



## Steven L. Shafer, MD

Emeritus Faculty-Med Ctr Line, Miscellaneous

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### Bio

#### BIO

My professional interests are data modeling, the clinical pharmacology of intravenous anesthetic drugs, and publication policy and ethics. Since March I have been modeling the COVID-19 pandemic. The R code is freely available at <https://github.com/StevenLShafer/COVID19/>. My daily updates are distributed by e-mail. Those interested in receiving the updates are welcome to contact me at [steven.shafer@stanford.edu](mailto:steven.shafer@stanford.edu).

My work in pharmacology includes studies of many of the intravenous opioids and hypnotics used in anesthetic practice. My focus has been mathematical models that characterize drug behavior. These range from conventional pharmacokinetic and pharmacodynamic models, inverse models (used to drive target controlled infusion systems), Bayesian models (used to handle model uncertainty), models of drug interaction, and models of receptor function that help elucidate mechanisms of drug action. My most recent work has explored whether neural networks offer any benefits over the standard engineering models used in pharmacokinetics and pharmacodynamics.

I have worked to bring these models to clinicians, investigators, and trainees. Thirty years ago I placed the program STANPUMP ("STANford infusion PUMP") in the public domain. STANPUMP was an open source software platform for Target Controlled Infusions of anesthetic drugs, as well as the pharmacokinetic engine for most, and perhaps all, commercialized TCI systems worldwide. More recently I have developed stanpumpR, an R implementation of pharmacokinetic algorithms for many of the common perioperative drugs. stanpumpR can be accessed at [www.stanpumpR.io](http://www.stanpumpR.io). The source code for stanpumpR is available at [www.github.com/stevenlshafer/stanpumpR](http://www.github.com/stevenlshafer/stanpumpR).

My work in publication policy and ethics follows my 10 years as Editor-in-Chief of Anesthesia & Analgesia. From 2006-2016 we uncovered two of the most prolific serial academic fraudsters in history: Joachim Boldt and Yoshitaka Fujii. I finished my term as EIC with the unenviable record of retracting more papers for research fraud than any previous editor of any journal, ever. This led to a lasting interest in publication policy and ethics. In collaboration with others I continue to develop statistical models to detect fraud, and serve on multiple editorial boards to offer guidance on publication policy and ethics.

I developed an interest in the role of clinical pharmacology to criminal law following my testimony on behalf of the State of California in the trial of Conrad Murray for the death of Michael Jackson. I continue to provide pro bono testimony in criminal cases involving anesthetic drugs.