

## Automatic control of general anesthesia: new clinical developments and experiments

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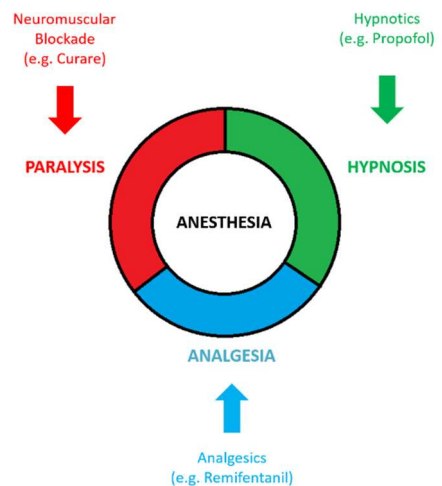
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### Background

General anesthesia is a key aspect of invasive surgical procedures, it provides three main effects on the patient: loss of consciousness (hypnosis), suppression of pain sensation (analgesia) and blockage of neuromuscular activity (paralysis). These effects are obtained by means of specific drugs which are administered by the anesthesiologist according to pharmacological models and clinical responses of the patient. Developments in monitoring techniques have resulted in quantitative indicators of the patient's anesthetic status which can be used as feedback signals for automatic drug administration.

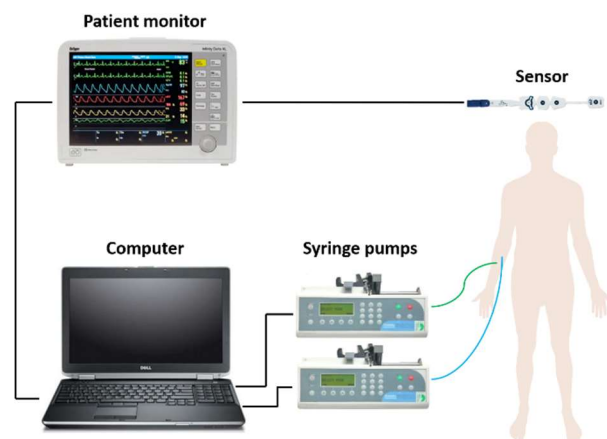


### Objectives

The objective of the research consists in the design, implementation and clinical validation of a closed-loop control system for the automatic administration of anesthetic drugs during general anesthesia.

### Methodologies

A computer that runs the control algorithm closes the control loop by reading the patient's biological signals from the monitor and automatically adjusting the infusion rates of the drugs by driving the syringe pumps in order to obtain and maintain an optimal anesthetic state.



### Expected Results and Impact

- Reduction of the anesthesiologist's workload, avoiding errors due to fatigue and distractions and consequently increasing patient safety.
- Improve the quality of anesthesia by providing a personalized drug infusion and consequently obtaining a reduction of side effects and a better post-operative recovery.
- Development of innovative control strategies.