PopPK and Bayesian Review

### “Population pharmacokinetics and Bayesian estimation of cyclosporine in a Tunisian population of hematopoietic stem cell transplant recipient”

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| Eljebari, Hanene, et al. "Population pharmacokinetics and Bayesian estimation of cyclosporine in a Tunisian population of hematopoietic stem cell transplant recipient." *European journal of clinical pharmacology* 68.11 (2012): 1517-1524. |
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### Mentions “therapeutic drug monitoring” in the first line of the abstract

*“Population pharmacokinetics (PopPK) modeling and Bayesian estimation seem to be the best way to predict cyclosporine disposition and dose requirements to achieve the therapeutic target in an individual patient”*

* Uses NONMEM for estimation. Mention using “two compartment model with first-order absorption and *a lag time*…”.
* Mention using “nonlinear regression analysis” – doesn’t specifically mention using Bayes to model the pharmacokinetics.
* Mention that covariates were “entered in the model using a linear model”. Not really sure what that means.
* They add a “random effect” in the following way

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Here, theta is a PK parameter and eta is a parameter for interperson variability. This is similar to how I would have approached this. Authors write “where θi is the typical value of the parameter and ηθi is the associated interindividual variability parameter with mean and variance ω2.”

* Model fit assessed with “NONMEM’s objective function value using the likelihood ratio test and by visual examination of the plots”.
* “Bayesian estimation” only appears when talking about estimating AUC from sparse data. Leads me to believe pharmacokinetic model is not Bayesian.