



## Community Spotlight

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### Pain Medication Treatment Modeling Project By Ricardo Cortez

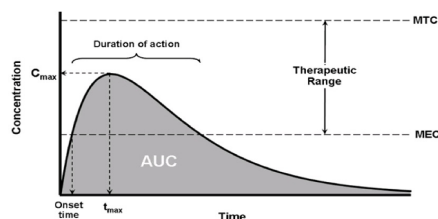


Image source:

The role of pharmacokinetics and pharmacodynamics in phosphodiesterase-5 inhibitor therapy

N Mehrotra, M Gupta, A Kovar & B Meibohm

*International Journal of Impotence Research* 19, 253–264 (2007)

#### Module Description:

Using techniques developed in first-semester calculus, students have an opportunity to model the concentration of pain medication in a patient's bloodstream, in order to determine a dosage regimen that maintains levels between the minimum effective concentration and the maximum tolerance concentration. The project calls on students to establish modeling assumptions, develop a basic model, implement the model in the context of various dosage patterns, interpret the results, and formulate a preliminary recommendation. The project then calls on students to check the validity of the model and subsequently refine the model (and their recommendations) under revised assumptions.

#### Teaching Setting:

This project has been tested in the classroom, and is suitable for high school or undergraduate students who have studied a semester of calculus.

#### Citation:

Cortez, R. (2018). [Pain Medication Treatment Modeling Project](#). [Math Modeling Hub](#), QUBES Educational Resources. [doi:10.25334/Q4WH77](https://doi.org/10.25334/Q4WH77)

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## Related Materials and Opportunities:

This resource was created by members of the [Math Modeling Hub \(MMHub\)](#). MMHub is an online community and resource repository for the teaching and learning of mathematical modeling at all grade levels. It is being collaboratively organized by COMAP, NCTM, and SIAM - three substantial mathematics professional societies with interests in modeling education. Check out their recently [redesigned site](#), browse other [MMHub resources](#), which are designed for pre-K through graduate students, or visit their [Getting Started page](#) to learn how you can get involved.

Stay tuned for more material of this type by the team of the [MODULE\(S<sup>2</sup>\)](#) project, which creates curriculum materials that provide undergraduate mathematics instructors with ways to offer opportunities for prospective teachers to develop mathematical knowledge for teaching (MKT) while they learn content in university algebra, geometry, modeling and statistics courses. The materials are designed to be taught with equity-based teaching practices, including going deep with mathematics and affirming mathematics learners' identities.

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