

# Improving Drugs Administration Safety in Pediatric Resuscitation Using Mobile Technology

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**Abstract.** The fast preparation of drugs during pediatric resuscitation is of utmost importance. The influence of the patient's weight on the drug doses requires to perform complex calculations and is a source of errors. A technological solution could be a real help in avoiding these kinds of mistakes. Relying on a user centered approach we have developed an application supporting drug preparation. It has been tested in simulations with predefined scenario. The developed tool consists of a screen displaying a list of drug that can be administered. When the user select a drug, the instructions regarding its preparation are displayed with all dosage precisely calculated. The tool has demonstrated a significant reduction of errors associated to administration, a speeding up the overall process and has been well received by the nurses.

## 1. Introduction

In pediatric emergency department critical situations where a patient's life is at risk may require fast preparation and administration of drugs. If some of these administrations are straightforward, other drugs require complex dosage computations that are dependent of the speed of infusion as well as the weight of the patient. Due to the stress of resuscitation and the infrequent practice of such complex calculation, errors and delays can happen [1, 2]. To assist caregivers in drugs preparation, caregivers currently use paper support such as double entry tables. The problem of this kind of support is the cognitive effort induced by the search of relevant information as well as the complicated calculations that have been to do without making any mistakes.

A technological solution could be a real help in avoiding these kinds of mistakes. We present here, the creation and evaluation of an application relieving caregivers of cumbersome calculations.

## 2. Methods

The product development followed a user centered design methodology where cycles of user requirement, prototyping development and validation stages were performed to provide a tool that fits to the specific constraints linked to resuscitation.

The evaluation of the usability consisted of nurses performing in simulations. The caregivers were requested to use the tool to perform the drug preparation and administration. At the end of the simulation the caregivers were interviewed to discover the strength and weakness of the proposed solution.

## 3. Results

The developed solution consist of a tablet application running both on android and IOS where the nurses can enter the weight of the patient. The application propose then a list of drugs that can be administered to the patient. When the user select a drug all the preparation step and the dosage adapted to the patient weight are displayed (Figure 1).

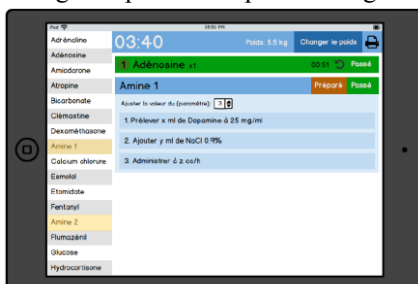


Figure 1 View of the application

The evaluation revealed a significant reduction of errors linked to drug administration and a reduction of time for the preparation of the drug. The tool received also a very good welcome from the nurses that have tested it.

## 4. Discussion

Dedicated mobile application have the opportunity to facilitate nurse's work even in stressful situations. The application aims both to improve efficiency and safety of the drugs administration process. The tool will provide a clear view on the ongoing medication plan and provide the necessary instructions that will relieve the caregiver of cumbersome calculations.

## References

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- [2] Wright K. Do calculation errors by nurses cause medication errors in clinical practice? A literature review *Nurse Education Today* 30(1) 2010 85-97