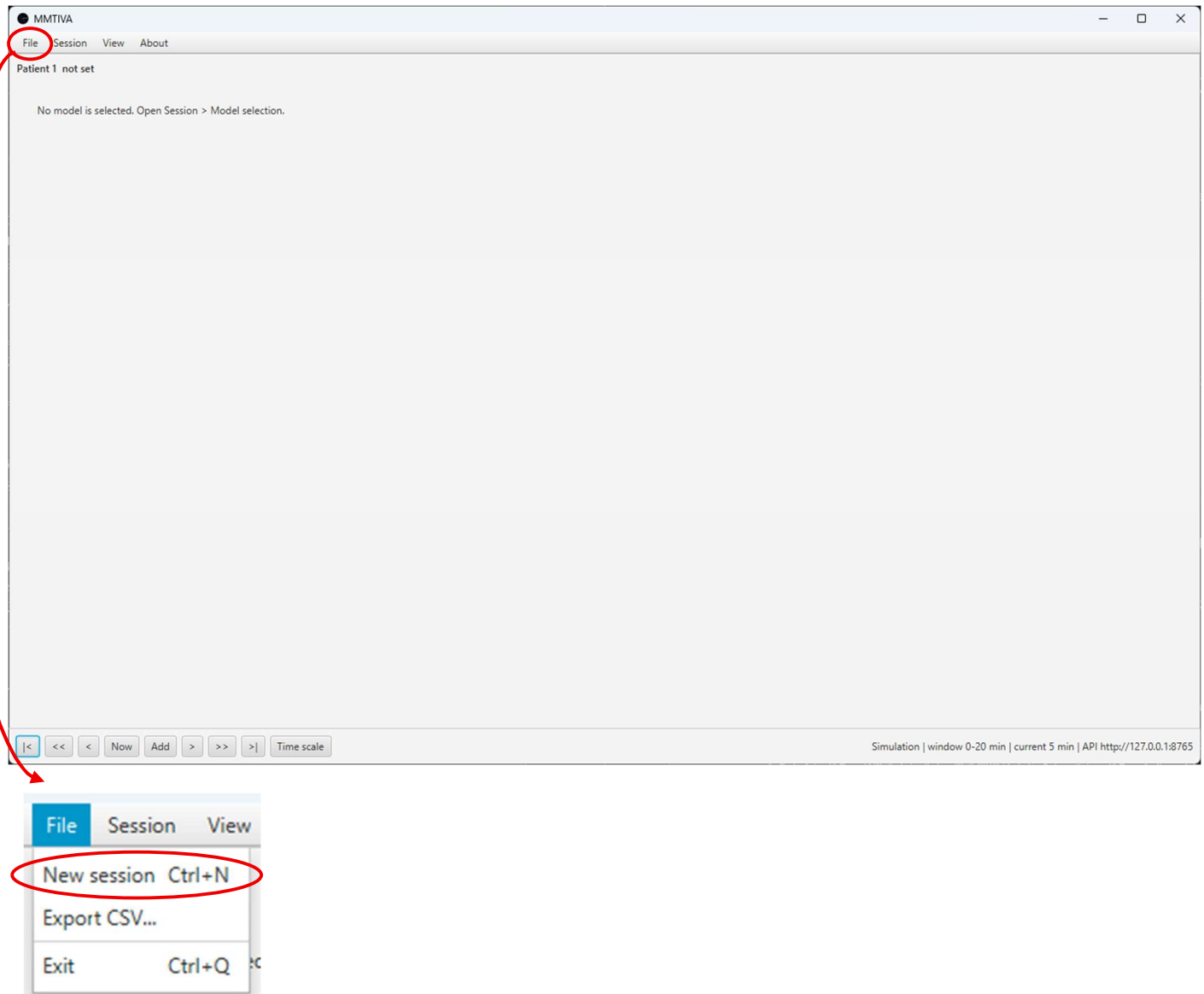
The Software is intended for education, research, and proof of concept. It is not intended for medical decision-making or decisions about the administration of medication to patients.

Users are responsible for using the Software at their own risk and exercising their own judgment. T-tech Co., Ltd. accepts no liability for any damage resulting from use of the Software.

Distribution: [Microsoft Store - MMTIVA](#)

## [Software Operation]

At first launch, the following screen is displayed.



Start a new session via File -> New Session or by pressing Ctrl+N.

### 1. Patient Data Entry Screen

**Patient data**

Patient 1

① Sex

Age years

② Age months

Weight kg

Height cm

Optional characteristics

Liver dysfunction ☐  
(for Remimazolam Eleveld models)

Serum Creatinine  mg/dL : CrCL 87.5 ml/min  
(for Remimazolam Eleveld ESRD, Lidocaine, and Rocuronium Kleijn models)

ASA PS  $\geq$  III ☐  
(for Remimazolam Masui model)

Asian ☐  
(for Rocuronium Kleijn model)

① Enter or select sex, age, weight, and height.

② Optional Characteristics: detailed patient information specified as model-specific parameters can be applied.

To display and compare two patients, check Use Patient2 and enter the information in the same way.  
Press OK to proceed to the model selection screen.

