

# DosePerfect

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## Project Overview:

Medication dosing mistakes can occur in over 17% of hospitalized children<sup>1</sup>, unfortunately contributing to negative medical outcomes. Improving dosage calculations will save children's lives. DosePerfect is a web based software that reduce potential sources of error while also increasing convenience.

## Design and Requirements:

DosePerfect is a dosing calculator intended to be as simple to use update and maintain as possible. This web application is required provide correct dosages for commonly used medications when given a pediatric patient's weight and age and also provide sizing information for commonly used medical equipment. The software should be accessible through a web browser, but must also support a deployment on a local network with no dependency on the internet.

When the user enters the application, a patient data input automatically appears, allowing the user to enter the weight and age of a patient. After that data is entered, all medications and equipment shown are presented with the correct dosage or size for the current patient. Once dosages for a new patient are needed, the user selects a "new case" button, and enters in a new weight and age. Dosages for different patients are never available at the same time, removing a potential dosage error source.

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<sup>1</sup> Medication dosing errors in pediatric patients treated by emergency medical services: John D Hoyle, Alan T Davis, Kevin K Putman, Jeff A Trytko, William D Fales  
PMID: 21999707 DOI: 10.3109/10903127.2011.614043

### **Website Front End:**

DosePerfect front-end was developed using ReactJS, Bootstrap and Material UI. DosePerfect will be used by medical professionals, so the web application is designed to be as simple as possible both to use, and to update in the future.

### **Website Back End:**

DosePerfect is a self-contained application that will not require an internet connection to function when being used in a local network deployment. No user data is stored or collected, and all functionality is handled locally. Only non-critical functions use external servers, such as the feedback and error reporting functionality.

### **Testing:**

We conducted two rounds of testing with 10 testers each time. Testers evaluated the availability, reliability, accuracy, overall design, and functionality of DosePerfect.

Overall, we received significant feedback from the first round of testing about the design and some functionality such as checking the validity of weight and age combinations in addition to user interface issues such as adaptation to various screen size, especially in small phone screens. We fixed the problems that addressed in the first-round testing and were able to confirm with testers that all issues were resolved. Additionally, tester comments helped make visual changes resulting in a more professional final product.

### **Future Improvements:**

DosePerfect is functional, and ready for web server deployment with the addition of a small additional number of medications for which we are currently missing full dosing data. As the project was developed using react, converting DosePerfect to an android or iOS application would be a simple project using react-native. This would potentially further improve ease of deployment, as no network at all would be required.