

How do you determine the right medicine dosage for a child?

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What's the right dosage of medication for children? Assistant professor Elke Krekels and her colleagues discovered that for some medicines, you can determine this quite simply. On 13 April Krekels received the TOP-

Publication award during the annual spring meeting of the Dutch Society for Clinical Pharmacology and Biopharmacy.

With medicines, proper dosage is crucial. You cannot always give a child the same quantity as an adult. But for a lot of medicines, the best dosage for a child has never been investigated. "For a long time, people thought it was unethical to "experiment" with children," says Krekels. "As a result, we don't always know what dose is safe and effective. In fact, every treatment became an experiment." Since the beginning of this century it has been compulsory to test new drugs also for their effect on children.

For medicines that were already on the market, doctors now often determine the right dose for a child based on experience. "Our research group at the Leiden Academic Center for Drug Research is now looking at how we can develop better guidelines for this," says Krekels. "We are doing this with special computer models."

Why weight-based dosing does not always work

Using these models, Krekels and her colleagues investigated a common dosing method in which [body weight](#) is used as the guiding principle. If a child weighs half as much as an adult, they are also given half the adult dose," explains Krekels. This method is nice and easy, but we now know that the physical differences between adults and children are much more complex than a difference in weight alone. Think, for example, of the size and blood flow of organs such as the liver and kidneys and the maturation of enzymes in these organs. All these processes develop at different rates. And they all affect the breakdown of the drug.

Sometimes, however, a simple calculation suffices. Krekels: "We have investigated when this is the case. So in those cases, we don't have to go to great lengths to determine the dose."

Appreciation for theoretical principles

Krekels gives special credit to her former Ph.D. student Elisa Calvier. "With her thesis, she laid an important foundation for this publication. Elisa was the first to apply the existing theory in this new way. She wrote a few thousand lines of computer code for the implementation."

Krekels often works closely with doctors to create models. That was not the case here. The prize-winning publication is based entirely on theoretical principles and computer simulations. Krekels: "I think it is nice to see that an association such as the NVKF&B, which focuses on [clinical research](#), expresses its appreciation for [theoretical research](#) in this way."

More information: Elke H.J. Krekels et al. Children Are Not Small Adults, but Can We Treat Them As Such?, *CPT: Pharmacometrics & Systems Pharmacology* (2019). [DOI: 10.1002/psp4.12366](https://doi.org/10.1002/psp4.12366)

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