

# Preliminary results of data mining in BIS guided Propofol-Remifentanil TCI Anaesthesia

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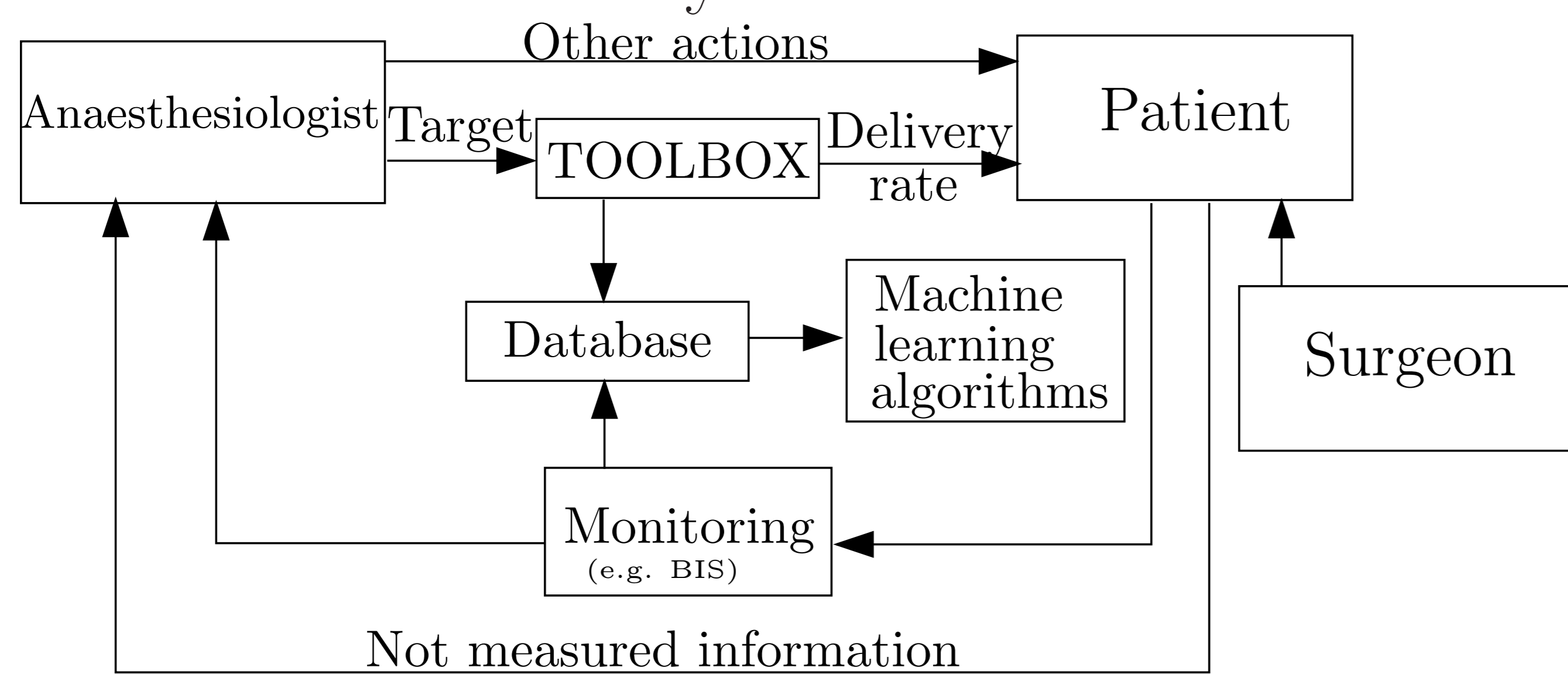
## Background and Goal of Study:

TOOLBOX is a software system [1] which allows the storage of BIS guided TCI anaesthesia in a database. The purpose of the study was to analyse the TOOLBOX record files to compare how the anaesthetists titrate the hypnotic and analgesic components of a total intravenous anaesthesia technique according to the phases and types of surgery.

## Materials and Methods:

The archive files of 34 patients undergoing thyroid surgery and 29 patients undergoing cardiac surgery were imported in a MySQL database. A BIS monitor (XP2000, Aspect Medical) was used to estimate the depth of the hypnosis. The anaesthesias were guided by Propofol-Remifentanil effect site TCI anaesthesia technique implemented in the TOOLBOX software. The analyzes used the statistical language R (<http://www.r-project.org/>).

The following figure shows the data collection procedure used for this study:



The software stores the 'Ce' target of the drugs and some hemodynamic parameters. A machine learning module is used to support the extraction of knowledge from data.

## Results and Discussions:

Before surgery			
	Thyroid surgery	Cardiac surgery	P value
Mean Ce Propofol	2.8 ± 0.9	1.3 ± 0.6	< 0.05
Mean Ce Remifenta	3.1 ± 1.6	2.6 ± 1.4	> 0.05
Mean BIS	40.7 ± 15	56.3 ± 14	< 0.05
%BIS ∈ [40, 60]	31.6	48.7	
%BIS < 40	58.6	10.5	
%BIS > 60	9.8	40.8	

During surgery			
	Thyroid surgery	Cardiac surgery	P value
Mean Ce Propofol	2.6 ± 0.5	1.4 ± 0.4	< 0.05
Mean Ce Remifenta	5.8 ± 1.9	5.3 ± 1.7	> 0.05
Mean BIS	39.3 ± 8.8	45.8 ± 9	< 0.05
%BIS ∈ [40, 60]	38.1	66.6	
%BIS < 40	59.2	25.3	
%BIS > 60	2.6	8.1	

Where 'Ce' is defined as the target effect site concentration and '%BIS' is defined as the percentage of time of BIS values within the range.

We found a statistical difference for mean Ce Propofol and for mean of BIS values between thyroid and cardiac surgery before surgery and during surgery .

## Conclusion(s):

When using a Propofol-Remifentanil effect site TCI anaesthesia technique, the analysis of the anaesthetists' behaviour shows that they administer the same Remifentanil Ce target concentrations during either thyroid or cardiac surgery. This study shows also that they targeted higher Propofol Ce and tolerated lower mean BIS values in ASA 1-2 patients undergoing thyroid surgery compared to ASA 3 patients undergoing cardiac surgery.

## References

[1] F. Cantraine and E. Coussaert. The first object oriented monitor for intravenous anesthesia. *PubMed - indexed for MEDLINE*, 16:3-10, 2000.