Chapter 14
A Multiplatform Decision Support Tool in Neonatology and Pediatric Care

Tiago Guimarães
Universidade do Minho, Portugal

Simão Frutuoso
Centro Hospitalar do Porto, Portugal

Ana Coimbra
Universidade do Minho, Portugal

António Abelha
Universidade do Minho, Portugal

ABSTRACT

As regards the dosage of drug, children are a much more vulnerable population than the adults. With this in mind it is extremely important the administration of the correct dosage. For this purpose, it was develop a framework, based on a prototype already tested in a real environment, with the main concern to help pediatricians in their daily tasks. Thus, this framework includes tools that can help in the preparation of Total Parenteral Nutrition prescriptions, table pediatric and neonatal emergency drugs, medical scales of morbidity and mortality, anthropometry percentiles (weight, length/height, head circumference and BMI), utilities for supporting medical decision on the treatment of neonatal jaundice and anemia and other calculators. This paper presents the architecture, their functionalities and a SWOT analysis of the solution proposed.

DOI: 10.4018/978-1-4666-9882-6.ch014

INTRODUCTION

The paediatric and neonatal patients are the most vulnerable population in respect to drug administration. Therefore, a dosage error can leave serious consequences and even be fatal. As it can be seen in Literature, 8% of the medication errors are from paediatric specialty, this may happen because to determine the medication dosages for each paediatrics patients the paediatricians have to take in count several factors, such as patient age, body weight, and in some cases body surface. The constant calculations and the numerous times that healthcare professionals have to check tables, may delay the medical consultation and also makes human error more likely to happen in the overly execution of those tasks. (Kaushal, et al., 2001; Rosse, et al., 2009)

The automation of these tasks available through an e-health and a m-health application will aim to make the professional life easier, saving their time, reducing the human error risks during calculations and improving the quality of healthcare delivery.

Artificial Intelligence in Medicine (AIM) appear with the need of introducing computers into medical practice for aid the physicians decisions using Artificial Intelligence based medical diagnostic reasoning, making possible to solve complex decision models in real time. Nowadays it is more common to describe them as clinical decision support systems (CDSS) instead of AIM systems. However this first CDSS generation was often inaccurate or irrelevant due to the fact that these systems were not integrated with other computerized systems making it impossible to support hospital operation and patient data management. (Zheng, 2010; Coiera, 2003)

The CDSS are computer based information systems that are interactive, flexible and adaptable, developed with the purpose of improving decision-making processes, providing this way to the physicians and other individuals with knowledge and specific, individualized information, intelligently filtered and presented at appropriate times. An example of a commonly used CDSS is the laboratory systems that generate alerts for abnormal values. (Zheng, 2010; Ramnarayan & Britto, 2002)

The most precious resource in a medical practice is clinical time, this is extremely limited, a physician in a medical consultation have to examine the patient, review historical data, make decisions, document new findings and prescribe treatments and drugs if necessary, with all this the CDSS could not be a distraction, or occupy more time than usual to perform all these tasks. Furthermore a CDSS should help the physicians by reducing the wasted time in useless things and reducing the time to perform a simple task, for example finding the patient historical data or even in the calculation of the drug dosages. (Zheng, 2010)