## 2. Drug Model Selection Screen

Up to four models can be selected for each drug.

Model selection

☒ Age Filter ☐ Realtime mode Basal time 10 : 41

Propofol ① ☐ TCI

☐ Marsh original  
☐ Marsh modified  
☐ Schnider  
☐ Continez  
☐ Short (not available for Patient 1 age)  
☐ Kataria (not available for Patient 1 age)

☒ Age Filter ☐ Realtime mode Basal time 10 : 41

Age Filter: age filter On/Off

If the entered patient age is outside a model's range, that model is filtered out and cannot be selected.

Realtime mode: select whether to run a real-time simulation and set the simulation start time.

① TCI checkbox: enables drug selection in Ce target TCI mode.

Propofol ☒ TCI

☐ ☐ Model

☐ ☐ o.Marsh  
☐ ☐ m.Marsh  
☐ ☐ Schnider  
☐ ☐ Continez  
☐ ☐ Short (not available for Patient 1 age)  
☐ ☐ Kataria (not available for Patient 1 age)  
☐ ☐ Paedfusor (not available for Patient 1 age)  
☐ ☐ Eleveld(arterial)  
☐ ☐ Eleveld(opiates auto)

TCI simulation is a PC-only function. When enabled, select one base model for TCI calculation (syringe column) and the models to display using the dose time series calculated from it (eye column). Only models that calculate  $C_e$  can be used as the TCI base. In TCI mode, the administration screen changes slightly (see below).

Model-specific notes are listed below.

- Remimazolam

Options are provided to display Eleveld model-based BIS and MOAA/S on the graph.

- Rocuronium

Selecting a model automatically enables Sugammadex administration settings.

Only Kleijn-family models display TOF ratio with concentration.

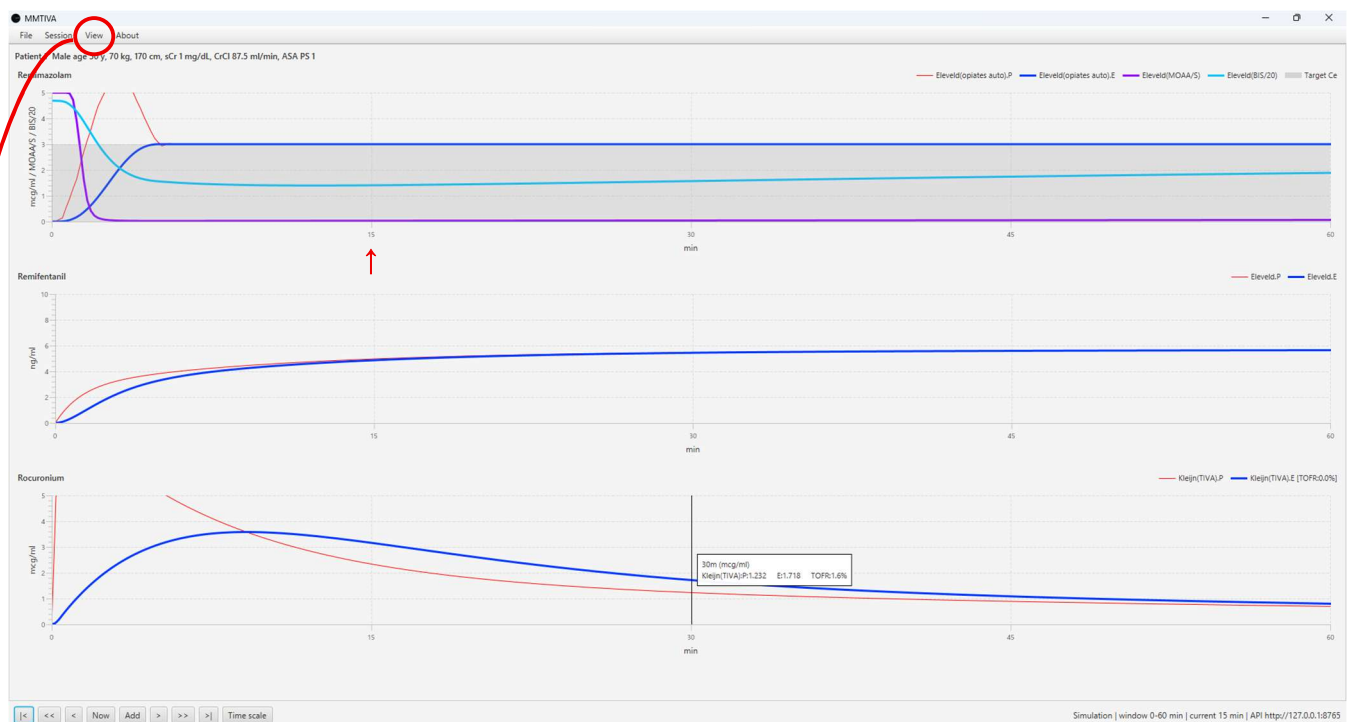
In TCI, Sugammadex administration automatically ends TCI; it cannot be restarted thereafter.

- Lidocaine

For Lidocaine,  $C_p$  for the metabolites MEGX/GX is displayed together with  $C_p$  for Lidocaine itself.

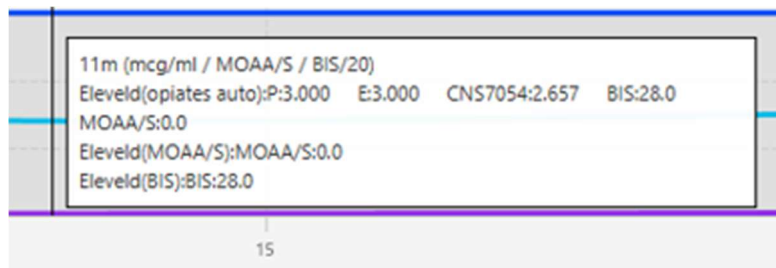
After selecting the drug models, press OK to start the simulation.

### 3. Simulation Screen



The screen differs slightly between simulation mode and real-time mode. This section uses the simulation mode screen.

In real-time mode, the graph updates every minute so that the second vertical axis from the left (↑) indicates the current time.



When the cursor is placed on the graph, the drug concentration at that time is shown in a dialog. Clicking in this state opens the drug addition screen with that drug and time already set.



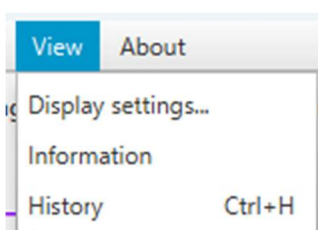
①②③⑦⑧⑨: move along the time axis (horizontal axis)

④ Now: returns to the current time in real-time mode.

⑤ Add: opens the drug administration screen.

⑥ Undo: cancels the most recent administration. History can also delete administration records.

⑩ Time scale: selects the horizontal-axis time scale. It can also be changed in sequence with the Space key.

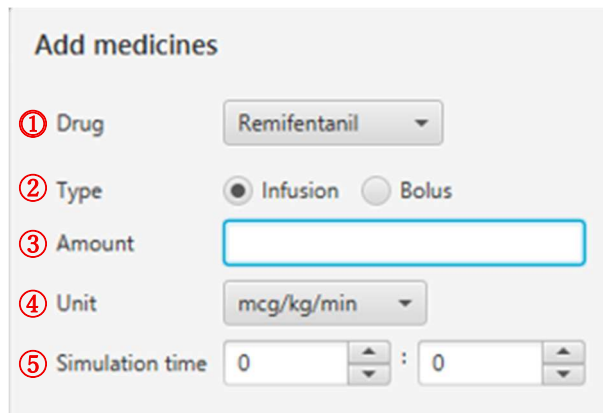


Display Settings: select show/hide for each drug's plasma and effect-site concentrations.

History: administration history. You can edit or delete records from this screen.

Information: displays patient and drug model information.

#### 4. Add Drug Administration Information Screen

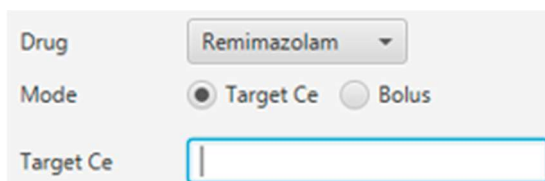


① Drug: select the administered drug

② Type:

Select infusion or bolus administration.

In TCI mode, select target effect-site concentration or bolus as shown below.



Bolus administration is also available in TCI mode; the simulation is recalculated from it.

③ Amount: enter the dose

To stop infusion or TCI, set the dose to 0 and enter the administration at the planned end time.

④ Unit: select the unit

You can select whether the unit is per kg. This cannot be changed on the target Ce entry screen.

⑤ time: select the administration time. If opened from the graph area, that time is applied automatically.

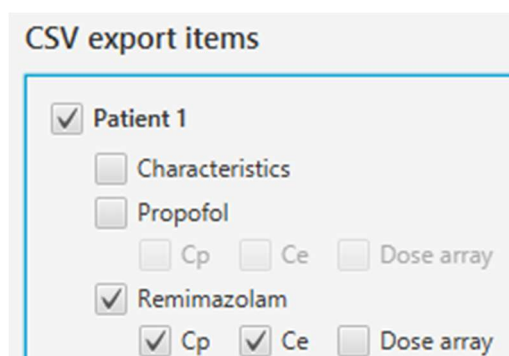
After setting the items above, press OK or Enter to complete drug administration.

#### 5. Subsequent Launch Screen

On subsequent launches, the previous simulation resumes automatically.

To start a new session, select File -> New Session.

#### 6. CSV Export



Simulation results can be exported as CSV from File -> Export csv.

You can select and output the simulation settings and each drug's Cp/Ce/dose-array time series.

## 7. Local Server Communication

When the Software starts, it launches a local server at

Base URL: <http://127.0.0.1:8765>

From this base URL, the following information can be obtained in real time using C/Python/HTTP clients.

### - Input

- Add drug administration information (infusion/bolus/target Ce)

### - Output

- Retrieve current concentrations

- Retrieve the entire simulation result

- Retrieve the drug administration time series in TCI

For details of this function, refer to the dedicated manual.